PHARMACEUTICAL JOURNAL

AND

TRANSACTIONS.

SECOND SERIES.

VOLUME VIII.

1866–67.

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THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. VIII.—No. I.—JULY, 1866.

THE MEDICAL COUNCIL AND THE PHARMACOPŒIA.

We alluded briefly, in our last number, to some of the proceedings at the meetings of the Medical Council, but at the time of our going to press the sittings of the Council were not concluded, and only the first day's proceedings were reported. The arrangements for the publication of the new edition of the British Pharmacopœia were discussed at more than one sitting, and occupied a good deal of attention. The following report was presented by the Pharmacopœia Committee:—

"The Pharmacopœia Committee have to report that since the date of their last Report Messrs. Redwood and Warington have continued to be engaged in the duty assigned to them; and they have so far completed their work, that the whole of the matter, with the exception of the Appendix, is now in type. The Committee have reason to hope that the volume will be ready for circulation, in proof, amongst the members of Council, in three months from the present time. Under these circumstances the Committee beg leave to direct the attention of the Council to the resolution adopted at the meeting of last year (Minutes, vol. iii. p. 285) as follows:—

"'That it is desirable to have a proof copy of the new Pharmacopœia in the hands of the members of the General Medical Council at least one month before the meeting of the General Medical Council, at which the opinion of the Medical Council is to be given relative to its being published, in order to afford to each member of Council the opportunity of making such suggestions to the Committee as may appear desirable.'

"As the Committee anticipate that the work will be ready some considerable time before the next Ordinary General Meeting of the Council, the Committee would wish to receive such further directions as the Council may feel it necessary to give them on this subject. The Committee, before concluding their Report, desire, in reference to an impression which seems to prevail, that some unnecessary delay has taken place in the production of the Pharmacopœia, to assure the Council that no time has been spent in the work which was not necessary.

"The Committee beg to inform the Council that they have not hitherto had occasion to draw upon the fund placed at their disposal by order of the Council. (Minutes, vol. iii. p. 285.)

"*May* 21*st*, 1866." "R. Christison, Chairman."

The presentation of this report led to a long discussion, in which the question was raised by Dr. Apjohn, a member of the Pharmacopœia Committee, whether, in describing bodies of definite chemical composition, symbols and proportional numbers should be used. The Committee, after devoting much consideration to the subject, had decided to omit them, and were, no doubt, partly influenced in this decision by a memorial which had been addressed to them by the Chemical Society, as follows:—

"*To the President of the General Council of Medical Education and Registration.*

"Burlington House, 19th March, 1866.

"Sir,—The President and Council of the Chemical Society venture to call the attention of the Medical Council to the system of chemical notation adopted in the British Pharmacopœia; and, as they are informed that a new edition of that Pharmacopœia is in course of preparation, they entertain a hope that it may not be an inopportune moment to urge upon the Medical Council the desirableness of considering whether, in the forthcoming edition of the work, the use of chemical symbols could not be advantageously dispensed with altogether. In the few cases which may seem specially to call for the use of such formulæ, a percentage representation of the composition of the body would, it appears, supply all the necessary data.

"The grounds on which the President and Council of the Chemical Society have been induced to suggest this course are these:—

"The system of notation at present adopted in the British Pharmacopœia is constructed in conformity with views which are rapidly disappearing from chemical teaching in this country.

"The Pharmacopœia is necessarily the text-book on which the examinations of Students of Medicine and Pharmacy in Pharmaceutical Chemistry are based. It appears, therefore, extremely desirable that no work shall be put forth on official authority, such as that of the Medical Council, which shall be at variance with the views propounded by many of the most active experimental leaders and principal teachers of chemical science; or which shall oblige the teacher to adopt a double numerical system in his exposition of the facts of chemical science to his pupils,—a course which is always a source of embarrassment both to professor and learner.

"It is obvious that the adoption of a plan such as the one now suggested does not necessitate any expression of opinion on the part of the Medical Council upon a subject which is still under discussion. At the same time, it will relieve the Council from the inconvenience of appearing pledged to the maintenance of doctrines which are no longer believed to be correct by many of the most competent to form an opinion on the subject.

"The President and Council of the Chemical Society trust that the importance of the subject will sufficiently explain their anxiety to bring this matter under the consideration of the Medical Council.

"Wm. Allen Miller, President of the Chemical Society.

"*To Dr. Burrows.*"

Dr. Apjohn strongly advocated the use of symbols, and although favourable to the old system of notation he suggested, as a sort of compromise, that formulæ should be inserted representing the composition of bodies by the old, and also by the new method. This was opposed by all the other members of the Committee, but after some discussion the Council passed a resolution "That it be an instruction to the Pharmacopœia Committee to give for each therapeutic compound, of definite constitution, occurring in the forthcoming edition of the Pharmacopœia, two formulæ—the first being that in ordinary use at present, the second being one constructed in accordance with the more recent views of what is called the 'unitary system.'"

Another subject relating to the Pharmacopœia was introduced by a communication from the Metric Committee of the British Association for the Advancement of Science, as follows:—

"*To the General Council of Medical Education and Registration.*

"10, Farrar's Buildings, Temple, May, 1866.

"Gentlemen,—We are desired by the Metric Committee of the British Association for the Advancement of Science to seek your aid in promoting the practical adoption of the Metric Weights and Measures Act, passed in 1864, being the 27 & 28 Vict. c. 117, An Act to render permissive the use of Metric Weights and Measures in the United

Kingdom.' Although this law is of a permissive character only, yet it allows full scope for the extensive application of the new system, and we trust that every opportunity will be seized for resorting to it, with a view of putting an end to the manifold defects and inconveniences of the present practice.

"We understand, with pleasure, that such an opportunity now occurs for introducing the metric decimal system into Medicine and Pharmacy, since the British Pharmacopœia, published in January, 1864, is about to appear in a second edition. The objection formerly urged to the introduction of the metric system side by side with the imperial, in all the formulæ for the preparation of drugs and chemicals, that the metric weights and measures were not yet sanctioned by the Legislature, is now removed by the passing of the Act; and we hope, therefore, that your Council will give its sanction to the proposed useful addition.

"In submitting to you the desire of the Metric Committee of the British Association, that the knowledge of the Metric System may be promoted in Medicine and Pharmacy, we would only add that, for international purposes, and especially for the use of foreign practitioners, and of British chemists in foreign countries, the ready comparison of the imperial with the metric weights and measures will be of great practical value; and, moreover, will tend to give effect to a reform expected to be highly useful to this country, and of extensive influence in social and international intercourse.

"We have the honour to be, Gentlemen,
"Your obedient servants,
"JOHN BARING, F.R.S., LL.D.,
"Chairman of the Committee.
"JAMES YATES, M.A., F.R.S.,
"Member of the Committee."

With reference to this communication a resolution was passed, "That the General Medical Council are not prepared to adopt, in its full extent, the suggestion of the Metric Committee of the British Association, but the Council will direct that a complete comparative table of metric and imperial weights and measures, with instructions for their mutual conversion, shall be inserted in the forthcoming edition of the British Pharmacopœia."

THE RECENT PROSECUTIONS FOR SELLING METHYLATED SPIRIT WITHOUT LICENCE.

Many of our readers may be aware that a crusade is just now being carried on by the Board of Inland Revenue, against the unlicensed retailers of methylated spirit. In Bristol, Birmingham, Dewsbury, and other places, informations have been lodged and convictions obtained. In Bristol the informer asked for "Methylated spirit flavoured with peppermint;" at Dewsbury we find the spirit was sold under the name of "Concentrated Essence of Indian Brandee." The defence urged in the latter cases was, "*That the offence had been committed in ignorance of the pernicious nature of the article, the defendants having been given to understand that it was a capital remedy for coughs and other ailments. In each case the mitigated penalty of* £12. 10*s. was imposed.*"

Sydney Smith once said, that the public would never travel safely on railways until a bishop had been killed. We by no means desire to suggest the sacrifice of a member of the episcopal bench on the altar of railway directors—we doubt its efficacy—and merely mention it because there seems in it a similarity to the methylated spirit question. The Pharmaceutical Society, backed by the higher medical authorities in Pall Mall, has long tried in vain to check the use of this vile compound of spirit of wine and naphtha in the preparations of the Pharmacopœia; a compound admirably fitted for hat varnish and French polish, but utterly hateful to the human, and perhaps even the equine stomach. The public health was not of sufficient importance to move the Commissioners of Inland Revenue, it was not in their keeping; happily the public purse is, and when the tribute to that purse is lessened or endangered by the use of methylated "Brandee" or spirit of peppermint, they show a wonderful alacrity for the public good, which will go far, we hope, to abate the nuisance.

We have reason to believe that most stringent measures will be taken immediately to restrict the use of methylated spirit to the purposes for which it was originally intended; purposes in which the presence of naphtha is entirely unobjectionable, and cheap spirit a great boon to the consumer.

Not very long since, a method of purifying this spirit, by freeing it from naphtha, was patented; but an Act was last year passed to bring the workers of the patent at once under the rectifier's licence, and the cleaned spirit consequently under duty again. At the same time there has been evidence of a desire, on the part of Government, to make the advantages of cheap spirit for its proper uses as widely available as possible, to bring it within reach of small as well as large consumers, and a licence to sell it in quantities not exceeding a gallon may be obtained for two guineas.

We have always regarded this licence as a great relief to chemists, to whom the public will persist in applying for spirit of wine for all purposes whatsoever, and often take offence if referred to a gin-shop to obtain it.

It would be well if the Legislature would grant the same qualified permission to chemists to sell rectified spirit for medicinal purposes, and all purposes save those of beverage, as they have granted for the sale of methylated spirit for its purposes; this will probably be done when chemists are, as we hope before long they will be, a registered body.

In referring to these prosecutions, while we are bound to uphold the Board of Inland Revenue in its efforts to repress frauds on the public, which act most injuriously also on the honest Pharmaceutist who desires to carry out the Pharmacopœia in its integrity, we are by no means insensible to the annoyances and inconveniences which may arise, and indeed have arisen, to members of our trade. Chemists are peculiarly open to these annoyances; although entirely opposed to substituting methylated for rectified spirit in medicinal preparations, they are compelled, in compounding, to use the articles designated by a prescription or order; and whether these articles are excisable or not, no licence has ever been, or could in justice be, required for their employment. Informers are confessedly an unscrupulous class. It is their business to find offenders, and very often to make them; they are expert in baiting traps and making pit-falls, therefore we would caution our readers to be wary of their devices. If a chemist has no licence to sell methylated spirit, he may, without one, supply "finish," a preparation containing one ounce of gum shellac in a gallon of methylated spirit. The special permission to do that was granted by the excise before the retail licence for methylated spirit was established; and a chemist not keeping methylated spirit may suggest finish as a substitute and sell it mixed or unmixed; he may declare it to his customer, label it, and honestly believe it to be "finish." But there have been cases in which this has not availed. It would seem that the makers of the article have grown careless, sometimes putting an insufficient quantity, and sometimes omitting altogether the shellac. In one instance the offender was in a position to prove that he had ordered "finish;" the article sent to him was invoiced as "finish," and received into his stock as such. In good faith he sold and labelled it accordingly; but the analytical chemist at Somerset House could find no trace of resin in it, and consequently a worthy member of our Society, whose high character in the trade places him above suspicion, has been mulcted in a pecuniary penalty, and worse than that, branded with the stigma of an excise conviction.

TRADE INTERESTS.

A modification of the outer title-page of the 'Pharmaceutical Journal,' which appears on the present Number—the 1st of the 8th Volume, 2nd series—will naturally lead our readers to reflect on the three divisions of the general subjects which should find place in a periodical of this nature:—those relating to "Chemistry and Pharmacy," "Botany and Materia Medica," and "Commercial" interests. This modification has been made not for the purpose of introducing any change into the work itself, but that each department may receive its fair share of consideration.

The first efforts of the Society were strictly educational. Pharmacy, as a science, had to be created. For this end, the School, the Lectures, and the Laboratory were originated; and it may be confidently stated that, at the present moment, English Pharmaceutists, as skilled scientific men, are quite able to sustain their position. Having laid the true foundation, we are the more at liberty to give greater prominence to trade considerations, which may hitherto have been somewhat in abeyance; and, in doing so, our efforts might be greatly assisted by the aid of the Society at large. It is, perhaps, the subject of all others most likely to be advanced by an interchange of opinions.

It may be asked, what are trade interests, and what is included in the phrase? Is it meant that the Journal should be a sort of price catalogue of drugs and sundries,—that it should puff the catch novelty of the hour,—or that it should chronicle sheet-lightning and the Chinese fire? Is it meant that it should fill its pages with familiar gossip best suited to the columns of cheap weekly literature, or pry into that class of preparations which from time to time have given commercial prosperity to individual houses? There is no such object contemplated; but it is thought that a wide field is open for the discussion of such matters as would prove either of interest or advantage to men engaged in business. In these days of extreme refinement we are in danger of being occasionally too fine. Let us then say at once, that the main object of this department should be efficiently to represent the shop. Notices of original apparatus, new remedial agents, better methods of laboratory manipulation, would be especially welcome, not excluding hints on dispensing arrangements, or any other subject bearing on the practical improvement of routine druggist's work. The Journal, also, should be the constant "Companion" and supplement to the Pharmacopœia; and it should be its aim to supply, month by month, that style of information of which we have so admirable an example in a recent well-known Compendium.

It will be a dark day indeed when the trade interest shall in any way interfere with or supersede the scientific. In this, as in all other things, we must use common sense. Still, it is felt that the high reputation of the Journal will not be endangered, and that its general acceptability may be increased by more direct attention to every-day particulars. Specially is the subject commended to those amongst us who have passed through their educational career with enviable honour, and who, with the full advantage of scientific acquirements, have entered upon active business occupations. Theirs is the help we want, and with such energetic aid, our Journal may soon stand without a rival as the best exponent of the trade interests of pharmacy.

HOW TO BECOME CONNECTED WITH THE SOCIETY.

With the list of Members, Associates, and Apprentices of the Pharmaceutical Society, published as usual this month, will be found a detailed statement of the

Regulations of the Board of Examiners, and other particulars relating to the Registration of Pharmaceutical Chemists, Assistants, and Apprentices, and to the means by which admission to the Society may be obtained. This will supply information for which application is very frequently made to the Secretary, and it may also serve to explain to what extent the published list of names represents those who are qualified to use the title of Pharmaceutical Chemist. It will be observed that the list is not the complete register, and does not therefore represent all those who have passed the examinations, but such of them as belong to the Pharmaceutical Society, as a distinct association. The only possible entrance to the Society is by examination, and therefore the regulations of the Board of Examiners indicate the means by which admission may be obtained. All who present themselves for examination are alike submitted to the test of their qualification by the examiners, without reference to the way in which they have obtained their knowledge. No prescribed course of study is required, but only the evidence of a certain amount of acquaintance with subjects, the knowledge of which is considered necessary as a qualification for the position to be taken. Candidates are at liberty to acquire this knowledge in any way they think proper, and those who come up to the required standard as tested by the examinations are passed and duly registered. The instruction provided by the Society, through lectures and laboratory course, is intended for those who require such assistance, either as a means of preparing for the examinations, or for the extension of their professional qualifications. It has been the study of the Council to make the school available for the extension of pharmaceutical knowledge, but it may be safely affirmed that, as regards the examinations, those who have studied in the Society's school have no further advantage than that derived from the knowledge they possess. If, then, the question be asked, "How can I become connected with the Society?" the answer is, first by passing the prescribed examinations and becoming registered, and then by applying to the Council for admission as Apprentice, Associate, or Member of the Society. The terms and conditions upon which the privilege is granted are stated in the printed regulations already referred to.

LEGISLATION AFFECTING MEDICINE AND TRADE.

A Bill has been prepared, founded upon suggestions of the Medical Council, and drafted at the Home Office, entitled the "Medical Acts Amendment Bill," the principal object of which is to remedy defects that have been discovered in the working of the Medical Act of 1858. This Bill was fully discussed at the recent meeting of the Medical Council, but it has not yet been introduced into Parliament, and under existing circumstances we should think it is not likely to be introduced this session.

The Veterinary Medical Bill, a copy of which we inserted last month, is still in the House of Commons, but has not yet passed through committee.

A Bill is in progress, having passed the Commons, relating to the carriage and deposit of dangerous goods, and referring especially to Nitroglycerine, which will no doubt pass, the necessity for it being admitted by all who are acquainted with the recent loss of life and property caused by explosions of Nitroglycerine.

A Bill was introduced into the House of Lords for restricting the selling and hawking of goods on a Sunday, but after meeting with some opposition it was withdrawn.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *6th June*, 1866,

Present—Messrs. Bird, Bottle, Brady, Carteighe, Deane, George Edwards, Hanbury, Haselden, Hills, Ince, Orridge, Sandford, Savage, Squire, Standring, and Waugh.

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

George Webb Sandford ....*President.*
Thomas Hyde Hills ....*Vice-President.*
Daniel Bell Hanbury ....*Treasurer.*

Elias Bremridge ....*Secretary and Registrar.*

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

COMMITTEES.

General.—Messrs. Bird, Carteighe, Deane, George Edwards, Hanbury, Haselden, Ince, Morson, Orridge, Squire, and Waugh.

Finance.—Messrs. Bird, Carteighe, Haselden, and Orridge.

Library, Museum, Laboratory, and House.—Messrs. Carteighe, Deane, George Edwards, Haselden, Ince, Morson, Orridge, Squire, and Waugh.

Benevolent Fund.—Messrs. Carteighe, Hanbury, Orridge, Squire, and Waugh.

Journal Committee.—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, George; *Edwards, J. B. (Liverpool); *Evans (Liverpool); Gale; Garle; Giles (Clifton); Hanbury, Daniel; *Haselden; *Morson; Proctor, B. S. (Newcastle); Reynolds (Leeds); Schacht (Clifton); Southall, W. (Birmingham); *Squire; *Standring (Manchester); Wilkinson (Manchester); Woolley (Manchester).

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

The Local Secretaries were appointed for the ensuing year, and the list was ordered to be published in the July number of the Journal and Transactions.

John Goucher, Shrewsbury, was elected a Member.

BENEVOLENT FUND.

The sum of £10 was granted to assist a widow in her efforts to obtain admission for her child into the British Orphan Asylum.

(EXAMINATION IN EDINBURGH, *6th June*, 1866.)

MAJOR (Registered as Pharmaceutical Chemists).

Bisset, George MacRitchie ....Edinburgh.
Bateson, Thomas ....Kendal.
Grosvenor, H. C.............. ....Glasgow.

* Members of the Council.

MINOR (Registered as an Assistant).

Addinell, John ....Leith.

REGISTERED APPRENTICES.

Allan, William..............Mr. H. C. Baildon.................Edinburgh.
Muir, David.................Mr. Iverach ....Kirkwall.

EXAMINATION IN LONDON, 13*th June*, 1866.

(Registered as Pharmaceutical Chemists.)

Averill, Henry Allcock ....Stafford.
Baxter, George ....Chester.
Long, John Temlett ....Bristol.
Pheysey, Richard ....Waterloo.

EXAMINATION, 20*th June*, 1866.

MAJOR (Registered as Pharmaceutical Chemists).

Dumolo, John Thomas ....Birmingham.
Forth, William ....Bridlington Quay.
Hodgson, William Henry ....London.
Pullin, William Henton ....Atherstone.

MINOR (Registered as Assistants).

Battle, John Scoley ....Lincoln.
Hall, Alfred Richard................................London.
Hebron, Richard.......................................Stokesley.
Johnson, Edwin Eli ....Nottingham.
Johnson, Samuel E. ....Lincoln.
Lloyd, John ....Bridgend.
Rayson, Henry ....Lincoln.
Wretts, John Robert.................................Ipswich.
Yates, Samuel Pearce ....Wellington.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Catford, John Pine	Mr. Turner	Honiton.
Chapman, Walter	Mr. Coleman	Bury St. Edmunds.
Gillett, Augustine	Mr. Purdue	Witney.
Howorth, George Buxton	Messrs. Boyce and Son	Chertsey.
Jones, James	Mr. Phillips	Carmarthen.
Titmas, Samuel David	Mr. Groves	Weymouth.

BENEVOLENT FUND.

SUBSCRIPTIONS RECEIVED DURING JUNE:—

COUNTRY.

	£	s.	d.
Birmingham, Sumner, William	0	5	0
,, Churchill, John..	0	5	0
Blandford, Groves, W. E. ...	0	10	6
Boston, Thomas, John H......	0	10	6
Brecon, Bright, Philip	1	1	0
Brighton, Smith, William......	0	10	6
Bristol, Hodder, Henry	0	5	0
Burslem, Blackshaw, Thomas .	0	10	6
Cambridge, Deck, Arthur......	0	10	6
Carlisle, Sawyer, James........	0	5	0
,, Sowerby, John	0	10	6
Coningsby, Brown, Samuel	0	5	0
Corsham, Stantial, John	0	5	0
Cottingham, Lister, George ...	0	10	6
Doncaster, Howorth, James...	0	10	6
Edinburgh, Newton, Christoph.	0	5	0
,, Tait, William	1	1	0
Exeter, Tanner, Nicholas W...	0	5	0

	£	s.	d.
Gateshead, Garbutt, Cornel. D.	1	1	0
Honiton, Turner, George	0	5	0
Kendal, Bateson, Thomas......	0	10	6
Kingston-on-Thames, Jones, William B.	0	10	6
Leighton Buzzard, Richmond, Robert	0	10	6
Market Harborough, Bragg, William B.	1	1	0
Minehead, Bond, John	0	5	0
Oswestry, Saunders, George J.	0	5	0
Pembroke Dock, Saer, David P.	0	10	6
Pontypridd, Bassett, Charles ..	0	10	6
Putney, Farmer, John	0	5	6
Rhyl, Jones, E. Powell.........	0	10	6
Rochdale, Taylor, Edward ...	0	5	0
Sittingbourne, Gordelier, P.W.G.	0	10	6
Stamford, Patterson, George..	0	10	6
Stratford, Essex, Morton, G...	0	10	6
St. Leonards, Maggs, S. B. ...	1	1	0
Swansea, Brend, Thomas	1	1	0
Todmorden, Lord, Charles	1	1	0
Torquay, Guyer, James B. ...	0	10	6
,, Narracott, Henry ...	0	2	6
Torrington, Fowler, Henry ...	0	5	0
Tring, Chapman, John	0	10	6
Tunbridge Wells, Howard, R.	0	5	0
,, Gardener, C.	0	5	0
Waterloo, Pheysey, Richard .	1	1	0
Willenhall, Seyde, John F. ...	0	10	0
Wisbech, Oldham, Wm. T. ...	0	5	0
Worle, Watson, Edward M...	0	10	0

LONDON.

Allen, Warner, & Co., Charterhouse Square	2	2	0
A. M.	1	1	0
Hickley, Thos., Edgware Road	0	10	6
May, John, Battersea	0	10	6
Parkinson and Son, 27, Southampton Row	1	1	0
Stocken, James, 13, Euston Sq.	0	5	0

DONATIONS.

	£	s.	d.
Anonymous (Conscience Money)	13	15	0
Watson, David, Leicester	0	10	6

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

FAREWELL DINNER TO THE VICE-PRESIDENT, NATHAN MERCER, ESQ., F.C.S.

The Council of the Association, to mark the esteem and friendship entertained for Mr. Mercer, invited him to a farewell dinner, previous to his departure from Liverpool to settle in Montreal. The dinner was held at the Alexandra Hotel, Dale Street, on the evening of the 12th inst., and thirty-four, including the chief guest, sat down; the President, A. Redford, Esq., occupying the chair, and John Abraham, Esq., the vice-chair. The cloth having been removed, the President, in a few eloquent sentences, proposed the health of her Majesty the Queen, and passed a well-accepted eulogium on her public and private virtues. The President next proposed the health of the Prince and Princess of Wales, coupling therewith the members of the Royal family, and especially his Royal Highness the Duke of Edinburgh, whose prospective visit to Liverpool he trusted would be of that enjoyable nature as to leave pleasant reminiscences on the memory of the young sailor-prince. He referred to the hopes entertained by her Majesty's subjects of the Prince of Wales, in relation to the future government of these realms, and expressed his confidence that the good examples of his august and revered parents were already indicated by the amiability and aptitude which his Royal Highness displays on all occasions. The Princess of Wales was referred to as an exotic of rare virtues and beauty, well qualified to grace any court, and the Duke of Edinburgh as a young prince of great promise, whose occupation, he regretted to say, from the ominous position of Continental powers, was not likely to be like Othello's, gone.

The toast was drunk with great enthusiasm.

The vice-chairman, Mr. JOHN ABRAHAM, then rose to propose the toast of the evening, "The Health and Prosperity of our Guest, Mr. Nathan Mercer." He expressed his feelings as incompetent to the task of doing justice to the subject entrusted to him by the chair, on the consideration of his longer acquaintance with Mr. Mercer. But, however inadequate to express his sentiments as they deserved, he felt great pleasure in undertaking it, as well because of his long acquaintance with Mr. Mercer, extending over a period of sixteen years, as of the friendly relations existing between them during that period. He said, that not only at the Council-board of the Chemists' Association, and at its general meetings, but also at the meetings of other learned societies of the town, he was thrown into Mr. Mercer's company weekly, if not oftener, during that time, and he was not travelling into exaggeration when he stated that he had always found in Mr. Mercer a man of just principles, sound judgment, and other virtues peculiarly fitted to raise him in his (Mr. Abraham's) estimation. His labours in connection with the Chemists' Association, however, though known to most of the company present, entitled him to the warmest sympathy of the Association. Not only was he (Mr. Abraham) directed by the judgment exhibited by Mr. Mercer at the council-board, but he was free to confess that at general meetings of the Association, whether Mr. Mercer lectured or offered remarks on the passing subject, he (Mr. Abraham) always derived instruction from him. After a few other remarks expressive of kindliness of disposition and warm sympathy of which Mr. Mercer was capable, the speaker concluded by assuring Mr. Mercer that he carried with him his entire good wishes for his health and success in his new undertaking, and in saying so much he felt confident he was only expressing the sentiments of friends around him, and of the Chemists' Association as a body.

The toast was drunk with evident feelings of warm-heartedness to Mr. Mercer, who was loudly cheered on rising to return thanks.

Mr. Mercer said, that since his determination of establishing himself in Canada became known, he was overwhelmed with the most convincing proofs of kindness, not only from his friends and acquaintances, but also from many who were not intimately known to him. He felt that the tangible marks of friendly sympathy and good wishes, so generously tendered to him, indicated more the kindliness of his friends than his deserving of them; but of all those marks of friendship there was none that he esteemed more than the compliment shown him on the present occasion. Were it not that his ambition of success in his new undertaking neutralized, in a great measure, the feelings of parting with so many friends, he would feel great despondency. But, whether successful or not, he would not deny that being removed from the Chemists' Association would be a chasm in his life, which no success he might achieve would fill up. He said that whatever little aid he might have rendered to the Association reflected upon that body, for it was from the Association he derived those advantages which enabled him to help on the progress it had made, and he was happy to find, year after year, that it was progressing. He would carry with him ardent remembrances of the pleasant and instructive evenings he spent at its meetings, and always with a desire of their enjoyment once more. He thanked Mr. Abraham, and the gentlemen present, for the feeling manner in which his name was introduced and received, and concluded by urging upon the minds of all connected in any way with chemistry and pharmacy in the town, to take timely advantage of the benefits offered them by a membership in the Chemists' Association.

The President next proposed "The Chemists' Association," which was well received. The Secretary, Mr. Martin Murphy, responded. The Treasurer, R. Sumner, Esq., proposed "The Pharmaceutical Society of Great Britain." He detailed the progress of the Society since its foundation, and spoke in high terms in praise of the good it had accomplished and was likely to perform in the future, and concluded by strongly urging upon all engaged in the profession of chemists and druggists to take advantage of the benefits which the Pharmaceutical Society offered.

The toast was warmly received, and thanks returned by Mr. H. S. Evans, who regretted the absence of his chief, the local Secretary of the Society. He recounted in detail the advantages and security offered by the Society to the profession, in the endeavour to raise it to a higher standard than was hitherto possessed. He next dwelt upon the difference existing between a section of the profession and the Society, deprecating the views so held, and concluded by hoping that at no long period every chemist and druggist in the kingdom would feel a pride in having his name enrolled in its list of members.

"The Town and Trade of Liverpool" was next proposed, and responded to by Mr. MILLER, T.C.

"Our Colonies," responded to by EDWARD DAVIES, F.C.S.

"The Chairman," by Mr. MERCER, was warmly received and gracefully acknowledged.

After a few other toasts the company separated, each individually tendering to Mr. Mercer kind good wishes for his health and prosperity.

ORIGINAL AND EXTRACTED ARTICLES.

OBSERVATIONS ON THE PRESENT STATE OF OUR KNOWLEDGE OF THE GENUS CINCHONA.

BY JOHN ELIOT HOWARD, F.L.S.

(*Abstract of a Paper read at a Meeting of the International Botanical Congress, and prepared by the Author, by desire, for the Pharmaceutical Journal.*)

The writer approaches the consideration of the Cinchonaceous plants rather more from a practical than from a technically botanical point of view, and thinks that much remains yet to be done by careful study of the plants themselves, to reduce Botanical terms to harmony with Pharmaceutic requisitions, and thus to discriminate between forms which, in a therapeutic point of view, produce wholly different products, and which have been thrown together by systematic arrangement founded on insufficient data. The *C. micrantha* of Huanuco, for instance, produces a "grey bark," characterized by its abundant yield of pure cinchonine; whilst the *C. micrantha* of Bolivia differs widely in its chemical contents, and presents apparently a somewhat differing form. Again, the *C. ovata* of Pavon and of Peru, gives an entirely worthless bark producing aricine (or paracin), whilst the *C. ovata*, var. *rufinervis*, Wedd., of Bolivia, is a plant allied to the Calisaya in its products, and the *C. ovata*, var. *erythroderma*, approaches to, and is not improbably found amongst the red-bark-producing plants.

Mr. Howard does not propose to found a diagnosis of species, either on the chemical constituents of the barks, or on their microscopical constitution, but to follow out more fully, and to a greater extent, the consideration of the barks as assisting in the discrimination of species and varieties, according to the precedent so ably established by Dr. Weddell in his admirable 'Histoire des Quinquinas.'

Mr. Howard is nearly in accordance with Dr. Weddell and with M. Gustave Planchon (whose recently published work* he regards as the most valuable *manual* that has yet appeared on the subject), in regarding "Cinchona as forming a very natural genus, the different forms of which often pass from one into another by insensible transitions," but leaving it open for further investigation whether there may not, as stated by Dr. Karsten, be a subgenus, forming a point of transition between *Cinchona* and *Ladenbergia*. However this point may be decided by botanists, the writer thinks that a considerable section of the *Cinchonæ* are allied in their chemical and also in their microscopical characteristics to the *Ladenbergiæ*, whilst, on the other hand, some of the latter seem to reciprocate this alliance.

The writer does not, however, regard the "transitions" as insensible, but rather as by *well-marked and permanent intermediate forms:* he looks upon the *Cinchonæ* not as he would upon the *Salices*, for instance, in which latter family it seems immaterial how many or how few are the number of species or varieties

* 'Des Quinquinas,' par Gustave Planchon; Savy, Paris, 1864.

recognized, since a Willow is still the same plant under whatever form, and it was supposed that this was the case with the Cinchonæ when the genus was first established. The *Quina primitiva* was supposed to have a kind of recognised *typical* character, and a superiority which was claimed as distinguishing the bark of Peru, or of New Granada, as viewed by the advocates of the products of these different regions. It was thought sufficient to distinguish the few varying kinds of cinchonaceous plants that were at first recognised by the prevalent form of the leaf as *cordifolia*, *lancifolia*, *oblongifolia*, *ovalifolia*, etc., thus confounding together even different genera through a premature classification.

This systematizing tendency has since, in the opinion of the writer, led to the grouping together of Cinchonæ essentially different, since the reality much more resembles what might be the case, if there existed amongst the varieties of Salix some which closely approximated, in the timber and the bark, to the Oak and others which in these respects counterfeited the Hazel, or as if a variety were to surprise us by producing Quinine instead of Salicine.

Thus the ovate or cordate or lanceolate form of leaf may appear to link together species of cinchona, which, on more profound study, may be seen to be entirely diverse in their character.

The writer may be permitted to illustrate his meaning as to premature attempts at systematic nomenclature by reference to another department of science, taking as an instance the names of the alkaloids produced by these same plants, which, according to the first impressions, ranged thus:—

Quinine.	Cinchonine.
Quinidine.	Cinchonidine.
Quinicine.	Cinchonicine.

Further and more careful examination shows a different arrangement, as indicated by their properties in reference to the ray of plane polarized light.

Quinine.	Cinchonine.	Cinchonicine.
Cinchonidine.	Quinidine.	Quinicine.
Powerfully lævogyrate.	Pre-eminently dextrogyrate.	Feebly dextrogyrate.

This latter being the true relation, as shown by Dr. Herapath in his communications to the Royal Society, on chemical grounds, and by Mr. Howard in Reports to the Under-Secretary of State for India, on specimens of bark grown in that country, from which it appears that it is the order in which in the plants themselves these alkaloids are produced, normally in concert, and under circumstances of changed locality are supplemented, or even superseded by each other. Thus the quinine-producing Calisaya forms always *some*, and abnormally *much* cinchonidine, and the cinchonine-producing *C. micrantha* of Peru forms in India a large product of quinidine.

Mr. Howard thinks the species of Calisaya can be best studied in connection with the different geographical centres, the products of which he proposes briefly to review, so far at least as concerns their most prominent species, beginning with Bolivia.

The Barks of Bolivia.

Cinchona Calisaya, Weddell.—This species certainly merits the first mention. It is beyond all question the first in importance in commerce, as furnishing the bark most largely used in the production of the precious medicine quinine. It contains this product in remarkable purity, with very little admixture of any other alkaloid—a fractional quantity of cinchonidine and cinchonine being (in the best specimens) the only exception.

It is not to be supposed that the products of wild forests should be kept carefully select in commerce, and consequently [illegible] such mixed parcels of bark, falls below that of the genuine tree; but Mr. Howard has satisfied himself, by the examination of carefully chosen specimens of Calisaya, of the existence of alkaloid equal to five per cent., and in one or two specimens even seven or eight parts in a hundred, of sulphate of quinine. This is more than double the product assigned by the late M. Delondre, whose 'Quinologie' he regards as a very valuable repository of knowledge, although (as is always the case) subject to some little correction.

The average produce of Calisaya bark in quinine,* though falling very far short of the exceptionally fine specimens before mentioned, is still considerably above that obtained by M. Delondre, and the product in cinchonine less by two-thirds than he states, only it may be that he includes the cinchonidine in the same category. These observations seem of importance in reference to the cultivation of the species in India. It must not be supposed that the large products obtained by Dr. De Vrij and Mr. Howard from the *Cinchona succirubra* grown by M'Ivor, are the measure of the superiority of this species over the Calisaya. In the writer's opinion, the reverse is the truth, and though, from some cause, equal success has not been attained with the latter in the East Indies, he does not at all despair of seeing the Calisaya reassume there its rightful supremacy as the queen of all quinine-growing species.

He is the more confirmed in this hope, because the Calisaya, though found so delicate in India, is growing luxuriantly under double glass in Mr. Howard's stoves,—one raised from seed sent by Sir R. Murchison to Kew in May, 1864,† two or three inches in height when first planted out in October, 1864,—having, in little more than two years, attained an elevation of more than seven feet, and spreading in every direction.

Mr. Markham says,‡ "The *C. Calisaya*, the most famous of all the South American bark trees, and which, in its native forests, is alike the most beautiful and the richest in quinine, has not been a success in India. I was grieved to see the plants of this species only five feet ten inches high, and six and a half inches in girth, at an age of three years, while their stunted and shrubby appearance, with dim coloured leaves, is as different as possible from the glorious Calisaya of the Caravayan forests."

Mr. Howard is endeavouring, in correspondence with Mr. M'Ivor, to ascertain the occasion of this contrast. It is not impossible that something may be due to the different effect of light passing twice through glass, by which means, a large portion of the actinic power (about half, as ascertained by photographic effects) is arrested. Mr. Markham says,§ that in a position which he examined "exposed to *the full glare* of the sun, there was a profusion of *Melastomaceæ* and no *Cinchonæ*," for "the latter evidently dislike very exposed situations;" and again he says, "the Calisaya avoids the banks of a river, never being found within several hundred feet of it; it prefers the steepest declivities of the mountain sides, and *a great deal, though not too much* shade." Mr. Markham speaks of "a locality well adapted for the growth of the Calisaya," where young plants *receive shade* from taller trees, while they also enjoy plenty of sunshine through the spreading branches." Perhaps this has not been sufficiently attended to in India.

It is further evident that there are very distinct varieties of the Calisaya,

* Not contained in the bark as *Sulphate*, as Delondre and Bouchardat's work might lead the reader to suppose.

† Dr. Hooker obligingly traced out the history of this plant by application to Sir R. Murchison, who says, "The cinchona seeds I sent you in 1864 were brought home by Mr. David Forbes, a great explorer of the Peruvian and Chilian Andes. I know that he attached some value to these seeds, which he told me were from trees of the very first quality in their bark and fructification."

‡ In letter to the Under-Secretary, etc., 16th January, 1866.

§ Letter to the Under-Secretary for India, June 9th, 1860.

and that it is by no means certain that the kind hitherto cultivated by Mr. M'Ivor is the best, although "descended from those procured by Dr. Weddell himself, in the forests of Caravaya and Bolivia."

Dr. Weddell gave to one of these varieties (the *Calisaya morada*) the name of *C. Boliviana*, and described it as a separate species, but in an article communicated to the Botanical Society of France, in March, 1855, after having seen in his second journey in Bolivia, new forms intermediate between the *C. Calisaya* and the *C. Boliviana*, this able botanist is disposed to regard the *morada* as a simple variety of the Calisaya. This agrees with what we know of *the different barks*, which are all, including the Boliviana, equally collected and imported as Calisaya. The bark of the *Calisaya morada* is never classed separately in commerce, and, indeed, it appears in Delondre and Bouchardat's well-executed plate i. as typical Calisaya; while, on the other hand, we find another well-marked variety, the *Calisaya blanca*, equally well figured by Goebel in his Pharm. Waarenkunde, plate vii., as also *China Calisaya*. Best executed and most characteristic of all, are Weddell's own figures of the bark, both of his *α. vera* and *β. Josephiana*. As far as the writer can judge, it is yet another variety which is now growing with him, the *Calisaya verde*, of which, as well as of the *naranjada fina*, *zambita*, *empedernida*, and one or two others, Dr. Weddell gave him specimens resulting from his *second* excursion to Bolivia.

For further information respecting this variety, the *Calisaya verde*, we must (for the present) turn to the Report by Mr. Markham of his visit to collect plants of the *Cinchonæ* in 1860. He says,* "The bark collectors and other natives assured me that there are three kinds of Calisayas, namely, the *Calisaya amarilla* or *fina* (*a. vera* of Weddell), the *Calisaya morada* (*C. Boliviana* of Weddell), and the *Calisaya verde* or *alta*,—not mentioned, as far as I am aware, by any author. They say that the latter is *a very large tree*, *generally growing very far down the valleys*, *and in much lower situations* than the other varieties. The veins of the leaves are never purple, but always a pale green, hence the name. The guide Martinez had cut a tree of this variety, yielding six or seven cwt. of bark, including canuto or bark from the branches; and Gironda had seen a tree in the province of Munecas, in Bolivia, which yielded ten cwt. of tabla, or trunk bark alone. The true Calisaya of Weddell only yields three or four cwt."

Such a tree as Gironda describes might probably be five feet in diameter, for Karsten, speaking of the *C. lancifolia* and *C. corymbosa*, says,† "trees are met with sixty feet in height, whose stems measure five feet in diameter. A single such gigantic tree, which truly is not often seen, *yields ten cwt.* dried, or thirty cwt. fresh bark."

It is highly probable that this is the sort which ought to be introduced into India, where its larger size, and probably more rapid growth, might render it a more valuable acquisition than the *a. vera* itself. Mr. Howard is the more disposed to think this, since from the size and appearance of the bark recently brought into this market from Bolivia, he is led to suppose that the collectors may have opened up fresh districts in which this kind abounds.

It is an important feature that the *verde* variety grows lower down the valley, and consequently in warmer regions than the other sorts. This may, at times, cause it to be less productive in quinine, but nevertheless, the richest specimens examined by Mr. Howard presented the characteristics of this variety.

The Calisayas of Bolivia thus seem to be most satisfactorily determined, and it remains only that Dr. Weddell should add to those labours, for which we are so much indebted to him, by publishing the materials which he has in hand to illustrate the remaining varieties of this species.

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* Letter to the Under-Secretary for State, June 9th, 1860. See 44.

† Med. Chinarinden, p. 28.

The Barks of Loja, or "Crown Barks."

Cinchona officinalis, Linnæus, *a. Uritusinga.*—The term *officinalis* has been (Mr. Howard thinks most correctly) restored by Dr. Hooker to the species which grew under his care from seeds sent by Don T. Riofrio, from the mountains of Uritusinga, near Loja. This is the *Cinchona Uritusinga* of Pavon, also the *Quina-quina* described by M. La Condamine, in 1738, and consequently the *C. academica* of Guibourt's Hist. des Drogues, and the *C. officinalis* of Woodville's Botany, vol. iii. p. 546. The plant flowered in the writer's possession in 1862, and a characteristic drawing, by Fitch, of the flowering branch, may be found in tab. 5364 of Curtis's Bot. Mag., which may be compared with that of the same species in the 'Nueva Quinologia.'

A plant of the above, about six feet in height, was presented by Mr. Howard to the Indian Government, and although it suffered from a sunstroke in the transit from Madras to Ootacamund, and lost all its leaves, it was restored, and by the skill of Mr. M'Ivor increased by cuttings to the extent of now between 6000 and 7000 plants. It has since flowered, and a characteristic specimen has been brought home by Mr. Markham, together with a portion of the bark.

A sister plant of the above, together with another, its direct descendant, suffered from an irruption of smoke into the stoves in the past winter, and Mr. Howard was compelled to cut them down. This gave the opportunity for examining the bark, which yielded on percentage of the dried bark :—

Quinine (crystallizing both as sulphate and as oxalate) . .	1·36
Cinchonine (part cryst. from sp. w., the rest cinchonicine)	0·57
Total .	1·93

A produce very much the same that bark of the same kind and age might have yielded in its native climate, and probably the first extracted from bark grown in Europe.

Although this kind has nearly become extinct in its native regions, it may regain its place in pharmacy, as it seems well adapted to India, and flourishes on the Neilgherries at an elevation of about 6000 feet.

Several other forms range themselves around this which we now constitute the central plant of the group, by restoring its original name. Mr. Howard ventures to propose the following arrangement of these, as one rendered necessary for the distinction of the barks in commerce, as these will soon come from India, and as the only way that he can see to extricate the subject from the confusion into which it has been thrown by premature attempts at generalization.

Cinchona officinalis, *β. Condaminea.*—Mr. Howard would drop the barbarous name *Chahuarguera*, given by Pavon to this plant, which is really the *Quina primitiva*, as having been traditionally the one which cured the Countess of Chinchon. It is therefore worthy to bear the name *Condaminea*, bestowed upon it, and also on other forms of the plant by Humboldt and Bonpland, in whose 'Plantes Équinoctiales' it is well shown in the *unshaded branch*, which is recognized by De Candolle as a very distinct form, from the shaded flowering branch producing a different sort of bark, to be afterwards described.

The bark of *β. Condaminea* is the rusty crown bark of Pereira,* and of English commerce. M. Planchon agrees with Mr. Howard that the larger portions of the bark represent the *Quinquina noueux* of Joseph de Jussieu.

Cinchona officinalis, *γ. Bonplandiana-colorata.*—This form of Loja bark was called, in the time of the Spanish dominion, *Colorada del Rey.*† It is well

* Confounded by Pereira with the *Huamalies mince et rougeâtre* of M. Guibourt, which seems to belong to *C. purpurea.*

† "The Spanish creoles still have the custom of giving the name *real* or *del Rey* to the best, most beautiful, and most valued articles; thus every place has its *Palma real, Quina del Rey*, etc." (Karsten.)

represented not only in the widely-dispersed herbarium of Pavon, but also by specimens sent home by Cross, both of a flowering branch and of the bark, from the Ravines of Cajamuna, near Loja, in 1861. The seeds sent home by this collector have vegetated well in India, and so successful has been the cultivation, that M'Ivor has already sent home bark fit for the English market, according to the estimation of the most competent judges. The plant is figured and described in Howard's 'Illustrations of the Nueva Quinologia' as a variety of *Chahuarguera*, which name might very well be exchanged for the above.

γ. *Bonplandiana-lutea.*—These two sorts are probably merely the *macho* and *hembra* varieties (those in which the male or female element preponderates in the flower, etc.) of the same plant, but the barks produced are markedly different, and these differences have remained unchanged from Pavon's day to this. They both deserve well their old reputation, and, though scarce, are still found in commerce; growing together Pavon says, and often coming together (sometimes intermingled) to the English market; but, though so nearly allied, not confused by insensible transition.*

Cinchona officinalis, δ. *crispa.*—This form of Loja bark was described and named by Tafalla as *Cinchona crispa*, and is described by Mr. Howard under that head in his 'Quinologia.' Nevertheless it is his opinion that it is so manifestly one of the forms of the Loja bark as to be best looked upon as above. It is the *Quina crespilla*, or *carrasquena* of the older botanists, and the *Quina fina de Loja* of modern trade.

The plant was found growing by Cross in a deposit of peat on the summit of the highest mountains (the Sierra Grande) around Loja. These Loja barks are adapted to grow on the roughest and most elevated portions of the Neilgherries, and also to flourish in Ceylon, and, beyond other sorts, to bear well the climate of the sub-Himalayan ranges, and there can be little doubt of their successful and profitable cultivation.

Dr. Seemann found the plant at a lower elevation, and excellent specimens were brought back by both these travellers, including the bark, concerning the source of which therefore no doubt can remain.

It is to be regretted that from the present confusion of nomenclature in India, it is difficult to ascertain what is meant by the descriptive terms there applied to the barks. If the above arrangement could be admitted, it would greatly simplify the matter, and be practically useful in its results.

Mr. Howard proceeds to a review of the grey barks of Huanuco, the red barks of Ecuador, the Pitayo barks of Popayan, and the lancifolia barks of New Granada, which will be published in the Proceedings of the Congress, and directs attention to the spelling of the name CINCHONA, or CHINCHONA, and to the allied genus CASCARILLA, or as called by the Germans LADENBERGIA. Nothing would tend so well to settle these questions as the free expression of opinion at a botanical congress.

In conclusion, the writer expresses his opinion, that every well-defined region of the Andes has its own prevalent and characteristic *Cinchonæ*, which are incapable of being reduced to any one typical form; he believes that no species has been clearly proved to prevail unchanged from end to end of the cinchonaceous region, and thinks that forms which resemble each other in distant parts will be found analogous rather than identical.

*** Dr. Weddell, after the reading of Mr. Howard's paper, assigned reasons for adhering to the Linnæan form CINCHONA, to which Mr. Howard subsequently gave his assent.

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* Darwin has shown, in an able paper communicated to the Linnean Society on another family of plants, that the form of the flower is either *entirely macho*, or *entirely hembra*, not passing from one into the other.

LINIMENTA BELLADONNÆ ET ACONITI.

BY A. F. HASELDEN.

From the first appearance of these two preparations in the British Pharmacopœia up to the present moment, two particular and prominent features in them seem calculated to strike and make a forcible impression upon the practical man, and undoubtedly others have observed and experienced all that may be written by myself. The two striking features are, in the first place, the improvement in point of cleanliness, appearance, and miscibility of them with other liniments, over the solutions in any shape of the aqueous extracts of the leaves. Secondly, the absence of good, economical, practical experience in the forms laid down for their preparation.

The superiority of them as stated has, I believe, been generally admitted, and so far their introduction has been well appreciated; it is upon the latter part that I desire to write a few words, and so draw attention to it.

To make the case clear to some readers it appears necessary to repeat here the P. B. form for one of these liniments, to wit,—Take of belladonna root, in powder, twenty ounces; camphor, one ounce; rectified spirit, thirty fluid ounces, or a sufficiency. Moisten the root with a portion of the spirit, and macerate for seven days; then percolate into a receiver containing the camphor, until the product amounts to one pint.

Mr. Stephenson, speaking of these liniments, says, surely they are too strong, twenty ounces of spirit will hardly exhaust twenty ounces of root. *Vide* Pharmaceutical Journal, pages 398–9, vol. v. second series. Now I find by experience that the dry powdered root of belladonna absorbs in the moistening, in the preparation either of one pint or three, as nearly as possible the same quantity of spirit by measure as there is dry powder by weight, and by the process of displacement a quantity of spirit equal to that absorbed is necessary to produce the required amount of product, so that forty fluid ounces of spirit are required for twenty ounces of liniment strictly following the Pharmacopœia. This is the largest quantity of spirit likely to be used, less has sometimes sufficed; there are then from fifeeen to twenty ounces of spirit left in the marc. An exact and scrupulous man would be disposed to throw away the marc as the P. B. does not direct what is to be done with it, and the liniment so prepared would be produced with a needless loss of material, and at an extravagant price; and though cost may not be an object to the builders of a Pharmacopœia, it is often of vital importance to the sick who stand in need of relief from suffering. The question which naturally suggests itself, and which requires answering is this, Should this waste take place, or should the spirit or rather tincture be displaced by water or strong salt and water, or should as much as possible be obtained by pressure in the ordinary way after the quantity has been percolated? By pressure I have upon more than one occasion saved a considerable quantity of strong tincture, in my opinion quite equal to that obtained by the displacement. Following up Mr. Stephenson's observation, the quantity of spirit ordered, or more properly speaking, the product, cannot contain all the value of the root; otherwise, in the form for preparing atropia, five pints or even more of rectified spirit would scarcely be necessary to exhaust one pound of root. I do not know that there is an actual necessity that the root should be exhausted, provided the preparation be uniform, but I do think that as little waste as possible is desirable. If, in the interests of science, it should be thought that the root should be exhausted, the surplus spirit might be recovered by distillation (for future use) leaving the precise quantity of spirituous liquid extract which would represent a given quantity of root. I do not give it as my opinion that this is advisable in a preparation intended only for external use.

Thus far I have written only of *Linimentum Belladonnæ;* the same remarks apply to the process and proportions employed in preparing *Linimentum Aconiti.* The quantity of spirit directed to be used in published forms for making aconitia is much greater for the exhaustion of the root than is ordered for the liniment; but besides this, the root is ordered to be boiled with the spirit, in order to extract the impure aconitia; if this be necessary it would seem equally so for the preparation of a perfect liniment, and this naturally leads up to another suggestion, viz. if these liniments depend upon the impure atropia and aconitia contained in them for any benefit to be derived from their use, would it not be well to use at once the alkaloids or their salts, adding a sufficiency of different colouring-matter to distinguish them by, and thus, with more probability, obtain certain and uniform preparations? For, the liniments as now prepared are very likely to vary both in strength and appearance, different samples of root producing more or less a greener or browner tint, arising possibly from difference of locality and soil, and from the time the roots have been collected and dried before being used; a somewhat similar variation in the shade of the greenish tint I have also noticed in the tincture of arnica root. From some specimens of aconite-root the manufacturers of aconitia, I believe, have great difficulty in getting a fair amount of product; this seems a still stronger argument in favour of the direct employment of the alkaloids. To some these remarks may seem crude and superfluous, but it is only by putting one's thoughts into shape, and offering them for the consideration of others, and so comparing notes and experiences that the information required and the end desired are to be realized, and I feel that it is possible that I may open a subject well deserving the attention of practical pharmaceutists.

May 30, 1866.

MEDICATED PESSARIES AND SUPPOSITORIES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Pray allow me a few words more on "Medicated Pessaries and Suppositories."

Mr. Bosley's comments in your June number, upon some remarks I made in the discussion at the last Pharmaceutical meeting, seem to call for a line or two of explanation. I was somewhat annoyed when I read the report of the discussion, in the Journal, to find that, owing to some trifling verbal alterations, the sense and intent of what I had said were considerably changed. Those present will bear me out in the statement that I did not in any way disparage the appearance or general character of the specimens exhibited by Mr. Bosley, but that I simply expressed a preference, in the case of suppositories, for a somewhat different shape, examples of which I then showed. Pessaries I did not allude to in any way, there being no material difference in opinion or practice concerning them. Even these remarks I should not have made but that the question of shape was one of the minor details I had endeavoured to set at rest in my paper.

Whether a short cone with a wide base, or a longer one with a narrower base, is the more suitable form for a suppository is not a question which argument will settle, neither is medical evidence much to the purpose, it is simply a case for the exercise of common sense. Required, the best shape for a suppository of a given weight; I think the obvious answer is, "a cone, as long as may be, consistent with sufficient firmness to ensure its easy introduction." Of the specimens I collected from various makers, previous to writing on the subject, those prepared by the Edinburgh houses seemed to me on the whole best adapted for the purpose, and my moulds were constructed with a view to obtaining a somewhat similar form.

In speaking of cocoa-nut stearine as a substitute for Theobroma oil, I by no means wished to advocate its use. There can be no doubt that the latter substance is by far the best material for this whole class of preparations, and whilst the weather is warm even the five or ten per cent. of lard recommended for mixing the powder with in the first place is unnecessary, if not unadvisable. The stearine requires more regulation with reference to weather than the cacao butter, at least my experience leads me to think so. Still, a dispenser having many suppositories to make, may not be ungrateful for the hint, especially if soap or any similar substance be a frequently prescribed ingredient.

There seems to be considerable difference in the quality of Theobroma oil. I have by me three specimens, English, French, and German in their origin. Of these, the French is the best, though not greatly superior to that from Germany, but either is better than the English. I believe the latter is quite genuine, but it has not had the same care bestowed upon its preparation that the foreign samples have evidently received.

I remain, yours truly,
Newcastle-on-Tyne, *June* 18*th*, 1866. HENRY B. BRADY.

THE PRESERVATION OF LEMONS.

Sir,—I have for some time adopted a plan of securing fresh lemon-juice at all seasons of the year, by the very simple process of varnishing lemons with a solution of shellac in spirits of wine. As an experiment, I kept a lemon many months in this way; and as lemons unprotected from external moisture are prone to decay, and the juice to deteriorate, I quite believe I have discovered a very simple, inexpensive process, by which the medical profession can secure lemons during the season of plenty, and lay up with a little care a store of fresh lemon-juice for the feverish patient at all seasons of the year.

To the housewife who desires to use the peel for flavouring, by simply kneading the elastic lemons in the hands, the skin of shellac readily peels off, and leaves the rind quite unimpaired.

I am your obedient servant,
8, *Torrington Place, Gordon Square, W.C.*, GEORGE MEE.
8*th June*, 1866.

CHLORODYNE AND THE MEDICINE STAMP DUTY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—You say in your May number, in reply to my question, "I should like to be informed the grounds of distinction between the following labels:—

"Barling's Essence of Peppermint,
Barling's Syrup of Rhubarb,
Barling's Chlorodyne,"

that "Mr. Barling will perceive that the ground on which the preparation to which this correspondence refers is held to be liable to the medicine stamp duty is, that it is described as 'Barling's Chlorodyne,' which implies an exclusive right to its preparation; of course the same would apply to the other articles mentioned by Mr. Barling."

This appeared such a strange doctrine to me,—I, in my ignorance, not being able to see the difference between Barling's Essence of Peppermint and Essence of Peppermint prepared by T. Barling,—that I sent two labels to the Board of

Inland Revenue, asking them if they were really liable. I send you the two labels—Barling's Essence of Peppermint and Barling's Cod-Liver Oil. In a few days I received a reply corroborating your view, and stating that they were both liable.

I immediately wrote to them again, enclosing one of Dr. De Jongh's labels for cod-liver oil, which is sold unstamped, and asking them to point out the particular difference between the two labels.

They replied as follows:—

"*Inland Revenue Office, Somerset House, London,*
"18*th May*, 1866.

"Sir,—I have laid before the Board of Inland Revenue your letter of the 8th inst., in further reference to the liability to medicine stamp duty of Cod-Liver Oil as sold by you, with the label of which you have transmitted a specimen.

"It is stated, on this label, that this preparation of Cod-Liver Oil is sold as imported and selected by you.

"Assuming that it is sold with this label only, and that it is not held out by handbills, advertisement, or otherwise, as beneficial to the cure or relief of disease,—the Board, upon further consideration, incline to the opinion that it may be sold without a stamp.

"I am, Sir, your obedient servant,
"T. Sargent."

Now I take it, that this is the correct interpretation of the Act: the thing which constitutes liability to the stamp duty is not the claiming an exclusive right in a thing, but advertising it either directly or indirectly as beneficial for the cure of any specific disease.

Therefore in regard to chlorodyne, it cannot be liable so long as it is simply called Barling's, or any other maker's chlorodyne; but it becomes so when any maker chooses to dilate on the curative properties of his particular article.

I am, yours obediently,
Thomas Barling.

Weymouth, May 28, 1866.

WHOLE-MEAL BREAD.

Sir,—I read with much satisfaction, in the 'Pharmaceutical Journal,' the report on Professor Church's experiments on wheat. It is a subject in which I take a very great interest, seeing that wheat constitutes so large a portion of human subsistence. He says "dressed wheat," so that I am not sure whether he means wheat with or without its branny covering. The translucent grain (Russian) contains more gluten, and consequently more nitrogen. It is for this reason that Odessa wheat (the paste being much more tenacious and every way better when cooked) is preferred in Italy for making maccaroni, vermicelli, and the like paste.

In cold and rainy seasons, the yield of gluten, and therefore of nitrogen in wheat is very greatly reduced. Very many years ago, I recollect that the wheat, during such a season, contained little or no gluten, and resultantly little or no nitrogen. When made into griddle bread or cakes, the sides collapsed or closed until they came into absolute contact, greatly to the distress of the poor suffering people who knew not *the reason why*. Bakers empirically mix foreign with home wheat, because the foreign contains more gluten, and thence makes better and more nutritive bread. In warm summers and in warm climates, generally the wheat is more glutinous. I have observed buyers in the markets here, chewing a little wheat so as thereby to ascertain rudely the amount of the gluten. They did not know anything about gluten as such, but they knew, in a general way, that sticky wheat—wheat that left a good residue when chewed, and the starch was washed out of it—made superior bread. It is by reason of this superiority of foreign wheats, that they come to be mixed with our domestic wheats in the preparation of bread. In fact, British wheat alone will not commonly make good bread. I have examined Russian wheat, a small shabby-looking translucent grain, that yet made beautiful bread,—far better, indeed, than that resulting from plump, magnificent-looking English wheat. What I want to see everywhere, however, is the preparation of *whole-meal bread*—bread including the bran, with the bran-gluten and the bran-phosphates, so all-essential to good bread and the nurture of our flesh and bones. But I do not think that the working classes, to whom it is so very important, will ever take to it fully until set the example by the more instructed classes, who yet themselves require instruction in this matter.

I am, Sir,
HENRY M'CORMAC, M.D.

Belfast, May 30, 1866.

PHARMACY IN AUSTRALIA.

TO MR. BREMRIDGE.

Sir,—Thinking that a little information respecting the drug trade as it is carried on at the Antipodes might interest you, I send you these few remarks.

The population of Sydney is nearly 100,000, about one-fourth of the whole colony, and there are about 40 chemists in this town and suburbs to supply the public,—one-half being *bonâ fide* chemists and the other half a mixture of broken-down storekeepers, etc., who have adopted the profession as a last resource. In the principal street, viz. George Street, there are firms equal to any in Regent Street, and who, from their style of doing business and quality of drugs, merit every confidence, and are well supported by the leading medical men; there are also a few who do a cutting trade. Prices, generally speaking, are very fair, but rents are extravagantly high and expenses very heavy. Those individuals who have crept into the trade of course do not hide their light under a bushel, as you will see by circular (enclosed), but try their hand at everything, viz. consultations, visiting, dentistry, etc. etc.; one of these gentlemen only made two fatal mistakes in about as many months. We have two wholesale druggists here; they charge on an average 75, and cent. per cent. on wholesale prices (London), and whilst they profess to be purely wholesale will serve any one with 1lb. of carbonate of ammonia or tartaric acid at wholesale price, to the prejudice of the retailer; strange to say, there is only one good London house represented here. Mr. Holloway has a draper for an agent, and Messrs. Perry and Co., of Triesmar notoriety, one of the oldest established retail druggists for an agent. All patent medicines cost wholesale 14*s*. per doz., small size, being only 4*s*. 6*d*. beyond cash price in London. There are plenty of assistants in the colony, more than can find situations, and several would be very glad to return if they only had sufficient means. The hours are generally from 7 A.M. to 11 P.M., and all day on Sunday, as at home, and a great many young men find a grave out here instead of a fortune, the climate being a very trying one. I am pleased to see that chemists begin to understand it is for their interest as much as for the safety of the public to compel every one to pass an examination before going into business, and I think if the same was law here it would do good, and not prevent a man from being a business man, which some foolishly suppose.

I remain, your wellwisher,
A PHARMACEUTIST.

Sydney, New South Wales,
April 20th, 1866.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

On Acetylene.

This gas has excited an unusual amount of interest among chemists since its isolation by M. Berthelot. To a great extent this is due, no doubt, to its being the only compound which can be obtained by the direct union of carbon and hydrogen. M. Berthelot effected its production, it will be remembered, by heating carbon to incandescence in an atmosphere of hydrogen by the voltaic arc. It then became the most natural starting-point from which to effect the synthesis of organic compounds from the inorganic elements. At the same time it became known that most organic compounds furnish acetylene when exposed to a red-heat. It was found in coal gas, and was obtained by transmitting the gaseous hydrocarbons, or the vapours of alcohol, wood spirit, aldehyd, ether, etc., through red-hot tubes. It was also got by passing electric sparks through the same substances. Fortunately, acetylene possesses very distinctive characters. It has a peculiar odour, and is readily absorbed by certain metallic solutions, especially by the ammonio-subchloride of copper, with which it forms the very characteristic red precipitate of acetylide of copper. It is mainly owing to the delicacy of this reaction that the general formation of acetylene at high temperatures has been so easily recognized. M. Berthelot states that a single drop of the reagent introduced into fifty cubic centimetres of hydrogen containing a thousandth part of acetylene is immediately covered with the characteristic red film. This is equal to the twentieth of a milligramme; but M. Berthelot adds that he can even detect a ten-thousandth part in fifty cubic centimetres of hydrogen, which is equal to the two-hundredth of a milligramme.

M. Berthelot has recently published* some curious and interesting experiments, showing that acetylene is always produced during the imperfect combustion of the ordinary hydrocarbons, and, in fact, of almost any organic body.

The following are some of these experiments:—

Into a gas jar, containing about 300 cubic centimetres of olefiant gas, is poured a little ammoniacal solution of subchloride of copper;† the gas is lighted, and the jar is inclined and revolved so as to spread the solution over the interior of the jar, and allow the flame to enter. A very abundant red precipitate is formed, both below the flame and in contact with it.

With marsh gas the result is similar but less striking.

The most brilliant effect, however, is obtained by the employment of ordinary ether. A few drops of ether are introduced into a gas jar, similar to the one used in the preceding case; two or three cubic centimetres of ammoniacal solution of cuprous chloride are added, the ether is lighted, the jar inclined almost horizontally and turned round; the entire inner surface is immediately coated with a blood-red deposit of acetylide of copper. Hydride of amyl gives an equally good result, and in fact the experiment succeeds with any volatile liquid that does not mix with the reagent. M. Berthelot also demonstrates the production of acetylene during the burning of hydrocarbons, by showing its presence in the products of combustion from any smoky flame. A funnel is fixed at a little distance over the flame, and, by means of an aspirator, a gas bottle is filled with the gaseous products. Some of the cuprous solution is then poured in, and the red precipitate at once obtained. Berthelot has obtained this result from the flames of a variety of substances, including ether, benzol, oil of turpentine, stearic acid, oils, and naphthaline.

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* Comptes Rendus and Bull. de Soc. Chim.

† This reagent may be made and used as follows:—A solution of chloride of copper is mixed with an equal volume of hydrochloric acid, and shaken with copper filings (or the copper precipitated from a solution of sulphate by a sheet of zinc) till it is colourless. Ammonia is then added to this solution, while it is out of contact with air, as otherwise it greedily absorbs oxygen, and forms the ordinary blue liquid.

With reference to these experiments on the production of acetylene by imperfect combustion, Berthelot states:—"The quantity of acetylene which manifests itself under these circumstances in the form of acetylide is evidently greater than that which is produced under the influence of heat alone, acting upon the same compounds. The quantity of acetylene really produced is besides much superior to that which becomes manifest in the form of acetylide, because the greater part of the acetylene burns almost immediately after being formed, and without coming in contact with the reagent. It is therefore probable that, by suitably modifying the experiment, a more advantageous method may be found for preparing acetylene than is at present known." Mr. M'Leod has described* an apparatus constructed in accordance with this suggestion. He inverts the method of burning, and employs an adaptation of the ordinary apparatus for burning oxygen in an atmosphere of hydrogen. It consists of a glass cylinder, with an opening at the top through which a constant stream of marsh gas is passed in, and two openings at the bottom, through one of which passes in a tube and jet at which oxygen is burnt, and from the other passes a tube leading to a wash-bottle containing the cuprous solution. By this means, Mr. M'Leod states, it is easy to obtain from marsh gas a gramme and a half of cuprous acetylide in an hour. The oxygen may be easily replaced by atmospheric air, and, in place of marsh gas, coal gas may be used, perhaps charged with ether vapour, and the process thus rendered very practicable.

M. de Wilde has shown† that acetylene is also formed in the well-known experiment of burning a mixture of olefiant gas and chlorine.

M. Reboul has studied the action of bromine on acetylene. Besides the liquid bibromide,‡ $C_2H_2Br_2$, already known, he describes a brominated compound, C_2HBr, which is gaseous. He has also obtained a tetrabromide, $C_2H_2Br_4$. De Wilde has also submitted acetylene and hydrogen to the action of platinum black, and has thereby obtained a gaseous body which he is inclined to regard as hydride of ethyle—

$$\underset{\text{Acetylene.}}{C_2H_2 + H_4} = \underset{\text{Hydride of ethyl.}}{C_2H_5,H.}$$

The action of potassium and sodium on acetylene, and the nature of the compounds which acetylene forms with copper, silver, chromium, and gold, have recently formed the subject of a memoir by Berthelot. He regards the latter compound as a new class of compound metallic radicals.

Purity of Magnesium.

Messrs. Wanklyn and Chapman|| have examined samples of commercial magnesium, such as is sold for exhibiting the magnesium light, and their results show it to be remarkably pure.

Their method of examination is to determine the volume of hydrogen evolved by the solution of a given weight of metal in dilute acid, either acetic, hydrochloric, or sulphuric. Considering the low equivalent of magnesium, and the accuracy with which hydrogen may be measured when collected over water saturated with air, they regard this method of estimation as an extremely rigorous one.

The apparatus employed is very simple. A small vessel, such as is used for determinations of carbonic acid, is used, and the gas passes by a bent tube to a graduated jar standing over water. When a known weight of metal has entirely dissolved, it is only necessary to read off the volume of gas, and make the usual reductions for temperature, pressure, and aqueous vapour.

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* Jour. of Chem. Soc. May 1866, p. 151.

† Bull. de Soc. Chim. March 1866.

‡ C=12.

|| Jour. of Chem. Soc. May 1866, p. 141.

The Water Supply of the Metropolis.

London is supplied with water by nine companies; five taking it from the Thames, one from the New River, one from the river Lea, and two from springs or Artesian Wells. These waters are now regularly analysed once a month by Dr. Frankland, and the results published in the returns of the registrar-general. In an annual report, of which an abstract was presented to the Chemical Society,* Dr. Frankland describes the methods of analysis adopted, and gives a table of the results obtained during the year 1865. He also shows by curves the variations in the amount of impurities present at different periods of the year, and compares these curves with one showing the rainfall during the same period. From these it appears that the river-waters are subject to greater variations than the spring waters. The total solid matter in the river-waters undergoes in all three cases a tolerably uniform diminution to the end of April; from then to the end of May it suffers in all cases a sensible increase, after which it again diminishes to June and July. It then oscillates slightly to November when it increases suddenly, and remains steady to the end of the year. The curves representing the loss by incineration, and the amount of oxygen required to oxidize the organic matter, take substantially the same form as that indicating the total solid matter.

A comparison of these curves with that representing the rainfall shows that the condition of the river waters is mainly influenced by the amount of rain; but, in opposition to the commonly received opinion, it proves that these waters are much purer in dry than in wet weather, even if the drought occurs during a very hot summer. Such, at all events, is the result of one year's observations.

As before mentioned, the constituents of the well waters are subject to less variation. The curves representing the total solid residue, and the oxygen required to oxidize the organic matter give some indications of following the rainfall curve; but that representing the loss by incineration exhibits no such tendency.

The following tables shows the average composition of the Metropolitan waters for the year 1865. The results are expressed as parts in 100,000 of water. By multiplying these numbers by 0·7 they are converted into grains per gallon.

Mean of the Monthly Analyses made during 1865.

In 100,000 parts of water.	Thames Companies.					Other Companies.			
	Chelsea.	West Middlesex.	Southwark.	Grand Junction.	Lambeth.	Kent.	New River.	East London (River Lea.)	South Essex.
Total solid matter	26·44	26·43	26·89	26·97	26·41	37·79	25·24	27·98	40·28
Organic and other volatile matter	1·50	1·57	1·77	1·54	1·61	1·65	0·98	1·62	1·82
Oxygen required to oxidize organic matter	·0794	·0581	·0791	·0636	·0818	·0149	·0251	·0504	·0103

The Adulteration of Almond Oil, and its detection.

M. J. Nickles states† that in the south an oil of apricots is made and sold in very large quantities. This oil closely resembles in its physical characters the sweet oil of almonds, and, being producible at a much lower price, is conse-

* Jour. of Chem. Soc. June 1866, p. 239. † Jour. de Pharm. May 1866, p. 332.

quently used largely for adulterating the almond oil of commerce. He alleges that even the best samples of almond oil constantly contain a larger or smaller proportion of apricot oil, and that sometimes the latter is entirely substituted for the former.

M. Nickles also describes the means by which he has been able to recognize this adulteration. He states that apricot oil possesses, in a high degree, the property of forming, with dry hydrate of lime, an emulsion which slowly assumes in the cold an unctuous consistence. Almond oil, on the contrary, forms no emulsion with lime, the powder slowly deposits, and the oil remains perfectly limpid. But if it contains a certain quantity of apricot oil it emulsifies by agitation, and in time deposits an unctuous matter, which can be separated by filtration in the cold. This substance is formed only by the foreign oil; and by this means not only can the adulteration be detected, but a separation of the two oils can be effected. This unctuous matter, which is neither an oil nor a soap, is fusible by a water bath, forming a limpid liquid which concretes on cooling; it floats intact on boiling water. It is soluble in hot oils, but as the temperature of the solution diminishes, it is deposited as a white cloud, more or less intense, which can be removed by filtration. Being fusible, it can be freed from excess of hydrate of lime by filtering it with the aid of a hot-water funnel. In this state it is soluble in sulphide of carbon, especially while it is in suspension in an oil. The mineral acids, assisted by a gentle heat, decompose it, setting free the apricot oil, which however again emulsifies with fresh hydrate of lime.

In examining a sample of almond oil, M. Nickles recommends the following method of procedure:—A dozen grammes of the oil are agitated with about a gramme and a half of pulverulent hydrated lime, then heated by a water bath, and lastly filtered while hot, either in an oven or by a hot-water funnel, so as to retain the unctuous matter in solution. As the oily filtrate cools, if apricot oil be present, it becomes white and opaque; the result is hastened by plunging the vessel in water or ice. By this means M. Nickles has detected one per cent. of apricot oil.

Almond oil is not the only oil which fails to emulsify with powdered slaked lime; olive and colza oils are in the same position. On the other hand, hemp, poppy, nut, and linseed oils furnish more or less of this unctuous matter, and castor oil gives a very thick coagulum.

IODIZED COTTON.

The following formula is given by Dr. Greenhalgh, in a communication to the 'Lancet' of May 26th:—Two ounces of iodide of potassium and one ounce of iodine are dissolved in eight ounces of glycerine, in which solution eight ounces of cotton-wool are thoroughly saturated and then carefully dried. The best method of applying it is to take a portion of the iodized cotton about the size of a half-crown piece secured by some silk thread tied crosswise, and, passing it through a speculum, to press it firmly against the cervix uteri, over which a piece of cotton-wool similarly secured, somewhat larger, and freely saturated in glycerine, should be placed and retained *in situ* while the speculum is being withdrawn. It may be applied twice or three times a week, and be kept in the upper part of the vagina from twenty-four to forty-eight hours.

It possesses the following advantages:—It is clean, light, and portable; it produces no irritation: destroys all fœtor; is considerably stronger than the compound tincture of iodine, is more readily absorbed, and can be kept in contact with the diseased tissues for a longer period. Moreover, it does not soil the linen like the medicated pessaries and suppositories, and many other topical applications in general use for uterine affections.

Several other remedies besides iodine are used by Dr. Greenhalgh in the same manner, such as cotton with iodine and atropine, cotton with tannin, cotton with matico, and cotton with morphia.

"HOMES WITHOUT HANDS."

BY M. C. COOKE.

Notwithstanding the recent and very interesting volume on this subject, it is not yet exhausted. Fresh facts may be gathered about what has already been done, and result in the contemplation of animal life in the highest phases of its intellectual or instinctive development. The infinite variety of means by which one end is to be attained is marvellous. To multiply its kind, and provide a home and shelter for its future offspring, is the great idea which pervades all forms of life. This is more or less elaborated in different individuals, but in all the same object is paramount. Two or three instances may be given here, which possess in themselves another interest, of an economic character.

Trehala.—A singular substance has long been known in the East under the name of *Trehala* or *Tricula.* It consists of oval cases from half to three-quarters of an inch in length, found attached by one side to twigs of a species of Syrian *Echinops.* The external surface is rough and irregular, nearly of the colour of Sicilian manna, hard, brittle, and with a sweetish taste. These cases are constructed by a little beetle (*Larinus subrugosus*, Chevr.). "It appears that the larva of the *Larinus* collects a considerable quantity of saccharine and amylaceous matter, which it procures from the *Echinops*, and that it constructs its dwelling by disgorging this matter and moulding it with its rostrum." Each case contains only one individual, and when this has assumed its perfect form it emerges from the orifice at the upper end. There is much in the history and economy of this little insect which is still a mystery to us, but enough is known to make us wish for more. Analysis of these curious nests has shown that they contain gum, starch, and sugar in their composition, and when thrown into water, at the ordinary temperature, they swell, partly dissolve, and become converted into a pasty mass. In Turkey and Syria they are collected and employed as food, many being sent to Constantinople and other Turkish cities, where they are regularly offered for sale. Some of this substance was exhibited in the Turkish department of the Great Exhibition of 1851. The insect itself is of an oblong form and black, about three-fifths of an inch in length. Its snout is projecting, with the antennæ attached on either side about halfway down. The elytra, or wing-cases, are marked on the surface by ten punctured lines, which commence at the upper edge and unite before reaching the opposite extremity.

Shukhur-ool-ashur, or *Shukhur treghal,* is a very similar substance, and consists of the nests of just such another little beetle. In this instance the country of production is India, where the cases are known by the Arabic names already given; they are far from common, but are collected by the natives and employed as a kind of manna. The plant on which they are found is the Mudar or Ashur (*Calotropis gigantea*, and probably allied species), whence the name "Sugar of the Ashur" is derived. Dr. Royle, in his 'Himalayan Botany,' says of it—"This is a sweetish exudation formed on the plant, in consequence of the puncture of an insect called *Gultigal.*" With but little modification this paragraph has been repeated by subsequent authors, and is almost the whole knowledge we have possessed of this substance or its fabricator. Having obtained specimens of the *Shukhur* from India, I succeeded in discovering one of the beetles still enclosed in its case, all the other cases being empty. This insect, with its nidus, I submitted to Mr. Smith, of the British Museum, for identification, and he has declared it to be the species known as *Larinus ursus* of Fabricius. It may now, therefore, be affirmed with confidence that the sweetish cases, or "sugar" of the *Calotropis* is the nidus of a small beetle known in Arabic as *Gultigal* (which, being interpreted, appears to mean "flower-nest"), and to entomologists as *Larinus ursus.* It is very much like the insect that produces the *Trehala*, as also is its nidus; although I am not prepared to affirm that both are in reality the same species, under different names, but should rather be disposed to regard them as distinct.

Poonyet.—Whilst upon the subject of "insect-homes," I cannot resist adverting to the substance, which is found in Burmah, and called *Pwai-ngyet* or *Poonyet.* It is a blackish resin, channelled with little chambers or cells, by some species of Dammar-bee, and is found in holes in the ground, and in hollow trees. This resin, or wax, is employed by the Burmese for caulking boats, and is constantly on sale in the bazaars. The resin which I have seen under this name is slightly fragrant, and apparently identical with that of *Canarium strictum*, the honeycombed structure alone excepted. The latter resin is common in Travancore, in Southern India: and Mr. J. Brown, of Trevandrum, says that it exudes from cuts in the trunk of the tree, and seems to be a great favourite with several species of insect, especially of one resembling a bee, called by the hillmen *Kulliada*, which live in pairs in holes in the ground. It is singular that the same tree is common in Malacca, where it yields a black resin, and there also is found a honeycombed resin, which the natives call "Dammar Klotee," and which is said to resemble the *Pwai-ngyet*, although the cells are larger, and the resin blacker and harder. This substance I do not remember to have seen. Dr. Mason, of Rangoon, states that he forwarded some specimens of the insect which produces the Burmese *Pwai-ngyet* to Mr. F. Smith, and that he identified them with *Trigona læviceps*, which had been first received from Singapore. The conclusion, therefore, at which I have arrived, is to the effect that the "honeycombed resin" of Pegu and Burmah is the natural resin which exudes from the bark of the Black Dammar tree (*Canarium strictum*), channelled and perforated by the insect known in Southern India as *Kulliada*, and which is also found at Singapore, as well as in Pegu and Burmah, and recognised by entomologists as *Trigona læviceps*, but whether the resin is perforated in a soft state, soon after it issues from the tree, or, if after it becomes hard, how the feat is accomplished, is more than I am at present able to affirm. Perhaps some correspondent who resides near one of the localities indicated will institute inquiries, and render our information more complete respecting the economy of the Dammar Bee.—*Science Gossip.*

OBSERVATIONS ON THE ORIGIN AND GEOGRAPHICAL DISTRIBUTION OF GUM COPAL IN ANGOLA.

BY DR. WELWITSCH.

This was a *résumé* of the author's notes and observations on the subject of copal, made during his travels in tropical West Africa, and if, he observed, "they do not lead to a conclusive result, especially in the indication of the species of trees which at present furnish, or may have formerly furnished, this resin, I hope at least to show that nearly all opinions published on this subject by foregoing authors are more or less erroneous." The gum copal, which is called by the Bunda negroes Ocote, Cocoto, or Mucocoto, is mostly found in sandy soil, in the hilly or mountainous districts all along the coast of Angola. The limits within which, in Western Tropical Africa especially, gum copal is at present or will hereafter be found, was stated to be coincident with the distribution of *Adansonia digitata*. In the province of Angola, the lands belonging to the government of Benguella, extending south of the Cuanza river, yield the most. The quantity exported from Benguella during the period from 1850 to 1860 amounted to 50,000 arrobas, or 1,600,000 lb. per annum. This resin is dug out of the loose strata of sand, marl, or clay, or else is found in isolated pieces washed to the surface by heavy rains, or exposed by earth-falls, such isolated pieces inducing the negroes to dig for larger quantities in adjacent spots. The search is sometimes carried to a depth of eight or ten feet; and is in certain cases combined with the gathering of the Urzella, that is, the different varieties of *Roccella fuciformis*; and also with the collection of several other gums, including gum arabic, which is found on the Acacias of these countries. The copal, being of unequal value, has to be sorted when brought to market; it is mostly classed according to colour, the deeper-coloured being generally worth double as much as the lighter sort, and the price is determined by weight. The lumps of copal vary in size, but are rarely found larger than a hen's egg, though occasionally they weigh 3 or 4 lb. The pieces are all covered with a whitish earthy crust, which sometimes exhibits veins or network. The occurrence of this crust was regarded by the author as proving that after falling from the mother tree they were forcibly transported by floods or earthfalls, and embedded in the soil in which they are now found. The total annual export of gum copal from all the districts of Angola was estimated at 2,000,000 lb. As to the origin of this West African copal, the author concluded that it was the exudation of some tree, though now found in a fossilized state, many of the pieces showing distinctly the remains of bark to which they had adhered. Whether all the varieties come from the same tree he regarded as a question remaining to be solved, but his observation had tended to establish the conviction that the differences were attributable to the age of the tree, or the nature of the soil on which it grew. According to Dr. Daniel, the Sierra Leone copal comes, in part, from a tree described by Mr. Bennett as *Guibourtia copalifera*, and which Mr. Bentham has since named *Copaifera guibourtiana;* though he also states that a considerable portion of it is washed to the surface of the earth, and is therefore of a fossilized character. The author concluded a lengthy review of the supposed sources of copal by observing, "that West African copal, and probably all gum resins exported under this name from tropical Africa, may be looked upon as a fossil resin, produced by trees which in long past periods adorned the forests of that continent, but which at present are either totally extinct, or exist only in a dwarfed posterity." This, he remarked, would be all the less surprising if the consideration were taken into account that "tropical Africa, the home of this copal, is at the present moment the least explored continent; and if it were further borne in mind that after another analogous resin, the amber, became known and brought into practical use, more than 500 years elapsed before the learned Dr. Goeppert, whilst pointing to its fossil nature, succeeded, with some degree of probability, in tracing its origin to coniferous trees."—*Gardeners' Chronicle.*

ORCHID TEA.

BY JOHN R. JACKSON.

To have to look to the Orchid family for any large staple articles of trade other than Vanilla, would be not only to look to a new field, but also to a very interesting one. The application of the leaves of one of these plants as a substitute for tea has lately come under my notice. The product has been heard of before in its native country, but never, so far as I know, in fashionable or civilized society. It has, however, now made its appearance in Paris as a regular article of trade, and is highly recommended as a most agreeable beverage.

The plant yielding this new description of tea is the *Angræcum fragrans* of Thouars, an epiphytal orchid of the island of Bourbon, where it is known and used under the name of "Faham." This word, once an obscure native name, is now, if we are to believe the enterprising French firm who has just introduced it, destined to become a "household word," for "Faham" is the name under which it is now sold in Paris, and the word appears in large letters upon the boxes in which it is packed, as well as upon the circulars accompanying them. The headings of these circulars run as follows :—"Faham, from the Isle of Réunion, imported from and manufactured at Réunion." There is also a rough, but not at all a bad cut of the plant producing it. The circular itself begins by saying that tea proper has never been well received in France, owing to the wakefulness resulting from its use, which has caused many persons to reject it altogether, while many of those who do use it drink it in default of a better substitute. The circular then goes on to state that it is for the purpose of remedying this state of things that the new infusion is intended; not to replace tea, which has indisputable advantages, but to afford an opportunity of choosing between two beverages, equally beneficial and useful. "Faham is not a new production. From time immemorial the natives of the islands of Réunion and Mauritius, though situated as it were at the very gates of China, have preferred it to tea; every traveller has partaken of their preference; one of our most illustrious writers, George Sand, eulogizes it in the midst of the fine description which she gives of the Isle of Bourbon, a eulogy which cannot be suspected of puffery, inasmuch as it was written thirty years before the introduction of Faham into France was thought of. Every work on botany of any importance similarly places it in the foremost rank of the beneficial productions of this favoured clime. The difficulties experienced in the gathering and manufacture of Faham on a large scale, and consequently the almost impossibility of procuring a sufficient quantity to recompense the labour of obtaining it for consumption, and also its very high price, have alone prevented until now this valuable article of diet from being imported into France. After many fruitless attempts, these obstacles have been overcome.

"Faham belongs to the family of Orchids; it grows upon the high slopes of the island of Réunion, in the midst of almost inaccessible forests. It possesses a taste differing greatly from that of tea, and is preferred by the majority of persons who have tasted it. It can be used as a substitute for tea on all occasions, as it combines its tonic and digestive qualities, free from the sleepless effect. It possesses an aroma of great delicacy, capable of being rendered more or less pungent according to the quantity used, and it gives forth a most agreeable perfume; after being drunk it leaves a lasting fragrance in the mouth, and in a closed room the odour of it can be recognised long after. This beverage has the further advantage over tea, which requires to be drunk at the time of making, that it can be reserved for a future occasion if requisite, and may either be taken cold or made hot again. Milk, or spirits in small quantities, especially rum, serve to develope its aroma, and, lending it additional delicacy or greater strength, render it a delicious drink. Lastly, this valuable plant is made use of to flavour custards and ices, to which it communicates its delicate fragrance.

"To be taken as a warm beverage, the leaves and stalks should be placed in cold water, in about the proportion of one gramme to a tea-cup, more or less, as the consumer may desire it of a greater or lesser degree of strength. The water should be immediately made to boil for about the space of ten minutes in the tea-kettle or other closed vessel. It should then be emptied into the teapot or tea-cups and sweetened accordingly."

A sample of this new kind of tea has recently been received at the Kew Museum; it was packed in a very neat canister-shaped box, similar to those now sold in Paris. These boxes are of two sizes, the smaller containing material sufficient for making fifty cups of Faham, and sold at *2 f.* 50 *c.*, and the larger one hundred and five cups, and sold at *5 f.* Upon opening the box in question the perfume emitted was exceedingly powerful, and very similar to that of the Tonquin bean. The leaves, unlike those of tea, appear simply dried, not shrivelled by heat, but are as flat as we should find them in any herbarium. The absence of any artificial colouring matter, or roasting, accounts for the very light colour of the infusion.

No doubt there are many persons who would prefer the fragrance of this article to the aroma of Chinese tea, but for my part I give preference to the latter—perhaps prejudice may have something to do with it. The perfume from the teapot is certainly very agreeable, and is an undonbted novelty; and if Faham came into general use, this domestic article would serve the twofold purpose of a teapot and a "perfume vaporizer." Doubtless if these leaves can be obtained in quantities sufficient for consumption as tea, the French perfumers might also import them to advantage, if for no other use. Powdered, they would make excellent sachets.

In the Museum at Kew are some cigars made of the leaves of *A. fragrans* simply rolled in a thin tobacco leaf. They are probably very agreeable smoking, but I am unable to say if this application is a common one in the island of Bourbon, or whether these specimens are rather a curiosity.—*Gardeners' Chronicle.*

MR. GALE'S NON-EXPLOSIVE GUNPOWDER.

The final Government trials to test to the utmost the value of Mr. Gale's discovery were made on the largest scale, on Wednesday afternoon and evening, in one of the Martello towers on the beach halfway between Hastings and Rye. Everything connected with these experiments was entirely managed by the members of the Ordnance Select Committee, and workmen from Woolwich Arsenal were employed to mix the strongest Government powder with the protecting composition, to barrel it, and to stack it in the Martello tower. Mr. Gale's only share in the proceedings was that he furnished the protecting compound, that his directions as to its mixture were implicitly followed, and that when all was ready he was invited to be present at these official tests, which, like all such, were very properly of the most severe and exacting kind. In the result they proved most triumphantly that Mr. Gale is right when he asserts that by means of his mixture the strongest powder can easily be rendered not only non-explosive, but even almost incombustible, and this without in the slightest degree deteriorating from its destructive power when the powder is separated, as it can be at once, from his protecting compound. On Wednesday, certainly, all efforts to blow up five tons of powder when mixed according to Mr. Gale's directions, not only proved utterly fruitless, but the powder actually twice went out, and it was after all found necessary to set fire to the woodwork of the Martello tower, in which it was stored, in order to consume it at all, and even then this was not entirely accomplished. Nothing, therefore, could possibly have been more complete than the success of the experiment, though the value of the invention will perhaps be more fully appreciated if we explain in a few words how simply such an astounding result is brought about.

It is nearly fifteen years since Mr. Gale began to direct his attention as a chemist and electrician to the discovery of a material which when mixed with gunpowder should render the whole mass at once fireproof, waterproof, and airtight, and at the same time be easily separable, and when separated leave the gunpowder totally uninjured. It is needless to say how many and how combined were the compositions tried before one at last was found to fulfil all these apparently irreconcilable conditions. This composition is nothing more nor less than powdered glass prepared in a peculiar manner. The commonest glass is heated to a bright whiteness and then plunged into cold water, which utterly destroys all the little fibre and elasticity glass can ever be said to possess, and renders it so friable as to be easily pressed to powder between the fingers. In this state it is placed in a machine shaped like a cask, in which are many small iron shot, and the machine being revolved rapidly, a minute or a minute and a half suffices to reduce the glass to a powder so impalpable that even fine wheat flour is coarse in comparison with it. This is mixed with the powder in the proportion of two parts to one, if it is only meant to render it non-explosive, but still leave it fiercely combustible; in the proportion of three parts of ground glass to one of common powder, if it is meant to make it almost incombustible; and in the proportion of four parts to one of the strongest gunpowder to make the latter absolutely harmless. Four parts are, however, generally considered necessary only for the strongest Government common powder. The method of mixing the two is simply by an adaptation of Robinson's cask-cleaning machine, which gives to the cask it holds a rapid double motion, two minutes of which is sufficient to blend the ground glass and the coarse grains of powder perfectly. So complete is this mixture that of forty samples taken from as many casks after two minutes' mixing, the relative proportions of the two materials were found to be in all cases absolutely exact. The forty 5 lb. samples when separated were all found to contain precisely 1 lb. of gunpowder and 4 lb. of powdered glass. The separation of the powder from the glass is made in a few seconds by coarse copper sieves. The grain of the best Government powder for cannon is nearly as large as a coffee bean, and this coarseness, combined with the fineness and weight of the powdered glass, enables the two to be separated almost instantaneously, and a very simple piece of copper machinery has been devised which will effect this process even more quickly and on the largest scale. One of the most important questions to be ascertained was whether the minute portions of the powdered glass, which more or less adhered to the grains of gunpowder after sifting, in any way affected its explosive qualities. For some time past, therefore, the Ordnance Select Committee have made a most careful series of experiments to resolve this doubt, and the decision they have come to is, that neither in rapidity of ignition nor explosive force is the gunpowder in any way deteriorated. Not only is it not injured, but its complete preservation from damp—almost as important in the case of powder as its preservation from fire—makes Mr. Gale's method of mixing far preferable to the present mode of stowage. The objections to the bulk which powder when thus mixed would occupy in the Government stores have also in a great measure disappeared upon examination. About twenty-five per cent. of the kegs in which gunpowder is now packed are left empty that the grains may be free to roll, and so prevent their "cakeing." This necessary precaution, however, induces another evil, which is that the constant friction of the grains often reduces half the contents of a keg to dust, and immense quantities are thus yearly returned to the mills to be recorned before it can be used. Of course, against all these evils of fire, water, friction, or deterioration, Mr. Gale's discovery is an absolute specific. With the adoption of his plan all the necessities for costly magazines would disappear, and so also would those huge spaces of waste land which are obliged to be kept free round these perilous storehouses, and on which farmers may not venture to cultivate nor architects to build. In the matter of transport alone this new method of mixing powder would effect a saving of £5. 10s. per ton.

As we have said, the Ordnance Select Committee have tried the mixture in almost every possible way, and always with the same unvarying success. Barrels of gunpowder thus protected have been placed on bare fires, have had red-hot pokers thrust into them, and the loose mixture has been thrown by shovelfuls into fires, but all in vain. It would not explode, and, in the great majority of instances, when tried in tolerably large quantities, it would not even burn. No experiment on a very large scale, however, was tried till Wednesday afternoon. This was made in a condemned Martello tower, called the Pett Tower, No. 37, situated on the beach about seven miles south of Hastings, and halfway between that town and Rye. General Lefroy superintended all the arrangements, and most of the other members of the Ordnance Committee were also present with General St. George, Professor Abel, the Government chemist, etc. For the experiment five tons of gunpowder had been mixed with 20 tons of Mr. Gale's composition, and packed in 338 barrels. Of these, 100 barrels were placed in the magazine of the tower and 238 in its upper wooden floor, the usual passages being left between the barrels for the purpose of examination. It was proposed to fire the magazine under conditions representing as far as practicable what might occur in reality, either by accident or design. In the first instance it was intended to try to fire it by means of the magneto-electric machine; then, if this failed, the interior woodwork of the tower was to be lit, to ascertain the mode of action of powder thus protected when stored in a burning building. A strong body of police were stationed at first to keep the spectators at a safe distance from the tower; but this precaution, though wise, was soon found to be unnecessary, and after a time every one came as near the building as he liked. In three of the barrels thus stowed away were three powerful fusees, each connected with a small quantity of pure gunpowder. These were fired one at a time from a voltaic battery in No. 38 Martello tower, about half a mile distant. On the discharge of the first fusee, no visible effect whatever was produced outside the tower. When the second fusee was fired, a small quantity of smoke was seen to issue from the chimney at the top of the tower roof, and no further effect beyond this was produced by the firing of the third fusee. After a short interval General Lefroy, with three other gentlemen, entered the tower, and found that the heads of two of the barrels containing the fusees had been blown out, and a small portion of the contents had been scattered over the surrounding barrels. The protected powder, however, had ceased to burn and was nearly cold. The third fusee had not taken effect at all.

It was then determined to set fire to the building. This was very easily done, as the floor of the first story consisted of loose planks, placed at a little distance from each other, so that they would rapidly burn, as the air could get between them. A pile of dry firewood was placed on this floor at the edge of the barrels of gunpowder, and on this being fired dense volumes of smoke were seen to issue from the door and windows of the tower. It was soon evident, from the peculiar colour of the vapour, that the gunpowder was being slowly consumed; and although the quantity of smoke was irregular and sometimes very dense, nothing in the slightest degree approaching to an explosion occurred. General Lefroy was soon so far satisfied of the non-existence of danger that he allowed several gentlemen to look in at the door of the tower, to see how the gunpowder was burning.

Two barrels of protected gunpowder were then placed on a pile of faggots, which were lit. From this a huge bonfire soon rose, and its flames were fanned into an intense fierceness by the strong sea breeze. These quickly penetrated the casks, which broke up and let loose their contents in the midst of the fire. Still there was not the slightest symptom of explosion. On the contrary, the mass of protected gunpowder rather deadened down the flames at first, and it was only at its edges that the mixture fizzed and spluttered like a bad portfire. During this time the fire in the tower continued, and smoke, but no flame, steadily issued from the openings. Occasionally a sudden increase in the volumes of smoke indicated that a barrel had burst and exposed an unusual quantity of powder to the flames; but so confident had the gentlemen become who had witnessed the experiments that they continually looked into the building, and actually went inside the door to see how the powder was burning. This they were enabled to do from the strong in-draught of fresh air which entered at the bottom of the doorway, while dense columns of smoke issued from the top. So totally was the explosive character of the gunpowder mastered that after the fire had been burning for nearly two hours, a window which had been closed on one side of the building was found quite perfect, and the glass was broken from the outside in order to admit more air to increase the fire. Apparently, however, even this considerable accession of air produced no effect. The barrels kept smouldering from one to another, emitting the most dense volumes of suffocating smoke, but no more. In spite of the interior of the tower having been fired, and the immense mass of burning embers which the beams left, the conflagration, if such it may be called, continued steadily to diminish as the barrels burst, and the powder literally smothered out the fire. Before nightfall the light in the tower had quite dimmed down, and it was generally believed that in a few hours more it would go out of itself, leaving half the barrels untouched and their contents in powder, when separated from the mixture, as little injured as if they had never left the magazine. —*Times, June* 22.

ON THE EXISTENCE IN THE TEXTURES OF ANIMALS OF A FLUORESCENT SUBSTANCE CLOSELY RESEMBLING QUININE.

BY HENRY BENCE JONES, A.M., M.D., F.R.S., HON. SEC. R.I.

(*Delivered at the Royal Institution, Friday, March* 23, 1866.)

When I last year brought to your notice the fact that "a single dose of lithium in a few minutes passes, through the circulation, into all the ducts, and into every particle of the body, and even into the parts most distant from the blood circulation, and when I showed you that it remains there for a much longer time than it took to get into the textures (probably for three or four days, varying with the quantity taken), and that then it diminishes, and finally, in six, seven, or eight days, the whole quantity is thrown out of the body," I little expected that by prosecuting an investigation into this chemical circulation in the body I should come upon that discovery which forms the title for this evening's discourse.

No imagination could have anticipated that this line of research into the rate of passage of substances into and out of the textures would lead to the supposition that man and all animals possess, in every part of the body, the most characteristic peculiarity of the bark of the cinchona-trees of Peru.

After determining the rate of passage of lithia, and other mineral matters, into and out of the body, Dr. Dupré and I proceeded to endeavour to trace the rate of passage of quinine into and out of the textures of animals.

We chose quinine because of that splendid test which led Professor Stokes to the discovery of the change of refrangibility of light.

Here, for example, are different solutions of quinine of different strengths, and by means of the production of fluorescence in the electric light, you see how we can determine which of these solutions contains the greatest quantity of quinine; and by forming standard solutions it would be easy to measure how much quinine existed in each of these solutions. Moreover, Professor Stokes discovered that when a solution of common salt was added to this quinine solution, the fluorescence entirely disappeared. Though this may be so for sun-light, it does not disappear in this electric light; and, moreover, on adding a solution of sulphate of soda to a solution of chloride of quinine, the fluorescence in great measure returns.

Still further, Professor Stokes showed that one solution of quinine entirely stopped these rays from passing into a second solution of the same substance, so that you might almost tell whether you had a solution of quinine by seeing whether it cut off the fluorescence from a second solution of quinine.

Our first object was to determine the delicacy of this reaction for quinine. We arrived at the following results, when the spark from a Ruhmkorff coil was the source of light:—

Sulphate of quinine gave	slight fluorescence	when	$\frac{1}{300000}$	of a grain was present.
"	feeble	"	$\frac{1}{330000}$	"
"	distinct	"	$\frac{1}{250000}$	"

One grain of sulphate of quinine in one million eight hundred parts of water showed the blue fluorescence distinctly in 20 grains of the solution. In another experiment, the same amount of quinine in one million four hundred and forty-four parts of water showed fluorescence very distinctly.

Having thus got our test, we proceed to apply it to determine the passage of quinine into and out of the textures of guinea-pigs.

A guinea-pig was given quinine, and, for comparison, another guinea-pig was killed at the same time, having had no quinine.

In the pig that had taken quinine, each organ was heated in a water-bath with very dilute sulphuric acid. This extraction was repeated over and over again. The acid extracts were mixed and filtered after cooling, neutralized with caustic soda, and repeatedly shaken up with their own bulk of ether. The residue left after evaporation of the ether, was taken up by dilute sulphuric acid, filtered and tested for fluorescence.

The pig that had taken no quinine, had each organ treated in a precisely similar way. To our great disappointment, at first, we found that not only had the pig that had taken quinine a fluorescent substance in the textures, but that an almost exactly similar substance was extracted from the organs of the pig that had taken no quinine. Every texture was examined, and in every one this fluorescent substance occurred.

We then endeavoured, in every possible way, to find a means of separating the natural from the induced fluorescence. And as every method failed, and we were compelled to recognize the close similarity of the substance that exists in the textures to quinine itself, we for a time dropped the original inquiry, and proceeded to a more complete investigation of the natural fluorescent substance in animals.

Without any preparation this substance can be shown to exist in the living and in the dead textures. There is one transparent substance which is above all most suited for this inquiry.

Here are some lenses removed from the eyes of bullocks, guinea-pigs, and man. You see how clear, white, and transparent these substances are; and if I take a bullock's eye, which by gentle pressure has been flattened so that the structure can be distinctly made out, there is plainly no colouring matter. As in quinine, nothing is seen until the blue rays of the electric light fall on the lenses; then look at the splendour of the reaction. Here, with the guinea-pig's lenses, the same is seen; and here, with the flattened bullock's-eye. You might be tempted to think that this is a *post-mortem* change, a result of decay; but here is a fresh bullock's eye, look at this blaze of bluish-green light; but still more full of suggestion is an experiment with a dilated pupil in a living animal or in man. Let me show you my own eye, for in it you can see the lens shining with this unnatural, because unaccustomed, light, looking like an opaque substance, a blue-green cataract.

Life and death then have nothing to do with the existence of this substance; here, it is present in the living lens; it does not disappear from lenses that have been kept for months in glycerine.

I have already said that this substance not only exists in the lens, but that it can be found everywhere by treating any animal substance, first with dilute acid, then neutralizing with alkali, and then extracting with ether: thus we obtain solutions having exactly the same properties as you see in the lens. Here, for example, is such an extract from the liver; here, from the kidney; here, from the heart. When an acid solution of this substance is treated with ether, no fluorescent substance is obtained. First, as with quinine, the acid must be neutralized before this substance or the quinine can be taken up by the ether.

Having then obtained these solutions, we were able to compare them with solutions of quinine in their actions on the spectrum. And first, the solution of the natural substance begins to fluoresce a little before the solution of quinine; but on carrying it on through the spectrum it ends where quinine ends.

The fluorescent light of the natural substance is a little more greenish than the fluorescent light of quinine.

If a quartz-cell containing this fluid is interposed between the source of light and a solution of quinine, no fluorescence takes place in the quinine; and if quinine is interposed between the light and this natural solution, scarcely any fluorescence is observed in it.

When a solution of salt is added to the naturally fluorescing substance, it is almost entirely destroyed, as happens with quinine.

If the natural solution is boiled with permanganate of potash, it does not lose its fluorescence, nor does quinine; but when permanganate with excess of alkali acts upon this substance or upon quinine, the fluorescent substance is entirely oxidized.

Hence this substance, by the mode of its extraction and by its remarkable action on light, is very closely related to quinine; and this led us to apply the chemical tests for quinine to this natural fluorescent substance, after extraction from the body.

The different tests for alkaloids like quinine, as morphia, strychnine, veratrine, atropine, you may see in the following reactions. First, quinine gives, as you see, a precipitate with iodine in iodide of potassium. Secondly, iodide of mercury in iodide of potassium also gives a precipitate. Thirdly, phosphomolybdic acid also gives a precipitate. Fourthly, bichloride of platinum gives a precipitate. Lastly, terchloride of gold causes a precipitate, and this precipitate is soluble in alcohol.

Now each and all these different reactions are obtained with these same reagents acting on the fluorescent substance that is extracted from animals.

So that here again we have chemical proof that this substance is an alkaloid, and that it is closely related to quinine.

We have named it animal quinoidine, because we have not as yet been able to crystallize it nor to obtain enough for an analysis.

Having satisfied ourselves that an alkaline fluorescent substance resembling quinine existed in the different textures, we endeavoured to determine the proportion that was present in different parts. For this purpose standard solutions of quinine of known strength were prepared, and equal amounts of substance were treated in precisely similar ways, and then the fluorescence was compared with the standard solutions of quinine. No very accurate estimations could thus be made, but comparative results could be obtained, and these are represented in the following tables:—

On the Amount of Fluorescent Substance in different parts of Guinea-pigs and of Man, measured by the number of grains of quinine in 100 litres (=176 pints) of water, that gave the same fluorescence.

	IN GUINEA-PIGS.			IN MAN.		
Liver	6 to 3	6	2	2	2	2
Lenses	3	2	2	2		
Kidney	3	2	2	2	2	3 to 6
Urine	3	2	2			
Bile	3	2	2			
Blood	3	2	2			
Brain	3	2	2			
Nerves	3	2	2	1	1	2
Muscles	3	2	2	1	2	2
Humours of the Eye	2	2	2			
Cartilages	...	...	...	3	1	
Spleen	...	...	...	1	1	3
Lungs	...	...	...	1	1	2

What, then, is the meaning of this widely diffused substance in animals which so closely resembles quinine? At present we are far from a perfectly clear answer. It is not thirty years yet since the presence of ammonia in the products of distillation of coal was considered "curious," because nitrogen was thought to be the characteristic of an animal substance, and absence of nitrogen was considered as the distinctive mark of vegetable creation. Gradually, year by year, each substance that has been thought to be the special property of the vegetable world has been found to occur in animals. Thus sugar, starch, woody fibre, vegetable colouring matter as indigo, albuminous substances, are common to animals and vegetables; and at length we have arrived at the fact that no distinction can truly be drawn between the three kingdoms of nature. In the body, salt and phosphate of lime and phosphate of soda are animal substances as much as fibrin and albumen. Sugar is as much an animal substance as albumen is a vegetable substance, and no separation can be made by chemical analysis between animal, vegetable, and mineral.

The processes which take place in the three different kingdoms are, however, very different. The vegetable generally from carbonic acid, ammonia, and water, can synthetically build up acids, neutral hydrocarbons, fats, alkaloids, and albuminous substances.

Whilst the animal generally from albumen analytically produces alkaloids, fats, neutral hydrocarbons, acids, and ulimately water, ammonia, and carbonic acid.

Thus the following table of synthetically and analytically produced substances common to both kingdoms may even now be formed :—

From Carbonate of Ammonia and Water. *Synthetically formed substances, by the plant or by the chemist.*	From Albumen passing down to Carbonate Ammonia and Water. *Analytically formed substances.*
Oxalic Acid.	Albumen.
Formic.	Casein.
Lactic.	Animal Quinoidine.
Acetic.	Indican.
Valerianic.	Glycocol.
Glycerine.	Taurin.
Sugar.	Leucin.
Starch.	Urea
Cellulose.	Caprylic Acid.
Cholesterin.	Caproic.
Butyrin.	Capric.
Palmatin.	Olein.
Stearin.	Stearin.
Olein.	Palmatin.
Capric Acid.	Butyrin.
Caproic.	Cholesterin.
Caprylic.	Cellulose.
Urea.	Starch.
Leucin.	Sugar.
Taurin.	Glycerine.
Glycocol.	Valerianic Acid.
Indican.	Acetic.
Quinine.	Lactic.
Casein.	Formic.
Albumen.	Oxalic.

From this point of view, then, our so-called animal quinoidine is descended from albumen, and its ultimate progeny are carbonate of ammonia and water, out of which substances the cinchona-tree, under favourable circumstances, is able to build up quinine.

$$C_{40}H_{24}N_2O_4.$$

From the large number of carbon atoms in quinine, it may be regarded as one of the early substances produced in the downward passage of albumen, and from this we shall very probably find the key to the question how quinine acts in the body.

When sulphate of quinine is taken, like the lithium and other substances which I brought before you last year, it rapidly passes from the blood into the textures.

Even in a quarter of an hour, after four grains of sulphate of quinine the fluorescence may rise to 75 grains to 100 litres. It is found in greatest amount in the liver and kidney; rather less in the blood, urine, and muscles; still less in the brain, nerves, and bile; and is perhaps even in this time increased in the lens of the eye.

In three hours the maximum effect of the quinine may be reached. It amounts then to from 100 to 200 grains of quinine in 100 litres of water, and it occurs to this amount in the liver, kidney, urine, bile, blood, brain, and muscles. The nerves and aqueous humour showed much less increase, and the lenses showed the least increase of all the textures.

In six hours the amount of fluorescence was rather less than in three hours.

In twenty-four hours it was considerably less than half as much as in three hours.

In forty-eight hours, except in the liver and blood, there was but little more fluorescent substance in the textures than naturally exists there.

And in seventy-two hours the liver showed no trace of increase of fluorescence.

Hence, in fifteen minutes the quinine had passed everywhere. In three hours it was at its maximum, and remained in excess for six hours. In twenty-four hours it was much diminished, and in forty-eight hours scarcely perceptible.

These results were obtained by extracting the natural fluorescent substance and the quinine together from the textures, determining the joint fluorescence by standard solutions; and by comparing the numbers thus obtained with the numbers given when no quinine was taken.

The following table of the fluorescence of the different textures after four grains of quinine had been taken by guinea-pigs was made:—

	Experiment 1, $\frac{1}{4}$ hour.	Experiment 2, $\frac{1}{2}$ hour.	Experiment 3, 1 hour.	Experiment 4, 3 hours.	Experiment 5, $4\frac{1}{2}$ hours.	Experiment 6, $5\frac{1}{2}$ hours.	Experiment 7, 6 hours.	Experiment 8, 8 hours.	Experiment 9, 24 hours.	Experiment 10, 32 hours.	Experiment 11, 48 hours.	Experiment 12, 72 hours.
Liver	75	40	20 to 40	100 to 200	100		100 to 200		50	4	6	6
Lenses	6 to 3	5	—	3	2		3 ,, 1		3		3	3
Kidney	75	40	20	100 to 200	100		100		50		3	3
Urine	50	20 to 10	20	100 ,, 200	100		100	4 to 6	12 to 6	2	3	3
Bile	12	20	5	100 ,, 200	13		75	5	12		3	3
Blood	50	20	20	100 ,, 200	12 to 25	20 to 40	100 to 50		12		6	3
Brain	12	10 to 5	5 to 3	100 ,, 200	6 ,, 12		25		6			3
Nerves	6	5	least	6	2		6		3		3	3
Muscles	50 to 25	20	5	100 to 200	50 to 100		25		12 to 6		3	3
Humors	—	5	—	6 ,, 3	2		3		6		3	least

We have been able also to find some trace of the passage of the quinine even into the lens of the eye of man.

The following table, which we owe to the kindness of Mr. Bowman, who gave us the cataracts, makes this evident:—

On the Increase of Fluorescence in Cataracts after Quinine.

Natural fluorescence of lens . . .	=	1·6 grs. of quinine per 100 litres of water.		
1 hour after 5 grs. quinine; cataract	=	1·6	,,	,,
$1\frac{1}{4}$,, ,, ,,	=	1·6	,,	,,
2 ,, ,, ,,	=	1·6	,,	,,
$2\frac{1}{4}$,, ,, ,,	=	2·1 to 3·1	,,	,,
After many days taking quinine ,,	=	6·2 to 3·1	,,	,,

The figures represent the number of grains of sulphate of quinine in 100 litres, 176 pints of water, required to give a fluorescence equal to that of the substances extracted.

Thus, then, the quinine goes everywhere; and wherever it goes it meets with the natural fluorescent substance like quinine, which is most probably constantly forming and undergoing oxidation. The incoming quinine causes a temporary excess of quinine in the textures. Probably it causes a stoppage of the fresh formation of quinine from albumen; a temporary arrest of the changes going on; a transfer of action probably to the quinine introduced, so that with large doses deafness and great prostration and almost imperceptible pulse are produced in man, whilst in guinea-pigs death even is caused by the extreme prostration. In small doses, quinine, probably like alcohol, gives an immediate stimulus when the first chemical action takes place; but soon the quinine retards the chemical changes in the nitrogenous substances, just as alcohol, by its secondary action, retards the chemical changes in the hydrocarbons in the different textures.

Possibly the increased resistance to changes in the textures and in the blood produced by excessive doses of quinine or alcohol, is analogous to that state well known to medical men under the very indefinite and probably incorrect name of uræmia.

From these experiments two hopeful prospects of possible discovery arise—1st, as to the explanation of the cause and cure of ague; 2nd, as to the treatment of diseases in parts of the body external to the blood-vessels.

1. Assume that a substance like quinine exists, in health, in the textures, can its rapid

destruction and removal through the action of marsh miasm give rise to ague? Does quinine cure ague by furnishing a substance which retards the changes which go on in the textures? and in the well-known property of arsenic to preserve organic substances have we also the explanation of its power in curing ague?

2. If the chemical circulation can carry alkaloids even into the non-vascular tissues, is it not reasonable to suppose that medicines pass through the blood and act on the textures? and is it not most probable that they take part in every chemical change that occurs outside the blood-vessels, as well as in the blood itself? Still further, may we not expect that among the multitudes of new substances which synthetical chemistry is now constantly forming, some medicines may be discovered which may not only have power to control the excessive chemical changes of the textures in fevers and inflammations, but may be able to remove the products of insufficient chemical action even in those diseases which affect the non-vascular textures, as, for example, in cataract and in gout?

It remains that I should in a very few words tell you what was already known regarding this fluorescent substance, and on the rate of passage of alkaloids into and out of the body, before we begin our work.

In 1845, Professor Brücke stated that the lens absorbed the blue rays of light to a very great extent, and that the cornea and aqueous humour did so to a less extent. In 1855, Professor Helmholtz examined for fluorescence the retina of the eye of a man who had been dead for eighteen hours. The first experiment showed that it was very feebly fluorescent. The colour of the light dispersed through the retina he found greenish-white.

In 1858, M. Jules Regnauld, using sunlight, found in man and the mammifera that the cornea fluoresced in a very slight degree. In the sheep, dog, cat, and rabbit, the crystalline lens possessed in the highest degree fluorescent properties. In these animals, and also in many birds, the central part of the lens, preserved by desiccation at a low temperature, retained this property. The central portion of the crystalline of many vertebrata and mollusca he found almost entirely without fluorescence. The vitreous humour possesses only a very feeble fluorescence, due to the hyaline membrane. The retina possessed a certain fluorescence which was not all comparable in intensity to that of the crystalline lens.

In 1859, L. Setschenow, of Moscow, a pupil of Helmholtz, at his request, experimented on the eyes of men and rabbits. The fresh retina showed the same phenomenon as the dead human retina. It diffused a greenish-white light, which, examined by a prism, gives a spectrum in which the red is wanting. The vitreous humour in a thin glass vessel showed only traces of fluorescence. The lens, on the contrary, fluoresced very strongly, the colour of the dispersed light being white-blue, exactly like quinine, only the quinine was a little stronger. Examined by a prism, the dispersed light gave a spectrum in which the red was wanting, and in which the blue tone predominated. The fluorescence begins, as in quinine solutions, between G and H, and is strongest at the outer edge of the violet rays, and extends into the ultra violet to the same distance in the case of the lens as in the case of the quinine solution.

When the cornea was cut out, it fluoresced much feebler than the lens; the aqueous humour did not fluoresce at all.

The appearances in the three last media, he says, can be shown with the greatest ease, even in the eye of the living man. When the eye is brought into the focus of the ultra violet rays, immediately the cornea and the lens begin to glimmer with a white-blue light. The cornea of the living eye is much more fluorescent than when dissected out, probably from the loss of transparency, consequent on contraction of the texture, and from evaporation.

Professor Donders has carefully investigated the time in which atropine and Calabar bean act on the iris in man.

A solution of atropine dropped on the cornea in fifteen minutes begins to act, and attains its maximum in from twenty to twenty-five minutes. In forty-two hours the pupil is rather smaller, and even after thirteen days the pupil was not quite its natural size.

The fluid extracted from the aqueous humour, injected into another eye, caused dilatation of the pupil.

A solution of Calabar bean began to act in from five to ten minutes; attained its maximum in from thirty to forty minutes. At the end of three hours it began to diminish, and disappeared entirely in from two to four days.

SULPHUR IN GAS.

Dr. Letheby, in his evidence before the Committee of the House of Commons, gave a table of the illuminating power and grains per 100 feet of sulphur of the gases of the most important towns in the United Kingdom. The value of gas may practically be viewed as dependent upon these two items. The illuminating power represents the money value, whilst, as sulphur is the most deleterious impurity found in gas, both as regards our health and its injurious effects upon property, it is necessary to have as small an amount of that substance as possible. But in looking over the tables given by Dr. Letheby, we are sorry to see that frequently the relative position of these two points are in inverse ratio to what they should be, and that as the percentage of sulphur increases the illuminating power decreases. In the large towns, such as Birmingham, Liverpool, Manchester, etc., we find the illuminating power great, but also a large percentage of sulphur. The increased illuminating power of gases in these places can be well understood, as it is no doubt due to competition, and the absolute necessity for good lighting in manufacturing and commercial districts; but still they do not seem to be alive to the importance of the absence of sulphur—a matter of serious danger to their goods if they have no regard to their lungs. The gas in "Pusey" may be taken as a fair specimen. The illuminating power was put at 16·49, and it contained 3·3 grains of sulphur in every 100 feet.

Chatham may be viewed as an example of a bad specimen of gas, as its illuminating power was put at 8·46, and yet it contained 18·2 grains of sulphur in the 100 feet. It is a pity that Dublin cuts so sorry a figure in this respect.

Dr. Letheby gives the illuminating power of the Dublin gas as 14·3, and says that it contains about 18 grains of sulphur in the 100 feet (17·92). He attributes the large amount of the sulphur in the gas now in use to the substitution of oxide of iron in the purifiers instead of lime, the removal of the refuse lime from the purifiers being considered a nuisance by those residing in the neighbourhood of the gas-works; but we question if the pouring of eighteen grains of sulphur, which is equivalent to fifty-five grains of sulphuric acid, during the combustion of 100 feet of gas, will not be more deleterious in the long-run than any local nuisance. Until a better mode of purifying the gas from sulphur than that now in use be devised, we should advocate a return to the lime purifiers. We believe that gas engineers wash the gas with the ammoniacal water, by which means a considerable percentage of sulphur is removed.—*Mr. C. C. Tichborne, in Medical Press.*

ON THE POISONOUS CHARACTER OF NITROGLYCERINE.

In the 'Hanoverian Journal for Practical Surgery and Medicine' (*Zeitschrift für praktische Heilkunde und Medicinalwesen,* heft i.) there is an article by Mr. B. Schuchardt on the injurious effects of nitroglycerine upon men and animals. Among the higher animals he found that it acted chiefly on the brain, and in large doses caused death. In order to study its effect upon himself the author took one drop at 10 A.M.; five minutes after great giddiness came on, accompanied by weakness of sight, headache with throbbing in the temples, weariness, sleepiness, strong aromatic taste in the mouth, a burning feeling in the throat, and pain in the region of the heart. An hour later, whilst incautiously endeavouring to take some nitroglycerine out of a bottle by means of a tube, he received a considerable quantity in the throat. Although he spat it out at once, and rinsed out his mouth with alcohol, he felt the above-described symptoms return, so that he was obliged to go to bed. He then fell into a half-senseless condition, which lasted some hours, and left behind a violent throbbing headache, with sensitiveness to light, giddiness, and trembling in the whole body. At first a feeling of warmth spread over the whole system, and the pulse increased in speed, later a feeling of cold came over him; besides this, there was burning sensation in the region of the heart, and nausea, but no vomiting. On the following day every symptom of poisoning had disappeared. There was no sign at all of convulsions.

When applied externally, nitroglycerine produces no effect at all; to have any action it must be absorbed into the blood. This seems to show that its poisonous effects are due to the products of its own decomposition. Perhaps protoxide of nitrogen is set free in the blood. As the blasting oil has the property of penetrating through organic tissues in a very marked manner, it is easy to understand that workmen handling the material should get headaches by absorption of it through the skin. As nitroglycerine is not volatile, no action through the lungs can take place.

As the excellence of nitroglycerine as a blasting material is sufficiently proved, it will not be long before it finds a wide application. Then will come the question whether its poisonous properties are not so considerable as to forbid its employment. The author of the article referred to believes, from his researches, that this is not the case. Experiments on animals have shown that, to cause death, comparatively large doses are necessary. It is true that upon man small quantities produce decided symptoms of poisoning, but, even after a somewhat large dose, these were not of such an alarming character as to cause any apprehension of a fatal termination. The author got about a hundred drops in his mouth and swallowed at least ten. Violent symptoms of poisoning came on, but not such as to cause anxiety about his life. In the arts and manufactures far more dangerous poisons are employed, such as phosphorus, cyanide of potassium, and corrosive sublimate. However, in consideration of the injuriousness of nitroglycerine, some precautionary regulations for its manufacture and sale should (in the author's opinion) be adopted. Besides this, workmen should be taught the dangerous nature of the blasting oil, in order to prevent their injuring themselves by carelessness in handling it. If these means were taken, it is thought that nitroglycerine would scarcely be found more injurious than any of the other poisons used in the arts and manufactures.

MANUFACTURE OF COD-LIVER OIL IN NORWAY.

BY J. LEON SOUBEIRAN.

Having been charged in the month of August last, by the Zoological Acclimatation Society, to go to Bergen, in Norway, to study the exhibition of fish which was to be held there, I have received some information on the manufacture of cod-liver oil, which, I believe, offers sufficient interest to the pharmaceutist for me to make it known.

Until latter years the cod-liver oil of commerce was obtained by the crude process of fermentation or putrefaction, the livers being thrown into barrels, and abandoned to themselves until the oil separated and arose to the surface, whence it was removed for use. Thus obtained, it is always coloured brown, and has a repulsive taste. The idea of heating the livers to extract the oil is of comparatively recent origin. This process, as applied in Norway by small manufacturers, is carried out by conducting the steam from a cylindrical boiler by several pipes into as many barrels containing the livers, each furnished with stopcocks at different heights. As the steam operates, the lighter-coloured oil separates and rises to the top, and should be drawn off as soon after it separates as possible. The oil obtained afterwards is more coloured and odorous, and it is thought that the solvent action of the steam extracts such substances as iodine and bromine compounds from the oil, and thus injures it.

To obviate this inconvenience, most of the regularly organized factories in Norway have an apparatus consisting of a vessel surrounded by a steam-jacket, so arranged that the oil can filter off in measure as it separates, which is considered to be a great improvement. This apparatus consists of a cylindrical vessel enclosing another cylindrical vessel of smaller diameter and less height, joined steam-tight to the first by a rim at the top. The inner vessel has a conical diaphragm, dividing it into two parts, which diaphragm is constructed of some material which acts as a filter, admitting the oil to flow into the lower apartment, whence it is drawn off by a stopcock, passing latterly through the steam chamber. This arrangement answers a good purpose.

We saw at Bergen an apparatus made by one of our pharmaceutists, M. Bouilly, which has appeared the simplest and most convenient of all. This consists of a cast-iron boiler, so arranged that a large curved tube passing through it constitutes part of the chimney of the furnace which heats it. From the top of this boiler four pipes convey the steam to four jacketed conical boilers, each capable of holding three or four barrels. The livers are placed in these, duly disintegrated, and as the oil separates it is removed at once into a large vessel, called a 'kyler,' to cool. During its cooling it becomes clear, forms an abundant deposit from which the oil is decanted and preserved in tinned iron vessels, which are preferable to wooden barrels, which sometimes give colour to the *very white oil* obtained at the commencement of the process.

When the livers are thus exhausted of the white oil, they are removed to a large boiler and heated by a regulated direct heat, until much of the oil remaining separates as a *blonde oil*, much used by the Norwegians for illumination. The residue is yet further treated to get a brown oil, used in the arts, whilst the final residue, of a resin-like matter, is used by the farmers as a manure.—*Journ. de Pharm., March* 1866, and *Amer. Journal of Pharmacy.*

ILLICIT SALE OF METHYLATED SPIRIT.

At the Council House, Bristol, on Friday June 8th, eight chemists of that city were charged, before the sitting magistrates, with the above offence. Mr. Dwelly, solicitor of excise, London, prosecuted.

The first case heard was that against Mr. E. T. Sharland, chemist, who was charged—first, that not being a distiller or rectifier of spirits, or licensed by officers of the Inland Revenue, he had sold certain spirits, whereby he had rendered himself liable to a penalty of £50; and secondly, that he mixed a quantity of methylated spirits with oil of peppermint, to fit it for use as a beverage, whereby he had rendered himself liable to a penalty of £100. Mr. Edlin (instructed by Mr. John Miller and Mr. Taddy) appeared for the defendant, who pleaded not guilty.

Mr. Dwelly, who appeared on behalf of the Inland Revenue, explained the law at considerable length in reference to the sale of methylated spirits. Of course spirits were articles which paid excise duty, but the Legislature had passed an Act of Parliament allowing spirits of wine to be sold duty free, under such restrictions as should prevent its being used as a beverage. It might be mixed with naphtha, and then the mixture would be methylated spirits, which might be retailed by persons taking out the necessary licence. Since the Act of Parliament had been passed allowing licences to be taken out, a great many had been taken out, but it had been ascertained that quantities of these spirits were sold in Bristol without the licence. Mr. Dwelly stated the facts of the present case, and said that the prosecutions were not instituted for the purpose of inflicting severe penalties upon the defendants, but as a warning to others.

Joseph Taylor, an officer of excise, stated that on the 8th of January he went to the shop of Mr. Sharland, and asked one of the assistants if he sold methylated spirits. The assistant said, "Yes." Witness said, "Put me up a half-pint, flavoured with oil of peppermint." The assistant brought him a bottle containing the methylated spirits and oil of peppermint. Witness paid 9*d.* for it. He took the bottle outside, and handed it to Mr. Cullingworth, an officer of excise. It was afterwards sealed with the seal of Mr. Evans, supervisor, and sent to Somerset House.

Mr. Edlin: Then you went about expressly for the purpose of getting the chemists to sell you this spirit illegally?

Witness: I went to the shop for the purpose of making a purchase.

Mr. Edlin: And asked for an article which you knew they could not legally sell; and you did not caution them? [No answer.] Did you buy it for a beverage?

Witness: I purchased it.

Mr. Edlin: That's not quite an answer to my question. Did you buy that as a beverage—to drink it?

Witness: I did not buy it to drink it.

Mr. J. Cullingworth proved having "directed" the bottle to the principal of the laboratory, Somerset House, and Mr. P. T. Evans proved the taking it to the railway office.

Mr. Harkness, one of the assistant chemists in the laboratory, Somerset House, stated that he had examined the contents of the bottle. The strength of the liquid was 61 over proof, and it was methylated spirit flavoured with oil of peppermint. The label on the bottle was "methylated spirit and oil of peppermint." He knew an article named "finish." It was a light kind of varnish, and was allowed to be sold without a licence. One ounce of gum shellac must be added to every gallon of methylated spirit to make it "finish." He examined it to ascertain whether or not it contained gum, but it contained none, and therefore was not "finish." Methylated spirit was made by an addition of naphtha to spirits of wine. The effect of the oil of peppermint was that to a certain extent it disguised the flavour of the naphtha.

Cross-examined: When the gum shellac was mixed with the methylated spirit in the carboy, the gum shellac would not deposit itself at the bottom of the carboy if the spirit was strong.

The witness, in reply to Mr. Dwelly, said that any chemist might know whether the spirits contained gum or not by the "water" test.

Mr. Evans, recalled, stated that he had called upon Mr. Sharland for an explanation of his selling the spirits without a licence. Mr. Sharland said he had not been in the habit of selling it, and did not know that it was required to have a licence.

Mr. Sharland: No, I did not say that; I said I sold it as I received it.

Mr. Edlin submitted that Mr. Dwelly should elect which of the two counts he intended to rely upon.

The question was discussed at some length, after which the Bench expressed an opinion that the second count could not be sustained.

Mr. Edlin then addressed the Bench on the first count. He argued that the liquid sold by his client was not methylated spirit, and that, therefore, he did not require a licence. He illustrated his argument by instancing the case of a pastrycook, who, although he mixed brandy with his mince-pies, was not required to take out a spirit licence, and he was not charged with selling brandy without a licence. According to Mr. Dwelly's own showing, what the defendant sold was not methylated spirit, but methylated spirit mixed with something else, which prevented it from being methylated spirit.

Mr. Castle reminded the learned counsel that if a person put sugar and water into brandy, and sold it, he still sold brandy.

Mr. Edlin said that, in dealing with drugs, a very small quantity of one sort materially altered the effect of another.

The Bench thought that the penalty had been incurred, but mitigated it to £12. 10*s*., the smallest amount, and would strongly recommend the Board of Inland Revenue to remit the whole.

Mr. Henry W. Sanders, of Southwell Street, was next charged with the two offences.

Mr. Edlin said he had conferred with Mr. Dwelly, and the result was that the second count was withdrawn. The defendant, therefore, would withdraw his plea of "Not guilty," and throw himself upon the consideration of the Bench. The defendant was in entire ignorance that he was subjecting himself to a penalty.

The same judgment was given as in the last case.

Mr. Hartland was next charged.

Taylor purchased the spirit on the 8th of January. Mr. Harkness analysed it, and found it to be 59 over proof. There were about 40 grains of gum to the gallon.

The same judgment as in the former cases.

Mr. R. W. Giles, of Clifton, was also charged, and he conducted his own defence.

Taylor said, that on the 14th of February he went to the defendant's shop and asked for a half-pint of methylated spirit flavoured with oil of peppermint.

The witness, in reply to Mr. Giles, stated that the bottle was labelled, "Finish half-pint, oil of peppermint half-drachm."

Mr. Harkness said he found the methylated spirit 61·1 over-proof, and there was no gum in it. It was methylated spirit rather purer than any of the other samples they had had to-day, but it was flavoured with oil of peppermint.

The witness was severely cross-examined by Mr. Giles on chemical science.

Mr. Giles was prepared to prove by evidence that the methylated spirit which he was charged with selling was purchased as "methylated finish," but assuming that it was methylated spirit, he contended that he was justified in selling a mixture of it with oil of peppermint. He quoted authorities to show that he might use methylated spirits for making tinctures, medicated spirits, etc., and sell them, except as ordinary beverages.

Mr. Castle said that Mr. Giles had argued the case ingeniously, but there was the Act of Parliament, which prevented chemists selling the spirits without a licence.

Mr. Giles further argued the case, and said that he had conscientiously endeavoured to keep within the law. These goods he had obtained from respectable sources. They were ordered by him as "methylated finish;" they were invoiced as such, and they were sold as such.

After some discussion, Mr. Phippen said he did not know the distinction between this case and the one which preceded it. There would be a similar judgment therefore.

Mr. Giles intimated his intention of appealing against the decision.

Mr. Ponting, Mr. Robert Fendick, Mr. A. Hodder, and Mr. Edward Maish were severally charged with the same offence, and judgment given as in the former cases.

Another case is reported in the 'Leeds Mercury' of June 22nd, in which a grocer, named Horsfall Cowgill, was charged before the magistrates at Colne, with retailing "Indian Brandee." Mr. F. Hartley, who appeared to prosecute, said it was notorious that the "Indian Brandee" was bought at 1*s*. 9*d*. per gallon, and sold at about 6*s*. per pint. The Bench inflicted the minimum penalty of £12. 10*s*., and expressed the opinion that the conviction would be sufficient to deter the large number of grocers in this locality who sell the "Indian Brandee."

A BILL FOR THE AMENDMENT OF THE LAW WITH RESPECT TO THE CARRIAGE AND DEPOSIT OF DANGEROUS GOODS.

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 the authority of the same, as follows:—

1. The goods or article commonly known as nitro-glycerine or glonoine oil shall be deemed to be specially dangerous within the meaning of this Act.

2. Her Majesty may from time to time, by order in Council, declare that any goods named in any such order (other than nitroglycerine or glonoine oil) are to be deemed specially dangerous within the meaning of this Act; and may from time to time amend or repeal any such order; and any goods which are by any such order declared to be specially dangerous shall, so long as such order is in force, be deemed to be specially dangerous within the meaning of this Act.

3. No person shall deliver any goods which are specially dangerous to any warehouse owner or carrier, or send or carry or cause to be sent or carried any such goods upon any railway or in any ship to or from any part of the United Kingdom, or in any other public conveyance, or deposit any such goods in or on any warehouse or quay, unless the true name or description of such goods, with the addition of the words specially dangerous, is distinctly written, printed, or marked on the outside of the package, nor in the case of delivery to or deposit with any warehouse owner or carrier, without also giving notice in writing to him of the name or description of such goods, and of their being specially dangerous. And any person who knowingly commits a breach of this enactment shall be liable to a penalty not exceeding *five hundred* pounds, or at the discretion of the Court to imprisonment, with or without hard labour, for any term not exceeding *two years*.

4. No warehouse owner or carrier shall be bound to receive or carry any goods which are specially dangerous.

5. In construing this Act the term warehouse owner shall include all persons or bodies of persons owning or managing any warehouse, store, quay, or other premises in which goods are deposited; and the word carrier shall include all persons or bodies of persons carrying goods or passengers for hire.

6. The Act of the Session of the twenty-fifth and twenty-sixth years of her Majesty's reign, chapter sixty-six, "for the safe keeping of petroleum," is hereby extended and applied to nitroglycerine, and that Act shall be read and have effect as if throughout its provisions nitroglycerine had been mentioned in addition to petroleum; save that so much of the said Act as specifies the maximum quantity of petroleum to be kept as therein mentioned without a licence shall not apply in the case of nitroglycerine, and any quantity whatever of nitroglycerine shall be deemed to be subject to the provisions of the said Act.

7. The said Act of the Session of the twenty-fifth and twenty-sixth years of her Majesty's reign is also hereby extended and applied to any substance for the time being declared by any Order in Council under this Act to be specially dangerous, and that Act shall be read and have effect as if throughout its provisions the substance to which such

Order in Council relates had been mentioned in addition to petroleum; save that the quantity of such substance which it shall not be lawful to keep as in the said Act mentioned without a licence shall, instead of the quantity specified in relation to petroleum in the said Act, be such quantity as is specified in that behalf in relation to any such substance in any such Order in Council.

8. This Act may be cited as The Carriage and Deposit of Dangerous Goods Act, 1866.

POISONING BY LAUDANUM.

Tuesday, June 19th, Mr. Payne, deputy-coroner, held an inquiry at the White Horse Tavern, Fetter Lane, respecting the death of Thomas Burges, aged thirty-two. It appeared from the evidence that the deceased had been a supernumerary at the Italian Opera. He lodged at the White Horse, Fetter Lane, and was at times, it appeared, without sufficient food. On Saturday he was found insensible, and at half-past nine Dr. Stone was called to see him. He said his illness was caused by laudanum poisoning, and asked who would pay if he attended him. Dr. Stone then left, telling Mr. Pyne, the landlord, to send for the parish doctor. Mr. Webb, the relieving officer, was then sent to for a medical order, and he gave one signed "Webb, M.D.," and did not state in it that it was an urgent case or one of poison. It was sent to Dr. Reed, the parish surgeon, who got it in "the usual course," and went his rounds. At two o'clock a message was sent to him stating the urgency of the case. He then went to the White Horse, but the deceased was then dead. Three bottles that had contained laudanum were found under his pillow. They had been purchased in Manchester. Dr. Reed said the *post mortem* examination showed that deceased died from opium poisoning. He was suffering from disease of the lungs, and it was possible that he might have taken the laudanum to alleviate pain. Immediate measures should certainly have been adopted with a view to save the deceased's life. The coroner having summed up, the jury returned a verdict, "That the deceased died from laudanum poisoning, but whether the death was caused by design or accident there was no evidence to show;" and they appended to their verdict the expression of their opinion, "That the medical orders granted by relieving officers ought to be more explicit, and that in all such cases the word 'urgent' should be written on the order; and the jurors further say that they regret that Dr. Stone did not give more attention to the deceased when he was called in to attend him."

SUPPOSED CASES OF POISONING.

Mr. Henry Edwards, the medical officer at the Cardiff Workhouse, has been charged with causing the deaths of two men, Francis Buckley and Evan Frank, who died on the night after taking some medicine which had been prescribed for them by Mr. Edwards. The *post mortem* examinations showed that the men had died from congestion of the lungs and brain. A very elaborate analysis, both of the contents of the stomachs and of the bottle of medicine, was made by Dr. W. B. Herapath, the result of which was that no poison, metallic or vegetable, was found, and the medicine prescribed by Mr. Edwards was found to be a harmless mixture, containing iodide of potassium and carbonate of potash in small doses. The charge against Mr. Edwards was at once dismissed by the Bench.

An inquiry made by Mr. Cockcroft, the coroner for South Northumberland, and a jury, at the village of Ponteland, and which has extended over two months, into the circumstances of the deaths of three brothers named Bushby, who occupied Donkin's Farm, near that village, was resumed on Thursday. In the early part of the year the deceased, strong, powerful Northumberland farmers, with the whole of their household, were prostrate with illness, and it was doubtful whether it was occasioned by the unsanitary condition of the surroundings of the farmhouse or by slow poisoning. They had the best medical advice, but the three brothers succumbed to the attack and died. A good deal of discussion took place as to the mysterious circumstances of these men's deaths, and the very serious results which had followed the illness of the other persons who had been ill—for the survivors are all more or less likely to be invalids for life; and the inquiry having been put into the hands of the county constabulary, the body of John Bushby was disinterred, and the viscera were analysed, the result of which left no doubt that he had died from the effects of arsenic. Notwithstanding, however, the long and patient inquiries which have been made by the coroner and jury, no clue has been found as to how the poison had got into the persons of the deceased men, whether it had been administered wilfully or had got into their food by accident. Mrs. Bushby, of Allendale, who went to the farm while the men were ill and dying, and who appears to have been poisoned also,—for she is quite paralysed, and has been confined to her bed sixteen weeks,—being unable to attend, and the coroner and jury feeling disinclined to close the inquiry without having first penetrated the mystery of the violent death of the three brothers, they have adjourned the inquest until the 30th of August.

AN OVERDOSE OF MORPHIA.

On Saturday June 2nd, Mr. Charles St. Clair Bedford presided over a jury at No. 15, Park Street, Westminster, on the body of Mr. William Gravatt, engineer. Mr. A. C. Lewis, of Furnival's Inn, attended for the nephew of the deceased and the nurse who had attended him; and Mr. Lewis, sen., of Ely Place, represented Dr. Poole, his medical attendant. Mr. W. Gravatt Cobbe identified the body as that of his uncle. The deceased had been ill about ten months, and on the previous Tuesday had been visited by Dr. Poole, in the absence of Mr. Lee who generally attended, who wrote a prescription, and said, "This is to be given at night if necessary, but not otherwise, and then only the half of it." It was given at eleven o'clock by the nurse. About half-past six in the morning, the nurse asked Mr. Cobbe to look at Mr. Gravatt, who was making a curious noise. Dr. Poole was sent for, but being out, Mr. Langston was called in. He asked the nurse what had been given, when she showed him the bottle, and said she had given the whole of the draught. He administered brandy, but death soon ensued. The bottle was here produced, the instruction upon it being, "The half of this draught to be taken at once." Dr. Poole did not say that it would be dangerous to take the whole of the draught at once. Mr. Samuel Chaplin, chemist and druggist, of 11, Tothill Street, said he prepared a prescription on Tuesday afternoon last, and the label on the bottle produced was in his handwriting. He made up a mixture and a draught. The draught contained four grains of muriate of morphia, the half of which was to be taken at once. If witness had been going to administer such a draught in a case of *delirium tremens*, he should have thought two grains would have been a heavy dose, and four grains probably a fatal dose. From one-quarter of a grain to a grain is a dose. Mr. Thomas Longston, surgeon, of 29, Broadway, Westminster, deposed to having been called to the deceased on Wednesday morning at seven o'clock. He was in a half comatose state, the face looking ghastly and the lips livid. There was a loud mucous rattling in the throat, the pupils contracted, the pulse imperceptible, and the body covered with cold perspiration. From these symptoms he thought he was dying from narcotic poison, and inquired what he had taken. He made a *post mortem* examination on Thursday. The stomach was placed in a jar for future examination, if necessary. He considered the cause of death to be an overdose of muriate of morphia. Four grains, to a certainty, would destroy life. That did not apply to opium-eaters, persons under *delirium tremens*, or those accustomed to take large doses of narcotics. Two grains was a very large dose, but would not of necessity be fatal. In general cross-examination, witness said if he gave one grain of morphia he should like to watch the effect. He certainly would not give two grains. Ruth Henny, the nurse, was then called. She gave Mr. Gravatt a dose of medicine, thinking it was the same as Mr. Lee had sent. She had no notion that it was poison. When she was in the room no one ever said anything about the half being taken. She did not look at the bottle, because he had had similar bottles before. The jury consulted for a short time, when they returned the following verdict:—"We find that William Gravatt was accidentally poisoned by an overdose of morphia, given inadvertently by his nurse, to whom, in the jury's opinion, sufficient caution was not given by the medical man in attendance on the deceased."

MISCELLANEA.

Standard Weights and Measures.—By a Bill now before the House of Commons the imperial standards of length and of weight, and the secondary standards of weights and measures, which have been in the custody of the Controller-General of the Exchequer, are transferred to the Board of Trade; and by that Board the three Parliamentary copies of the imperial standards deposited at the Mint, with the Royal Society, and in Greenwich Observatory, are to be compared with the imperial standards once in every ten years; and the secondary (now to be called the Board of Trade) standards of length and weight are to be so compared once in every five years, and adjusted or renewed, if requisite. The Queen in Council may define the amount of error to be tolerated in other secondary standards of length, weight, and capacity, when compared with the Board of Trade standards. The custody of the standard trial pieces of gold, silver, and copper is transferred to the Treasury.—*Times.*

Hydrated Silicate of Magnesia as a substitute for Subnitrate of Bismuth.—We learn from the 'Journal of Practical Medicine and Surgery,' that M. Garraud, a physician of Laval, thinking that the inefficiency of the subnitrate of bismuth was sometimes due to the temptation afforded by its high price to fraud and adulteration, was induced to try the hydrated silicate of magnesia, a substance common to the district where M. Garraud resided, and considered to be a silicate of magnesia and lime. It is reduced to a fine powder and given in the same manner as the subnitrate of bismuth, in doses of 4, 8, or 10 grammes a day, suspended in water: and the numerous cases of diarrhœa in which this medicine has been administered, experienced a rapid diminution of the intestinal flux.

Rendering Nitroglycerine Non-Explosive.—It appears that practically there is no greater difficulty in rendering nitroglycerine non-explosive and explosive at pleasure than there is in accomplishing the same feat with gunpowder, although the means employed are, of course, dissimilar. The recent accidents with the new explosive agents have induced Mr. Nobel to turn his attention seriously to the subject, and he is now enabled to state that by mixing the nitroglycerine with methylic alcohol (a cheap spirit, popularly known as spirit of wood) the nitroglycerine is rendered unexplosive either by percussion or heat. When required for use, water is added, which absorbs the spirit, and the oil sinks to the bottom of the vessel, whence it is drawn by a siphon, and its explosive nature thereupon found to be restored. Experiments for testing the value of this discovery have already been made in America, and given highly satisfactory results. We look upon the subject as one of the greatest importance to miners, and shall be glad if the new discovery enables us to transport nitroglycerine, at least as safely as blasting-powder, while we believe it has already been proved much more efficacious.—*Mining Journal and Chemical News.*

A Villanous Compound.—At the Dewsbury Police-court, on Monday, June 18th, six tradesmen were charged by officers of Inland Revenue with selling methylated spirits without licence. The spirits were sold under the name of "Concentrated Essence of Indian Brandee," but were a deleterious mixture of naphtha and brandy of the worst quality. In defence it was urged the offence had been committed in ignorance of the pernicious nature of the article, the defendants having been given to understand that it was a capital remedy for coughs and other ailments. In each case the mitigated penalty of £12. 10*s.* was imposed.—*Evening Standard*, June 20, 1866.

The Value of Petroleum and other Oils as a Fuel.—An official report of the result of Mr. Richardson's experiments in burning petroleum and other oils as a fuel for marine and locomotive engines was yesterday forwarded from Woolwich to the Board of Admiralty, and it is stated that the report was exceedingly favourable. It is now suggested that a couple of boilers, one fed with ordinary fuel, and the other fitted up internally according to any method which Mr. Richardson may direct, should be tried competitively, and an announcement of the result should be drawn up and laid before their Lordships.—*Times*, June 21.

A New Explosive.—A few days ago, we noticed the fact of the master of the ship 'St. Joseph,' recently arrived at this port, having found a suspicious box on board his vessel, marked "Sodium," flung it overboard, and as soon as the package touched the water an explosion occurred, lifting the sea into an immense column to the stern of the vessel. We infer, from a San Francisco journal, that it was a new chemical mixture called sodium amalgam. This material is never manufactured in very large quantities, though it has been advertised for sale in San Francisco, one firm claiming to have as much as 200 oz. for sale. The amount does not seem large, but when it is understood that the explosive power of 1 oz. of sodium is equal to that of about 25 lb. of gunpowder, or $2\frac{1}{2}$ lb. of nitroglycerine, it can readily be conceived that even 15 oz. or 20 oz., exploded in one place, would create immense havoc. And when one further reflects that even so little a thing as a spoonful of water coming in contact with 200 oz. of sodium would occasion an explosion equal to that which would be occasioned by the ignition of 5000 lb. of powder, or the concussion of 500 lb. of nitroglycerine, we can form some conception of its tremendous destructive power.—*Boston Journal.*

Education of Medical Students.—The General Medical Council has been occupied during its recent sittings with the preliminary education of medical students. They have laid down a minimum standard of subjects for examination in which youths must pass before being admitted to commence their professional studies. They are as follows:—Compulsory—1. English language, including grammar and composition; arithmetic, including vulgar and decimal fractions; algebra, including simple equations; geometry, first two books of Euclid; Latin, including translation and grammar; and one of the following optional subjects—Greek, French, German, natural philosophy. After the year 1869, Greek will be transferred to the list of compulsory subjects. Certificates of proficiency in these subjects will be received from all the authorized examining bodies in the United Kingdom. Very long debates have taken place upon this scheme, which has hitherto been enforced by some medical corporations and not by others. It was objected that the remuneration of medical men in many country districts was not such as to tempt scholarly and educated men to undertake the duties, but the opinion prevailed that the preliminary training of medical men should in every case be brought at least up to the standard indicated.

Suicide by Prussic Acid.—We regret to announce that a melancholy suicide took place in Dublin, on Tuesday, May 15th. Mr. Carter E. Draper, of the firm of Bewley and Draper, wholesale druggists, was found dead in his bed, from the effects of prussic acid. The deceased, who was fifty-five years of age, had for some time exhibited symptoms which caused much uneasiness to his family. An inquest was held, and a verdict returned, that he had committed suicide under the influence of insanity.

REVIEW.

Suggestions for a New System of Chemical Nomenclature. By G. Hamilton, F.C.S., F.R.A.S., Professor of Chemistry at Queen's College, Liverpool.

It requires considerable courage, if not boldness, on the part of any chemist, however eminent, to propose a radical change in the entire system of names for chemical substances. Such a scheme must necessarily have so little, if any, chance of being adopted that it is likely to receive but a small amount of serious consideration. Moreover, the creation of a new system which shall be perfectly applicable to the present state of our science appears so difficult a task, that we are apt to regard it as impossible to any but a giant mind, and consequently to look with suspicion on any new attempts. Nevertheless, the necessity for more perfect names is daily increasing. The present nomenclature is unsystematic, inconsistent with our views, and incapable of extension. It has been concocted by so many cooks that it is utterly spoilt.

Whether the present time is well suited for its entire reconstruction may be fairly questioned, but it certainly behoves every chemist to study the principles which should guide us to that end. For this reason we would ask our readers to give a kindly consideration to Professor Hamilton's pamphlet. It simply professes to offer suggestions for a new system, and not to contain the system.

Nevertheless, Mr. Hamilton developes the outline of a scheme for naming according to one uniform plan all known compounds, and also every possible combination. In the first place, the names of the elements are changed so as to make each terminate in *ine*.

Thus, sulphur, mercury, copper, etc. become sulphine, mercurine, cuprine, etc. The name of every compound is then constructed out of the names of the elements it contains. To express the relative proportions of the elements in a compound the vowels are employed, giving to them the signification of numbers. Thus, a = 1, e = 2, i = 3, o = 4, u = 5. When two vowels are placed together they signify the sum of the two— u a = 6. Two vowels with an *m* between represent the products of the two vowels multiplied together—ume = 5 × 2 = 10. By this and similar means almost any number may be expressed. To name a compound, we take the names of the elements it contains, cut off the termination *ine*, place in its stead the vowel or combinations of vowels to indicate the number of atoms present, and add a final *n* to the whole. Thus, HCl contains one of Hydrine and one of Chlorine; cut off the *ines* and put an *a* in the place of each, add a final *n*, and "Hydrachloran" is obtained as the name of the compound. H_3N contains three of Hydrine and one of Nitrine; in place of the first *ine* put an *i*, and of the second an *a*, add final *n*, and "Hydrinitran" is the result. Following out this system we get such names as Hydretoxan for Water (H_2O), Carbehydruatoxan for Alcohol (C_2H_6O), Hydresulphatoxon for Sulphuric Acid (H_2SO_4), Hydronitrachloran for Sal Ammoniac (H_4NCl), Kalacarbanitran for Cyanide of Potassium (KCN), etc.

This method of using vowels to represent numbers is not, as Mr. Hamilton states, entirely new. It has been long used as a system of artificial memory. It was proposed and successfully employed by Laurent in naming the numerous chlorinated derivatives of naphthaline. Moreover, it was also adopted by the late Mr. Mansfield in naming compounds according to his "Theory of Salts;" and many of his names closely resemble those now suggested.

But in the first page of his book Mr. Hamilton lays down, in eight propositions, the principles upon which he considers a perfect system of nomenclature should be based. The second of these propositions is as follows:—

"No names should be used involving hypothetical views of the constitution, relations, or functions of the things named."

Do Mr. Hamilton's names comply with this condition? The name for water is hydretoxan, which implies that it is a compound of two atoms or equivalents of hydrine and one of oxine. The name depends, therefore, on the proportional number of oxygen being 16. Is not this "involving a hypothetical view of the relation of things"? There are even yet some men of note who assign a different value to oxygen, and consequently a different constitution to water. Alumina is named by Mr. Hamilton "Alumotoxin" = Al_4O_3. This involves a constitution for the compound which modern writers do not assign to it. Most chemists would now call it Alumetoxin = Al_2O_3, Al being 27·5.

We abolished the prefixes bi, proto, etc. in our old system of nomenclature for such compounds as the chlorides of mercury, because they led to the inconvenient expression of theoretical views which were constantly changing. Mr. Hamilton's system would revive in full force those very difficulties. If the author wrote "Mercurachloran," would he mean calomel or corrosive sublimate? We could not answer the question without knowing the weight he assigns to the atom of mercury.

Professor Hamilton's scheme is only good so long as the table of combining proportions remains unchanged, and the formulæ of bodies continue constant. But the former are always liable to alteration, and we can never hope for perfect accordance regarding the latter. We want names which shall serve to identify substances. These suggestions give us in fact nothing more than a concise method for translating symbolic formulæ into language.

Obituary.

Died, June 9th, aged thirty-eight, Mr. John Handley, Pharmaceutical Chemist, Wakefield.

We regret to announce the death of Mr. Alexander Ure, surgeon to St. Mary's Hospital. About three years ago Mr. Ure met with a heavy fall from a horse while attending on the field as surgeon to the Scottish volunteers, since which time he has rapidly declined. He had a rare knowledge of the chemical and therapeutical departments of Materia Medica. Mr. Ure was an Honorary Member of the Pharmaceutical Society, and a contributor to this Journal.

BOOKS RECEIVED.

ON THE FUNCTION OF ARTICULATE SPEECH, AND ON ITS CONNECTION WITH THE MIND AND THE BODILY ORGANS; ILLUSTRATED BY A REFERENCE TO RECENT OBSERVATIONS ON CERTAIN DISEASED STATES OF THE BRAIN. By W. T. GAIRDNER, M.D., etc. Read before the Philosophical Society of Glasgow, March 7, 1866. Glasgow: Printed by Bell and Bain, 41, Mitchell Street, 1866. (Pamphlet.)

THE TRUE AND THE FALSE SCIENCES; A LETTER ON HOMŒOPATHY. London: John Churchill and Sons, New Burlington Street. 1866.

TO CORRESPONDENTS.

The Jury Lists.—We remind our readers that churchwardens and overseers are now making up the list of persons qualified to be returned as jurors for the ensuing year. These lists will be exhibited on every church-door, etc., during the first three Sundays in September, and we recommend all persons qualified to claim the exemption to see that their names are not on the list, or, if placed on the list, to see that they are removed.

Persons having seceded from this 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.

M. P. D. (Tenby).—*Granular Citrate of Magnesia.* See Vol. I. (2nd series), page 301.

K. B. (Leicester).—Apply to the Director-General of the Medical Department of the Navy, Somerset House.

W. G. H. (Reading) wishes to know the composition of "Goold's Mixture for cleaning Rifles."

"*Scotland.*"—Apply to the Secretary, with name and address.

F. D. (Liverpool).—We know of no work on the subject.

Halley's Acid Solution.—Mr. J. Tomalyn Potts, of 128, Brompton Road, S.W., in reply to "A Manchester Correspondent," in our last number, sends the following formula:—Alcohol 3 parts; Sulphuric acid 1 part: mix.

R. K. (London) sends the same, giving the authority:—

"Your correspondent U. J. H. (Manchester) is no doubt mistaken in the name. I am much inclined to believe that Haller's solution is meant; I therefore send you the formula for the Elixirium Acidum Halleri, or Mistura Sulphurico-Acida, according to the Prussian Pharmacopœia, edition 1862,—

℞ Spiritûs vini rect. partes 3.
Acidi sulphurici puri, ,, 1.

Acidum sulphuricum agitando sensim in spiritum vini instilla. Sit ponderis specifici =0·998, usque ad 1·002.

"Your correspondent will bear in mind that on the Continent, in Pharmacy, liquids are weighed and not measured."

"*Inquirer*" (Horncastle).—A preposition; see Latin Dictionary.

M. P. S. (Cheltenham).—The article in question is sold without a stamp, and is thought to be not liable to the Patent Medicine Duty.

Student (Edinburgh).—Fownes's 'Manual of Chemistry' and Bentley's 'Manual of Botany.'

W. C.—Refined white sugar is pure sugar, and raw sugar contains some impurities in addition to this; the former must therefore contain most "saccharine matter."

S. B. (Darlington).—The only practical method of obtaining the soda and potash from the solution described would be by evaporation. The alkalies could not be separated by precipitation.

Full price will be given for the following numbers of this Journal:—January, February, and June, 1865; and January, 1866.

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.

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PROHIBITION OF THE USE OF METHYLATED SPIRIT IN MEDICINE.

Under the title of "A Bill to Amend the Laws relating to the Inland Revenue," there is a measure now before Parliament which, passed into law, will produce a very important influence on the state of pharmacy in this country. By its operation the trade in methylated tinctures, methylated sweet spirit of nitre, and other medicines made with methylated spirit, will be brought to a speedy termination. It may be important for those who have such preparations in stock to know that from and after the passing of this Bill any person who shall sell or have in his possession any medicine intended for internal administration, excepting ether and chloroform, in the manufacture, composition, or preparation of which methylated spirit has been used, will be subject to a penalty of one hundred pounds. This will very effectively settle the question which has been so much discussed, relating to the use of methylated spirit in pharmacy. The great and crying evil which has grown up since the introduction of methylated spirit in 1855, and which has arisen from the unrestricted permission given by the Board of Inland Revenue for the use of methylated spirit as a substitute for spirit of wine in the preparation of medicines, will thus be removed, and we trust this will be accomplished without interfering with the benefits otherwise resulting from the employment of duty-free spirit in the arts and manufactures. In the introduction of the Act passed in 1855, for allowing spirit of wine mixed with wood-naphtha to be used for certain purposes duty-free, it was not contemplated that this spirit would receive any extensive application in pharmacy, and it was strongly urged by the chemical referees who reported upon the subject prior to the passing of the Act, that there ought to be some restrictions placed upon its use in medicine. Such restrictions, however, were not placed, and the evils that were then predicted as the inevitable consequence have been more than realized. The Board of Inland Revenue have become sensible of the error originally committed, and are about to apply, we hope, an effectual remedy. The Bill relates to other matters besides that which immediately concerns us. Its title does not at all specifically indicate its purport, and it might have passed through both Houses of Parliament without our attention having been drawn to it, but as a watchful eye is kept by the officers and Council of our Institution upon all matters affecting the interests of the body they represent, this measure did not escape their vigilance. There are only two clauses in the Bill that relate to methylated spirit or in any way affect pharmacy, but those clauses were found to have a very important bearing, and to admit of an interpretation that would prevent the use of methylated spirit in the manufacture of strychnia and other medicines in the production of which the cheap spirit is employed with advantage, and without any of the evils complained of in other cases. Several interviews have taken place between the President, together with Mr. Morson and the Secretary of the Pharmaceutical Society, and those who originated and have charge of the Bill, and a modification has in consequence been made in the clauses as they originally stood, with the view of removing the defects referred to. The clauses, in their amended form, are as follows:—

"8. No person shall use methylated spirit, or any derivative thereof, in the manufacture, composition, or preparation of any article whatsoever capable of being used, either wholly or partially, as a beverage or internally as a medicine; and if any person shall use methylated spirit, or any derivative thereof, in the manufacture, composition, or preparation of any article as aforesaid, or shall sell or have in his possession any such article in the manufacture, composition, or preparation whereof any methylated spirit, or any derivative thereof, shall have been used, he shall forfeit the sum of One hundred pounds, and such article shall be forfeited, together with the vessels or packages containing the same. Provided always, that nothing herein contained shall apply to the use of methylated spirit, or any derivative thereof, in the manufacture, composition, or preparation of sulphuric ether or chloroform, or prevent the sale or possession of any sulphuric ether or chloroform. *Provided also, that nothing herein contained shall prejudice or affect the power of the Commissioners of Inland Revenue to allow methylated spirit to be used by such persons as they may authorize in such branches of the arts and manufactures of the United Kingdom as the said Commissioners may sanction or approve.*

"9. If any person shall, after any methylated spirit shall have been mixed with gum-resin for forming the mixture known as "Finish," or any like mixture, separate the gum-resin from the said methylated spirit, or alter the said mixture in any manner except by adding thereto a further quantity of gum-resin, *or any article for the sole purpose of colouring the same,* he shall forfeit the sum of Two hundred pounds, and the said spirit and mixture respectively so separated or altered as aforesaid shall be forfeited, together with the vessels or other packages containing the same."

The words printed in italics have been introduced in Committee, and those in the eighth clause are intended to retain power in the hands of the Commissioners to authorize the use of methylated spirit in the manufacture of medicines, such as strychnia, where the spirit is not left as a component part of the product. There is no intention to interfere with the use of methylated spirit in any such manufactures, but only in those cases where the spirit is used as a solvent or menstruum and is retained in the product, such product being intended for internal use either as a beverage or a medicine. All such applications of methylated spirit will be rendered illegal, and stringent measures will be adopted for suppressing them. We have always advocated the adoption of this course, and are glad to find the authorities at Somerset House prepared to carry out what has been repeatedly urged upon them as the only safe course for the protection of the public revenue, and also for the protection of the interests of pharmacy.

The latter part of the eighth clause might perhaps have been made a little more explicit than it is, and it was suggested to the promoters of the Bill, that in allowing the use of methylated spirit for the manufacture of ether and chloroform, it would be well to state that this Act was not to interfere with the *use in medicine*, as well as with the sale and possession of ether and chloroform made from methylated spirit. It is distinctly stated, however, by the authorities in Somerset House, that the clause as it stands is not intended or understood to limit in any way the use of methylated ether or chloroform.

LICENCE FOR THE SALE OF PEPPER.

One of our members having applied to know, whether, now that the duty has been taken off pepper, it is necessary for those selling it to take out a licence for the purpose, the Secretary, Mr. Bremridge, made the inquiry at Somerset House, and has received the following reply :—

"*Somerset House*, 21*st July*, 1866.

"My dear Sir,—In returning the enclosure of yours of the 20th instant, I beg to say that the licence is yet payable for sale of *pepper*, as that article is included with 'tea, coffee, cocoa-nuts, and chocolate,' in one licence and duty.

"*Red* pepper is specially exempt by law from license, but all descriptions of white and black pepper have been held as requiring it for sale.

"I am, my dear Sir, yours truly,
"WM. CORBETT."

BILL RELATING TO THE CARRIAGE AND DEPOSIT OF DANGEROUS GOODS.

This Bill is still before Parliament. Two or three alterations are proposed in it ; but these will not affect the general principles of the measure, which are, that certain articles, including nitro-glycerine, may, by an order of her Majesty in council, be declared to be "specially dangerous ;" that the same regulations as are applied to the storing of petroleum shall apply to such dangerous goods without limit to quantity, and that such goods shall not be sent by any public conveyance, or deposited in or on any warehouse or quay, without having their true name or description, together with the words "specially dangerous" distinctly and legibly attached to them. It is also provided that no carrier or warehouse owner shall be required to receive or carry any such dangerous goods.

The only substance named in the Bill as "specially dangerous" is nitro-glycerine, and it is left to the Privy Council from time to time to include other dangerous substances, if it should be thought desirable to do so. This is putting a great power into the hands of the Privy Council, and it has been suggested that if they should be induced to act upon imperfect or insufficient information, much inconvenience might be caused by putting unnecessary restrictions upon commerce. Thus, for instance, if gun cotton should be added to the list, it could not be kept in the usual way, even in small quantities, for use in medicine or photography. It was thought desirable to communicate with those having charge of the Bill on this subject, and accordingly the President and Secretary of the Pharmaceutical Society, together with Mr. Morson, had an interview with Sir Stafford Northcote, who assured the deputation that no additions affecting pharmacy would be made to the list of dangerous substances without apprising he Council of the Society of the intention to do so.

LEARNING AND LITERATURE.

There is a point with regard to Pharmacy which, unhappily, is no secret ; it forms the unfailing topic of many a familiar communication ; it is whispered into the private ear of a much-enduring editor ; and it claims its full share of journal publicity, namely, a feeling of discontent among practical business men with the social position and the trade capabilities of their occupation.

Long hours *versus* small remuneration is the stereotype complaint which finds its expression sometimes in ignorant, commonplace vituperation; sometimes in phrases of fantastic bitterness; but sometimes also, and the oftenest, in the language of intelligent and deep regret. It would ill become us not to put the most liberal construction on all such animadversions; the pressure of stern facts would more than justify lamentations that in the abstract might be considered exaggerated and overcharged.

Thoughtful men, having the interests of Pharmacy at heart, have neither been ignorant of, nor have withheld their active sympathy from this acknowledged and unquestionable evil.

But the dream of the most enthusiastic philanthropy was tempered by the knowledge that great difficulties stood like a lion in the way. In the first place, it was felt that the wisest generalities could never meet individual wants. Secondly, it was a known truth that men, to a large extent, must be left to regulate their own affairs, and will brook no seeming interference. Thirdly, from the ills incident to pharmacy must be sifted out those which belong to humanity in general, and are simply part of the order of the good providence of God.

Still, the fact that *all* could not be accomplished offered no reasonable excuse that therefore *nothing* should be attempted; and this great problem imperatively claimed attention,—What shall be done to raise English pharmacy? what best method shall be adopted to render such an occupation more worthy of pursuit?

In truth it was high time that some adventurous spirits should become the pioneers of a reform, for things had culminated to their worst.

While half the world were slumbering in their beds, down went the dreary shutters of the druggist's shop; and hours after half the world had quietly gone home, his red lights, like danger signals, were still glowing in the windows. I have no wish to harp upon the grievances of the druggist's life, but at least it may be said that its actual condition afforded strong temptation to the young apprentice to accept the first possible chance of forsaking his intended calling.

Wisely, we think, was the problem solved by the determination on the part of our Society to link learning and literature to trade,—a design visionary in its first aspect, yet the profoundest practical wisdom. Let not the phrase be misunderstood by being narrowed in its application. Learning,—that is, not the mere routine of a scholastic training, however excellent in itself, but learning in its truest sense, the absolute personal possession of that acquired knowledge which shall thoroughly qualify a man for his position, of which literature is the inevitable sequence.

It was, indeed, a bold experiment, and open to serious misconstruction, especially in the minds of those whose range of thought is limited, and who entertain a constitutional dread of the transcendental.

Now that the scheme has stood the test of time, we are in a position to form a just estimate of the sound judgment of our predecessors. They aimed at great essentials and left minor details to arrange themselves, knowing that having once created skilled and well-qualified pharmaceutists, the whole range of trade pharmacy would necessarily reap the advantage. In our own immediate day we can scarcely estimate the courage that was involved in the adoption of this scheme,—it savoured then too much of theory. Now, its correctness has received the living proof of a great and influential association, which not only has marvellously promoted Pharmacy as a science, but by a reflex though not an unforeseen influence has brightened and elevated the social position of the pharmaceutist. And yet the doctrine that Learning might be linked to Trade with no injury to the latter, and that Literature might lend direct assistance to Commercial interests was never more fully recognized or more strongly advocated than by the Founders of our Society before the charter was obtained, nor has there ever been a shadow of reason for any change of opinion or of practice in reference to it.

The question, how shall we raise pharmacy and benefit the pharmaceutist, has from time to time suggested itself to other minds, as it is most natural it should. Viewing the subject from its superficial, that is, its trade-union aspect, the problem has received a different, and, in our opinion, an erroneous solution.

It has been reasoned out as follows:—Let us take these hard-working druggists from their separate islands and make them meet together; let us inspire them with mutual interests and save them from themselves; let us band them in a corporate body, and from henceforth let them be united.

Whenever this theory has been put in practice it has failed, not from any want of honourable and high intention, but simply because it has no element of vitality. *Ex nihilo nihil fit.* The union thus effected was that of steel-filings without the magnet, and the edifice erected had about as much stability as the tents forwarded to the Crimea when the Government forgot the pegs.

But the doomed object of so much benevolence fared but indifferently, for he rose next morning a few shillings short in pocket, a sadder though not a wiser man. Mere registration is utterly powerless as an elevating agent. These remarks are not made with an ulterior or concealed design of exalting any particular association: their sole object is to demonstrate that to create a true society where intellect as well as the amenities of social life have to be represented, there must be some solid, stimulating incentive; some positive and constraining motive, some influence more abiding than the mere flourish of a dinner speech, or the canvass of an energetic secretary.

We believe the adoption of a higher, and, indeed, only effectual plan has been productive of unmixed good. It *has* broken in upon the monotony of the druggist's life; it *has* raised him in the social scale; it has abundantly widened the scope of his operations, while it has entered many a wretched little retail and transformed it into a prosperous establishment. A few weeks hence, and there will be a visible demonstration of the result of this union between learning, literature, and trade. The British Pharmaceutical Conference is a natural outcome of the theory. The ancient capital of lace and hosiery is about to welcome a set of men, not one of whom despises trade, however much in danger of being intellectually above it. There could have been no such Conference had any other plan to raise the druggist been adopted; and its very existence shows that while he has ceased to be the mere drudge of an onerous business, the due cultivation of his intellectual tastes has not utterly crippled his resources.

Learning, in the sense already given, and literature, its inseparable ally, are the only talisman that can bind our society together; they are the only sufficient motive for its continuance, and they are its salt.

THE BRITISH PHARMACEUTICAL CONFERENCE.

As the time for the annual gathering of the British Pharmaceutical Conference draws near, a few words concerning the association itself and the probabilities of the coming meeting may be acceptable to those of our readers who are interested in its proceedings.

The somewhat indefinite scheme of working laid down by the original members, proposing but one object, the "Advancement of Pharmacy," and accepting as a natural consequence the corresponding improvement in the status of all connected with it as a profession, yet defining no precise limits to the means which were to be employed towards the desired end, further than that an annual peripatetic meeting was to be a chief feature, naturally led to some speculation as to what might be the result of the undertaking. It was thought by those who met in Newcastle in 1863, that in an association, framed on a mere voluntary principle, which sought no other bond of union than professional fellowship and sympathy, whose existence depended only on the desire of those interested in pharmacy for opportunities of intercommunication such as the proposed union might supply, much must be left to the common sense and good feeling of its members. Any rules for its guidance, further than the very simplest, seemed out of place,—the elaborate bye-laws and official regulations to suit every contingency, which are of necessity a portion of the framework of any society whose membership implies a certain legal standing and responsibility, would only retard its operations. On the other hand, the absence of restrictions would leave the Executive Committee at liberty to attempt experiments in any direction which might seem desirable, and thereby widen its sphere of usefulness.

That there was room for such a society, and that it might labour honestly in its own field, ministering to, rather than interfering with existing institutions, the meetings at Bath in 1864 and at Birmingham last year give ample evidence. Not only have those who have attended these gatherings been gratified and instructed, but we have been told by the pharmaceutists of the two cities named, that the visit of the Conference has done much to improve the mutual relations of the resident chemists; that the coolness, not to say distrust which too often existed amongst men of the same calling has given place to a fair measure of neighbourly respect, and even of friendship. A breaking down of personal prejudices is the natural outcome of associations founded in good-fellowship—to "bear and forbear" the lesson they teach.

The approaching meeting at Nottingham will probably leave the same impression that has attended those which are passed, though the executive have taken advantage of their elastic framework, to enlarge somewhat its programme. During its first two years, the Conference enjoyed the presidency of Mr. Deane, and to members of the Pharmaceutical Society we need say nothing of Mr. Deane's qualifications for the post. Much of the success of the gatherings at Bath and Birmingham may fairly be attributed to the varied scientific knowledge, the moderation, and the geniality which characterized his guidance of the discussions. This year Professor Bentley succeeds to the chair, and very many of his old pupils will be at hand to welcome him warmly. Those who have not this bond of attachment will readily accept his leadership, on the ground of his well-known scientific attainments, and his valuable contributions to pharmaceutical literature.

On running over the programme of the meeting, two points attract our attention as novelties. One of these is Mr. Ince's paper on "Pharmaceutical Ethics." Hitherto the Conference has confined its labours to the investigation and discussion of scientific subjects, but here is a new and important development. That there should be a desire manifested for a paper on the relation of pharmaceutists to each other, is of itself a pleasing sign that the efforts of those who have for long been endeavouring to make pharmacy mean something more than shopkeeping are beginning to bear fruit. We do not know anything of the line which will be pursued in arguing the various ethical questions which may be treated of, nor even the precise subjects which may be included in the paper; but, whatever the opinions of the author may be, it is scarcely possible that they can do more than represent the views of the majority. For this, unlike purely scientific points argued by the few, is one on which every member has, or should have, an opinion regulating his own practice; and as no opportunity has hitherto occurred for the general discussion, or even for the recognition of the subject, there can scarcely fail to be a lengthy and animated debate upon it.

The second point which we would note is the proposed "Exhibition of Objects relating to Pharmacy." The experiment of an annual exhibition of pharmaceutical novelties has been tried with success by the American Pharmaceutical Association—a society which served to some extent as the type in the establishment of the Conference.

The propriety of attempting something of the same sort was discussed during the Birmingham meeting, and the details having been duly considered by the Committee, it was determined, with the full approval of the Nottingham members, that the experiment should be tried this year. Accordingly, in May last a copious circular was issued by the secretaries, defining the general arrangements which had been made, and enumerating, in a classified form, the chief objects which it seemed desirable should be represented in the proposed exhibition.

We have been favoured by the secretaries with some particulars concerning the contributions promised, and are pleased to be able to predict a good representation in each of the sixteen classes enumerated by the circular; and as applications for space are still coming in, there is little doubt the display will be varied and interesting. Our transatlantic brethren, through Mr. Parrish, have shown their approval and sympathy in a contribution of objects described as "simple forms of apparatus used by us, also Materia Medica specialities characteristic of the country;" and the pharmacy of the West Indies and the continent of Europe will not be unrepresented. We need not attempt to enumerate those who have promised their support to the undertaking, as our space would not admit a complete list, and to pick out individuals would be invidious; it is sufficient to note that the list of contributors is large, and contains a good proportion of names which of themselves are a sufficient guarantee of the objects to be exhibited. The field is a wide one, comprising not merely pharmaceutical preparations, appliances, and fittings, but the whole range of dietetics, and indeed everything that has a bearing on the theory or practice of pharmacy. We understand that it is intended, in order that those who cannot be present to make their own observations on the collection may reap a share of the benefit, and also in order to give to it some permanent value, that a committee shall be appointed to report on the objects displayed in the various sections. If the success of the experiment is in any way proportionate to the labour bestowed upon it by the Local Committee, the Exhibition will probably be one of the most interesting features of the Nottingham meeting.

THE VETERINARY SURGEONS' BILL.

The Bill was opposed on the ground of its not sufficiently recognizing the qualifications of Scotch and Irish Veterinary Surgeons, and it is therefore, for the present, withdrawn.

FRESH ARRANGEMENTS FOR LABORATORY INSTRUCTION.

It will be seen by a notice elsewhere that arrangements are made for facilitating the entry of students in the Society's Laboratory to work for a few hours at a time or two or three days weekly, to suit the convenience of those who cannot devote more time to such studies.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *4th July*, 1866,

Present—Messrs. Brady, Carteighe, Deane, Evans, Hanbury, Haselden, Hills, Ince, Morson, Orridge, Randall, Sandford, Savage, Standring, and Waugh.

The following were elected—

MEMBERS.

Averill, Henry Allcock	Stafford.
Baxter, George	Chester.
Blackman, Thomas	Cheltenham.
Long, John Temlett	Hotwells, Bristol.
Pheysey, Richard	Waterloo, Liverpool.
Smith, Richard	London.

EXAMINATION, *18th July*, 1866.

MAJOR (Registered as Pharmaceutical Chemists).

Cable, George Hughes	Dunmow.
Coleman, Alfred	Norwich.
Corner, Robert	Hartlepool
Doughty, Edward Thomas	London.
Ellinor, George	Rotherham.
Farries, Thomas	Driffield.
Goulden, Edward Baker	Walworth.
Green, James Samuel	Braintree.
Hunt, Charles	Bristol.
Jones, William	Shrewsbury.
Kinch, Charles James	Henley-on-Thames.
Padwick, John	Christchuch.
Sandell, Thomas Oliver	Uttoxeter.
Sharp, John James	Newcastle-on-Tyne.
Squire, Peter Wyatt	London.
Watts, Charles Cracknell	Richmond, S.W.
Yates, Robert	London.

MINOR (Registered as Assistants).

Baker, Oswald	London.
Bass, Charles William	Gloucester.
Baxter, Robert	Huntingdon.
Bradley, Charles	Birmingham.
Daniel, Edward	Carlisle.
Harrison, George	Sheffield.
Kent, Thomas Ramsey	London.
King, James Hurman	Bristol.
Mallam, George Bessant	Oxford.
Newey, John Taylor	London.
Palmer, Alfred Neobard	Bury St. Edmund's.
Walker, Walter Tracey	Maidstone.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Brasted, Alfred Ernest	Mr. Hyslop	London.
Colchester, Wm. Markham, jun.	Mr. Colchester	London.
Forster, Henry	Mr. Sarsfield	Durham.
Griffiths, Edwin Harpham	Mr. Holmes	Hanley.
Humphreys, John	Mr. Earee	Staines.
Rigby, James	Mr. Barber	Liverpool.
Tavernor, Francis	Mr. Medley	Derby.
Vincent, Philip	Mr. Vincent	Fulham.
Wincles, William C.	Mr. Bing	Canterbury.

ERRATA IN LIST OF MEMBERS, ETC., JULY, 1866.

Honorary Members: *after* Warington, Robert, *insert* F.R.S.
" *after* Würtz, Charles Adolphe, M.D., *insert* F.R.S.

In the List of Country Members the following name was omitted:—
1861...638...*Edwards, William...Shrewsbury.

In the List of Registered Apprentices and Students:—
For Saul, William W....Mr. Prior...Oxford, *read* Saul, William B....Mr. Pring...Taunton

In the List of Local Secretaries:—
For Carnarvon, Owen, Griffith, *read* Carnarvon, Griffith, Robert.

BENEVOLENT FUND.

Subscriptions received during July:—

Country.

	£	s.	d.		£	s.	d.
ertford, H. G.	0	10	6	*Nottingham*, Jenkins, Joseph	0	10	6
Leamington, Pullin, Wm. H.	0	5	0	*Pontypool*, Wood, William	0	5	0
Liverpool, Hunt, Thomas	0	10	6	*Rotherham*, Ellinor, George	0	10	6

London.

	£	s.	d.		£	s.	d.
Hodgson, William Henry, 199, Fleet Street	0	10	6	Pidduck, John, Harrow Road	0	10	6
				Pratt, Edm., 49, Berners St.	0	10	6

ORIGINAL AND EXTRACTED ARTICLES.

COLORIMETRIC METHOD FOR THE ESTIMATION OF NITROUS ETHER IN SPIRIT OF NITRE.

BY MR. JOHN T. MILLER.

Dissolve 200 grains of thin sheet copper in diluted nitric acid, and evaporate the mixture at a gentle heat nearly to dryness. Add 4 or 5 ounces of water, and drop in solution of soda or potash until the liquor becomes slightly turbid; then add 60 grains of crystallized acetate of soda, and sufficient water to make up the quantity to 10 fluid ounces. Set aside for a few hours, and filter.

The blue colour of this liquor is changed to *green* by the addition of a certain amount of nitrite of ethyl. When less than this is added, the resulting colour is a mixture of blue and green, the shade depending on the quantity of nitrite present.

By comparing, then, the effect upon the liquor of a sample of spirit of nitre, with that of a standard solution of nitrous ether, the strength of the former may be readily ascertained.

The standard employed in my experiments was composed of 5 volumes of nitrous ether prepared by Liebig's process, and 95 volumes of rectified spirit.

Instead of this, the impure ether made by the Dublin process may be used. When carefully prepared, it contains, according to my trials, about 65 per cent. by volume of nitrous ether. The solution should be neutralized with acetic acid, if reddened litmus paper turn blue when dropped into it.

The experiments may be performed as follows:—

Take two one-ounce stoppered bottles of colourless glass, and introduce into each half a fluid ounce of the test liquor. To one portion add the sample of spirit of nitre by a few minims at a time, and at intervals of a minute or so, until the mixture appears of a bluish-green colour; then close the bottle, and note the quantity of spirit which has been expended. A small Mohr's burette, graduated in minims, is very useful for this work. Now add cautiously the standard solution to the other portion of the test-liquor until it shows exactly the same tint as the last. From the quantity of the standard and of the sample used, the strength of the latter may be easily calculated.

The precautions to be observed are—1. If the sample turn solution of iodide of potassium brown, it should be shaken with a little magnesia and filtered. If this be not done, the result will be too high. 2. If the sample and standard differ *much* in strength—if, for instance, the latter be ten or twelve times as strong as the former—the result will be rather too low. This small error may be avoided by properly diluting the stronger solution with rectified spirit. 3. The standard solution should be fresh, or at all events not more than a few days old.

The following are among the results obtained:—

In spirit of nitre made according to the British Pharmacopœia, except that the nitrite of soda was dissolved in twice its weight of water, between 6 and 7 per cent. of nitrous ether was found. It amounted to about 10 per cent. of the first fifth of the distillate, which was of pleasant odour and flavour, and nearly free from aldehyde. The next two-fifths were almost pure spirit of wine. The last two-fifths contained the remainder of the ether and much aldehyde. A spirit of about the same strength as the above, but much more fragrant and palatable, and quite free from aldehyde, may be made by using a nitrite of soda containing 40 per cent. of real nitrite, and decomposing this by so small an excess of sulphuric acid as to leave the *nitrate* of soda intact. In carefully-prepared P.L. spirit of nitre only about 1 per cent. of nitrous ether could be discovered.

An examination of ten samples of the *best* spirit of nitre—fair specimens, probably, of the article in general use—showed the average content of nitrous ether to be 0·8 per cent. The highest result was 1·26, and the lowest 0·3 per cent.

I may observe, in conclusion, that by a similar process to the above, the estimation of nitrite of soda can be effected with considerable accuracy.

Sheffield, July, 1866.

SINAPINE TISSUE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—My attention has been recently directed to an article purporting to be an elegant and efficient substitute for the ordinary mustard poultice. It is called "Sinapine Tissue," or "Mustard Paper," and is put up in an envelope which contains also a number of testimonials from well-known physicians. In one of these Dr. Benjamin W. Richardson writes: "Sinapine Tissue, Mustard Paper, this is a thin paper *charged with mustard* and forming a substitute for a mustard poultice. We have tried the tissue practically, and find it answers all the objects of the mustard poultice, with the advantages of being cleanly and easy in application, and always ready. It is a great improvement." In another, Dr. Spencer Thompson says, "Your Sinapine Tissue is a most excellent application. I am recommending it very generally. I am glad to be able to mention it in the new 'Appendix' just coming out in connection with my 'Dictionary of Medicine.'"

Now I wish to point out that, in the first place, although mustard *may* have been employed in the preparation of this paper there is no evidence of its presence, and that it does not owe its irritant power to mustard but to *capsicum*. In the second place, that Dr. B. W. Richardson and other gentlemen who should have known better, have allowed themselves to be deceived and have lent their names unconsciously to aid a misrepresentation. Thirdly, I would ask a question, Is capsicum a safe or pleasant rubefacient? I do not wish to attach too much importance to my own experience in the actual use of this "Mustard Paper," as it is well known that the effect of an ordinary sinapism varies very much upon different persons, and anything I could say would weigh but little against the opinion of the eminent medical gentlemen whose names I have mentioned. I may however observe, that while I can employ an ordinary mustard poultice for the usual time, and with the ordinary effect, my sufferings from the use of the tissue were so great and extended over so long a time that I can easily imagine the results of its application to a person of sensitive skin or feeble frame might be serious.

I would, however, only ask, in the interests of Honest Pharmacy, that the labels of this and other proprietary articles should set forth their real composition, and that the name of one remedy should not be given to a preparation of which another is the basis.

I am, Sir, yours obediently,

Harry Napier Draper.

ON NOTES AND QUERIES.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Taking advantage of the suggestions in page 5 of the Journal for the month of July, I suggest that there should be a more extended system of notes and queries, the same as there is in the 'Lancet,' 'Medical Times,' and other magazines; for undoubtedly a great deal of information is to be obtained by knowing the results of each other's manipulations, etc.

For instance, in the preparation of iodized cotton, can any one say the best way of making it? I had previously tried, but found it very difficult to get the cotton well saturated and of a uniform appearance, as there does not appear to be enough glycerine.

May I also make a remark about early closing? Looking at the observations made about it at present, it appears to me that we have not looked at the reason why late hours exist, and have existed for how long I cannot say. I think it is because our business partakes partly of the dispensable and indispensable. If people are ill, they must have medicine, whether the shop be open or shut, whether it be night or day; and because of this, the public seem to think (and druggists apparently too) that everything else must be served.

Now, if our shops were shut at seven, and nothing else attended to but the absolute wants of the public, a far better state of things would soon exist. A few circulars politely informing customers of our intention, and the steady resolve that when the box of toothpowder or bottle of scent was asked for that we did not sell them after seven, or whatever hour had been agreed upon, the burden which is now so grievous to be borne would be almost removed.

I am, Gentlemen, yours,
F. D. Delf.

14, *Hardman Street, Liverpool.*

TRADE INTERESTS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Allow me to remark, with regard to the editorial statement in last month's 'Pharmaceutical Journal,' that, as a dispenser, a more commercial aspect in that periodical will be most welcome.

New remedies are well defined: podophylline is podophylline, but pray what are granular citrate of iron, granular citrate of bismuth, granular citrate of magnesia, etc.?

A lady came to me a few days ago with a prescription—"Granular effervescent citrate of iron." She remarked, "Please give me the brownish-red kind; I have had it made up several times before; once it was white, once almost black, once reddish-brown; the latter suits me best, the white I cannot take at all, it has an inky taste and makes my head ache,—not so the brown." I obtained a sample of the three kinds: citrate? of iron granulated put me in mind of man,—there was the nigger, the redskin, and the white man ironically.

I will not attempt the chemistry of these complex bodies; all I have to say is, if we must have these elegant medicines, please let the Journal tell us their names, and at least what colour they ought to be, so as to ensure uniformity in this important particular.

I have one suggestion to make. Popular names are much in request by granulators: I earnestly request, the next granulation that comes out, the talented inventor will imitate the wonderful success of Baron Munchausen, and call it granular effervescent citrate, or any other -ate or -ite, of "Fudge," prepared *only* by Chemist, Properties Dose . "Fudge" is quite as popular as iron or magnesia, and it would save us poor chemists, who are applied to by the public as intelligent informants, much embarrassment.

Nepenthe, chlorodyne, black drop, are all very well in their way; but these pseudo-chemicals, dressed up according to the fancy of different manufacturers, unmask our "limited liability," and will ere long create a panic. We turn to the Pharmaceutical Charter.

I am, your obedient servant,
George Mee.

Torrington Square, London.

PROFESSOR HAMILTON ON THE REVIEW OF HIS 'SUGGESTIONS.'

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The review of the 'Suggestions for a New System of Chemical Nomenclature,' in the last number of the 'Pharmaceutical Journal,' is written in a spirit of such candour and fairness—I might say even of forbearance and generosity—that I would gladly remove from the mind of the writer a most erroneous opinion which he seems to have formed regarding the position which I have assumed, and the purpose for which the pamphlet was written.

If the "Suggestions" had been offered as a complete and perfect system of chemical nomenclature, and if I had proposed that chemists should at once give up the present nomenclature and accept mine, I should indeed have displayed, not only "considerable courage, if not boldness," but also most censurable rashness, and an unpardonable amount of vanity. The facts, however, are far otherwise. In the letter to Dr. Odling, p. 2, are the following words:—"My object would be fully accomplished if the principles at the beginning of the pamphlet, and the suggestion contained in the last paragraph at the end, were fairly considered and discussed." The "principles" are the eight propositions in which I have endeavoured to express the requisites of a perfect nomenclature, not in the belief that a perfect nomenclature can ever be formed, but in the belief that some such basis should be acknowledged by chemists, and laid down authoritatively as a guide in forming new names, and thus constructing a nomenclature as nearly perfect as the present state of our knowledge will permit.

The "Suggestion" in the last paragraph of the pamphlet is "that the Chemical Society of London should appoint two or three of its members to study this subject. Of course I mean by this, to study the condition of our present nomenclature and report upon it. No one man, although he possessed "a giant mind," has a right to alter even a single name, much less a whole nomenclature. The Chemical Society is the only body in the kingdom that can deal authoritatively with the subject. I took what I considered to be the proper course for bringing the "Suggestions" before the Chemical Society in the most respectful and least pretentious manner, and some of the leading members of that learned body can testify that my manner was not characterized by "boldness."

The reviewer quotes principle No. 2 of the pamphlet: "No names should be used involving hypothetical views of the constitution, relations, or functions of the things named," omitting, however, to notice the exceptions provided for in the marginal note, and then asks, "Do Mr. Hamilton's names comply with this condition?" Now, the first paragraph after the eighth proposition is this: "I am very far from supposing that I have succeeded in framing such a system; the united efforts of all living chemists would scarcely accomplish such a task." And, in reference to these same names, I have said in the letter to Dr. Odling, p. 1, "I do not propose them as they are for adoption, I offer them only as illustrations of a *Method*." The principle No. 2 never can, in fact, be universally complied with. When our knowledge is imperfect, hypotheses must, to a certain extent, supply its place, and language must, to that extent at least, participate in the imperfection of our knowledge. But the principle is not the less useful on account of our inability *perfectly* to comply with it. It may serve as a guide and a check in the construction of new names. It is one thing to be compelled from necessity temporarily to use terms involving hypotheses, it is quite a different thing to revel in them with delight as if it were not only philosophically legitimate but even commendable and creditable to invent and multiply such terms. Witness the following *ten* names for *one* compound:—chlorocarbon, bichloride of carbon, perchloroformene, perchlorinated chloride of methyl, dichloride of carbon, carbonic chloride, tetrachloride of carbon, superchloride of carbon, perchloruretted formene, perchloruretted hydrochloric ether.

It may be a very harmless, nay, even a useful exercise to shuffle the symbols of a compound into all possible combinations to detect analogies and affinities with other compounds, but when the result is *not* to detect such analogies or affinities, but merely to increase the number of conflicting, sterile hypotheses and perplexing names, the exercise is neither harmless nor useful.

The following paragraph, which seems to have been entirely overlooked by all who have criticized the 'Suggestions,' occurs on page 18:—

"As no ingenuity or skill could convert into order the chaos of confusion which prevails in our present nomenclature, and as no new system, however perfect, could be readily substituted for an old and familiar one, however bad, the only practicable method of bringing about a change such as the condition of the science now requires is to use the language most familiar to us and most generally understood, for all the purposes of ready description and common discourse, and to create an entirely new system of names, precise as the terms of mathematics, to be available in all cases where exactitude is required."

The reviewer will see from this passage that I have not been guilty of the egregious folly of supposing that an old and familiar nomenclature should or could be given up, and a new one, however perfect, adopted in its place. By all means let us continue to use our present nomenclature as it is, but when new names are required for new things, and when we desire to speak with a precision unattainable by the old method, let us have at least some principle to guide us, as nearly perfect as we can frame, to suit such cases as they occur. Old, inaccurate and confused names will, in time, by a natural decadence, give place to systematic and more exact ones, and the language of chemistry, instead of becoming more perplexing and perplexed by the progress of discovery, will be, like the science itself, constantly advancing towards a higher state of perfection.

I am very little concerned about the fate of the "Suggestions," and very little inclined to defend the new names; but has the reviewer really succeeded in showing any inconsistency between the principles and the names? "The name for water," the reviewer states, "is hydretoxan, which implies that it is composed of two atoms or equivalents of hydrine and one of oxine. The name depends, therefore, on the proportional number of oxygen being 16." Is not this "involving a hypothetical view of the constitution of things"?

I answer—(1.) When water is decomposed the products are, as *a matter of fact*, two equivalent volumes of hydrine and one of oxine, the name hydretoxan therefore expresses this *matter of fact*, and involves no hypothesis whatever. (2.) The name does *not* depend on the proportional number of oxygen being 16. It might be 8 or 100, or 32 or $5\frac{1}{4}$, or any other number, whole or mixed, provided such a number be taken for hydrogen that the *proportion* shall remain unchanged.

Again, the name alumotoxin, Al_4O_3, Al being 13·7 does *not* imply a different constitution for alumina, from that expressed by the name alumetoxin, Al_2O_3. Al being 27·5, both formulæ, and consequently both names, express the *same constitution.*

The difficulty of deciding whether corrosive sublimate should be called mercurachloran, $HgCl$, or mercurachloren, $HgCl_2$, is not one which pertains to nomenclature. It pertains to the state of our knowledge respecting a certain physical fact. The correct formula and the correct name are both determined, at once, the moment the correct equivalent of mercury is known. In all cases, then, where correct equivalents *are* known, how could "Mr. Hamilton's system revive in full force those very difficulties"? "Professor Hamilton's scheme," continues the review, "is only good so long as the table of combining proportions remains unchanged, and the formulæ of bodies continue constant. But the former are always liable to alteration, and we can never hope for perfect accordance regarding the latter."

My very able and intelligent reviewer does not here mean that the proportions themselves in which bodies combine are liable to alteration, but that our conventional methods of representing those proportions are the subjects of change. Thus, if we take $O=8$, and $Fe=28$, then peroxide of iron is Fe_2O_3, ferretoxin. But if we change the equivalent of O from 8 to 16, then peroxide of iron is Fe_4O_3, ferrotoxin. Now, is not my scheme just as good *after* this change as it was *before* it. The name changes with the formula because the name expresses the formula. And this the reviewer seems to have fully understood when he wrote the next paragraph :—

"These suggestions give us, in fact, nothing more than a concise method for translating symbolic formulæ into language." I take this, from so able an authority, as a very high testimony in favour of the 'Suggestions.' If we can only succeed in *concisely* expressing in language, oral and written, all that can be so accurately and succinctly expressed by symbols, our nomenclature will have attained to a very high degree of perfection.

I am, yours very respectfully,
GEORGE HAMILTON.

[We beg to assure Mr. Hamilton that in writing our remarks on his pamphlet, we were anxious to pay him every personal courtesy and respect, and that we had no intention of ascribing any "boldness" to him in the sense in which he appears to interpret it. We may also observe that we did not entertain the "erroneous opinion" that he offered his "Suggestions" as a "perfect system," or proposed any immediate radical change of names. But we did assume that he desired the value of his "Suggestions for a new system" to be tested by free discussion and criticism.

We did not refer to his proposal, that the Chemical Society should appoint a commission to study the subject of nomenclature, because we considered that it had been practically anticipated, a committee of that Society having been formed for the purpose about two years ago.

The eight principles laid down in his work were not noticed in detail, because we ventured to think it of little use to discuss principles if they cannot be reduced to practice. Probably many chemists could succinctly express what a perfect system should be; the whole difficulty is to create such a system. As the bulk of Mr. Hamilton's pamphlet is occupied by a method for the uniform construction of a new set of names, we regarded that method as a practical contribution towards the solution of a practical difficulty, and made it the subject of our criticism.

We implied that Mr. Hamilton's names are not in accordance with his second principle. They depend on the proportional numbers assigned to the elements. But these numbers are not ascertained by direct experiment; they are the result of reasoning on a number of facts, and they involve "views of the constitution, relations, and functions of bodies." All chemists do not use the same table of combining proportions, nor is there much immediate prospect of greater agreement in this respect than has previously existed, consequently Mr. Hamilton's scheme would involve practical inconvenience. The same substance would be named differently by different writers. Mercurachloran would be written by one chemist for calomel and by another for corrosive sublimate. Would such a name be "precise as the terms of mathematics"? We are inclined to think that we have names at present in use which involve less hypothesis and are less open to objection.

To our remarks on the name Hydretoxan (expressing H_2O) for water, Mr. Hamilton gives two answers. To the first we reply, that as a "matter of fact," water yields *two volumes* of hydrogen and *one* of oxygen; but when Mr. Hamilton calls these "*equivalent volumes*," he mixes hypothesis with fact, and that hypothesis he imports into his name. Does he suppose that all chemists who formerly wrote water as HO were ignorant of the "matter of fact" he describes? His second answer is simply a quibble. In mentioning proportional numbers in this country, the unity of hydrogen is always understood and therefore not expressed. Mr. Hamilton apparently admits that two formulæ are in use for Alumina, but he considers that a molecule containing five atoms has the same constitution as one containing seven.

In his present letter Mr. Hamilton quotes from "the letter to Dr. Odling," but the copy of the pamphlet which we read contains no such letter.]

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

On Town Sewage and its Value.

In February of the present year, a discourse was delivered before the Chemical Society, by Dr. Gilbert, "On the Composition, Value, and Utilization of Town Sewage." The substance of this discourse has been since embodied in a paper by Messrs. Lanes and Gilbert, and published in the Society's Journal.* This paper forms a most comprehensive treatise on the subject, and is of considerable length, filling 48 pages. In some preliminary remarks on the general position of the sewage question, the authors, although admitting the difficulties and loss attending the present system of water-purification for towns, nevertheless deprecate the idea of returning to any cesspool, tank, or barrel method of collecting excreta, as being inconsistent with habits and notions of cleanliness, and with the maintenance of the comfort and health of large populations. They moreover show that neither on the Continent nor in this country has such a method resulted in any substantial profit to the towns adopting it. Even in Belgium, where, it has been stated, the excretal matters sell for something over £1 per person per annum, the authors found by personal observation and inquiry that in no case did the town population realize as much as averaged one franc per head per annum, while the practice of collection and removal was attended with much nuisance and discomfort.

In a chapter on the "Composition and Value of Sewage," the authors state it is one thing to determine the amount of constituents contained in sewage or contributed to it by a given population, and to estimate their value accordingly, as if they existed in the dry and portable condition of the various concentrated manures of known value in the market; but it is obviously quite another to settle the really available or realizable value of the same constituents when they are distributed through an enormous volume of water, and if they must be transported and utilized in that condition. With this qualification they then discuss in detail the means of determining the theoretical value of sewage. When the calculation of this value is based on an analysis of the sewage, they show that the result may be very simply arrived at as follows:—"If a value of 8*d.* be put upon every pound of ammonia shown by analysis to be contained in sewage, or if for each grain of ammonia per gallon, a value of one farthing be given to the total constituents in one ton of the sewage, the result will in either case agree almost exactly with that obtained by the elaborate method of giving the currently-adopted market values to the several constituents, taking dry and portable manures as the standard." Thus, in 1865, Liebig assumed the average sewage of the metropolis to contain 7·2 grains of ammonia per gallon, and he estimated the value of the constituents in 1 ton of such sewage to be rather over $1\frac{3}{4}d.$ The authors' estimate would also give rather over 7 farthings, or $1\frac{3}{4}d.$ In 1857, Messrs. Hofmann and Witt concluded from their investigations that the average *dry weather* sewage of the metropolis contained about 8·2 grains of ammonia per gallon, and calculating the value of the sewage according to the amount of ammonia, organic matter, phosphoric acid, and potassa, they estimated that of the total constituents in 1 ton of such sewage to be about 2·11*d.* It is clear, that giving a value of $\frac{1}{4}d.$ to the total constituents per ton of sewage

* Journ. Chem. Soc. ser. 2, vol. iv. p. 80.

for each grain of ammonia per gallon, would yield almost identically the same result.

The authors quote a number of analyses which have been made of metropolitan sewage. The results show a variation of from about 3 to more than 41 grains of ammonia per gallon. This variation is due to the unequal dilution to which sewage is subject. The authors consider that the sample analysed by Messrs. Hofmann and Witt (containing 8·2 grains of NH_3 per gallon) represents the *average dry weather* sewage of the metropolis better than any previously collected and examined. It was a mixture of equal portions taken every hour during 24 hours of dry weather, and the constituents in 1 ton were estimated to be worth rather over 2*d*. According to information furnished to the analysts, the quantity of such sewage (*i. e.* sewage exclusive of rainfall) was calculated to be about 158,000,000 tons per annum.

The authors next describe the series of experiments which were made at Rugby, from which they conclude that from that town there are, on an average, about 60 tons of sewage per head per annum, containing 6½ grains of ammonia per gallon.* From this it would result that 12½ lbs. of ammonia were contributed annually for each average individual of the mixed population, of both sexes and all ages.

The authors then discuss another method which has been adopted for computing the value of sewage, namely, by the calculation of the amounts of fæces and urine, or of the various constituents of these, voided by persons of different sexes and ages. In 1854, the authors, basing their estimates on very comprehensive data, relating both to the amounts of constituents consumed in the food and voided in the urine and fæces, of persons of different ages and both sexes, concluded that probably about 10 lbs. of ammonia, and total constituents of the estimated manurial value of about 6*s.* 8*d.*, were annually contributed to sewage per individual of a mixed town population. More recently they have revised their estimates, and reviewing the whole of the evidence they have concluded that the amount of ammonia annually contributed to the sewer-water by an average person of a mixed population was pretty certainly more than 10 lbs., as formerly assumed, but probably less than 12 lbs., and making allowance for the fractional part of the excretal matters of horses, cows, dogs, and other animals, of the refuse of slaughter-houses, of soot, and of other refuse matters that may reach the sewers, it was concluded that still not more than 12½ lbs. of ammonia would be contributed annually to the sewers from all sources per head of mixed town population. This would indicate an estimated value of 8*s.* 4*d.* per annum for the total constituents in the sewage for each average individual. Since the publication of this last estimate, however, numerous gaugings of the mid- and high-level northern sewage have been made, and many samples have been analysed by Mr. Way. Although these results are not yet published, the authors are enabled to state their general bearing. They appear to indicate that the total amount of dry weather sewage averages only about two-thirds as much per head as that assumed by Messrs. Hofmann and Witt, but that the amount of ammonia per gallon agrees with their estimate. It would follow from this that the amount of ammonia annually contributed to the sewage, from all sources, per head of a mixed population, is more nearly 10 lbs. than 12½ lbs. We have then from 10 to 12½ lbs. of ammonia, and an estimated value of from 6*s.* 8*d.* to 8*s.* 4*d.* for the total manurial constituents contributed to sewage by each average individual of a mixed town population. The actual amount of fluid per head per annum, is calculated to be about 80 and certainly not exceeding 100 tons, inclusive of rain and subsoil water. Taking it at 80

* The Rugby sewage contained, according to the author's analyses, 27 parts of phosphoric acid and 42 parts of potassa, for 100 of nitrogen.

tons and 10 lbs. of ammonia per head per annum, the average sewage (rain included) would contain less than 4 grains of ammonia per gallon, and only 1*d.* worth of constituents per ton. According to the authors' calculations, one ton of Peruvian guano would represent 3050 tons of such sewage. The remaining chapters of this memoir are devoted to a consideration of the crops to which sewage is applicable, and the results of direct experiment and of common practice in the utilization of sewage. The following are the general conclusions which the authors draw from their investigations:—

1. It is only by a liberal use of water that the refuse matters of large populations can be removed from their dwellings without nuisance and injury to health.

2. That the discharge of town sewage into rivers renders them unfit as a water supply to other towns, is destructive of their fish, causes deposits which injure their channels, gives rise to emanations which are injurious to health, is a great waste of manurial matter, and should not be permitted.

3. That the proper mode of both utilizing and purifying sewage is to apply it to land.

4. That, considering the great dilution of town sewage, its constant daily supply at all seasons, its greater amount in wet weather when the land can least bear, or least requires more water, and the cost of distribution, it is best fitted for application to grass, which alone can receive it the year round. It may, however, be occasionally applied with advantage to other crops within easy reach of the line or area laid down for the continuous application to grass.

5. That, having regard to both urban and rural interests, an application of about 5000 tons of sewage per acre per annum, to meadow or Italian rye-grass, would probably, in the majority of cases, prove to be the most profitable mode of utilization, though the quantity would have to be reduced, provided experience showed that the water was not sufficiently purified; and it is pretty certain that the farmer would not pay $\frac{3}{4}$*d.*, and it is even very doubtful whether he could afford to pay $\frac{1}{2}$*d.* per ton, the year round, for sewage of the average strength of that of the metropolis (excluding storm-water) delivered on his land.

6. That the direct result of the general application of town sewage to grass land would be an enormous increase in the production of milk, butter, cheese, and meat; whilst, by the consumption of the grass, a large amount of solid manure, applicable to arable land and to crops generally, would be produced.

7. That the cost or profit to a town of arrangements for the removal and utilization of its sewage must vary very greatly, according to its position, and to the character and levels of the land to be irrigated. Where the sewage can be conveyed by gravitation, and a sufficient tract of suitable land is available, the town may realize a profit; but, under contrary conditions, it may have to submit to a pecuniary sacrifice to secure the necessary sanitary advantages.

Action of Magnesium on Metallic Solutions, and its use in Toxicology.

M. Z. Roussin, in a paper read before the Society of Pharmacy at Paris, states that the metal magnesium put in contact with slightly acidulated solutions of proto- or persalts of iron, of protoxide of cobalt, and of nickel or zinc, gives rise to a disengagement of hydrogen, and a precipitation in the metallic state of the metals from these solutions. Magnesium equally precipitates silver, gold, platinum, bismuth, tin, mercury, copper, lead, cadmium, and thallium. Aluminium is not precipitated. The salts of chromium and manganese give deposits of oxides. Arsenic and antimony are not precipitated from their acid solutions by contact with magnesium, but they combine with the hydrogen produced by the reaction, and pass off as arseniuretted or antimonetted hydrogen.

M. Roussin recommends the use of magnesium as preferable to zinc in toxicological examination. It is capable of precipitating all the poisonous metals upon its surface, excepting arsenic and antimony, which however may be detected in the gas evolved. He recommends the organic matter to be destroyed by the usual methods, the acid liquid concentrated, and ribbon magnesium introduced as long as any deposit is formed.

Chlorate of Quinine.

Mr. C. R. C. Tichborne, having been requested by Dr. Lyons to prepare him some pure chlorate of quinine, found that this salt could be best prepared from chlorate of barium. He describes its characters as follows:—When crystallized from a watery solution it forms small mushroom-shaped masses, which, on examination, are found to consist of filiform snowy-white crystals radiating from a centre. Crystallized from a spirituous solution, it resembles more the ordinary salts of quinine in appearance. Heated gently upon a spatula, it gradually melts, and after a little time goes off with a vivid combustion, which, if the salt is dry, sometimes amounts to an explosion. A carbonaceous residue is left. Treated with hydrochloric acid and gently warmed, it evolves chlorine copiously, which may be recognised by its smell. On adding ammonia in excess to this mixture an emerald-green colour is developed. It is very soluble in boiling water, but rather insoluble in cold. When pure, it crystallizes with difficulty from this solution, but much more readily if it contains traces of any of the ordinary salts of quinine.

Formation of Nitrite of Potash.

M. Wœhler states that when ammonia is decomposed by permanganate of potash, the disengagement of nitrogen is very feeble; and if the liquid be filtered after decolorization, the presence of nitrite of potash in it may be demonstrated by the evolution of nitrous vapours on the addition of sulphuric acid.

Specific Gravity of Mercury.

Dr. Balfour Stewart has recently made at the Kew Observatory some determinations of the specific gravity of mercury. At 60° F., he found it to be 13·569 as compared with water at the same temperature.

ON RECENT PROGRESS IN THE HISTORY OF PROPOSED SUBSTITUTES FOR GUNPOWDER.

BY PROFESSOR F. A. ABEL, F.R.S., V.P.C.S., CHEMIST TO THE WAR DEPARTMENT.

(*Delivered at the Royal Institution, May* 4, 1866.)

The changes which have been effected in the composition of gunpowder since its first application as a propelling agent have been limited to small variations in the proportions of its constituents. But the modifications which have from time to time been introduced into the details of its manufacture, *e.g.* the preparation of the ingredients, their incorporation, and the conversion of the mixture into compact masses (grains, etc.) of different size and density, have been sufficiently important and successful to secure the fulfilment by gunpowder, in a more or less efficient manner, of the very various requirements of military science and of different branches of industry.

The characteristics of gunpowder, as an explosive material of permanent character, the action of which is susceptible of great modification, are mainly ascribable to the peculiar properties of the oxidizing agent, saltpetre. Frequent attempts have been made to replace this constituent of gunpowder by other nitrates (such as those of sodium, lead, and barium); but, although materials suitable for blasting operations have been thus prepared (such as soda-gunpowder, and barytic powder, or *poudre saxifragine*), all mixtures of this class, hitherto produced, have exhibited important defects, when compared with gunpowder manufactured for propelling purposes.

The well-known oxidizing agent, chlorate of potash, which differs from saltpetre only in containing chlorine in the place of nitrogen, is far more energetic in its action upon oxidizable bodies than any of the nitrates. Thus, a mixture of chlorate of potash with charcoal alone, deflagrates as violently as gunpowder, and is far more readily inflamed by percussion than the latter; while a mixture analogous to gunpowder, containing chlorate of potash in place of saltpetre, detonates violently when struck with moderate force, and acts far too destructively, on account of the rapidity of its explosion, to admit of its safe employment in firearms.

Many years ago, a mixture known as German or white gunpowder, and consisting of chlorate of potash, ferrocyanide of potassium, and sugar, was proposed and tried without success as a substitute for gunpowder; and since then many preparations of similar character have been suggested for employment either as blasting and mining agents, or for use in shells, or even for all the purposes to which gunpowder is applied. The most promising of these, claimed as discoveries by Mr. Horsley and Dr. Ehrhardt, are mixtures of chlorate of potash with substances of permanent character and readily obtained, containing both carbon and hydrogen; such as tannic and gallic acids, and some kinds of resins. These mixtures are much less violently detonating than most of the explosive mixtures containing chlorate of potash, while, if well prepared, they are decidedly more powerful, as explosives, than gunpowder. For blasting purposes, some of these mixtures probably possess decided advantages over ordinary blasting powder, and possibly they may also be susceptible of employment for sporting purposes; but they are not applicable to firearms used for war purposes, because, in order to ensure the requisite uniformity of action, the ingredients must be submitted to proper processes of incorporation, etc., such as are applied to the manufacture of gunpowder; and this treatment would render the mixtures far more violent, and consequently destructive in their action upon firearms, than if used in the form of crude mixtures.

A comparatively very safe application of chlorate of potash to the production of a substitute for gunpowder was made about six years ago by a German chemical manufacturer, M. Hochstädter. Unsized (blotting) paper was thoroughly soaked in, and coated with, a thin paste consisting of chlorate of potash, finely-divided charcoal, a small quantity of sulphide of antimony, and a little starch, gum, or some similar binding material, water being used as the solvent and mixing agent. The paper was rolled up very compactly and dried in that form. In this manner, very firm rolls of an explosive material are obtained, which burns with considerable violence in open air, and the propelling effect of which, in small arms, has occasionally been found greater than that of a corresponding charge of rifle powder. Moreover, the material, if submitted in small portions to violent percussion, exhibits but little tendency to detonation. But as no reliance can be placed on a sufficient uniformity of action, in a firearm, of these explosive rolls, this alone sufficed to prevent their competing with powder. The same description of explosive preparation, differing only from that of M. Hochstädter in a trifling modification of its composition, which is certainly not likely to lead to its greater success, has recently been brought forward in this country by M. Reichen and Mr. Melland.

One or two other much cruder explosive preparations, containing chlorate of potash, alone or in conjunction with saltpetre, have met with some application to blasting purposes. One of these consisted of spent tan, in small fragments, which was saturated with the oxidizing agent, and afterwards dusted over with sulphur. When flame or a red-hot iron is applied to this preparation, it deflagrates very slowly and imperfectly; but when employed in blast-holes, where it is confined within a small space, it develops sufficient explosive force to do good work. In addition to comparative cheapness, the great advantage of safety was claimed for this material by its inventor, a claim which was substantiated by the partial destruction by fire, on two occasions, of a manufactory of the substance near Plymouth, without the occurrence of an explosion.

The accidental explosions of gunpowder which are occasionally heard of, occur, in most instances, at the manufactories, and in the course of some operations (especially that of incorporation) to which the explosive mixture is submitted. The only means of guarding against, or reducing as much as possible, the liability to the occurrence of these accidents, consist in the strictest attention to the precautionary measures and regulations which experience has proved to be essential to safety, and which, in spite of the strictest supervision, are unquestionably sometimes overlooked or imperfectly carried out by workmen. Explosions of gunpowder, generally of a serious character, do occur, however, though very rarely, during the transport of the material, or in the magazines where it is stored. The great explosion of a gunpowder magazine at Erith in September, 1864, specially directed the attention of Government and the public generally to the necessity of adopting measures for reducing, as much as possible, the risk of occurrence of such disastrous accidents. Hence, much interest has recently been excited by a well-known method of rendering gunpowder less dangerous in its character, which has been brought prominently before the public by Mr. Gale, and which consists of diluting powder, or separating its grains from each other, by means of a finely-powdered non-explosive substance. Attempts have several times been made in past years to apply to practical purposes the obvious fact, of which nobody acquainted with the nature of gunpowder could be ignorant, that, by interposing between the grains of powder a sufficient quantity of a finely-divided material, which offers great resistance to the transmission of heat, the ignition of separate grains of the entire mass may be accomplished without risk of inflaming contiguous grains. In 1835, Piobert made a series of experiments with the view to apply this fact practically, to reduce the explosiveness of gunpowder, and similar experiments of an extensive character were carried on by a Russian chemist, Fadéiff, between 1841 and 1844. These experimenters found that the object in view might be attained by diluting gunpowder with any one of its components; they also employed very fine sand (a substance closely allied in its physical characters to the powdered glass, which Mr. Gale now proposes to use); but the preference appears to have been given to a particular form of carbon. It was not attempted altogether to prevent the burning of a mass of gunpowder, when a spark or flame reached any portion, but to reduce the rapidity of combustion so greatly as to prevent the occurrence of a violent explosion. No more than this is accomplished by the employment of powdered glass in the proportions directed by Mr. Gale. Indeed, as the quantity of diluent required to give to different kinds of gunpowder the character of equally slow-burning materials increases with the explosiveness of the particular powder and with the size of its grain, the proportion of powdered glass with which the gunpowder employed in rifled cannon would have to be mixed to render it only slow-burning, would be about double the quantity required for almost altogether preventing the ignition of fine-grain powder, or of the comparatively weak blasting powder with which Mr. Gale's public experiments appear generally to have been instituted. Although a sufficient dilution of gunpowder may secure such comparative safety to the neighbourhoods of large magazines, or to the crews of merchant vessels in which gunpowder (for blasting purposes, etc.) is transported, as to compensate fully for the inconvenience attending the great increase of volume of the powder, there is no doubt that such a treatment of gunpowder actually issued for military and naval service would be attended by more than one serious obstacle; such as, the tendency of the powder, unless very largely diluted, to separate from the glass, during transport by land or sea, to so considerable an extent as very greatly to diminish the degree of security originally aimed at; the very great addition which would have to be made to the arrangements for carrying the necessary ammunition, in active service; the necessity for introducing, in the field or on board ship, the operations of separating the powder from the glass and transferring it to cartridges and shells (which, whatever sifting and other arrangements were adopted, would be time-taking and very dangerous), instead of preserving the ammunition ready for immediate use; and, above all, the incalculable mischief which would inevitably result from the establishment, in the minds of the soldier and sailor, of an erroneous feeling of security in dealing with gunpowder, which, however harmless it may for a time be rendered, must finally be handled by the men in its explosive form. The extremely rare occurrence of accidents with gunpowder, on board ship or in active land-service, is mainly due to the strictest enforcement of precautionary regulations, some of which may appear at first sight exaggerated or almost absurd, but which combine to maintain a consciousness of danger and a consequent vigilance indispensable to safety.

One of the most remarkable materials recently employed to replace gunpowder as a destructive agent, is nitro-glycerine. This substance was discovered by *Sobrero*, in 1847, and is produced by adding glycerine in successive small quantities to a mixture of one volume of nitric acid of sp. gr. 1·43, and two volumes of sulphuric acid of sp. gr.

1·83. The acid is cooled artificially during the addition of glycerine, and the mixture is afterwards poured into water, when an amber-coloured oily fluid separates, which is insoluble in water, and possesses no odour, but has a sweet pungent flavour, and is very poisonous, a minute quantity placed upon the tongue producing violent headache, which lasts for several hours.

The liquid has a specific gravity of 1·6, and solidifies at about 5° C. (40° F.); if flame is applied, nitro-glycerine simply burns; and if placed upon paper or metal, and held over a source of heat, it explodes feebly after a short time, burning with a smoky flame. If paper moistened with it be sharply struck, a somewhat violent detonation is produced. Alfred Nobel, a Swedish engineer, was the first to attempt the application of nitro-glycerine as an explosive agent, in 1864.

Some experiments were, in the first instance, made with gunpowder, the grains of which had been saturated with nitro-glycerine. This powder burnt much as usual, but with a brighter flame, in open air. When confined in shells or blast-holes, greater effects were, however, produced with it than with ordinary gunpowder; its destructive action is described as having been from three to six times greater than that of powder. The liquid could not be employed as a blasting agent in the ordinary manner, as the application of flame to it from a common fuze would not cause it to explode. But Mr. Noble has succeeded, by employing a special description of fuze, in applying the liquid alone as a very powerful destructive agent. The charge of nitro-glycerine having been introduced, in a suitable case, into the blast-hole, a fuze, to the extremity of which is attached a small charge of gunpowder, is fixed immediately over the liquid. The concussion produced by the exploding powder, upon ignition of the fuze, effects the explosion of the nitro-glycerine.

The destructive action of this material is estimated, by those who have made experiments in Sweden and Germany, as about ten times that of an equal weight of gunpowder. Therefore, although its cost is about seven times that of blasting powder, its use is stated to be attended with great economy, more especially in hard rocks, a considerable saving being effected by its means in the labour of the miners, and in the time occupied in performing a given amount of work, as much fewer and smaller blast-holes are required than when gunpowder is employed. The material appears to have recently received considerable application in some parts of Germany and in Sweden; but, in England, its employment has been confined to one set of experiments instituted in Cornwall last summer, upon which occasion a wrought-iron block, weighing about three hundredweight, was rent into fragments by the explosion of a charge of less than one ounce of nitro-glycerine placed in a central cavity.

Nitro-glycerine appears, therefore, to possess very important advantages over gunpowder as a blasting and destructive agent, but the attempts to introduce it as a substitute for gunpowder have already been attended by most disastrous results, ascribable in part to some of its properties and the evident instability of the commercial product, but principally to the thoughtlessness of those interested in its application, who appear to have been induced, either by undue confidence in its permanence and comparative safety or from less excusable motives, to leave the masters of ships, or others who had to deal with the transport of the material, in ignorance of its dangerous character.

The precise causes of the fearful explosions of nitro-glycerine which occurred at Aspinwall and San Francisco will, in all probability, never be ascertained; but they are likely to have been due, at any rate indirectly, to the spontaneous decomposition of the substance, induced or accelerated by the elevated temperature of the atmosphere in those parts of the ships where it was stored. Instances are on record in which the violent rupture of closed vessels containing commercial nitro-glycerine has been occasioned by the accumulation of gases generated by its gradual decomposition; and it is at any rate not improbable that a similar result, favoured by the warmth of the atmosphere, and eventually determined by some accidental agitation of the contents of the package of nitro-glycerine, was the cause of those lamentable accidents. The great difficulties attending the purification of nitro-glycerine upon a practical scale, and the uncertainty, as regards stability, of the material, even when purified (leaving out of consideration its very poisonous character and its extreme sensitiveness to explosion by percussion when in the solid form), appear to present insurmountable obstacles to its safe application as a substitute for gunpowder.

The conversion of purified lignin or wood fibre into an explosive substance of the same nature as gun-cotton, was accomplished by chemists soon after Schönbein's discovery of gun-cotton was made known. Finely-divided wood, or sawdust, may, by treatment with suitable agents, be to a very considerable extent purified of substances foreign to cellulose; and, if then submitted to careful digestion in a mixture of the strongest nitric and sulphuric acids, and properly purified, it furnishes a highly explosive material similar to the most explosive gun-cotton, and possessed apparently of considerable stability. Captain Schultze, a Prussian artillery officer, who was entrusted by his government a few years ago with the investigation of gun-cotton, appears to have come to the conclusion that finely-divided wood offered greater prospect of conversion into a controllable explosive agent than cotton wool. The ultimate result of his investigations has been the production of a "gun-sawdust," the explosive properties of which depend in great measure on its impregnation with a considerable proportion of an oxidizing agent, either saltpetre or a mixture of that salt and nitrate of barium. The wood, having been reduced to a tolerably uniform state of division, is submitted by Captain Schultze to purifying processes for the separation of resinous and other substances from the lignin, and the product is converted by digestion in a mixture of sulphuric and nitric acids into a very feebly explosive material, which leaves a considerable carbonaceous residue when burnt. This product after purification is impregnated with a sufficient proportion of nitrates to give it rapidly explosive power, the oxidation of the carbon being now almost complete. The objects which appear to be aimed at by Captain Schultze in following this method of manufacturing a wood-gunpowder, are, the production of a more gradually explosive material than is obtained by the most perfect action of nitric acid upon wood-fibre, and the possibility of preserving the material in a slightly explosive and therefore comparatively harmless form, until it is required for use, when it may be soon rendered powerfully explosive by impregnation with the nitrates. It is asserted that this powder is considerably more powerful than gunpowder as a mining agent; and that, by its employment in mines, the operators are enabled to return to work sooner than when gunpowder is used, because there is little or no smoke produced by its explosion. The latter is an undoubted advantage which Schultze's powder shares with gun-cotton. Advantages are also claimed for this material when employed in firearms, and it is possible that when applied to sporting purposes, it may compete successfully with gunpowder in this direction also; but its behaviour as an explosive, and the peculiarities of its structure, afford little promise of its advantageous employment in arms for military and naval purposes.

Important progress has been made in the history and the application of gun-cotton since its study was resumed in this country about three years ago. Very considerable quantities of the material have been manufactured at the works of Messrs. Prentice, at Stowmarket, and at the Government Gunpowder Works at Waltham Abbey; its application to mining and artillery purposes, and to small arms, has been, and is still the subject of systematic experiment, conducted by the Government Committee on Gun-cotton; its employment as a blasting agent is steadily increasing in several important English mining districts; and considerable, though not uniform, success has already attended the employment of gun-cotton cartridges for sporting purposes.

The system of manufacture of gun-cotton, as perfected by Baron Von Lenk, has undergone but trifling modifications in its employment in this country. It has been made the subject of careful investigations by Mr. Abel, and the results furnished by many experimental manufacturing operations, and an examination of the products, have shown that the process of converting cotton into the most explosive form of pyroxylin or gun-cotton, and of purifying the material, have been so greatly perfected by Von Lenk as to render a strict adherence to his simple and precise instructions alone necessary to ensure the preparation of very uniform products, which exhibit in their composition a very much closer approximation to purity than those obtained in the earlier days of the history of gun-cotton.

Although the conclusions arrived at by the many chemists who investigated the composition of gun-cotton, soon after Schönbein's discovery, varied very considerably, the constitution has been very generally regarded as definitively established by the researches of Hadow, published in 1854. According to that chemist, the most explosive gun-cotton has the composition expressed by the formula $C_6H_7N_3O_{11}$ (which was first assigned to the substance by W. Crum, in 1847), and may be regarded as cellulose, in which three atoms of hydrogen are replaced by three molecules of peroxide of nitrogen.

The name *trinitro-cellulose* has therefore been assigned to gun-cotton, its constitution being expressed by the formula $C_6 \left\{ \begin{matrix} H_7 \\ 3\,NO_2 \end{matrix} \right\} O_5$. Hadow's conclusions have been confirmed by other chemists, more especially by Redtenbacher, Schrötter, and Schneider, who have analysed specimens of gun-cotton prepared under Von Lenk's directions. But a Report upon the Austrian Gun-cotton was published in 1864 by Pelouze and Maury, in which the formula $C_{24}H_{36}O_{18}, 5\,N_2O_5$ is assigned to the product of Von Lenk's process; the conclusions of those chemists being founded partly upon some analytical results, and partly upon the increase of weight which they found cotton to sustain, when submitted to treatment with the mixed acids. They found the greatest increase in weight to be 78 per cent., a number slightly in excess of that which would correspond to the requirements of the formula which they adopt.

An experimental inquiry into the composition of gun-cotton, as obtained by Von Lenk's process, has been instituted by Mr. Abel; and the very numerous analytical and synthetical results which he has obtained confirm the correctness of the formula assigned by Crum and Hadow to the most explosive gun-cotton, and demonstrate satisfactorily that the products obtained by following strictly the instructions given by Von Lenk are invariably trinitro-cellulose, in a condition as nearly approaching purity as a manufacturing operation can be expected to furnish.

The most explosive gun-cotton is perfectly insoluble in mixtures of ether and alcohol; but by varying the proportions and strength of the acids employed for the conversion of cotton, products of less explosive character are obtained, which are more or less freely soluble in ether and alcohol (furnishing the well-known material *collodion*). If, therefore, in manufacturing gun-cotton, the conditions essential to the production of insoluble pyroxylin are not strictly fulfilled, the uniformity of the product will suffer.

The ordinary products of manufacture are never altogether free from soluble gun-cotton; but the proportion present is small and very uniform, amounting to about 1·5 per cent. They contain, besides, a small quantity (about 0·5 per cent.) of matter soluble in alcohol alone, and possessed of acid characters, which is evidently produced by the action of nitric acid upon such small quantities of resinous or other matters foreign to pure cellulose, as are not completely removed from the cotton fibre by the purification which it receives.

There appears good reason to believe that this impurity in gun-cotton is of comparatively unstable character, and that the great proneness to spontaneous decomposition which has been observed by Pelouze and Maury, De Luca, and others, in some specimens of gun-cotton, is to be ascribed in great measure to the existence in those specimens of comparatively large proportions of those unstable bye-products.

One hundred parts of carefully-purified cotton wool have been found by Mr. Abel to furnish from 181·8 to 182·5 parts of gun-cotton. The increase which *perfectly pure cellulose* should sustain by absolutely complete conversion into a substance of the formula $C_6H_7N_3O_{11}$ (*trinitro-cellulose*) is 83·3; the above results are therefore strong confirmations of the correctness of this generally-accepted view of the composition of gun-cotton. In carrying out the actual manufacturing process, as prescribed by Von Lenk, somewhat lower results are obtained, because of impurities existing in the cotton employed, and of loss of product during its purification.

Very extensive experiments are in progress at Woolwich, with the view of examining fully into the extent of liability to change of gun-cotton when preserved in store, or exposed for prolonged periods to light and to degrees of heat ranging between the ordinary atmospheric temperatures and that of boiling water. The results hitherto arrived at, though they have shown that, under severe conditions, gun-cotton is liable to decompose, have not confirmed the conclusions arrived at by the French chemists, with regard to the great instability of the material. Thus, De Luca states that all specimens exposed by him to sunlight decomposed either on the first day or within a few days. But, at Woolwich, no single instance of such rapid decomposition of gun-cotton, made by the present process, has been noticed. A very gradual and slight development of gas occurs after a time when the substance is exposed to sunlight; but the quantity which has been collected from specimens exposed at Woolwich to direct day- and sunlight for two years and a half, is very small, and the gun-cotton has in all instances preserved its original appearance. Pelouze and Maury state that gun-cotton always decomposes perfectly within a few days, by exposure to temperatures of 55°–60° C. (130°–140° F.), and they lay great stress upon the explosion of a specimen directly it was introduced into a vessel heated to 47° C. (116°·6 F.). But, at Woolwich, a specimen of ordinary product which has been exposed now for twelve months to 65° C. (150° F.), has evolved only a small quantity of gas, and retains its original appearance perfectly. Several specimens, after having been exposed for some hours to a temperature of 90° C. (194° F.), during which period some nitrous vapours were in all instances evolved, have since been exposed to light in closed vessels for about twenty months, and still retain their original appearance and explosive characters. Several large ammunition-cases, closely packed with gun-cotton, have been preserved for six months in a chamber, the temperature of which was maintained for three months at 49° C. (120° F.), and afterwards at 54°–55° C. (130° F.), arrangements having been made for periodically registering the temperature within the boxes, which were kept closed. In no instance has the latter temperature risen to an extent to indicate serious chemical change, *i. e.* it has always been below the temperature of the air in the chamber. These few examples of results already obtained are given to show that the behaviour of gun-cotton manufactured in England by Von Lenk's process does not, as yet, at all justify the condemnation which the material has recently received in France.

One most important point in connection with the preservation of gun-cotton appears to have been lost sight of by the French experimenters. The material may be most perfectly preserved, apparently for any period, either by immersion in water, or, still more simply, by being impregnated with just sufficient moisture to render it perfectly uninflammable. In this condition, gun-cotton is much safer than gunpowder can be rendered, even by mixture with very large proportions of incombustible materials. It may be transported with quite as much safety as the unconverted cotton; indeed, it appears to be very much less prone to gradual decay, if preserved for very long periods in a damp condition, than cotton or other vegetable substances. Many specimens of gun-cotton, preserved for several months in a very damp chamber, together with paper, cotton fabrics, and wood, retained their strength of fibre and all their original properties, and had no signs even of mildew upon them, while the paper fabrics in immediate contact with them had completely rotted away, and the wood was covered with fungi.

Considerable progress has been made in the manipulation of gun-cotton, with the object of modifying its explosive action. The rapidity with which gun-cotton burns *in open air* admits of ready and very considerable variation by applying the simple expedients of winding, twisting, or plaiting gun-cotton yarn of different sizes. But, although a mass of gun-cotton may be made to burn in a comparatively gradual manner by being very tightly wound, a charge of the material in that form acts quite as destructively when exploded in the bore of a gun as an equal charge consisting of the yarn wound very loosely, because the pressure of gas established by the first ignition of the charge renders the compact packing of the gun-cotton powerless to resist the instantaneous penetration of flame between the separate layers of the material. The assertion that a power had been acquired of controlling the explosive action of gun-cotton in a firearm by simply varying the compactness with which the material was twisted or wound, has, therefore, proved quite erroneous. There are, however, two methods of reducing the rapidity of explosion of gun-cotton, which are much more likely to furnish successful results. The one consists in diluting the material by its admixture either with a less explosive variety of gun-cotton or with some inexplosive substance, such, for instance, as the cotton in its original form. The latter mode of dilution has recently been applied by Messrs. Prentice to the construction of cartridges for sporting purposes, and they describe the results already arrived at as very promising. The second method of controlling the explosion of gun-cotton consists in consolidating the material by pressure into compact homogeneous masses, and in confining the first ignition of such compressed gun-cotton in the bore of the gun, to certain surfaces. The gun-cotton fibre in the form of yarn or plait may be compressed into very compact masses by being rammed into strong cylinders of pasteboard or other suitable material; but much more perfectly homogeneous and solid masses are produced, independently of cylinders or other cases, by a method which Mr. Abel has recently elaborated, and which consists in reducing the gun-cotton fibre to a fine state of division or pulp, as in the process of paper-making, and in converting this pulp by pressure into solid masses of any suitable form or density.

This method of operating affords also special facilities for combining both methods, dilution and compression, of reducing the explosive violence of gun-cotton. The material is, in fact, operated upon by this system, in a manner exactly corresponding to the processes by which the explosive action of gunpowder is regulated to so remarkable an extent. Some results, which are admitted by the most sceptical as encouraging, have already been arrived at, in the systematic course of experiments which are in progress, with the object of applying the methods of regulation, pointed out, to the reduction of gun-cotton to a safe form for artillery purposes. Its arrangement in a form suitable for small arms is a much less difficult problem, which may be considered as approaching a perfect solution. For employment in shells and for military mines, both land and submarine, the compressed or solid form of gun-cotton presents special advantages, on account of the great compactness which may be imparted to it; a given weight arranged so as to ignite instantaneously under pressure (*i. e.* in strong vessels), may be made to occupy the same space as an equal weight of gunpowder, whereas the forms of gun-cotton hitherto applied to these purposes occupy about three times the space of gunpowder.

Beautiful pyrotechnic effects may be readily produced by means of gun-cotton, though the absence of smoke, which, in some of its applications (especially in mines), would constitute an important advantage, detracts from some of the effects which may be obtained with pyrotechnic compositions. On the other hand, gun-cotton fireworks may be displayed in-doors without inconvenience.

There appears at present no reason to doubt that the application of gun-cotton with great advantage to at least some of the more important purposes for which gunpowder is used, will, ere long, be fully established, and that this interesting explosive agent is destined to occupy a permanent and prominent position among the most important products of chemical industry.

DOUBLE FLOWERS.

Is the appearance of double flowers in some plants, that is to say the partial or complete transformation of the sexual organs into petals, the result of high cultivation, or must the change in question be attributed to physico-climatical influences? In modern times the opinion has been repeatedly expressed that the double state is the result of culture; consequently it is the effect of a rich luxurious soil, care in the supply of water, frequent stirring up of the earth, and the application of liquid manures and other agents which are supposed to produce double flowers. This, however, according to our view, is not the cause of doubleness. In the first place we consider it necessary to direct attention to the cultivation of Stocks, in order to see in what way this is accomplished to obtain seeds from plants, the majority of which shall produce double flowers; and then we will adduce some phenomena which may perhaps serve as supports of our theory.

Stocks intended to supply seeds of the above-mentioned character are cultivated in pots, placed on stages, with arrangements to protect them from rain and dew. These plants are only furnished with just sufficient water for their preservation, causing a spare growth, and in consequence of this the flowers produce defective sexual organs. The seeds from these plants are mostly of an abnormal shape, which is so striking that experienced cultivators are able to separate those which will furnish double flowers from those which will produce single ones. According to this, it would appear that the starved state of the plants brought about by withholding water is the cause of their bearing seeds which produce flowers whose capability of generation is wanting through the change of the sexual organs into petals. To explain the cause of this phenomenon more clearly, we maintain that water plays a double part in vegetation; in one of its constituents it furnishes an indispensable element, and then it also serves to convey the ingredients of the soil through the roots into the plant.

If a soil were ever so rich, but deficient in water, plants would not grow in it on hot days. In the absence of this root-function the leaves could not inhale from the air carbonic acid and ammonia—vegetation would be at a stand-still. Under such conditions we see that many cereals, barley for instance, when only a few inches high, come into ear. The potato produces imperfect stolons, but these, after the first soaking rain sets in, form tubers, which we had good opportunity of observing in the course of last summer, on the well-cultivated estate of Schoenkirchen, when the roots were examined during the drought and after the rain.

The means by which we arrived at the conviction that double flowers are a consequence of dryness of soil and atmosphere, and not of a luxurious soil rich in nutritious matter,—two phenomena on which we have bestowed attention, will serve to show.

Fifty years ago we saw *Kerria japonica*, in a hothouse, with single flowers. Twenty years later we met with it in several gardens, in the open air however, but always with double flowers. At this time we were assured that single-flowered plants were no more to be found in the whole of Europe, and those who were forming herbaria offered considerable sums for a branch of *K. japonica* with single flowers. We were requested to take the plant in hand for the purpose of inducing it to produce single flowers. We were advised to plant it out in a rich soil, which was done; but by chance the situation was sloping, consequently it did not retain moisture, and all the flowers produced for several years in succession were double. Shortly after, the captain of an English ship again brought plants bearing normal flowers from Japan, which were soon spread over the Continent, and of which we received one plant. After three years all the young plants raised from cuttings were double-flowered.

In the year 1820 we several times visited a garden in the neighbourhood of Vienna, well known on account of its plant culture. The gardener there possessed an immense plant of *Camellia japonica floribus simplicibus*, and some small plants raised from this by cuttings, but no other variety of Camellia. He fertilized the flowers with their own pollen, harvested seeds, which he sowed, and the plants raised from them were placed in an extremely dry, lofty conservatory, where, after some years, instead of producing single flowers they all produced double ones. The seedlings and mother plant were planted in one and the same kind of earth, and some of the flowers on the old plant also showed an inclination to become double.

This, at that time, to us, enigmatical phenomenon, was kept in mind until we had an opportunity of instituting comparisons between the climates of Japan and China and our own, and we then concluded that in the case of a plant imported from thence and exposed to such different climatic influences, the origin of the greater or less imperfection of its sexual organs was probably owing to this change, as we had experienced in Kerria and Camellia; and that the sterility of many other exotic plants might be attributed to the same cause. The difference in the climatic relations of Japan and Europe is very considerable. In Japan, previous to the new growth of Kerria and Camellia, a rainy season of three months' duration occurs; in Europe, on the contrary, dry winds prevail, especially in the eastern part, where our plains are often transformed into deserts. Is it, therefore, remarkable that a plant introduced from Japan into Europe, exposed to the influences of this great diversity of climate, should produce imperfect sexual organs incapable of further propagating the plant from seeds? Double flowers are abnormal, and in this respect are looked upon by botanists with contempt. A rich soil, with the necessary amount of moisture, will never engender double flowers. (*From Otto's Gartenzeitung.*)—*Gardeners' Chronicle.*

NOTE ON THE TENACITY OF LIFE OF THE SEEDS AND SPORES OF SOME PLANTS.

BY PROF. WILLIAM H. BREWER.

Edwards and Colin (Annales des Sci. Nat., 2, Bot. i. 227) made experiments on the power of resisting elevated or depressed temperature possessed by the seeds of various leguminous and cereal plants. They found that all lost their vitality if heated in water at 167° Fahr., which is the temperature at which starch grains burst; that most of the seeds had their vitality destroyed when heated in water below this, but would stand a temperature of 122°; while in steam they would stand 144° Fahr.; and in *dry* air some germinated after being heated a very short time to 167° Fahr. Above this all lost their vitality. Some would stand a dry cold of 70° Fahr. below zero.

Berkeley states (Introduct. to Crytogam. Bot. p. 68) that he has "recorded an instance of the germination of thousands of grape seeds after three emersions in boiling water;

and Dr. Lindley mentions the fact of raspberry seeds growing after being boiled for jam, in which case, if the sugar were really boiling, the temperature would be above the boiling-point of water." The author considers, however, that the observations were not sufficiently exact in either case.

Balfour states ('Class Book of Botany,' p. 628), "the seeds of *Phytolacca decandra* and of the Raspberry have been known to germinate after exposure for a short time to the heat of boiling syrup," but does not give his authority.

Hemmingway states (Ann. of Nat. Hist., 1, viii. 317) that the seeds of *Sambucus nigra* germinated after being twice boiled in making wine, being present during the vinous fermentation, and remaining twenty months in the dregs of the cask.

In regard to the spores of fungi, Berkeley remarks ('Outlines of British Fungology,' 32) "that the spores of certain fungi would bear a moist heat equal to that of boiling water without losing their power of germination. They have also considerable powers of resisting frost, but the exact limits in either case under varying circumstances have not at present been ascertained."

More to the point are the experiments of the eminent cryptogamic botanist Payen, on the red mould in the interior of bread, which created such a stir in Paris nearly twenty years ago. This mould, the *Oïdium aurantiacum*, was developed in the interior of the bread within an incredibly short space of time after it had been baked, especially in the barrack-bread (*pain de munition*), at Paris. He found (Ann. de Chim. et de Phys., 3, xxiv. 253) that pieces of bread, and also of dough, upon which the spores of this fungus has been sown, and then exposed in tubes of moist air for half an hour to the respective temperatures of 212°, 221°, and 248° Fahr., afterwards produced the red fungus; while similar pieces of bread and dough, treated in a similar manner, but not sown with the spores, did not yield this specific fungus. When the spores were heated in tubes to 284° Fahr. they lost their red colour, and then ceased to germinate.

It seems that in this case, as in that of the cereals, the vitality of the seeds or spores is retained under certain circumstances up to nearly or quite the temperature required to decompose the chemical substances in the seed, or to disorganize the structure. In the still lower Cryptogams we have no data either as to the chemical character of their spores, the temperatures required to change their organic compounds, or to disorganize their structure, and none whatever as to the temperatures they may withstand and still germinate. It seems, therefore, unsafe to assume, without proof to the contrary, that their vitality (germinating power) is destroyed at a temperature much below that required for their actual destruction or disorganization.

One of the most remarkable examples of tenacity of life in the higher plants is presented by the *Lewisia rediviva* of Western North America, a large-flowering fleshy plant, of the Portulaceæ, growing in British Columbia, Oregon, and California. Dried specimens that have been two years or more in an herbarium will still grow, and are often troublesome from sprouting while between the papers. One specimen, collected by Dr. Lyall, of the British Navy, was "immersed in boiling water" to stop this growing propensity before drying out; and yet, more than a year and a half afterward, it showed symptoms of vitality, and in May of 1863 it produced its beautiful flowers in the Royal Gardens of Kew. This plant in flower is figured in 'Curtis's Botanical Magazine' for August of that year. It is very desirable that some special experiments should be made to ascertain just how much boiling it may undergo without loss of vitality.—*Silliman's Journal, May*, 1866.

ON YELLOW WAX COMPARED WITH WHITE AS A CONSTITUENT OF CERATES, ETC.

BY FERRIS BRINGHURST.

Having for some time theoretically believed in the superiority of selected yellow wax over white wax, in making cerates, ointments, suppositories, etc., and having practically and thoroughly tested this theory, I am so well convinced of its correctness as to be strongly tempted to depart from the strict letter of the Pharmacopœia, and use the yellow to the exclusion of the white, in all compositions, officinal and non-officinal, of which wax is a constituent.

About eight months ago I made some simple cerate, using some yellow wax, for exhibition at the last meeting of the American Pharmaceutical Association, a specimen of which is on the table, and will be found to have kept well, and in fact is as good, if not better, than the specimen of officinal cerate made about six weeks since.

I have used yellow wax for several years in making "Glycerine Cream," and have never known it to spoil, while in "Cold Cream," made with white wax, the change of age is readily detected. This difference is no doubt due in part to the preservative influence of the glycerine.

In making suppositories, I have for a long time used the yellow instead of white wax, for giving proper consistence to the cocoa butter, and find a decided advantage.

In the former case, the original chocolate odour is well preserved, while in the latter there is a rank odour, like that of stale burnt coffee.

About two years ago, while the armies for and against the Republic were contending about Spottsylvania, I was one of a committee sent from our city to Fredericksburg to care for the sick and wounded. Having a knowledge of medicines, I was at once assigned as hospital steward in the main hospital of the second corps, then actively engaged. Large supplies of dressing were required, and I had occasion to open and inspect many cans of simple cerate, some bearing the labels of eminent houses here, others that of the U. S. Army Laboratory ; all, no doubt, made according to the officinal formula, and of selected materials, but there was scarcely any of it I considered fit to dress sores and wounds, requiring a bland cerate free from irritating qualities, as the *Ceratum Adipis* is intended to be. Let us for a moment compare the virtues of the two.

Selected yellow wax, having been subjected to but one simple manipulation, contains a trace of honey, to its advantage rather than otherwise, a peculiar balsamic principle, which gives it a delightful odour, and tends to preserve, not only the wax but all its compounds also, and a yellow colouring-matter which is considered its objectionable feature.

Commercial white wax, having passed through several manipulations, nearly always contains a considerable portion of tallow, paraffine, or other sophistication, is deprived of all its honey, and nearly, if not quite all its balsamic principles, and is so deteriorated by the bleaching process that a slightly rancid odour is nearly always observable, and, in my judgment, it produces a strong tendency to rancidity in all its compounds. It has no particular advantage over the yellow, except in point of colour, which is a very doubtful advantage, considering the sacrifice of useful features peculiar to the latter.

What does the suffering patient care for the colour of an ointment, if it is adapted to his case and heals his wound? And I would ask what good and sufficient reason is there for throwing aside the peculiar virtues of yellow wax, and making a really inferior cerate, liable to constant deterioration, in order to have it white?

Mr. Maisch said that he had no practical experience with the substitution in ointments and cerates, of yellow for white wax. Mr. Bringhurst had referred to the rancidity of all the simple cerate made by private parties, and at the U. S. Army Laboratory, which he saw on the battle-field. The speaker, said, however, that he had examined many samples of so-called simple cerate used by the army, and had found quite a number furnished by houses considered respectable, which did not contain a trace of wax, which was substituted by Japan wax and paraffine. This fraudulent preparation is easily recognized by its semi-transparent appearance, while true simple cerate is opaque. Japan wax is a fat, usually more or less rancid the way it appears in commerce, and must, therefore, necessarily hasten the decomposition of lard. Paraffine renders lard rancid still more rapidly. These facts account in part for the experience of Mr. Bringhurst.

Some private houses had furnished to the army true simple cerate, and all made at the U. S. Army Laboratory in this city was prepared strictly according to the Pharmacopœia. In 1863, shortly after the Laboratory went into operation, the speaker had met with some difficulty in obtaining pure lard, the commercial being found to contain a fraudulent admixture of from 12 to 16 per cent. of water. Subsequently, however, pure lard was prepared by the manufacturers for this institution. Although the material was used strictly in the proportion of the national Pharmacopœia, still the manipulation differed somewhat from that followed by pharmaceutists on the small scale. The material was fused by steam, then stirred until it became so thick that, on being run into cold tin cans, it would congeal in a few minutes. Made in this way, it was not quite as white as usually met with in apothecaries' stores; but a thin layer on the surface, containing more wax, and being firmer on that account, rather tended to counteract the tendency to become rancid; and he had repeatedly examined some several months after its preparation, and, though a slight odour of incipient rancidity was observed, this decomposition had not proceeded far enough to unfit it for surgical use. From 800 to 1200 lbs. were frequently run off in one day.

Mr. Bringhurst said that he had no doubt that the simple cerate, like all other preparations made at the U. S. Army Laboratory, were prepared in accordance with the Pharmacopœia; but he had opened a great many packages issued from that institution and found them all rancid, and, in his opinion, unfit for dressing wounds.

Mr. Maisch.—Early in 1863 he had proposed to make simple cerate with yellow instead of white wax, as probably furnishing a preparation not so prone to change as the officinal, but the surgeons who had to decide upon it would not entertain the proposition because the preparation would be so different in appearance from that with which the surgeons of the army were familiar that it would be returned. There was, however, one reason which easily accounts for the rancidity of the simple cerate as met with in the general hospitals and on the battle-field. Mr. Henry N. Rittenhouse, who is present at this meeting, and who has acted as medical purveyor during a considerable period of this war, has had practical experience in the mode of furnishing medical supplies to the army, and could give better information on this point than the speaker. Towards the close of a quarter, the Laboratory would endeavour to have a stock of all preparations on hand to fill the requisitions of the various medical purveyors, who made theirs three months in advance. The surgeons in charge of general hospitals likewise made their quarterly requisitions three months ahead, and they were usually filled by the purveyors from the supplies received during the previous quarter. It will be seen that six to nine months might have elapsed before the medical supplies reached those points where they were to be used, and that nine to twelve months might pass away before they were all used. This is entirely too long a period to preserve simple cerate, which is rendered still more inclined to change by the heat of our summer.—*Amer. Journ. Pharm.*

ORANGE-LEAF WATER AS AN ADULTERATION OF ORANGE-FLOWER WATER.

M. Gobley (Journ. de Pharm., April, 1866, 249) says, that water distilled from orange-leaves is sometimes substituted for or mixed with orange-flower waters, than which it is much less odorant or agreeable. He proposes the following chemical means of distinguishing between these two waters. Twenty parts of nitric acid, ten of sulphuric acid, and thirty of water are mixed. The assay is made by mixing one part of this test acid solution with five parts of the distilled water of orange-flowers, when a rose-colour of greater or less depth, according to the strength of the water, occurs. With the water of the leaves no such coloration occurs. Unfortunately this test is only useful in distinguishing the separate waters, as it will not detect the presence of the leaf-water even negatively, as orange-flower water is made of several commercial strengths. It is also the opinion of M. Rabot that age deprives this water of the property of being coloured by the acid mixture. [We have tried this test with orange-flower water, imported in flasks, and find it to react perfectly; but water made from oil of neroli did not react, so that this test will distinguish the distilled orange-flower water from that made from oil of neroli.—Ed. Amer. Journ. Pharm.]

BOTANY BAY, OR GRASS-TREE GUM.

BY P. L. SIMMONDS, F.S.S.

This remarkable resin, which is known in different parts of Australia under various local names, as "black boy" gum, grass-tree gum, etc., would seem to be obtained from several species of *Xanthorrhœa*, of which there are six or seven well-defined species in Australia. The resin has long been known among druggists as gum acroides. It was generically named by Swartz from its peculiar colour.

This resin was first described in Governor Phillips's voyage to New South Wales in 1788. Mr. Phillips states that it was employed by the natives and first settlers as a medicine in cases of diarrhœa. The resin of *X. hastilis* as it occurs in commerce sometimes forms masses of considerable size; but as it is very brittle, although tolerably hard, it usually arrives in small pieces, and in the state of a coarse powder. Its colour is a deep yellow, with a slightly reddish shade, and considerably resembling gamboge, but darker and less pleasing. The colour of its powder is greenish-yellow. When chewed it does not dissolve or stick to the teeth, but tastes slightly astringent and aromatic, like storax or benzoin. When gently heated it melts, and when strongly heated it burns with a smoky flame, and emits a fragrant odour resembling balsam of tolu, containing apparently cinnamic acid mixed with a very little benzoic. The quantity of carbazotic acid which this resin yields when treated with nitric acid is very great, and it is easily purified. Incidental mention has already been made of this resin ('Technologist,' vol. ii. p. 25; iii. p. 19; and v. p. 227), but as it appears to be occupying increased attention in Australia just now, some further details respecting it may prove useful.

The grass-tree is one great characteristic of the scenery and of the vegetation of Australia. It puts one in mind of a tall black native with a spear in his hand ornamented with a tuft of rushes. On the spear is found an excellent, clear, transparent gum, and from the lowest part of the tree oozes a black gum, which makes a powerful cement, used by the natives for fastening stone heads on their hammers. The resin may be obtained in inexhaustible quantities. *X. hastilis*, *australis*, and *arborea* seem to be the most generally diffused species.

A late Melbourne paper thus speaks of the tree:—"There are few who have ever travelled any distance in Victoria but have met with the grass-tree, which is to be found in nearly all parts of Australia. Up to a few months ago it was supposed only to be a useless growth encumbering the land. A few knew from the natives that it contained a very tenacious gum. The blacks used it as a glue for joining parts of their weapons, but it is only within the last few months that the following valuable articles have been obtained, after great labour and expense, by a Mr. Dodd, St. Romain's. The place where Mr. Dodd has erected his works to carry on the experiments is situated about eighteen miles in a southerly direction from Colac, and here for some months past experiments have been carried on in connection with the grass-tree. The root is the portion used in these experiments, and usually weighs from 10 lb. to 50 lb. The root is composed of the stems growing in a close mass around the inner portion or kernel. From the outer portion gum shellac in large quantities is obtainable; the refuse contains a large quantity of gas, and can be made available for lighting the works. From the inner portion is extracted, by pressing and distilling, a spirit equal to the best brandy; after distilling, a quantity of saccharine matter remains, from which sugar can be extracted. The present supply of grass-tree in the neighbourhood of St. Romain's is computed to be equal to a supply of 600 tons per week for the next ten years. Great quantities of young grass-trees abound, which will keep up the supply, and doubtless cultivation would enlarge the roots."

In a paper which we read before the Society of Arts, in 1855, "On the Gums and Resins of Commerce," we entered rather fully into the character and uses of this resin. We therein stated that Captain Wray, R.E., submitted a report to the local authorities of Western Australia in 1854, on the manufacture of illuminating gas from the *Xanthorrhœa* at one-third the expense of lighting with oil or candles.

The plant grows in abundance all over Western Australia, and is composed of a core of hard, fibrous pith, about half of its whole diameter, round which there is a layer of resin, varying from half an inch to one inch or more in thickness, which forms the connexion between the leaves and the core. Between these leaves and also adhering to, and covering them, is a considerable quantity of resin; resin also exudes in large lumps from the sides of the plant.

The method of obtaining the material in the colony for this purpose was as follows:—In the first instance, the leaves and resin were separated from the core by breaking up this plant with an axe and sifting the resin from the leaves; but it was found by experience that as much gas was obtained from an equal weight of the leaves and resin together, as from the resin alone. The quantity of resin obtained from an average-sized "black boy" was about 45 lb. weight. This was collected easily at the rate of 5 lb. per hour, by a person having for his tools an axe and a sieve.

Should the resin be collected for export, I am satisfied that by a proper arrangement of crushers and sieves, a labourer, at 4*s.* per diem (the colonial rate), could collect at least one hundredweight per diem, enabling the resin to be brought to market, at Freemantle, for £4 per ton, the ton weight measuring forty-five cubic feet when pressed. The quantity of pure gas obtained by Captain Wray's experiments was at least four cubic feet to the pound of resin and leaves, but much more might be obtained by a more complete apparatus.

A cart-load of the plants, eight in number, weighed 1,048 pounds. When the core was removed, the leaves and resin weighed 628 pounds. This core is very good fuel when mixed with other wood. The specific gravity of the gas is ·888. The products of the distillation are gas, tar, and coke. The tar obtained was about one quart for every 10 lb., and this, when re-distilled, gave 8 per cent. fluid oz. of naphtha, and 20 per cent. of a sweet, spirituous, non-inflammable liquor. The coke remaining was about one-quarter of the original weight, and with other fuel burns well. The coke of the leaf has a bright shining appearance, and when ground with oil, is a very good substitute for lamp-black in paint. The gas has a smell somewhat similar to coal gas, not nearly so offensive, but sufficiently strong to make any escape immediately perceptible. Its illuminating power appears to be very superior to coal gas, and its light very white.

Captain Wray is of opinion that when the production of the gas from the resin of the *Xanthorrhœa* is conducted with suitable apparatus, the cost per annum will be materially reduced, so far, indeed, that the resin may become a large and profitable export from the colony, to places which are not lighted at all, or lighted with oil. The supply is almost unlimited; and even were it not so, it would be advantageous to get rid of the plant from all the land fit for cultivation. Should it be found, however, that the plant was likely to get scarce, the resin might be obtained by tapping.—*The Technologist.*

PERUVIAN CINCHONAS.

We have been favoured with the following letter for publication relating to the Cinchona:—

"I was glad to see from your letter that the seeds had turned out a success. I was in Peru during some three years, in daily contact with the Cascarilleros (as the quinine bark collectors are called) of both Peru and Bolivia. I always found the Cascarilleros ready to assist in anything I wanted. I went with them on their bark-hunting expeditions far into the interior, and made a collection of plants, leaves, etc., to bring home to Europe, which, however, were all lost in the siege of La Paz, in 1863, when our house was completely sacked, being close to the part of the town entered by the besiegers. I only saved the bag of seeds, which, luckily, was in my portmanteau with clothes, and which, fortunately, are from the district considered as the finest Cascarilla of Bolivia; the bark from that part (the head-waters of the river Beni) fetching a far higher price than any other in South America, at least so the best China bark merchants assure me.

"As I had not sufficient knowledge of the trees myself, for there are various species of this tree growing everywhere, I trusted to some Indian cascarilleros whom I knew, and think they did not deceive me when they assured me that this was the finest sort; the seeds were collected in 1861, in the forests on the east side of the river Massiri, in the province of Laricaja, lat. $14\frac{1}{2}°$ S., long. $70\frac{1}{2}°$ W. The Massiri is a tributary of the Beni, a principal branch of the Madera arm of the Amazon, and inhabited by the Takana Indians, from whom I received much kindness. They live exclusively along the river, their principal food being fish and monkeys, though some of the nearer ones, as at Huanay, have maize and sugar-cane. Cotton, both white and nankeen, grows everywhere in abundance, wild, as a perennial shrub or tree; quality excellent, and nearly equal to Sea Island, as I have had them tested in Manchester. They are very clever in making woven articles of this cotton.

"The bark tree is not found along the rivers, but at from 1000 to 4000 feet higher up, either in single trees or small clumps amongst the other trees, easily recognisable by the particular green colour of the leaves, and the Cascarilleros find out the trees by ascending lofty trees or hills, and paying attention to this fact, otherwise the undergrowth of these immense virgin forests would render it impossible to find them. I, with others to assist me, have been half a day cutting a way to one of these clumps. The climate is everywhere intensely hot and moist, and the fevers deadly, especially in the rainy season; the mortality, as may be expected, very great. All the rivers abound in gold; I believe as rich as California. A friend of mine, Don Laurento Villamel, took 1200 oz. of gold ($23\frac{1}{2}$ carat) out of about an area of 30 feet square on the river bed.

"I always was in excellent health, which I attribute to being always at work on foot, hunting, or pounding the rocks with a hammer. Still I often took three grains of sulphate of quinine in the morning.—*David Forbes*." [We learn from Mr. Howard, the eminent quinologist, that a plant reared from one of the seeds above alluded to proves to be a new and probably valuable kind of Calisaya—the "verde," of which an account was given in Mr. Howard's important communication on the Cinchona barks read at the recent Botanical Congress.* Eds.]—*Gardeners' Chronicle*.

AN INQUIRY INTO VEGETABLE FIBRES AVAILABLE FOR TEXTILE FABRICS.

BY H. SHERWOOD.

During many years past a considerable number of fibres easily obtainable have been brought into notice, some of which appear to possess peculiar excellences; but, though recently the market value of the great staples of manufacture has been and still continues high, and thus every inducement has been offered to bring into use some of those fibres, yet the advance towards this end has been but small,—cotton cloths and linen cloths remaining substantially the only vegetable fabrics possessed by us. Still, the public mind has been awake to the importance of the subject; and many attempts have been made, chiefly towards an end laid down as the great necessity of the times, viz. the bringing of a fibre into the market in a state suitable to be worked on cotton machinery, and to fulfil all the peculiar uses of cotton. The object of these notes is to inquire how far a just view of the general subject prevails,—how far the endeavours towards utilizing new fibres have been reasonable, and to seek light on the manner of their suitable treatment.

Of all fibres doubtless cotton is one of the most desirable. The evenness of thickness, the length, strength, and softness of each fibre, together with its flattened spiral form, adapting it so admirably for spinning into high count yarns, will cause it ever to retain its prominence for an immense class of fabrics. Little also is left to be desired in the perfection of its manufacture. But the day was when cotton was unknown in Europe; and in like manner, as cotton has found its specially suitable uses, so doubtless other fibres will be found to have theirs,—uses which are now usurped by the less suitable staples of flax and cotton.

Flax and its kindred fibres do not appear to have advanced very much in perfection of manufacture even from middle ages. Evenness of yarn appears the chief aim in most proposed improvements in flax, which cannot be expected to be fully attained from fibrous material used with masses of cells agglutinated together, and consequently liable to unevenness. Hemp might probably with great advantage have its uses considerably extended by improved states in which to use it. Jute is probably used to its full capabilities, and certainly further than the public approve of.

Beyond these staples the utilization of other fibres appears almost confined to semi-civilized nations consuming local products. Their manner of using these, though some are probably worthy of consideration even by manufacturing Europe, are beyond the subject of this inquiry. The few which Europe has attempted appear to have been intended chiefly for mixing with other fibres now in use. But is it not doubtful whether this design in their use may not be in the main defective? Each fibre has its own speciality, which may be a peculiar excellence or a peculiar beauty, and many may produce cloths as totally different from cloth or linen as these differ from each other. Is it not also doubtful whether the imperative necessity for fibres to be workable on cotton

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* See 'Pharmaceutical Journal' for July, p. 14.—Ed. Ph. J.

machinery be not the demand for idle machinery rather than of thinking men able to adapt machinery to requirements? Though some fibres exist which appear eminently adapted for mixing with silk and with combed wool, yet probably these fibres are destined to be more used alone than in any combination. But we may presume that the raw materials appearing on the market in a state suitable for the manufacturer would create their own machinery, their own suitable uses, and their own demand.

The attempts at improvement in the use of fibres have very properly taken the direction of dividing the filaments from their natural state of further separation, or into the individual cells of which each filament is composed. Amongst the earlier attempts made during the last fifteen years appear prominent those of the Chevalier Claussen, who unfortunately erred through claiming qualities for his products which could not reasonably exist. That split filaments of flax should dye much better than whole filaments equally cleansed from loose vegetable matter is what cannot be conceded; nor that they should acquire a greater felting property than the corresponding increase of number of filaments would give. Neither can it be allowed that any fibrous material uneven in breadth of filament should be suitable for mixing with wool or silk, if beauty of yarns be necessary. Nevertheless, though the material was rendered imperfect through erroneous treatment (the cause of the evil effects of which have since been demonstrated during researches on the rooting effect of silicates on cotton cloth), the state of fibre was manifestly a step in the right direction, and pointed to a new character of cloth, producible from less expensive fibres than flax, equidistant from cotton and linen, possessing more warmth and softness than the latter, and for heavy fabrics more strength and firmness than the former. During the course of these remarks it will appear evident that many fibres exist well adapted for such a class of manufacture of desirable excellence, and at moderate prices.

The efforts to substitute the former supply of cotton claim prominence here. Amongst others we have those of Mr. Thompson, of Dundee, who exhibited in Austinfriars, E.C., some beautiful samples of jute claimed to be suitable for this purpose and for mixing with wool. But it could not be supposed that a hard, brittle, and coarse-celled fibre such as jute should possess any of the properties required for cloths now produced from cotton (and the experiment certainly did not appear to have developed any qualities not previously known), whilst for mixing with combing wools, the average length of the individual cells (in which state alone it could be satisfactory for this use) appears shorter than the necessities of the trade demand, though doubtless some jute exists of elongated growth of cell which might be thus applied for some fabrics.

The praiseworthy attempts of Mr. Harben to extract a fine fibre from *Zostera marina* claim notice. Here a beautiful fibre really exists, constituting the bone of the leaf. It appears to possess brilliancy, softness, and many of the desired properties; and though, when completely separated, it is short and tender, yet it would be a desirable adjunct to our fibrous materials if it could be separated in sufficient quantity and at moderate prices. The latter seems doubtful from the small yield of fibre in proportion to bulk of weed containing it, joined to the difficulties of preparing it, irrespective of probable difficulties of cultivation to a large extent except over very extended distances. We may here pause to inquire whether sufficient attention has been given to the bye-products, say as a source of gum substitutes or of glucose. The mucilage itself appears closely allied to other mucilages which, as is well known, are easily convertible into other forms.

Considerable attempts have been made, and are still making (by a company recently formed for its development), in France, and to some small extent in England also, to produce a substitute for cotton from China grass. We have here a fibre naturally brilliant, with cells of from three to eighteen inches long, and bearing a striking similarity, when not too closely viewed, to some long-stapled hairs and wools. We shall best consider the attempted treatment of this magnificent fibre as a cotton substitute by the patent of Messrs. Mallard and Bonneau, of Lille, upon which most of the later patentees appear to have rung their changes without imparting any substantial novelty. These gentlemen have operated by cutting the grass into lengths of about two inches and treating it with oil and alkalies. With the chemical part of this treatment we have, at present, no concern, but with the fibre alone. The cell, as compared with cotton, is brilliant, straight, stiff, cylindrical, and more than twice the thickness (about equal to medium and fine mohair). When cut down, and rendered uneven by separating the fibre, considerable difficulty must exist in the spinning. Report gives it the character of producing a firm cloth; but its comparative coarseness and non-adaptability for long count yarns must hinder its bearing a high commercial value in such a state of preparation, whilst its magnificent length and strength, exceeding, with few exceptions, every other fibre, together with its peculiar beauties and qualities, adapt it for far more valuable employment than to enter into competition with coarse-stapled cottons, or, at least, to scarcely fill a place capable of being filled by fibres of half the cost. Towards its preparation for those more suitable and valuable uses, many attempts have been made with mediocre success. It appears generally to have baffled all efforts either to completely separate it into its cells, or to retain in these the length and strength which they naturally possess.

Much attention has been given of late, both in Canada and in the United States, towards producing a cotton substitute for flax. The government of the United States, with its usual fostering care, voted, in 1864, a subsidy of 10,000 dollars to defray the expense of a commission to ascertain whether it be practicable to prepare from flax such a substitute. The success appears to have been moderate, and some interesting samples have been shown of flax so prepared both from the United States and from Canada. Some grounds of hope of complete success appear to exist, as it is proposed or decided to extend the commission for another year with a further grant of money.

It is a consideration of much importance whether it has not been taken too much for granted that what may be termed "manufacturing properties," which specially belong to cotton, will be present in any or all fibres, when separateed into their individual cells, and whether any of these fibres, when so prepared, will actually supply the peculiar place of cotton. Most of their properties would seem rather to point to a totally new class of cloths; doubtless, also, to a modified mode of working the fibres. A want of adaptiveness for spinning appears to exist in a greater or less degree in all. The peculiarities of many which possess a similar length to cotton consist in being gradually tapered from the middle to the ends; stiff throughout, almost cylindrical, little twisted, showing under the microscope great brilliance and smoothness of surface. Some exhibit polarity enough to adhere in a long string when placed end to end. Some possess the remarkable softness of the fibrine of chamois leather, but are very short and tender. But other fibres exist which possess great evenness of thickness long as mohair. One at least has all the length and fineness of coarse middle draft silk. Yet with all these varied materials lying buried under chemical difficulties of a very slight character, compared with many which are continually overcome, except the isolated instance of China grass, we use to-day nothing which Nature has not almost "prepared" ready to our hands!

Much misapprehension appears to prevail concerning the strength and other properties when prepared for fabrics which exist in the natural filaments before preparation. A consideration of the widely differing states will at once convince us that is possible that the exact opposite may be the reality. Take *Phormium tenax*, the New Zealand flax, as an example. This fibre in its natural state is of immense strength, and is also worked by the Maories to a great degree of fineness in certain ways, that is, by cleansing and combing out the ends of the filaments as a fine lustrous fringe. The separated cells possess great brilliancy, but, instead of being long and strong as has been inferred, they do not exceed $\frac{1}{4}$ to $\frac{3}{8}$ inch in length, and are amongst the weakest of fibres. But when it is considered that the fibres are coated with a large amount of vegetable matter, amongst which tannin is decidedly marked, which, with the proteic bodies, invariably present in fibres, will form a sort of brittle leather, we cannot wonder that, when built up into long filaments, it should class amongst the toughest of fibres. No better familiar simile can be given of this difference of strength than a billiard ball now making, constituted chiefly of about the shortest of all fibrous substances (paper pulp), which, when mixed with glue, becomes so tough that no fall or ordinary amount of beating can destroy it. The susceptibility of *Phormium tenax* for dyes has also been much spoken of. But will not this be accounted for by the fact of its being used by the Maories in a half-cleansed state, when the tannin would naturally fix dyes forcibly. When fully cleansed, capable of being worked on European machinery, it appears to possess no such remarkable property.

The lists of comparative strength of other fibres published as having been tested against each other at various times, though doubtless excellent practical tests of their value for ropes or for sackcloth, form no criterion of their strength when prepared for manufacturing into fabrics, as is exemplified in the case of New Zealand flax. Their strength for this purpose being solely dependent upon the length and strength of their individual cells, and upon the surface form of these cells whether favourable or otherwise to binding together in spinning.

In resuming the subject we will endeavour to seek out the properties and adaptabilities of some known fibres, and conclude with an inquiry how far their attempted treatment accords with that required by their supposed chemical composition.—*Technologist.*

THE USES OF SULPHUROUS ACID GAS.

For many months Dr. Dewar, of Kirkcaldy, has been engaged in impressing upon the Government, the public, and the profession, the importance of employing the fumes of sulphur in the prevention and cure of disease, and quite recently he has extended their use in a different and scarcely less important direction—the preservation of animal food. Without accepting his views of the nature of disease—pointing, as he seems to indicate, to the origin of all disease from cryptogamic spores—as at all correct, we may nevertheless state that he has arrived at several interesting and remarkable practical results. Dr. Dewar's experiments were at first initiated in connection with cattle plague, and his method of fumigating byres is to take a chafer two-thirds full of red cinders, place a crucible in them, and in it a piece of sulphur stick the length of one's thumb, which is sufficient for a byre containing six cattle. If ordinary attention be paid to ventilation, the attendant may shut himself in along with the cattle during the process, not only without detriment, but, as we shall presently see, with occasionally unlooked-for benefit. This process may be repeated four times a day, and the result has been that, when this system has been thoroughly and determinedly practised, there has been no case of death among the cattle from any epidemic cause whatever. Nor has this been the sole result. Ringworm, angle-berries (*molluscum*), mange, and lice have disappeared; and a horse which had been a few times unintentionally fumigated, was unexpectedly cured of obstinate grease of the heels. Nay more, in a large dairy, which for thirty years had maintained a notorious character for mortality from pleuropneumonia, and the present tenant of which had for eight years past never been one whole month free from this disease amongst his cattle up to the 1st of November last, and had buried sixteen cows during the preceding twelve months, the last of them only three days before he began to fumigate, this disease has since then ceased to be observed, and the cows have remained perfectly healthy. These facts are extremely remarkable, and of themselves would compel a further investigation of the influence of sulphurous acid fumes; but what we have still to relate is still more extraordinary, and could scarcely be believed but upon the testimony of an upright and honourable medical man, such as we know Dr. Dewar to be. For not only were chilblains and chapped hands found to disappear from the hands of the attendants upon those cattle which were regularly fumigated, but in the case of a groom of Dr. Dewar, supposed to be dying from phthisis, and who was employed to fumigate certain cattle, the most extraordinary results were attained; for within one week the night sweats had ceased, his cough gradually abated, the expectoration diminished, and he gained nearly two stone within four months, and though now dependent for existence upon one lung or little more, he looks nearly as strong and is as able for ordinary stable work as he was previous to his illness.

This case has been observed by Professor Sir J. Y. Simpson, by Dr. Halliday Douglas, and by other medical men, who are conversant with the facts. Indeed, so remarkable and encouraging have the results obtained in this and in several other similar cases appeared to Dr. Halliday Douglas, that he had determined to construct a chamber for the purpose of employing sulphur fumigation in connection with the Chalmers Hospital, that he may have an opportunity of personally investigating the matter and testing the results. It is truly somewhat singular, and peculiarly illustrative of the circular—or shall we rather say spiral—manner in which medicine moves, or, if you will, progresses, though its progression is limited, and as yet not well defined, that Hahnemann was led by his theory of disease to propound sulphur as the most important remedy in tuberculosis, while Dr. Dewar, from the success of sulphur in its treatment, has been apparently led to deduce its origin from cryptogamic sporules—a closely similar theory. With theories, however, there is at present no need of troubling ourselves; the practical results are sufficiently striking to ensure for this treatment a more careful and extensive trial. In diphtheria and various other complaints sulphur fumigation has proved immediately and strikingly beneficial; and in at least one instance it has almost instantly cut short an outbreak of hospital gangrene in the wards of our Edinburgh Infirmary, and, properly employed, it may possibly prove capable of limiting the spread of cholera, fever, and other contagious diseases. For the disinfection of inanimate material the addition of a little nitre to the sulphur, and the combination of these fumes with the steam of boiling water, improvises a disinfectant at once the most powerful, most searching, and most efficacious which can be obtained, utterly destructive at once of any latent contagion, and of every form of insect life. But we have not yet exhausted all the strange properties of sulphur fumigations: it is not only productive of animal health while in life, but it also prevents putrefaction after death. In some recent experiments (in June weather) in regard to this, a sheep's head was kept quite fresh and sweet for thirteen days; a boiled crab—well known to be a peculiarly perishable edible—was quite sound after eight days; haddocks, after being smoked two or three times, were found to be quite fresh at the end of eight days. The process is equally applicable to every other form of animal food, which merely requires to be fumigated three or four times a day in a chamber closed as much as possible against the admission of fresh air. At a convivial entertainment recently given by Dr. Dewar, the company were entertained with viands thus preserved, and one and all expressed their perfect satisfaction with the success of the process, as evinced by the satisfactory condition of the food presented to them.

How novel and strictly original Dr. Dewar's views are as to the pleasantly tonic virtues of suphur fumigations may be learned from a statement in the most recent work on Materia Medica, Dr. Scoresby-Jackson's 'Note-Book,' where he states that in sulphur fumigations "great care must be taken to protect the respiratory organs from the fumes by closing the apparatus round the neck;" and yet how inconsistent these ordinary views are with popular experience may be learned from the popular idea of the great benefit to be derived from new flannel, that is, flannel thoroughly impregnated with sulphur fumes, and also with the fact that in woollen mills, in certain departments of them, the workmen live from year's end to year's end in an atmosphere thoroughly impregnated with sulphurous acid gas. Unquestionably a laborious and tedious accumulation of experience in regard to the positive influence of sulphur fumes upon the health may be anticipated by an inquiry into the ordinary condition of such workmen; and we shall feel obliged if any of our readers shall be kind enough to contribute any information on this head, similar to that which was contributed to the 'Monthly Journal,' by Dr. Thomson, of Perth, in regard to the influence of an atmosphere charged with oil. It would indeed prove singular if, after all, the benefit supposed to be derived from oil was solely due to sulphur.—*London Medical Press and Circular.*

PRECAUTIONS AGAINST CHOLERA.

(*Extracted from the Memorandum prepared by Mr. Simon, the Medical Officer of the Privy Council.*)

"4. In relation to Asiatic cholera, as now threatening us, there are two principal dangers against which extreme and exceptional vigilance ought to be used. First, there is the danger of drinking water which is in any (even the slightest) degree tainted by house refuse or other like kinds of filth; as where there is outflow, leakage, or filtration, from sewers, house drains, privies, cesspools, foul ditches, or the like, into streams, springs, or wells, from which the supply of water is drawn, or into the sub-soil in which the wells are situate; a danger which may exist on a small scale, as at the pump or dip-well of a private house, or on a large scale, as in the sources of supply of public waterworks. And, secondly, there is the danger of breathing air which is made foul with effluvia from the same sorts of impurity. Information as to the high degree in which those two dangers affect the public health in ordinary times, and as to the extreme degree of importance which attaches to them at times when any diarrhœal disease is epidemic, has now for so many years been set before the public by this department and otherwise that the larger works of drainage and water-supply by which the dangers are permanently obviated for large populations, and also the minor structural improvements by which separate households are secured against the dangers, ought long ago to have come into universal use. It is to be feared that on a very large scale this wiser course has not been adopted, and that even yet, in very many instances, temporary security has to be found in measures of a palliative kind. So far as such is the case, attention is most earnestly called to those parts of the general memorandum which relate to the matters in hand. All chief sources of the one danger may be held in check, as follows—by immediate thorough removal of every sort of house-refuse and other filth which is now accumulated; by preventing future accumulations of the same sort, by attention to all defects of house-drains and sinks by which offensive smells are let into houses, by thorough washing and lime-whiting of uncleanly premises, especially of such as are densely occupied, and by disinfection, very freely and very frequently employed, in and round about houses, wherever there are receptacles or conduits of filth, wherever there is filth-sodden porous earth, wherever anything else in or under or about the house tends to make the atmosphere foul. As provision against the other danger, it is essential that immediate and searching examination of sources of water-supply should be made in all cases where the source is in any degree open to the suspicion of impurity; examination both of private and of public supplies; and where pollution is discovered everything practicable should be done to prevent the pollution from continuing, or, if this object cannot be attained, to prevent the water from being drunk.* The examination of sources of water-supply should of course extend to all receptacles of water storage, such as the tanks and reservoirs of public supply, and the butts and cisterns of private houses.

"5. That such precautions as the above (never unimportant where human health is to be preserved) are supremely important when the spread of cholera is to be prevented, is a truth which will best be understood when the manner in which cholera spreads is considered. Happily for mankind, cholera is so little contagious, in the sense in which small-pox and typhus are commonly called contagious, that if proper precautions are taken where it is present there is scarcely any risk that the disease will spread to persons who nurse and otherwise closely attend upon the sick. But cholera has a certain peculiar contagiousness of its own, now to be explained, which, where sanitary circumstances are bad, can operate with terrible force, and at considerable distances from the sick. It appears to be characteristic of cholera—not only of the disease in its developed and alarming form, but equally of the slightest diarrhœa which the epidemic influence can produce, that all matters which the patient discharges from the stomach and bowels are infective; that the patient's power of infecting other persons is represented almost or quite exclusively by those discharges; that they, however, are comparatively non-infective at the moment when they are discharged, but afterwards, while undergoing decomposition, acquire their *maximum* of infective power; that, if they be cast away without previous disinfection, they impart their own infective quality to the excremental matters with which they mingle, in filth-sodden earth or in depositories and conduits of filth, and to the effluvia which those excremental matters evolve; that, if the infective material, by leakage or soakage from drains or cesspools, or otherwise, gets access, even in the smallest quantity, directly or through porous soil, to wells or other sources of drinking water, it can infect, in the most dangerous manner, very large volumes of the water; that the infective influence of choleraic discharges attaches to whatever bedding, clothing, towels, and like things have been imbued with them, and renders these things, if not dis-

* If, unfortunately, the only water which for a time can be got should be open to suspicion of dangerous organic impurity, it ought at least to be boiled before it is used for drinking, but then not to be drunk later than twenty-four hours after it has been boiled. Or, under medical or other skilled direction, water in quantities sufficient for one day's drinking in the house may be disinfected by a very careful use of Condy's red disinfectant fluid. This should be added to the water (with stirring or shaking) in such number of drops that the water an hour afterwards shall have the faintest pink colour which the eye can distinctly perceive. Filtering of the ordinary kind cannot by itself be trusted to purify water, but is a good addition to either of the above processes. It cannot be too distinctly understood that dangerous qualities of water are not obviated by the addition of wine or spirits.

infected, capable (as the cholera patient himself would be capable, under the same conditions) of spreading the disease in places whither they are sent for washing or other purposes; that, in the above described ways, even a single case of disease, perhaps of the slightest degree, and perhaps quite unsuspected in its neighbourhood, may, if local circumstances co-operate, exert a terribly infective power on considerable masses of population. 'If local circumstances co-operate,' however, is the stated condition for that possibility; and it will be observed that the essence of the sanitary precautions, which have been recommended to nuisance authorities and others, is to annihilate those 'local circumstances.' The choleraic infection does not seem able largely to injure any population unless a filthy state of things be presupposed. It is presupposed that the atmosphere or the drinking-water of the population is impure with the most loathsome of impurities; that the infective material has had opportunities of action which decent cleanliness would not have afforded it; that, in inefficient drains or cesspools, or other like depositories, it has had time to develope its own infective power, and to render other stagnating filth equally infective with itself; and that from such foci of infection the disgusting leaven of the disease has spread, in air or water, to be breathed or swallowed by the population. In this view of the case it will be understood that works of sewage, house drainage, and water supply, properly executed and properly used, give to town populations an almost absolute security that cholera, if introduced among them, can have no means of spreading its infection. And equally it will be understood that, in the absence of those permanent safeguards, no approach to such security can be got without incessant cleansings and disinfections, or without extreme vigilance against every possible contamination of drinking water.

"7. Personal precautions against cholera consist essentially in avoiding the unwholesome circumstances which have been described; and where that avoidance can be secured there need not be further thought on the subject. Even where cholera seems imminent the danger is quite conspicuously one which ought not to give occasion to panic. Intelligence and cool decision are wanted against it. The case is no longer that of a mysterious pestilence coming (like the plagues of past centuries) on ignorant and but half-socialized populations; it is the case of a distinct and measurable attack, against which definite precautions can be taken with success; and power to enforce those precautions is in the hands of local authorities throughout the country. But individual security cannot be promised apart from the security of districts; and for selfish safety, no less than for the general good, it is expedient that every man should do his utmost to promote where he dwells a vigorous sanitary administration over the largest possible area. Those who know that such an administration is at work around them need have but little apprehension as to the result.

"8. As to personal precautions, in a narrower sense of the words, only one general rule can be laid down—a rule, however, which is most important for persons who unfortunately find themselves in the midst of local outbreaks of cholera, and which each individual must apply according to his experience of his own bodily habits—the rule of living as strictly as possible on that system which commonly agrees best with the health; to guard, as far as practicable, against all exhausting influences of privation, fatigue, exposure, and the like; and, as regards diet, especially to avoid all acts of intemperance and all such eating and drinking as are likely to disturb the stomach or bowels.* But

* Precautions against causing such disturbance to oneself by errors of diet will vary somewhat with different individuals. Every person of ordinary discretion knows the habits of his own body, and can be tolerably confident, within certain limits of food, that he gives himself no occasion of such illness. Apart from personal peculiarities (where each man must judge for himself), the chief dangers of diet appear to be as follows:—Firstly, in those mere excesses of diet which (especially under circumstances of fatigue) occasion sickness to the stomach, or an increased labour of digestion; secondly, in taking food, solid or fluid, which is midway in some process of chemical transition—half-fermented beer and wine, water containing organic impurities, meat and game and venison no longer fresh and not completely cooked, fish and shell-fish in any state but the most perfect freshness, fruit or vegetables long gathered or badly kept, and the like; thirdly, in the excessive or unseasonable use of refrigerating drinks or ice; fourthly, in partaking largely of those articles of diet which habitually, or by reason of imperfect cooking, pass unchanged through the intestinal canal; and, fifthly, in the indiscreet use of purgative medicines, or in taking any article of diet which is likely to produce the same effect.

while faults of the latter kind are peculiarly apt to be hurtful, it must not therefore be supposed that the customary healthful habits need be changed. For instance, there is no reason to suppose that fruits and vegetables, of such kinds and in such states as would be wholesome in ordinary seasons, are unwholesome when cholera is present; nor (subject to what will directly be said about premonitory diarrhœa) is there any reason to believe that persons in good health ought in cholera times, with a notion of fortifying themselves against the disease, to take drugs or drams which they would not take in ordinary times. Anything to be wisely done in this direction ought to be done under the advice of skilled medical practitioners, and except with such advice people ought to be most chary both of drugging themselves and of taking such pretended preservatives as are extensively offered for sale.

"9. In places where cholera is present or threatening, one particular bodily ailment requires exceptional vigilance. That ailment is diarrhœa. For the most part in this country cholera begins somewhat gradually; so that for some hours, or even days, before the symptoms become alarming, a so-called 'premonitory diarrhœa' may be observed. Where cholera is tending to be epidemic, there always exists, side by side with it, in the district a large amount of epidemic diarrhœa, representing in part the earlier stages, in other part the slighter degrees, of the same insidious and infectious malady. This diarrhœa (painless and apparently trivial though it be) may in any case suddenly convert itself into cholera; and, apart from the very serious significance of the symptom as regards the patient himself, it must be remembered that every such diarrhœal patient may be a well-spring of infection to others. It also seems probable that accidental diarrhœa, originally independent of the epidemic influence, is, of all known personal conditions, the one on which the cholera-infection can most easily fix itself. And thus on all accounts it is of the most essential importance that no looseness of bowels should be neglected in places where cholera exists. A very important part of their Lordships' Medical Relief Regulations enjoins the making of local arrangements by which this object shall be secured for all the poorer inhabitants of infected districts; and other classes of the population are warned to be also vigilant for themselves. In any infected district every looseness of bowels or sickness of stomach ought, as quickly as possible, to be brought under skilled medical treatment; and if the symptoms begin at all sharply, or if they (however mild) do not very promptly yield to treatment, the patient ought invariably to remain in bed.

"10. Too much importance cannot be attached to the duty of thoroughly disinfecting, without delay, with chloride of lime or otherwise, all discharges from the stomach and bowels of persons under the epidemic influence, as well as all bedding, clothing, towels, and the like, which such discharges may have imbued; and all privies and other like places to which such discharges may have access should be kept flooded with solution of sulphate of iron, or solution of carbolic acid."

IMPORTANT EXCISE PROSECUTION AT WOLVERHAMPTON.

SELLING METHYLATED SPIRITS WITHOUT A LICENCE.

At the Wolverhampton Police Court, on Wednesday, a case of considerable importance to chemists and druggists, and not less so to the public at large, came on for hearing before the stipendiary magistrate, I. Spooner, Esq. It was an information laid at the instance of the Commissioners for Inland Revenue against Mr. Thomas Reade, chemist and druggist, of Cock Street, who was charged, first, with selling methylated spirits without a licence, and secondly, with selling certain methylated spirits coloured and flavoured to be used as a beverage. Mr. Marshall, of London, appeared on behalf of the Inland Revenue, and Mr. Motteram (of the Oxford Circuit), instructed by Mr. W. C. Umbers, defended.

Mr. Marshall, in opening the case, said the information was laid under the 24th & 25th of Victoria, chap. 91, sec. 5 and 6; and the penalty was for the first offence £50, and the second £100. The Board had ordered the information to be laid, as many other similar cases had occurred.

Mr. Motteram: Pray don't talk about other cases, as this is the only one we have. The others may be as absurd as this.

Mr. Marshall: Very well; but the Board having had information given them—

Mr. Motteram: I don't care what the Board were informed; I object to your speaking about any other case than the one we have to deal with.

Mr. Spooner: I think, Mr. Motteram, Mr. Marshall has a right to state the reasons which led the Board to take these proceedings.

Mr. Motteram: Very well, Sir; only don't let us waste time by talking about other cases.

Mr. Marshall: I merely wish to say what gave rise to these proceedings. The Board having information given them that chemists in the North of England were selling methylated spirits without a licence, gave certain instructions to Mr. M'Rae, Supervisor of Excise in Wolverhampton, who went to the defendant's shop on the 23rd of April, and asked for an article called "Indian Essence." He was served with the article, took it away, packed it up, and sent it to the laboratory at Somerset House for analysis. It was there analysed and was found to contain methylated spirits.

Mr. Motteram: I admit all that.

Charles M'Rae, Supervisor of Excise in Wolverhampton, was called, and stated that on the day named he went to the defendant's shop in Cock Street, and asked Mr. Reade how he sold his "Indian Essence." Mr. Reade replied "3*d.* per ounce;" and he (witness) inquired whether, as he wanted a large quantity, he would not make a reduction. Defendant asked how much he wanted, and witness said about three pints. Mr. Reade said he would let him have some at the rate of 27*s* per gallon, but as he did not sell it by measure, but by weight, he would give him an equivalent weight to three pints. He was then served with a quantity of the mixture, equal to about three pints, or $1\frac{1}{4}$ pound to each pint, and at witness's request the mixture was put into three pint bottles, for which he paid 10*s.* 6*d.* The bottles were each labelled as follows:—"Reade's Original Indian Essence, a pleasant and effectual medicine, warming and comforting—Antispasmodic, Astringent, Diaphoretic, and Diuretic. Perfectly free from any injurious drugs, and may, therefore, be taken with the greatest confidence. Dose: Adults, one tablespoonful, to be repeated when required; children, one or two teaspoonfuls. Prepared by Thomas Reade, chemist, 9, Cock Street, Wolverhampton. Only threepence per ounce." Witness took the bottles to his office, in Church Street, and he afterwards forwarded two of the bottles, securely packed, to Somerset House. A portion of the third bottle he gave to the defendant's solicitor, and the remainder he now produced.

Cross-examined by Mr. Motteram: I was not suffering severely from spasms myself when I went to defendant's shop. I believe I did say to defendant that I was unwell, and that I wanted to try his "Indian Essence," for the purpose of relieving me. I don't think I said I had been recommended to try it. I won't swear I did not say so. I can't remember saying so.—Mr. Motteram: But I'll make you remember a good many things presently. Seek to convict a man fairly, and then I don't care.—Witness: I did not go to the shop for any purpose.—Mr. Motteram: Why you went to convict him; what did you want with three pints?—Witness: The Commissioners of Inland Revenue had instructed me to get three pints.—Mr. Motteram: And did you not resort to this expedient to get three pints? Did you not say that you wanted some to send away to persons who recommended you to try it?—Witness: I can't remember that I did.—Mr. Motteram: Don't fence with the questions in that way. Did not the defendant tell you that he did not sell it by measure, but by weight?—Witness: He did.—Mr. Motteram: And he also told you that if you took a large quantity he would let you have it for 3*s.* per pound?—Witness: He did.—Mr. Motteram: You are a Scotchman, are you not, Mr. M'Rae?—Witness: Yes.—Mr. Motteram: And, as a Scotchman, did you not the next moment try to cheapen with Mr. Reade, and say it was very dear?—Witness: I believe I did; but I can't remember these little things.—Mr. Motteram: They are not little things, Sir; they are most important things, and very disgraceful things. In consequence of what you said, did not Mr. Reade say at last, that if you took a large quantity you should have it at the wholesale price, 2*s.* 8*d.* per pound?—Witness: I believe he did.—Mr. Motteram: Did you then try to cajole him on to sell it you by measure?—Witness: I was ordered to buy it by measure.—Mr. Motteram: And did you not try with all the cunning of a Scotchman to get it by measure?—Witness: I did not try any cunning. It did not matter to me whether I got it by weight or measure, so that I got the quantity I wanted. Defendant would only sell it by weight. I tasted the mixture after I bought it. I did not dislike it, nor I did not care much about it. I should say it is not a beverage.

Mr. William Harkness, analytical chemist to the Board of Inland Revenue, proved the receipt of the two bottles of the essence produced from the previous witness. He made an analysis of the contents of one of the bottles, and found it to consist of methylated spirit, strength 70·1 under proof, highly sweetened with either treacle or very coarse brown sugar. It also contained a small portion of chloroform. He produced the methylated spirit which he extracted from it. It was not a mixture recognized as a medicine in the 'British Pharmacopœia,' date of which was 1864.

Cross-examined by Mr. Motteram: Had been in the employ of the Commissioners of Inland Revenue, as analytical chemist, for six years. Could tell from his analysis most of the ingredients contained in the essence. Could not tell whether Scotch treacle was present, for he did not know what Scotch treacle was, although he was a Scotchman. He considered the question a quibble. He found golden syrup present, and water and chloroform. He supposed chloroform was a medicine. Did not find essence of ginger, but would not swear that there was none present. Did not try for it. If there was any it was in very small quantities. Did not try for essence of capsicum, or for gentian, nor did he find any. The essence had a slightly pungent taste, and he would not swear that capsicum did not contribute to that pungency. Chloroform, infusion of gentian, essence of ginger, essence of capsicum, were all recognized in the 'British Pharmacopœia,' provided they were made from pure alcohol. He did not find in the mixture any sweet spirits of nitre. Had there been 100th part of one per cent. he should have discovered it. Methylated spirit was used to a certain extent, he knew, in the making of tinctures, but, in his opinion, no respectable chemist would use it. Mr. Motteram here handed a list of medicines sent out by the South Staffordshire Hospital in 1864 to be contracted for, specifying thirty-six tinctures made up with methylated spirit, and asked the witness what he thought of that. Witness replied, all he could say about it was that it was disgraceful.—Mr. Motteram: And all I can say is that the governors of the South Staffordshire Hospital are very much obliged to the chemist of six years' standing, for the compliment he has paid them. Don't you know that there is a standing order for their use both in the army and navy?—Witness: I do not.— Mr. Spooner: Do you know whether they are used in the London Hospitals?—Witness: I do not.—Mr. Motteram: Why, Sir, do you not know that these methylated spirits are very extensively used by the great body of surgeons and dispensers in the United Kingdom?—Witness: I did not know it; and my opinion is, that if it is so used, that they care more for getting cheap spirits than for the health of their patients.—Mr. Motteram (sharply): What do you know about it? you're not a physician. If methylated spirit is cheaper, what has that to do with it, if the poor want it, and it is as good?—Witness: Yes, if they get medicine as good.

Mr. Spooner: I can't help thinking that medicines made from the pure spirit are the best to use; and I must express my astonishment that an institution like the South Staffordshire Hospital should use any other.

Mr. Motteram: I am told, Sir, that methylated spirits are not only cheaper but equally efficacious.

Mr. Richard Bannister, another of the analytical chemists at Somerset House, spoke to the analysis of the essence, which he found to consist of methylated spirit, syrup of sugar, and a small quantity of chloroform.

In cross-examination, witness said that he found no traces of spirit of nitre.

This was the case for the prosecution.

Mr. Motteram then addressed the Court for the defence. He said his client was a very respectable chemist, carrying on business in Wolverhampton, and he had had the good fortune, for the benefit of suffering humanity, to invent a medicine called "Reade's Indian Essence," which he sold at only 3*d.* per ounce, and which the witness M'Rae knew was a good thing for the disorder he told Mr. Reade he was suffering from when he went to entrap him. Before, however, he went into the particulars of the case, he must say that he could not compliment those who resorted to such means as the witness M'Rae resorted to, for the purpose of entrapping a man whom they wished to convict. Now the essence in question was one which Mr. Reade had produced at considerable expense to himself, and which had attained a very extensive sale, and for which he charged, as his circular said, only 3*d.* per ounce. And yet, although people could get gin and brandy at a much lower price than they could the essence, the Inland Revenue in their wisdom thought that the people of Wolverhampton were such savages as to purchase the essence at 27*s.* a gallon as an alcoholic beverage. He contended that it was meant for and sold as a medicine, and as nothing else, and he further contended that his client was perfectly right in the use of all the ingredients which this essence contained. Now the Act under which these proceedings had been taken, made it penal for any person to sell methylated spirits without a licence; and by another section it was enacted that if any person should colour or prepare any methylated spirit with intent to fit such spirit for use as a beverage, he should be deemed guilty of an offence, and forfeit, on conviction, the sum of £100. Then, in order that there might be no mistake as to what the intentions of the Inland Revenue were on the subject, he would read a letter which had been received by Alfred Bird, of Birmingham, from the Inland Revenue Office in answer to a communication which he had written to them. Mr. Bird's letter was to the effect (dated 1863) that having seen a list of pharmaceutical tinctures and medicines, all made of unduty-paid methylated spirits, he wished to know if this was allowed, or whether it was necessary to take out a methylated spirit licence, when such spirit was not sold alone but used in pharmaceutical tinctures, etc. In reply, the letter from the Inland Revenue Office stated that the Board did not object to the manufacture and sale of any strictly pharmaceutical preparation, made with methylated spirits, so long as such preparations were used for medical purposes only, and not so made and sold as a cover for use as a beverage.

Mr. Spooner: Has the attention of the authorities at Somerset House been called to this letter, Mr. Marshall, before taking these proceedings?

Mr. Marshall said that the permission given by that letter was only meant to extend to the preparation of medicines recognized by the Pharmacopœia, whereas, under the name of Indian brandee and Indian whiskee, it was prepared and sold for dram-drinking purposes all over the country. The Indian essence sold by the defendant was not considered as a medicine; the Commissioners regarded it in the same light as those sold for dram-drinking purposes.

Mr. Motteram denied this: He denied that there was any identity between Indian brandee and his client's Indian essence, and said he would prove in evidence that not a drop of methylated spirit, pure, was used in its preparation; but methylated nitrous ether was used, and it was the methylated spirit contained in this that the chemists of Somerset House found by their analysis. They had stated that they could not find sweet nitre, but he would call Dr. Hill, a gentleman who for fifteen or sixteen years had been a professor and teacher of chemistry, and who had earned for himself a reputation sufficient to be elected medical officer and analyst for the borough of Birmingham, and he would prove that the mixture contained sweet spirits of nitre, which, as they had been told, contained methylated spirits, and that was what he (Mr. Motteram) meant at the outset of the case, when he said that he would admit that methylated spirits were to be found in the essence. Then as to the question whether this methylated spirit was generally used in the making up of medicines: the documents which he had handed in to the Bench contained the list of thirty-six tinctures, etc., required to be tendered for to the South Staffordshire Hospital, showed that methylated spirit was frequently used. If, then, an institution like the South Staffordshire Hospital could use this spirit, why not the poor be able to go to Mr. Reade, and buy it in such medicines and tinctures as they might need for their relief? But in point of fact Mr. Reade did not use the pure methylated spirit in making up this essence, and he would call the defendant's assistant, who would swear positively that no pure methylated spirit was ever used in the essence; and, if he did this, he should consider that he had proved sufficient to show that the case must be dismissed.

Dr. Hill, Professor of Chemistry and Public Analyst for the Borough of Birmingham, was then sworn: He said that he was applied to by Mr. Reade to analyse the "Indian Essence." He received four samples of the essence. One was a bottle which had been purchased at the shop of a Mr. Cottis; the other three were a bottle which were compounded at Mr. Reade's, in his presence; a portion of a bottle which came through the excise; and a portion of methylated nitre which he saw put into the essence that was compounded in his presence. There was no pure methylated spirit put into the essence he saw compounded. He took four ounces and distilled it, for the purpose of extracting the spirit and nitrous ether, and found it to contain nitrous ether with methylated spirit and chloroform. The nitrous ether was the sweet spirits of nitre. The methylated spirit was an essential element of the nitrous ether. Upon analysing the nitrous ether he found methylated spirits contained in it. He found the presence of sweet spirits of nitre containing methylated spirit in all the three bottles of essence. They presented the same analytical results in like proportions. In the preparation of the essence, which was compounded in his presence, he saw the following among other ingredients used:—Scotch treacle, golden syrup, sweet spirits of nitre, essence of ginger, capsicum, infusion of gentian, and chloroform.

Mr. Spooner: Enough to frighten the stomachs of all the Queen's subjects in Wolverhampton.

Mr. Motteram: With all respect to the Bench's stomach, I would recommend you, in case of cholera, to try some; it will do you good.

Mr. Spooner: I should be in doubt about it.

Mr. Hill, continuing, said there was no pretence for saying that the mixture was anything but a medicine, for everything it contained was a medicine, except the treacle and water. Methylated spirit was used very extensively in the preparation of medicines, and the methylated nitrous ether even more so. The advertisement described the medicine fairly enough; certainly it was diaphoretic and diuretic.

By Mr. Marshall: I have never used methylated spirits myself, nor do I intend. The "Indian Essence" is a pharmaceutical medicine, but not according to the Pharmacopœia. I found indications of nitre in all the tests; am quite sure of its presence, having made comparative tests of each sample. Even if I had not seen the essence made, my evidence would not have differed.

By Mr. Spooner: The Council of Physicians are much opposed to the use of methylated spirits. They are not now used in the General Hospital, Birmingham.

Mr. Spooner, in reply to an observation from Mr. Motteram, said he asked these questions for the good of the public. He thought that in hospitals especially they ought to have the very best they could get, and he was very much surprised at what he had heard.

Mr. Dulley, chemist, of Worcester Street, was next called. He deposed that the "Indian Essence" was a medical preparation, and that there was no pretence at all for saying that it was a beverage.

Andrew Hanning, sworn, said that he had been in the employ of the defendant since December last, and during that period had had the mixing of the essence. That prepared for Dr. Hill, in the presence of that gentleman, was made in precisely the same way as in all other instances. There was no pure methylated spirit used. They used, in all cases, methylated nitrous ether only, and all the methylated spirit ever present was that which existed in the ether. It was as a medicine, and a medicine only. He had tried it himself, and found instant relief from it. During the time he had been in Mr. Reade's service they had had about forty gallons of nitrous ether, and only about one gallon of the pure methylated spirit. They had only used about half of the latter, and that was in the preparation of varnish.

The Stipendiary: That seems to me to be its proper use.

Mr. Motteram: But you are prejudiced. This essence is really a wonderful medicine.

Mr. Harkniss, recalled by the Bench, said he was quite sure that there was not a particle of nitre in the essence.

Mr. Hanning swore positively on his oath that not a particle of pure methylated spirit had been used in the composition of the essence. During the time he had been with the defendant they had made altogether from 80 to 100 gallons of the essence.

Mr. W. Y. Brevitt, Darlington Sstreet, and member of the Pharmaceutical Society, said he had examined a bottle of the "Indian Essence," and he considered that it was a pharmaceutical preparation. He supplied the South Staffordshire Hospital this year, and supplied the methylated preparations mentioned in the tender. Did not sell the essence.

By Mr. Spooner: I don't use methylated spirits in my own prescriptions; but I may add for your information that the late Mr. Nesbitt did not object to the use of methylated nitre. Naphtha is used as a medicine. I wish it to be understood that I don't agree with methylated preparations. There are not so many tinctures with methylated spirit used in the South Staffordshire Hospital now as formerly.

This being the case for the defence,—

Mr. Spooner said that he was prepared then to give his judgment upon the case. The judgment was subject to appeal, and he was very glad that it could be appealed against, both as regarded facts and law; but with respect to law, he did not think that such a course would be necessary. As regarded the facts, however, it was a very different thing. Three chemists had been called, and had differed in their evidence, as chemists always did, when employed on opposite sides. It was, he regretted to say, found to be the case that scientific men could always take a scientific view according to the wishes of the party whose cause they were engaged to support; and science was not yet so certain but that they might do so conscientiously. It had been urged by the learned gentleman for the prosecution that the Government chemists had necessarily more knowledge of such points as the one which had been considered than had Dr. Hill, because they were more constantly engaged in analyses of this kind than Dr. Hill, who was only called in on these particular investigations. He would grant, for the sake of the argument, that this was so, and possibly, if he had to decide upon the evidence of the chemists, he might have been inclined to come to the conclusion that those who had come from Somerset House were more likely to be right than Dr. Hill. But it would be seen that the case did not depend solely on the evidence of those witnesses; it went further, because the witness Hanning, who had been in defendant's employ six months, and who knew how the mixture was made—and whose evidence he was inclined to believe, for he appeared to give it in a perfectly truthful and straightforward manner—had sworn positively that no methylated spirits were used. Under those circumstances he should dismiss the case. He thought, however, that the inquiry had done some good, for it would draw the attention of the public to the extensive use of methylated spirits in the making of medicines, and he hoped that the South Staffordshire Hospital would be the first to take steps to prevent such use of it, at least for internal medicines. He should do his best, so far as he had any influence, to bring about that result.

The proceedings, which had occupied the attention of a crowded Court for four hours, then terminated.

POISONING BY ACONITE.

On Wednesday, July 4th, the Brighton borough coroner held an inquest on Mrs. Ellen Vivian Warder, aged about thirty-five years, wife of Dr. Alfred William Warder. The deceased lady was the sister of Mr. R. Branwell, a surgeon at Brighton, but neither she nor her husband resided there. They came on a visit to Brighton, about two months ago, and took lodgings in a house in Bedford Square. About six weeks ago Mrs. Warder was attacked with illness. Her husband himself attended on her till her brother, Mr. Branwell, called in the aid of Dr. Taafe, of Brighton. Richard Patrick Burke Taafe deposed to having been called in, four or five weeks ago, to attend the deceased. He described her symptoms and his remedies at very great length. She got better for a time. but about a week before her death she got gradually worse. When he first saw her Dr. Warder said that he had been prescribing 20-drop doses of Fleming's tincture of aconite, as the only remedy to allay the pain of the strangury, which remedy had also produced tingling in her limbs. Witness objected to the remedy and the dose, and substituted such remedies as henbane, castor, and valerian. These remedies seemed to do good at first, but after some days he was informed that she could not take them. Witness continued: On Sunday morning I saw Mr. Branwell in the course of the forenoon, and I then noticed the peculiarity of this case to him. I said I was very much puzzled, and could not understand it. He looked at me very hard, and said he had a painful impression in his own mind, and that he intended to mention it to me, but for motives of delicacy had not done so. On Saturday, before I saw Mr. Branwell, I suggested to Dr. Warder that I should have another medical man's opinion. He said, "I wish you would." Witness then minutely detailed the results of the *post-mortem* examination, and added, I am not in a position to state that there is any natural cause of death. Charlotte Lansden, living at 36, Bedford Square, Brighton, deposed that deceased and her husband came to lodge there on the 23rd of May last. Deceased did not appear to be ill when she came to her house. Dr. Warder rang a call-bell about half-past five on Sunday morning. Witness sent her servant immediately, but the bell was rung a second time before the servant reached the room. She followed her servant immediately. Deceased was in bed and undressed. She was not able to speak, and seemingly unconscious. Her countenance was very calm. Deceased died about six o'clock. My servant had told me on the Saturday night that Dr. Warder was going to sit up. I then went and offered to assist him, but deceased herself declined my doing so. I have never given deceased food. Dr. Warder used to ask for me to do so if he did not come back in time; but, as a matter of fact, I have never given her food. I have a nephew staying with me who is about six years old, and when I have not been in the way, he has often eaten all that has come down from the room of deceased—the beef tea, and so on. When he called us up Dr. Warder begged of my servant to go for Mr. Branwell. He said he had rung the bell immediately he saw the change. When she came to my house deceased said she was excitable, and that she did not wish any one about her, and therefore I did not see her frequently. Dr. Warder always remained with her when she was ill; she could not endure him to leave her for a moment. I never suggested a nurse, for she told me she preferred her husband to do everything for her. At this stage of the proceedings the inquiry was adjourned for ten days, the coroner informing the jury that in the meantime he would direct Dr. Taylor to make an analysis of the contents of the stomach and intestines.

The adjourned inquiry was resumed on Monday, July 16th, when Dr. Taylor handed in a report of the result of various analytical tests, in which he said he was unable to trace poison in any portion of the parts submitted to him. Their general appearance, however, was not unlike those which would be produced by aconite; although, in the absence of a description of the symptoms before death, he was unable to state that death was caused by that poison. The coroner then read over the evidence taken at the previous inquiry. Dr. Taylor then said that from his knowledge of the case, he had formed a conclusion as to the cause of death. The symptoms were not consistent with any disease he had ever seen or heard of; but they were consistent with what he thought would be produced by the administration of small quantities of aconite, or some other poison of a similar nature, than by anything else he knew of. The appearances of the body did not show any natural cause of death; but they were such as would have been produced by the action of tincture of aconite. The last case of poisoning by aconite he had an opportunity of observing occurred in November, 1863, and the symptoms during life and the appearance after death were precisely similar to those in this case, only they were more severe, the person in that case dying in two hours after taking a large dose. Aconite, when given in small quantities, acts particularly on the heart, lowering its action, rendering the person weaker and weaker until he dies of syncope. Doses as small as ten or twelve minims would cause this effect if the doses were given repeatedly.

Dr. Wilkes, lecturer in chemistry at Guy's Hospital, stated that he was unable to connect the illness of the deceased with any known disease. He was inclined to the same belief as Dr. Taylor was that the symptoms were mainly due to aconite. The jury returned the following verdict: "Deceased died from the effects of aconite given by her husband, and that he committed wilful murder."

On Tuesday, July 10, Dr. Warder was found dead in his bed. A bottle with prussic acid was found in the room, and he appeared to have taken about half an ounce of the acid. Evidence was given that showed that he had planned his death very methodically. Dr. Warder was for some years lecturer on medical jurisprudence at the School of Anatomy and Medicine adjoining St. George's Hospital, and medical officer to St. Luke's Workhouse, Chelsea.

An inquest on the body was held on the following day, when application for an adjournment was made, on the plea that members of the deceased's family had exhibited insanity. The plea was considered by the Jury, and the inquest was adjourned in order that an examination of the brain of the deceased might be made.

REVIEWS.

Tratado de Farmacia y Farmacognosia. Por Cárlos Murray, Profesor de Farmacia y Farmacognosia en la Facultad de Medicina, Presidente y Ex-Secretario generale de la Sociedad de Farmacia Argentina, Miembro de la Sociedad Química de Paris, etc. Buenos-Ayres, 1866, 8vo, pp. 679.

Among the agreeable evidences of progress presented by the South American Republics, we note an attention on the part of Government to pharmaceutical education.

At Buenos-Ayres, in the Argentine Republic, there exists, attached to the Faculty of Medicine, a professorship of pharmacy and pharmacology, the occupant of which is the author of the meritorious work above cited.

As a treatise on pharmacy written in Spanish and printed and published in South America must be a novelty to most of our readers, let us here say that Professor Murray's work is a well-printed volume of large octavo form, and of more than 600 pages. The first part comprises preliminary observations, tables of weights and measures, a description of the methods of ascertaining specific gravities, thermometric equivalents, remarks on the selection of drugs, pharmaceutical nomenclature, etc. The second is devoted to pharmaceutical operations and a description of the preparations that it is their object to produce. The third part, which extends over 230 pages, treats of pharmaceutical bodies derived from the inorganic kingdom. To exemplify the arrangement adopted, let us turn to the article on sulphur, which appears under the unfamiliar designation of *Azufre*. First comes a short history of the element, then a description of the forms in which it is employed in medicine, as *Azufre sublimado*, *Azufre lavado*, and *Azufre precipitado*. Then we have three formulæ for sulphur ointments and one for sulphur lozenges. Sulphuric, sulphurous and hydrosulphuric acids follow.

The fourth part, headed "Farmacia Orgánica" (organic pharmacy), comprises all that cannot be included in the previous portions of the work, and the classification of its contents is, to our mind, much less satisfactory than that of the preceding divisions. Sections are devoted to ligneous substances, pectinous bodies, starches, gums, sugars, essential oils, turpentines, etc., but as there are none for the various parts of vegetables, such as leaves, roots, seeds, etc., these have to be introduced under other headings, and occur not unfrequently in very strange positions. Thus, under the head "resins" we find not only mastich, copal, and elemi, but caoutchouc, ginger, jalap, podophyllum, kousso, and kamala.

Notwithstanding this defective and unnatural classification, which, however, we trust will be rectified in another edition, Professor Murray's work is a very commendable production, and calculated to render good service to the school of pharmacy with which he is connected.

A Selection of the Eatable Funguses of Great Britain. Edited by Robert Hogg, LL.D., F.L.S., and George W. Johnson, F.R.H.S., and illustrated by W. G. Smith. London: 'Journal of Horticulture and Cottage Gardener' Office, 171, Fleet Street.

To those of our readers who desire a concise and popular account of the eatable funguses of Great Britain, we can cordially recommend this volume, which has, moreover, the additional merit of being well illustrated by twenty-four coloured plates. The twenty-four eatable funguses selected for description and illustration are the red-fleshed mushroom (*Amanita rubescens*, Pers.); edible morel (*Morchella esculenta*, Linn.); maned agaric (*Coprinus comatus*, Fries); mild mushroom (*Russula lepida*, Fries); orange-milk mushroom (*Lactarius deliciosus*, Fries); violet mushroom (*Inoloma violacea*, Fries); liver fungus (*Fistulina hepatica*, Fries); parasol mushroom (*Lepiota procera*, Scopoli); variable mushroom (*Russula heterophylla*, Fries); white-topped mushroom (*Agaricus dealbatus*, P.); edible pore mushroom (*Boletus edulis*, Bull.); giant puff-ball (*Lycoperdon giganteum*, Batsch.); summer pore mushroom (*Boletus æstivalis*); spindle-stemmed mushroom (*Agaricus fusipes*); yellow-gilled mushroom (*Russula alutacea*); chantarelle (*Cantharellus cibarius*); meadow mushroom (*Agaricus campestris*); spine-bearing mushroom (*Hydnum repandum*); horse mushroom (*Agaricus arvensis*); plum mushroom (*Agaricus Prunulus*); oyster agaric (*Agaricus ostreatus*); rugged-stemmed tube mushroom (*Boletus scaber*); great woodland mushroom (*Agaricus giganteus*); and curled sparassis (*Sparassis crispa*). To many of our readers the bare enumeration of twenty-four eatable funguses as inhabiting Great Britain will appear very surprising; but even these, according to good authorities, are by no means all the eatable funguses of this country, and the authors of the present volume remark, "There are many other fungi besides these that are figured in this work that are considered edible by some, while they are regarded by others as suspicious. The species, therefore, that are included in this work have been selected with every consideration of caution, and none have been admitted except what are known to be not only deleterious but eatable and nutritious." In thus limiting their selection, we think the authors have acted very judiciously; but there is one notable omission in the present volume which must have arisen from some strange accident, for we find no mention of the common truffle (*Tuber cibarium*). In the description of these fungi many valuable hints and directions are given as to the best time of collecting, and the mode of cooking the different species.

The work is well printed, published at a moderate price, and contains a short and easy introduction to the study of fungi. Our readers would do well to obtain a copy, and test its value for themselves.

BOOKS RECEIVED.

NOTE-BOOK OF MATERIA MEDICA, PHARMACY, AND THERAPEUTICS. By R. E. SCORESBY-JACKSON, M.D., F.R.S.E. (Will be noticed next month.)

CHEMICAL ADDENDA; being a Brief Exposition of the Salient Features of Modern Chemistry. Designed as an Appendix to Elementary Text-Books on the Science. By the Rev. B. W. GIBSONE, M.A., etc. London: J. H. Dutton, Wine Office Court, Fleet Street. 1866.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES; being an Analytical and Critical Digest of the principal British and Continental Medical Works published in the preceding six months. Vol. xliii., January—June, 1866. London, John Churchill and Sons; Edinburgh, Maclachlan and Co.; Dublin, Fannin and Co.

ACCIDENTS TO VOLUNTEERS: a Lecture delivered to the City of Oxford Companies of the Oxfordshire Rifle Volunteers. By E. L. HUSSEY, Surgeon to the Administrative Battalion. London: Macmillan and Co. 1866.

VIVISECTION; IS IT NECESSARY OR JUSTIFIABLE? being two Prize Essays published by the Royal Society for the Prevention of Cruelty to Animals. London: Robert Hardwicke, 192, Piccadilly. 1866.

NATURE AND THE BIBLE IN AGREEMENT WITH THE PROTESTANT FAITH. By James Davis, C.E. London: Houlston and Wright, 65, Paternoster Row. 1866.

TO CORRESPONDENTS.

An Incipient Botanist.—(1) Erythræa Centaurium. (2) Glechoma hederacea. (3) Melampyrum species. (4) Echium vulgare. (5) Polygala vulgaris. (6) Epilobium parviflorum. (7) Cardamine pratensis. (8) Hypericum perforatum. (9) Hypericum pulchrum. (10) Geranium pusillum. The specimens forwarded were so small and in such a bad state when received, that it was almost impossible to name them with certainty.

A Young Botanist (Liverpool).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

W. F. (Harrold).—Benzole will probably answer the purpose.

T. P. L. (Peterborough).—Dealers in pepper are still required to take out a licence; see page 51.

"*Bistort*" (Bayswater).—The labels in question are not safe: it would therefore be better to alter the wording. No. 1 should be "Cholera" or "Diarrhœa" mixture, merely giving the dose. In No. 2 the last line in the paragraph describing the dose should be omitted. With the above alterations the labels would not be liable to stamp duty.

W. (*M.*).—The *Linimentum Cantharidis* of the British Pharmacopœia is similar to "Bullen and Burt's Blistering Fluid."

A paper by Mr. S. Darby on "Considerations as to the Dietetic Properties of Wheat in its different states," arrived too late for publication this month.

Full price will be given for the Journal of January 1866, by the Secretary.

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.

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WHAT IS IN THE WATER?

There has probably never been a time when so much attention was directed to the quality of the water used for domestic purposes as there is at present. Effects have been ascribed to impurities in the water we drink, which, if credited, could not fail to create some alarm, and to raise many doubts with reference to the wholesomeness of this essential constituent of our food. When a fatal epidemic occurs, men begin to inquire into the probable causes of the visitation; and the air, the water, the food, the habits of life, of those who suffer are severally brought under review, in the hope of finding the source of the evil, by the removal of which relief might be obtained, or a recurrence of the malady prevented. At one time epidemics were chiefly ascribed to atmospheric influences, and the chemist was appealed to for the determination of the abnormal conditions of the air, from which diseases might be supposed to arise. The chemical composition of the air was known; the importance of its oxygen was universally admitted; the ill effects of carbonic acid and other gases, when present in excess, was obvious; these were all estimated and noted; analysis was carried to its utmost practicable extent; yet it cannot be said that any complete or satisfactory insight into the atmospheric causes of disease have thus been obtained. No one doubts that what we call "pure air" is essential to the maintenance of a healthy condition in those who constantly breathe it. But what is pure air? If it be a mere mixture of nitrogen and oxygen with a little carbonic acid and the vapour of water, where is it to be found? The atmosphere in which we live is something more than atmospheric air as determined by chemical analysis, and as usually represented in works on chemistry. Some portions of all the volatile matters that are exposed on the surface of the earth are converted into vapour and mixed with the atmosphere, and in addition to this there are innumerable beings, both animal and vegetable, whose living organisms are diffused through the air we breathe. The purest atmospheric air contains all these, and the most impure, or at least the most unhealthy, hardly differs in anything that the chemist can estimate or identify. There are situations where typhus fever or ague prevails, and a blue mist has recently been described which is said to be in some way connected with cholera, but nothing certain or definite is known of the particular conditions of the atmosphere that induces or favours any one of these diseases. So completely has chemical analysis failed to detect in air the sources of disease, that nobody now ever thinks of sending a sample of air for analysis, although at one time this was not unfrequently done. But although chemical analysis in this case fails, chemists and physiologists are nevertheless enabled, by the application of scientific knowledge, to indicate much that contributes in the air to the development and propagation of disease; and much has been done through the recommendations of scientific men towards removing or mitigating the evils of a vitiated atmosphere.

At the present time, however, the attention of the public is directed, not so much to the air they breathe as to the water which enters so largely into their food. This being a denser form of matter than air, and the substances with which it is mostly contaminated being so also, chemical analysis is more effectively applied here, and analytical results indicate much more sensible differences in different samples of water presented to us in nature than are ever found in the atmospheres of different localities. The examination by chemical analysis of the waters used for domestic purposes is becoming more and more generally resorted to. Irrespective of any supposed influence which the water used with food may have in inducing specific disease, there are well-marked differences, as determined by analysis, which indicate the extent to which it is applicable for various domestic purposes.

The purest description of natural water is rain-water, but even this is not absolutely pure. The air is washed by the shower that falls, and the surface upon which the rain is received and the means by which it is collected add something to that which was previously contained in it. Usually, however, rain-water, if carefully collected and stored, is very nearly pure, and is never likely to contain anything injurious to health. It is perhaps less palatable than good spring water, on account of the absence of carbonic acid and carbonate of lime, which render spring water brisk and agreeable, but even this deficiency might be remedied by a system of aeration. The collection of rain-water for domestic use has been too much neglected. In towns where the atmosphere is much contaminated with smoke and other impurities the rain-water collected from the housetops could hardly be used without submitting it to careful filtration, but by this means it would certainly be made better than the river waters so generally employed. There is hardly a house with a tiled or slated roof that might not be made, with the aid of filtration, to supply water of unexceptionable quality for all purposes where pure water is required by those who live there. In country places this method of providing a good water-supply is now deservedly receiving increased attention. It is often the only practicable means by which a good and safe supply can be secured.

Next to rain-water, collected under the most favourable conditions, the purest natural water is that of some of the lakes situated in mountainous districts. These lakes are, in fact, large reservoirs of rain-water collected from the neighbouring mountains, and where the nature of the soil and the geological formations are favourable very little foreign matter is derived from the surfaces over which the water runs into the lakes. Some of the lakes of Scotland, the North of England, and Wales, contain very pure water, well suited in every respect for domestic use. There is often, however, a little colour in lake waters, derived from peaty soil over which the water has run, and it may be stated as essential to the purity of lake water, that it should not have been collected from any great distance, that the lake should have an outlet to the sea, that it should not be situated in a populous district, or surrounded by cultivated land. Where these conditions are absent, the water of a lake is likely to partake of all the objections that attach to the more impure waters of rivers and even of the sea.

River water, which has hitherto afforded the principal supplies to most large towns and populous districts, is much less pure than rain or mountain-lake water. Rivers receive their supplies from different sources,—from surface drainage caused by rains, from the overflowings of lakes, and from springs; but the usually inferior quality of river water is not due to the sources from which it is derived, but to the numerous additions of foreign matter that are made to it. Pursuing its course for long distances through districts often highly cultivated and thickly peopled, the river necessarily becomes the receptacle for all sorts of impurities, which are thus quickly removed from places where they would otherwise become a nuisance, and ultimately poured into that greatest and most polluted of all lakes, the sea. The sewage of towns and villages, the refuse of factories, the drainage of cultivated lands, the products of decomposition of animal and vegetable matter, are carried down to the river and swept away with the current. River water is thus subject to great variations in quality; it is scarcely ever sufficiently pure to justify its use as drinking-water. The increase of population and of manufactures, and the extension among the people of habits of refinement, have tended to increase the impurity of our rivers. They necessarily partake to a certain extent of the character of sewers, and in a thickly peopled country, where the inhabitants are accustomed to the refinements of a high state of civilization, it would be extremely difficult, if not impossible, to obviate this result.

If the generally received opinion of geologists be correct with reference to the original condition of the earth and the successive changes it has undergone, all the water that at present covers so large a portion, and has penetrated beneath the surface, of our globe, must have been condensed from the atmosphere. It has all had one and the same atmospheric origin, and it is even now constantly undergoing repurification by a process of distillation, through atmospheric agency. The comparatively pure condensations from the air, besides supplying our lakes and rivers, moistens the otherwise parched soil, and percolates through the ground until at last it is arrested by impervious strata over which it seeks its level under the influences of gravitation, springing out here and there, as irregularities in the surface or other physical conditions of the ground, favour such a result.

Spring water and the water of artificially-formed wells come from the same source, and consist essentially of rain water that has percolated through different geological strata, and has thus become impregnated with mineral and organic substances, from which its peculiar characters are derived. If the ground through which the water has passed be maiden soil, or has received only the usual treatment of agriculture, nothing is usually contributed by this process to render the water unfit for drinking purposes. Spring and well waters generally contain more mineral matter in solution than is present in the other waters already noticed, in consequence of the large surfaces brought into contact in the percolation; and as salts of lime and magnesia predominate among the mineral constituents, these waters have the character of hardness, and are therefore not well suited for washing or for cooking. The porous ground through which the water has passed being filled with air, such water will be well aerated, and this will contribute to the decomposition of any organic matter which the water may have acquired from the upper strata of soil. The briskness and generally agreeable taste of spring and well waters, which cause them to be preferred for drinking, are due to the air, and especially carbonic acid, absorbed from the ground, to their coolness, and to the small amount of organic matter present.

Although the terms spring-water and well-water are often used as synonymous, we employ the latter term here to designate an artificial opening into a subterranean supply of water, while the former term is applied to a natural and continuous flow from the surface of the earth. The sources of supply in both cases are identical, but the conditions affecting the purity of the water as drawn for use are different. A well is subject to contaminations which cannot affect a spring. The water as it gushes from the rock, if the source be pure, will be free from external contamination, and the constant flow will keep it in this state; but the well may receive something from without which is either corrupt or corruptible, and which may render what otherwise would be good unfit for use and dangerous to health.

The question is now frequently asked, What water should we use for drinking? The wells in London and other large towns have frequently been found to be contaminated with sewage, and the water has sometimes become so dangerous to health from this cause that peremptory measures have been adopted to prevent its use. In most, if not all cases, the water of the shallow wells of London contains products of the decomposition of animal and vegetable matter derived either from the sewers or the surrounding soil, and although we believe this is generally, from oxidation or other causes, in such a state as to be incapable of causing injury to health, yet occasionally it has been found to be otherwise, and in some instances it has been clearly shown that the spread of cholera has been caused by the use of impure well-water.

In an article published in the last number of this journal, Mr. Simon, the Medical Officer of the Privy Council, says—"In relation to Asiatic cholera, as now threatening us, there are two principal dangers against which extreme and exceptional vigilance ought to be used. First, there is the danger of drinking-water which is in any (even the slightest) degree tainted by house refuse or other like kinds of filth; as where there is outflow, leakage, or filtration from sewers, house drains, privies, cesspools, foul ditches, or the like, into streams, springs, or wells, from which the supply of water is drawn, or into the subsoil in which the wells are situate,—a danger which may exist on a small scale, as at the pump or dip-well of a private house, or on a large scale, as in the sources of supply of public waterworks. And, secondly, there is the danger of breathing air which is made foul with effluvia, from the same sorts of impurity."

Again, in some remarks appended to a return representing the quality of the metropolitan waters in July of the present year, furnished by the Metropolitan Association of Medical Officers of Health (which will be found at page 172), it is stated—"It is very probable that the most perfect processes of purification, so far as they can be used at the works of the water companies, will never be sufficient to ensure such a purity of water as the complete removal of those subtle agents of disease which even the most refined appliances of the chemist have failed to discover. It may therefore well be that all discoverable traces of organic matter may be removed from water, and yet it may still contain enough of the minute germs of disease to manifest its morbific action whenever it is used. Experience, indeed, teaches us that it is not the quantity of organic matter in water so much as its quality which determines its dangerous properties; and if it be true, as modern pathological science has almost demonstrated, that the real agent of such diseases as infectious fevers, cholera, the rinderpest, and other allied zymotic maladies, are living germs, and not a gas or vapour, or dead organic miasm, it must rest with the physiologist rather than with the chemist to decide on the means which are best suited to their destruction; and it is more than probable that the chemist would be putting forward very dangerous propositions if, by relying on his science alone, he ventured to dogmatize on so difficult a subject."

With these statements from the best authorities before us, how can we answer the question so frequently asked, Is the water we are accustomed to drink a good, wholesome, and safe water to use for that purpose? It is very clear that a complete and satisfactory answer to this question cannot be founded upon chemical analysis alone. By this means we can ascertain the amount of inorganic matter in the water with great accuracy, and as far as the elements are concerned, we can determine what such matter consists of. We can also show the influence of the inorganic or mineral constituents of the water in decomposing soap, and in other ways affecting its use for certain domestic or manufacturing purposes. It is but rarely that the mineral constituents of water from any of the ordinary water-supplies are such as in any way sensibly to affect the health of those who drink it. In a sanitary point of view, therefore, the inorganic or mineral constituents of drinking-water are looked upon as comparatively, if not wholly unimportant. It is organic impurity, and products resulting from its decomposition, that give to water the qualities most to be feared by those who drink it, and here, unfortunately, chemistry does not aid us very much. It does, however, afford us some insight into the general nature of the organic impurity that is or has been present in the water. We can determine, within certain limits, the amount of organic matter, not so accurately as we can determine the inorganic constituents, but sufficiently so for practical purposes. We can ascertain the presence or absence of nitrogen and sulphur in the organic matter, and thus judge of its animal or vegetable origin. Even if organic matter be wholly or almost wholly absent, we may discover products of its decomposition in the forms of ammonia or nitric acid, from which it may be concluded that there is a connection somewhere between the water and organic impurity, and that although the latter has been rendered harmless by its decomposition, slightly varying conditions might present it in a less advanced state of decay, in which it would be decidedly deleterious. Other products of decomposition, such as sulphuretted hydrogen, would of course bespeak the necessity of avoiding its use, but this makes a direct appeal to the senses which hardly requires to be verified by chemical analysis.

But when the chemist has done his utmost through the exercise of his art, he can only represent, and that approximately, the quantity of organic matter, say one, two, or four grains in a gallon, and, by a more refined application of his art, the presence or absence of nitrogen in this matter. Beyond this he cannot specify its particular nature, source, or condition. The quantity is too small and the task too difficult to admit, in an ordinary analysis, of its examination being carried even as far as the available means of the chemist extend. The results of analysis are therefore usually expressed in very general terms.

All water employed for domestic purposes contains some organic matter, and if, as stated in the document to which we have already referred, "it is not the quantity of organic matter in water so much as its quality which determines its dangerous properties," what is the value of analysis in such a case, seeing that by this means the quality cannot be ascertained? Undoubtedly, taken alone, and in the form in which the results are usually expressed, analysis does not go for much, but it does nevertheless afford some assistance in judging of the extent to which the water has been exposed to the polluting influences of decomposing matter. This is, perhaps, of more value as a guide with reference to the dietetic use of water under ordinary circumstances than with special reference to cholera or other contagious diseases. In these cases we are told that modern pathological science has almost demonstrated that the real agents of such diseases are *living germs*, which the most refined appliances of the chemist have failed to discover, which chemical analysis cannot therefore indicate, and with reference to which no system of filtration can be depended upon for their removal.

In answering the question we have assumed to be put, we should neither wholly neglect nor exclusively rely upon the results of chemical analysis, but should bring to bear upon the subject every available means of ascertaining the past and present conditions to which the water has been subjected, so that we may draw our conclusions from that which is unseen as well as from the results of direct experiment.

Thus, the exercise of common sense in the investigation of the conditions to which the water has been exposed, aided by the results of analysis, and some knowledge of physiological investigations and the laws of nature, will lead to the following conclusions with reference to this matter:—

1. All water that has received drainage containing animal and vegetable matter in a state of putrefactive decomposition, and especially excrementitious matter, either is or is liable to be in a state unfit for use as drinking-water, and the chemist cannot determine by analysis whether the dangerous state exists or not.

2. All rivers necessarily receive drainage, and they are generally contaminated with sewage and other decomposing organic matter which may render the use of such water injurious to health.

3. Shallow wells situated in large towns are subject to pollution from infiltration, from leakage of sewers, and other similar causes, and as these waters are stagnant the organic matter present, if it has not passed, is liable to assume, its most dangerous condition.

4. Spring water, when favourably situated, is free from suspicion of its containing organic impurity that could prove injurious to health.

5. Rain-water, if properly collected and stored, is the best and safest water to use for domestic purposes, and especially for drinking.

6. In the absence of rain-water or good spring-water, the best and most palatable water should be selected from other sources, choosing that which is most free from organic matter, and which has been least exposed to sewage contamination. In order to guard as far as possible against the influence of living germs, by which it is supposed that disease may be propagated, it is recommended on the highest authority that when water to which a suspicion attaches is used for drinking purposes, it should be previously boiled, the heat of boiling water being destructive to the vitality of such germs. A supply sufficient for the day should be daily submitted to the boiling temperature, and this after it has cooled may be rendered more palatable by the addition of a little syrup of lemon, or even a few drops of diluted sulphuric acid.

METHYLATED MEDICINES.

From communications we have received from several correspondents, it appears that the operation of the Act recently passed, prohibiting the use of methylated spirit for certain purposes in medicine, and the "Order" founded upon the Act, which has been issued by the Board of Inland Revenue, are not, in many instances, clearly understood. This misunderstanding, we believe, has been caused by a verbal error in the order above referred to, which contains the following paragraph:—

"By the above Act, s. 8, it is provided that no person shall use methylated spirit or any derivative thereof in the manufacture, composition, or preparation of any article whatever capable of being used either wholly or partially as a beverage or internally as a medicine, nor shall sell or have in his possession any (such) article in the manufacture of which any methylated spirit or any derivative thereof shall have been used, under a penalty of £100, and the forfeiture of the article and vessel containing it."

The word (such), which we have inserted within brackets, has been omitted (obviously by mistake) in the printed papers circulated, and hence the impression with some of our correspondents that the use of methylated spirit was entirely prohibited. The prohibition applies only to the preparation of medicines intended for internal use, and only to such of these as retain the methylated spirit as a component part of them, as in the case of tinctures. There is an exception in favour of ether and chloroform, which are still allowed to be made with methylated spirit, and the preparations so made may be used for any purposes in medicine or otherwise.

Those persons who have methylated medicines, the production of which is prohibited by the Act, if they were made before the passing of the Act, will not be interfered with by the Board, provided the stock of such articles be disposed of before the 1st of January next. This was but a reasonable concession to make, and we hope all those who have been drawn, by the temptation of cheapness, into the substitution of methylated for pure spirit, in the preparation of medicines such as are referred to, will assist in putting an end to a practice which, if it had been extended or continued, would have reflected great discredit upon the state of pharmacy in this country.

In the order already referred to, it is stated that, "should any chemist desire to use methylated spirit in any process necessary for the production of substances used in medicine, and in which no spirit or derivative thereof shall remain after the completion of such process, special application must be made to the Commissioners for leave to use the methylated spirit for such purpose." We believe the authorities at Somerset House have no wish to limit the use of spirit, free from duty, for any legitimate manufacturing purpose, provided the product shall be inapplicable for use as a beverage. The recent Act is expected to facilitate the carrying out of the object originally contemplated in this respect, which was to relieve the manufacturing interests of the country from the heavy duty imposed on spirit used for drinking, and thus to place English manufacturers upon a more equal footing with those abroad. We trust that now the difficulty has been overcome with regard to pharmacy, the Commissioners will be able to devise means by which the production of pure wood spirit and its sale, duty free, may be authorized for those purposes for which it appears to be well suited.

It will be recollected that last year an Act was passed specially for the purpose of imposing the spirit of wine duty upon purified wood spirit or wood naphtha. This course was adopted in consequence of the discovery of a process which was then being practically applied for the purification of wood naphtha, by which this spirit was rendered as free from empyreumatic or other disagreeable taste or odour as the best spirit of wine. It was feared that, in the then state of the methylated spirit question, the use of the purified wood spirit might open a door to new frauds upon the Revenue, and the purified product was therefore subjected to the heavy duty imposed upon spirit of wine, by which means the manufacture was at once entirely stopped. During the short period of its existence, however, it was ascertained that pure wood spirit, which could be produced at a cost of about ten shillings a gallon, presents some advantages even over spirit of wine. Thus, it forms excellent collodion without the addition of ether, and it forms a very good basis for perfumes; but these and other available applications have been entirely stopped through the operation of the Act referred to. It is now a question, which we hope those in authority will consider, whether the manufacturing interests might not be advanced without detriment to the Revenue or to the interests of pharmacy by permitting the production and use of purified wood spirit under certain regulations, free from duty. It has been suggested that the purified spirit might be flavoured with some essential oil, in which state it could be sold for use in perfumery, while possibly other additions might be made where it is intended for other purposes.

NOTTINGHAM.

Ever since the days of Horace, and probably before, the world has recognized the necessity of occasional relaxation. The bow always bent has been too long the fit emblem of the pharmaceutist, and we rejoice that the good old times are past when continual labour was considered the only and cardinal virtue of a business man. Yet nothing should we more deprecate than that the trade-science which we exercise should lose its manly and professional character, and should sink into a mere social union however friendly and well-intentioned.

We believe the British Pharmaceutical Conference, just held at Nottingham, will have precisely the opposite effect. In the first place it is of manifest advantage to bring men of the same calling in personal contact with each other. From that day they are apt to forget their small jealousies, and to take a broader and truer view of the conduct and purposes of others,—the grand lesson taught by Nottingham is tolerance.

Secondly, there is no greater stimulus to individual exertion than the direct influence of those with whose names we may have been for years familiar. Tell me with whom thou goest, and I will tell thee what thou doest. Hereafter, men will read Faraday as long as the reverence for high philosophy remains; they will peruse his works with calm and critical respect; but half an hour's familiar intercourse with the living man would create an interest never to be forgotten. This we have all more or less experienced, and we may feel grateful that it has entered into the minds of some to place within reach such an admirable and inspiring impetus. Thirdly, this Conference has a strong tendency to render us dissatisfied with ourselves. When a man once feels his own comparative inferiority, he has passed the Rubicon of inaction—his awakened conscience goads him on to the achievement of something better than the routine of his past life. No pharmaceutist, be he who he may, can help leaving Nottingham, without at least *intentions* practical and excelsior. That many of these will perish we know by repeated and sorrowful recollection, but that some will bear abundant fruit we may also most confidently affirm.

Lastly, we hold it no slight matter that these annual gatherings break in upon the monotony of the druggist's life: his path, we may venture to assert, is not too thickly strewn with roses, and he has on the average small share in the amenities of social life; but he will dispense not the less accurately, or pursue his daily avocations with less diligence, because for a few days he was content to cast in his lot with some of his fellow-workers.

The prestige of the solitary hermit has vanished; a new line has run clean through his secluded cell, and the men of these days consider that intercommunication, good fellowship, and personal intercourse, are but three indications of the better and more liberal spirit of the age in which we live.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *1st August*, 1866,

Present—Messrs. Bird, Bottle, Carteighe, Deane, George Edwards, J. B. Edwards, Evans, Hanbury, Haselden, Hills, Ince, Morson, Sandford, and Savage.
The following were elected—

MEMBERS.

Bateson, Thomas ....Kendal.
Davies, James Hugh ....Aberystwith.
Pullin, William Henton ....Leamington.

John Langdon Haydon Down, M.D. London, was elected an honorary and corresponding member.

BENEVOLENT FUND.

The sum of ten pounds was granted as temporary assistance to a distressed member of the Society, late at Bury St. Edmunds; and the sum of twenty guineas was also granted to the widow of a member late at Dover.

The reports of the Professors and the Director of the Laboratory were read, and the awards made to the successful candidates.
These awards will be distributed at the evening meeting on the 3rd October, when the successful competitors will be expected to attend to receive the same.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT NOTTINGHAM, 1866.

The first sitting of the Conference was held on Tuesday, August 21, 1866, at the Assembly Rooms, Nottingham, at ten A.M.; the President, Professor Bentley, F.L.S., in the chair.
The attendance was large; members from a distance especially being more numerous than on any previous occasion.
Delegates from Provincial Chemists' Association were accredited to the meeting as follows, viz.:—

Bath, Messrs. Commans and Pooley.
Leeds, Messrs. Smeeton and Yewdall.
Liverpool, Dr. J. B. Edwards, Messrs. Abraham and Redford.

The following gentlemen were balloted for and duly elected members of the Conference:—

Ault, Mr. J., Eastwood, Nottingham.
Baldock, Mr. J. H., 143, New Bond Street, W.
Barker, Mr. W. R., 143, New Bond Street, W.
Bicknell, Mr. W., Ebury Street, Pimlico, S.W.
Blain, Mr. W., Market Street, Bolton.
Bosley, Mr. J. L., 128, Brompton Road.
Bourdas, Mr. I., jun., 48, Belgrave Road, S.W.
Bremridge, Mr. E., 17, Bloomsbury Square, W.C.
Carver, Rev. Mr., M.A., Nottingham.
Charity, Mr. W., Swan Lane, Upper Thames Street, E.C.
Christopher, Mr. W., Crickhowell.
Collinson, Mr. S., Nottingham.

Crawshaw, Mr. E., 30, Market Street, Burnley.
Curtiss, Mr. T. W., Holbeach, Lincolnshire.
Darby, Mr. S., 140, Leadenhall Street, E.C.
Dennis, Mr. J. L., Alfreton Road, Nottingham.
Ellinor, Mr. G., Rotherham.
Faull, Mr. E., Beeston.
Francis, Mr. J., 54, High Street, Wrexham.
Goodyer, Mr. F. R., Mount Street, Nottingham.
Gould, Mr. J., Red Lion Square, Newcastle-under-Lyme.
Gowland, Mr. W., 48, High Street, Sheffield.
Gowland, Mr. G. R., ditto ditto.
Granger, Mr. E. J., Upper Clapton.
Greaves, Mr. J., Matlock Bath.
Greaves, Mr. S., Ironville.
Guyer, Mr. J. B., 11, Strand, Torquay.
Harbutt, Mr., Bridlesmith Gate, Nottingham.
Hart, Mr. C. D., Derby.
Harvey, Mr. E., Giltspur Street, E.C.
Harwood, Mr. E. G., 21, Newport Street, Bolton.
Henty, Mr. H. M., 87, High Street, St. John's Wood, N.W.
Hill, Mr. J., 123, West Street, Sheffield.
Hodgkinson, Mr. J. S., Matlock Bridge.
Holloway, Mr. T. H., Upper Sydenham.
Houghton, Mr. T., High Street, Oxford.
Howarth, Mr. J., Doncaster.
Jackson, Mr. W., Mansfield.
Johnson, Mr. T. S., 75, Bury New Road, Manchester.
Johnson, Mr. F., Derby Road, Nottingham.
Johnson, Mr. G. R., 18A, Basinghall Street, E.C.
Johnson, Mr. J. G., ditto ditto.
Kemp, Mr. D., 106, High Street, Portobello, Mid-Lothian.
Knott, Mr. R., Blackburn Road, Bolton.
Littlewood, Mr. S., Sutton in Ashfield.
Marreco, Mr. A. F., Newcastle-on-Tyne.
Maw, Mr. C., 11, Aldersgate Street, E.C.
Morson, Mr. T. N. R., 38, Queen Square, Bloomsbury, W.C.
Morson, Mr. T., 124, Southampton Row, W.C.
Oakland, Mr. W., Alfreton Road, Nottingham.
Parker, Mr. S., Alfreton Road, Nottingham.
Pars, Mr. R. C., Thrapstone.
Phillips, Mr. T., Shrewsbury.
Potts, Mr. R. S., Ilkeston.
Radley, Mr. W. V., 74, Market Place Sheffield.
Ransome, Mr. W., Hitchin.
Redford, Mr. A., 30, Oxford Street, Liverpool.
Robinson, Mr., Alfreton.
Savory, Mr. , 143, New Bond Street, W.
Savory, Mr. C., 143, New Bond Street, W.
Siebold, Mr. L., 225, Oxford Street, Manchester.
Shemmonds, Mr. A., Lichfield.
Shepperley, Mr. S., jun., Long Row, Nottingham.
Smeeton, Mr. W., 26, Commercial Street, Leeds.
Tait, Mr. W., 139, Princes Street, Edinburgh.
Taylor, Mr. S. H., 2, St. Ann's Square, Manchester.
Terry, Mr. T., St. George's Road, Bolton.
Tidman, Mr. W., Wormwood Street, E.C.
Ward, G., F.C.S., Mechanics' Institution, Leeds.
Watkinson, Mr. J. W., Kearsley, Farnworth.
Watson, Mr. D., Hotel Street, Leicester.
Watson, Mr. T. D., 18 A, Basinghall Street, E.C.
Watson, Mr. J., Hotel Street, Leicester.
Whyte, Mr., Rusholme, Post Office, Manchester.
Williams, Mr. J., 5, New Cavendish Street, W.
Wilson, Mr. E., The Moor, Sheffield.
Wright, Mr. G. H., 7, Poultry, E.C.

Apologies for non-attendance were presented from Messrs. J. Mackay, of Edinburgh; Tylee, of Bath; Jones, of Leamington; J. C. Braithwaite, Matthews, and Williams, of London; Wilkinson, of Manchester; and several other gentlemen.

The Report was then read by Dr. ATTFIELD:—

"REPORT OF THE EXECUTIVE COMMITTEE.

"Since the last annual gathering of the members of the Conference at Birmingham, in September, 1865, your Committee have met but twice. On the first occasion arrangements were completed for the publication of the volume of Proceedings, a copy of which was shortly afterwards issued to the members and to a few eminent scientific men and societies of Europe and America. At the second meeting, the annual list of subjects for investigation was compiled, a copy being subsequently sent to every member. The proposal of the Nottingham Local Committee to hold an exhibition of objects relating to pharmacy during the week of the annual meeting in that town, was at the same time carefully considered and approved, arrangements for carrying out the same under the auspices of the Conference being cordially adopted.

"During the past year death has removed three members from our roll, men whose names are well known to all interested in progressive pharmacy, Mr. W. Southall, of Birmingham; Mr. T. B. Teasdale, of Darlington; and Mr. H. Booth, of Rochdale.

"The total number of members of the Conference for the year 1865–66 was 305; it is now nearly 400.

"The Executive Committee cannot but congratulate the members on the rapid and successful progress which the Conference has made. Whether we look to the many and important papers which have been read at its two annual meetings, to the brotherly feeling and co-operation which have been developed among those attending the gatherings, or to the good local influence which its yearly celebration has produced, we see evidence of the soundness of its constitution, and tangible proofs of its healthy prosperity.

"And now, having established the Conference on so firm a foundation, and looking with pleasure and satisfaction on the many names of known workers which its register includes, we would appeal to all members to canvass the professional brethren of their own or other towns with the special object of largely increasing our number. The formation of exhibitions similar to that which is so prominent a feature of the present meeting is but one means of aiding the advancement of pharmacy, which might be adopted by your executive, were more subscriptions at their disposal. The Committee trust that this method of widening the basis of operation without altering the character of the Conference will receive the individual attention of the members."

The financial position of the Conference was then laid before the meeting.

The Treasurer in Account with the British Pharmaceutical Conference, 1865–66.

Dr.	£	*s.*	*d.*	*Cr.*	£	*s.*	*d.*
To Cash in hand, August, 1865	2	4	5	By Expenses of Birmingham			
,, 258 Subscriptions—				Meeting—			
4 for 1863–4				Printing £1 5 6			
43 for 1864–5				Advertising 2 10 6			
183 for 1865–6				Hire of Furniture 9 0 2			
26 for 1866–7				Porter 0 19 0			
2 for 1867–8 (Total 258)...	64	10	0	Copying Reports 0 7 0			
					14	2	2
				,, Cost of Proceedings—			
				,, Printing, etc., Taylor and Co. ...	20	16	0
				,, General Printing—			
				Taylor and Co. £6 2 6			
				Baines and Sons 0 12 0			
					6	14	6
				,, Postage..................................	13	17	7
				,, Stationery	1	12	5
				,, Advertising.............................	1	10	0
				,, Expenses of Exhibition (Printing), Baines and Sons..........................	2	2	0
				,, Petty Disbursements, chiefly cost of directing circulars	1	18	2
				,, Balance in hand.......................	4	1	7
	£66	14	5		£66	14	5

1866.	£	s.	d.
August. Balance in hand	4	1	7
6 Subscriptions for 1863–4, still unpaid	1	10	0
14 ,, 1864–5, ,,	3	10	0
77 ,, 1865–6, ,,	19	5	0

Examined and found correct.

EDWARD SNAPE.
JOHN CHURCHILL.

BIRMINGHAM, *August* 17*th*, 1866.

Mr. R. W. Giles (Clifton) moved the adoption of the Report, and, in doing so, congratulated the Conference on its great accession of members and increased influence. There were many gentlemen amongst those just elected, whose names were a most important addition to their roll, and he was prepared to accept them as a proof that the Conference had shown itself possessed of the elements of stability and permanence.

Mr. Fitzhugh (Nottingham) seconded the motion, which was carried.

The President then addressed the meeting, as follows :—

ON THE STUDY OF BOTANY IN CONNECTION WITH PHARMACY.

Having had the honour of being called upon to preside on this occasion, it devolves upon me to open the proceedings of the Conference with an introductory address; and, after mature consideration, I have thought that in no way could I better discharge my duty than by pointing out the relations which exist between botany and pharmacy, and the consequent advantages which the pharceutist must derive from a knowledge of botanical science. The question *cui bono*, to what practical end and advantage do your studies tend? is one which, however distasteful to those who love knowledge for its own sake, and for the priceless pleasures it brings, is nevertheless one which can never be lost sight of by the working bees in this necessarily utilitarian age. I know that by many, perhaps by most pharmaceutists, the study of botany is regarded as of but little value—indeed, by some as practically useless. It will be my object on the present occasion to show that such conclusions must be founded on a very imperfect knowledge of the science of botany, and the important and intimate relations it has to, and its practical bearings upon, the profession of pharmacy.

The time allotted to the meetings of the Conference will not allow me to devote that attention to the subject which its importance deserves; hence I shall confine myself to the consideration of some of the more immediate and direct advantages which the pharmaceutist will derive from a knowledge of botany leaving its value as a mental training and as a recreation to some future opportunity. Firstly, I find that at the present time there are about four hundred species of plants, some parts of which, or their products and secretions, are employed as remedial agents, and a considerable proportion of which enter into the officinal preparations of the British Pharmacopœia. It cannot but be regarded as important that those who have constantly to handle and make use of these substances should be able to recognise the species of plants which yield them, to know the countries from which they are derived, to describe their general characters and structure, their positions in the vegetable kingdom, and their medical properties and uses. Indeed, the value of such knowledge ought to be manifest to all, as without it the pharmaceutist would be unable to guard against fraudulent adulteration, accidental substitution, or the ignorance of herb-gatherers and herbalists. Two cases which have recently come under my own observation will bring prominently under notice the importance of a knowledge of botany in the detection of substitutions and adulterations. One was the substitution of double feverfew flowers for those of chamomile; and the other, the admixture of the stamens with the officinal style and stigmas of the saffron plant. The former will exhibit the importance of an accurate knowledge of the diagnostic characters of plants and their parts; and the latter the necessity of an acquaintance with the general characters and structure of the different parts of plants. None but a botanist would have detected and traced such adulterations to their right sources; and the fact of the latter adulteration having hitherto been undetected in Great Britain, and only once briefly noticed abroad as having occurred in France, although since proved by me to have been practised in this country for many years, clearly exhibits the general ignorance of botany amongst pharmaceutists, and the necessity which exists for its more careful, general, and systematic study.

As regards plants of foreign origin, it is true that most pharmaceutists would have but little opportunities of becoming acquainted with them, but if such should be the case, and the pharmaceutist were compelled to confine his practical study of plants to those indigenous to, or apparently wild in, this country, he would find much to instruct and interest him, for he would thus not only learn how to distinguish the poisonous species from those which were harmless, and in this way might be means of averting serious accidents, but he would find many which were officinal in the British Pharmacopœia, and with which he ought to be thoroughly acquainted, as *Aconitum Napellus*, *Papaver somniferum*, *Papaver Rhœas*, *Sinapis nigra*, *Sinapis alba*, *Cochlearia Armoracia*, *Linum usitatissimum*, *Rosa canina*, *Sarothamnus Scoparius*, *Conium maculatum*, *Sambucus nigra*, *Valeriana officinalis*, *Anthemis nobilis*, *Taraxacum*, *Dens Leonis*, *Arctostaphylos Uva Ursi*, *Solanum Dulcamara*, *Datura Stramonium*, *Hyoscyamus niger*, *Atropa Belladonna*, *Mentha piperita*, *Mentha viridis*, *Digitalis purpurea*, *Daphne Mezereum*, *Daphne Laureola*, *Ulmus campestris*, *Humulus Lupulus*, *Quercus pedunculata*, *Pinus sylvestris*, *Abies excelsa*, *Juniperus communis*, *Crocus sativus*, *Colchicum autumnale*, and *Aspidium Filix-mas*. It is botany that gives us the knowledge required to recognise these species, and to distinguish them from other plants with which they may be intentionally or ignorantly mixed, or for which they have been substituted.

A knowledge, again, of the general properties of the various Natural Orders of plants will give us a clue in the search for new remedies; for it is very probable that in a country like our own, which, as we have just seen, contains so many important plants growing in a wild state, may also yield many others the properties of which are as yet unknown; and even should such not be the case, it will doubtless direct more attention to the properties of our native plants, some of which are but too little appreciated at the present day, so that, in the event of war or any other cause which may occasion a deficiency or withdrawal of any of our important remedies now obtained from abroad, we might find substitutes at home. I must content myself with one illustration of the importance of keeping up a knowledge of the properties of the plants of this country. This is afforded us by the *Aspidium* or *Nephrodium Filix-mas*, the male fern, one of the commonest plants of this country. The *root*, or more properly the *rhizome*, of this plant had been reputed for ages to possess powerful anthelmintic properties, but in consequence of the common use of medicines of like properties obtained from abroad, its virtues were almost lost sight of until lately, when in consequence of the introduction from Abyssinia of Kousso, a substance reputed to possess most powerful vermifuge properties, attention was again directed to it, and it was introduced into the British Pharmacopœia; and I believe most persons will agree with me that its reputation is now established, as the most valuable and certain anthelmintic in that volume. Besides this, there are without doubt many other indigenous plants which are not at present officinal, or which are but very little employed, or whose properties are altogether unknown, which would be available, and would have their reputation established as important remedial agents should any necessity for their employment arise.

Thus, in the first place, we may take as illustrations the Natural Orders Malvaceæ and Gentianaceæ. The plants of the former Order are generally characterized by mucilaginous and demulcent properties, and these are prominently manifested in our indigenous *Althæa officinalis* and *Malva sylvestris*, both of which were, until the publication of the British Pharmacopœia, officinal in this country; and why the former, certainly one of the best emollient and demulcent medicines known, should have been omitted from that volume, I am at a loss to conceive, for nothing has been introduced in its place which will altogether replace it. Again, the plants of the Gentianaceæ are all more or less bitter, and possess stomachic and tonic properties; and as we have many common plants indigenous to this country belonging to that Order, they might be employed, if necessary, as substitutes for the officinal *Gentian* and *Chiretta*, which are of foreign origin; as, for instance, the *Menyanthes trifoliata*, *Erythræa Centaurium*, *Chlora perfoliata*, *Gentiana campestris*, and other species of *Gentiana*, etc. Indeed the two former plants were included in the last Edinburgh Pharmacopœia, but they were but little used, their properties being comparatively unknown, owing principally to the common use of the readily obtainable gentian, nevertheless they both possess, particularly the former, well-marked stomachic and tonic properties, and are probably equally efficacious as the *Ophelia Chirata*, now introduced into the British Pharmacopœia.

Then, again, amongst our indigenous plants, we have many with well-marked purgative and astringent properties. Thus, amongst those of a purgative nature we may mention the *Linum catharticum*, *Rhamnus catharticus*, *Euphorbia Lathyris*, *Helleborus fœtidus* and *Helleborus viridis*. Some of these might be frequently substituted with advantage for drugs of similar properties derived from foreign plants. Of astringent plants we have a great many growing wild in this country, two of which are especially valuable, namely, the *Potentilla Tormentilla* and the *Polygonum Bistorta*. With regard to the former, Dr. Christison has justly remarked that "it is equally applicable with catechu, kino, and other astringents of foreign origin in the treatment of chronic dysentery and other chronic mucous discharges."

Another indigenous plant, of much value, is the *Acorus Calamus*. This is abundant in the marshes and by the sides of rivers in some parts of this country. Many pharmacologists have borne ample testimony to the value of its rhizome in medicine, as a stimulant excitant, and mild aromatic tonic, and as a remedy in intermittent fevers; but it is scarcely or ever employed at the present time, though, as stated by Pereira, "it might be frequently substituted, with good effect, for the more costly Oriental aromatics." Again, as is well known, we can obtain from the bark of various species of *Salix* and *Populus*, the alkaloid salicine, which has been found to possess well-marked tonic, and to some extent anti-periodic properties, and which has consequently been tried as a substitute for the alkaloids quinia and cinchonia. Some few years ago, in consequence of an anticipated scarcity in our supplies of cinchona barks, much attention was directed to salicine; and, although, in consequence of the successful cultivation of Cinchonas in India, no deficiency of barks is now likely to occur, it is right that we should not lose sight altogether of any substance which is calculated even in the slightest degree to act as a substitute for the valuable alkaloids obtainable from those barks. Again, the *Arum maculatum*, so abundant in our hedges, etc., would yield us, if required, abundance of starch, which might be employed as a substitute for sago and the various kinds of arrowroot now derived from abroad. The above are but a few of our indigenous plants which have been found to possess well-marked medical properties; if time allowed, I might refer to a host of others, as the *Chelidonium majus*, *Cochlearia officinalis*, *Saponaria officinalis*, *Viola odorata*, *Agrimonia Eupatoria*, *Bryonia dioica*, *Archangelica officinalis*, *Daucus Carota*, *Galium Aparine*, *Cotyledon Umbilicus*, *Inula Helenium*, *Artemisia Absinthium*, *Achillea Millefolium*, *Lactuca virosa*, *Cyclamen hederifolium*, *Borago officinalis*, *Melissa officinalis*, *Marrubium vulgare*, *Gratiola officinalis*, *Chenopodium olidum*, *Asarum europæum*, *Aristolochia Clematitis*, etc. etc.; but they will be sufficient as illustrations of the importance of a knowledge of botany to pharmaceutists resident in this country. The observant pharmaceutist may even by a diligent prosecution of botany, be the means of enlarging the boundaries of science, for as has been well observed of the study of natural history:—"So wide, indeed, is the scope which this science embraces, so multifarious are the points of information to be elicited, and so easily may many of these points, under peculiar circumstances, be elucidated, that there is room for the beneficial endeavours of the youngest student, no less than of the most matured and philosophic mind. The successful prosecution of natural history, like that of all other demonstrative sciences, depends upon facts; and when we consider the number of the data necessary to complete the history of an individual species, and then reflect on the hundreds of thousands of species which exist upon the earth, we shall immediately perceive that every attentive observer has the power of contributing something towards his favourite science,—something which has been yet unobserved, or if observed, unrecorded. He may thus remove the veil from one stone at least of the temple of nature, or he may, by the discovery of one single but important fact, clear away an accumulation of doubts and difficulties that have long impeded the paths of the greatest adepts."

But if a knowledge of Botany be so desirable and so valuable in its results to the pharmaceutist resident in this country, it will become of far greater service if he be led by desire of gain, ambition, pleasure, or any other cause, to visit or reside in a comparatively unknown part of the world; and in a nation like our own, with colonies in all parts, such a contingency is by no means unlikely to arrive. Then his acquaintance with botany will give him a clue to the properties of the plants he will find growing around him, for its study will have informed him that those which are closely allied in structure—that is, those belonging to the same Natural Orders may be expected to resemble each other in their medical and other properties. He will thus know that whilst the plants of some Orders are almost without exception poisonous, or to be regarded with suspicion; those of others are at least harmless; while those of other Natural Orders may be expected to possess some important properties, which will render them valuable as medicines; or as applicable for manufacturing purposes, or in the arts, or domestic economy.

Thus, to take a few illustrations, a knowledge of systematic botany will have informed him that the plants of the Natural Orders Cruciferæ, Caryophyllaceæ, Malvaceæ, Sterculiaceæ, Byttneriaceæ, Tiliaceæ, Aurantiaceæ, Vitaceæ, Rutaceæ, Linaceæ, Rosaceæ, Crassulaceæ, Passifloraceæ, Cactaceæ, Grossulariaceæ, Myrtaceæ, Onagraceæ, Boraginaceæ, Lamiaceæ, Orchidaceæ, Palmaceæ, Cyperaceæ, Graminaceæ, and numerous others, are generally harmless, as these Orders scarcely contain any well-marked poisonous species; while at the same time he will have learned that the plants of the Orders Ranunculaceæ, Menispermaceæ, Papaveraceæ, Sapindaceæ, Coriarieaceæ, Anacardiaceæ, Cucurbitaceæ, Umbelliferæ, Lobeliaceæ, Apocynaceæ, Loganiaceæ, Solanaceæ, Scrophulariaceæ, Artocarpaceæ, Euphorbiaceæ, Amaryllidaceæ, Melanthaceæ, Araceæ, and others, are to be regarded with suspicion, as they all contain poisonous plants, and some scarcely comprise any but highly dangerous plants.

Then, again, do we wish to know the medicinal properties of plants, or to search for new remedies? we have an important guide in a knowledge of botany. Thus, the Papaveraceæ yield a milky juice, which frequently possesses well-marked narcotic properties; the Cruciferæ are antiscorbutic and stimulant; the Malvaceæ, Sterculiaceæ, and Tiliaceæ mucilaginous and demulcent; the Guttiferæ, acrid and purgative; the Rutaceæ, antispasmodic, diuretic, and tonic; the Linaceæ, emollient and demulcent; the Oxalidaceæ, refrigerant; the Simarubaceæ, bitter and tonic; the Rosaceæ, Lythraceæ, and Saxifragaceæ, astringent; the Cucurbitaceæ, acrid and purgative; the Myrtaceæ, aromatic and pungent; the Cinchonaceæ, tonic, febrifuge, and astringent; the Vāleri-anaceæ, stimulant and antispasmodic; the Gentianaceæ, tonic; the Convolvulaceæ, purgative; the Solanaceæ, narcotic; the Boraginaceæ, mucilaginous and emollient; the Lamiaceæ, aromatic, carminative, and stimulant; the Piperaceæ, acrid, pungent, aromatic, and stimulant; the Lauraceæ, aromatic, stimulant, tonic, and diaphoretic; the Myristicaceæ, aromatic, stimulant, and carminative; the Pinaceæ yield turpentine, pitch, and resinous substances; the Zingiberaceæ are aromatic, stimulant, and stomachic; and the Marantaceæ yield starch in large quantities. The above are but a few illustrations, given for the purpose of exhibiting the value of a knowledge of botany in guiding us in the search for new remedies, if we should be stationed in a comparatively unknown country,—or even in a limited degree in our own native land.

It is right, however, that I should mention, that plants which are now placed by botanists in the same Natural Orders are frequently found to possess very varying properties. Thus, the poisonous *cocculus indicus* plant is in the same Order with that of the *calumba* and *pareira brava;* the edible *mango* with the *poison-ash;* the highly poisonous *calabar bean* with the *liquorice;* the powerful *elaterium* with the edible *melon* and *cucumber;* the poisonous *hemlock* with the edible *parsnip* and *carrot*,—the aromatic, stimulant, and carminative *anise*,—and the fœtid *assafœtida;* the deadly *Madagascar poison-nut* with the nutritious *cow-tree* of Demerara; the narcotic *belladonna* and *henbane* with the edible *potato* and stimulant *capsicum;* the *breadfruit* and the nutritious *cow-tree* of South America with the poisonous *Upas;* the edible *asparagus* and *onion* with the purgative *aloes* and the *diuretic squill;* the powerful *colchicum* and *cevadilla* with the slightly astringent *Uvularia;* the narcotic *Lolium* with our *corn* producing plants; and other examples of a like kind might be readily found. Many illustrations might even be given of varying properties in plants now regarded as belonging to one and the same genus. A few examples must, however, suffice:—Thus, the highly poisonous *Aconitum ferox* and *Aconitum Napellus* are placed with the febrifugal *Aconitum heterophyllum;* the poisonous *Capparis pulcherrima* with the stimulant and antiscorbutic *Capparis spinosa;* the delicious *Mangosteen* with the powerfully-purgative *gamboge;* the *Guarana* or *Brazilian cocoa* with the poisonous *Paullinia pinnata*, *P. Cururu*, and *P. australis;* the edible *Coriaria nepalensis* and *C. sarmentosa* with the poisonous *Coriaria myrtifolia* and *C. ruscifolia;* the highly-poisonous *Strychnos Nux-vomica* with the harmless *S. Pseudo-quina;* the edible *potato* with the *woody nightshade;* and the *sweet cassava* with the poisonous *bitter cassava*. It should be noticed, however, in regard to the varying properties possessed by species of the same genus, that one part of a plant frequently possesses different properties from another, and that while one may be poisonous, another may be harmless; hence in comparing the properties of one plant with another the same parts of each should be taken. With such precautions we shall find but comparatively few examples of difference of properties in plants of the same genus, although such may be occasionally found, as the fruits of the different species of Capparis, Gambogia, Coriaria, and Solanum; the barks of the species of Strychnos; the root of species of Manihot, etc.

In reference to the above apparent exceptions of plants arranged in the same Natural Orders, etc., having different properties, it should be remembered that no properly educated botanist would pretend to say that any of our natural systems, as at present constructed, is altogether perfect, for such cannot be the case until we possess a much greater knowledge of plants than we can as yet boast of; but at the same time all searchers after truth must admit, from the many examples quoted above of the general medicinal properties of certain Natural Orders, that a knowledge of them, even as at present defined, is of most essential service in guiding us to an acquaintance with the properties of unknown plants; and I think, therefore, that we may justly conclude that the apparent exceptions which we occasionally find in the properties of certain plants to those now placed by us in the same Natural Orders, are due to some differences of structure, or to the varying conditions under which they have been placed, which, in our present imperfect knowledge we have overlooked, or regarded as unimportant, for no one can as yet form any conclusions of value as to the effect an apparently trifling difference of structure would produce, or what change might not be occasioned by an alteration of the conditions under which plants were placed. Such exceptions, therefore, instead of discouraging and inducing us to lay aside the search after a true natural system as useless, should rather act as a stimulus to further investigation; for, to use the words of Linnæus, the formation of a true natural system should be regarded as the "primum et ultimum in botanicis desideratum."

We find, therefore, that a pharmaceutist possessed of a good knowledge of botany would, in case of need, or in a deficiency of supply in the drugs of ordinary use, and with which he was well acquainted, possess a clue to the resources by which he was surrounded, and would accordingly, in many cases at least, be as much at home in a comparatively unknown country as in his own native land; for such knowledge would enable him to search for new remedies, when he would be almost certain to find something of value, not only for his own use, but for that of the world at large. In this way he might be the instrument of discovering a most important remedial agent, which by the blessings it would confer upon mankind would be the means of handing down his name to posterity as one of the great benefactors of the human race. In this respect alone, therefore, a knowledge of botany cannot but be considered as of the most essential service to the pharmaceutist whether residing in this or any other part of the world.

Another way in which an intimate acquaintance with the parts of plants would be of the greatest advantage to the pharmaceutist is, by the assistance it would afford him when called upon to ascertain the cause of death or otherwise in cases of suspected poisoning. Some persons, whilst admitting that a pharmaceutist should possess that amount of acquaintance with botany which would enable him to recognise the common medical plants and distinguish their parts from those of an analogous nature usually employed for their adulteration, or for which they have been accidentally substituted,—nevertheless regard as unimportant any knowledge of the internal structure of plants and their organs, and would consider the time spent upon such investigations as so much withdrawn from more practical and important studies. Such a general knowledge of plants would be, however, useless as a guide to the toxicologist in his search for the cause of disease or death in cases of suspected poisoning. A minute acquaintance with the external configuration and condition of the surface of the parts of plants, and of their internal structure, is that alone which would here be serviceable to him, and armed with such knowledge, he would frequently, by examining the contents of the stomach by the unassisted eye, or by a simple magnifier, or by the aid of a more powerful microscope, be able to trace the cause of death or disease to some small fruits or seeds, or to some other parts of poisonous plants, and thus be in a position immediately to assign a cause for the suspicious symptoms or death; and would frequently, also, save by such a simple investigation a complicated, and perhaps unsatisfactory, chemical analysis. Among other fruits and seeds which would be thus readily distinguished by the accurate botanical observer from their external configuration and character of surface, I may mention Hemlock, Fool's Parsley, Aconite, Stavesacre, Lobelia, and Nux-vomica. A knowledge of the internal structure of the woody tissues of plants might also afford the pharmaceutist great assistance in cases of suspected poisoning by Savine, as the peculiar structure of Gymnospermous wood would in such instances, unless the Savine had been administered in powder, be at once evident, and lead to its detection.

A minute acquaintance with the internal structure of the various parts of plants and of their products and secretions, will be also of the greatest service in enabling the pharmaceutist to detect adulterations and substitutions amongst our vegetable drugs and food substances. In a knowledge of the minute anatomy of plants and the practical use of the microscope the German and even French pharmaceutists are very far in advance of their English brethren, as the foreign works on pharmacology will at once render manifest. It behoves the English pharmaceutist to devote more time and attention to these matters, as means of detecting adulterations and substitutions, or otherwise he will not only be left behind by his foreign brethren, but also by the intelligent analysts of this country connected with the medical profession and the Excise. The officers of the latter service especially are now directing much attention to the detection of adulterations, etc., by the aid of the microscope, and I trust it will not be long before pharmaceutists generally follow their good example. Such men as Deane, Brady, Howard, Evans, Stoddart, and many others amongst our own body, are exceptions to the general rule, and their investigations will show how important and valuable the microscope may become in the hands of accurate observers.

At the present day much attention is properly directed to all matters connected with the health and comfort of our population, and as members of an intelligent profession all pharmaceutists should be able to explain the influence of plants in regulating and maintaining the purity of the atmosphere we breathe and of the water we drink,—agents upon which we are dependent for our very existence. Surely such knowledge cannot be considered unimportant and useless, for if a pharmaceutist desire to raise his social position or even to maintain it, it will be absolutely necessary for him to keep ahead of the general population in all matters referring to the health of the people. One important branch of his education must not therefore be neglected, namely, that which has reference to plants in a state of life or action and their influence in nature.

A knowledge of the functions comprised in the history of the life of the plant and of its several parts or organs will be also of great practical assistance to every pharmaceutist, and more especially to those engaged in the cultivation of medicinal plants. A few illustrations on this point will be of much value :—Thus he will learn, in the first place, how important is a proper supply of light to a plant, for if that be wanting, transpiration or exhalation of watery vapour from its leaves and other green parts will soon cease, and that this cessation of one function will speedily be followed by that of absorption also, in consequence of the plant becoming gorged with unremoved fluid matters. Hence the plant will become unhealthy, and unless removed from the influence of such an unfavourable condition it will ultimately die. A knowledge of this action of solar light upon vegetation is of direct importance to the pharmaceutist, as it teaches him not only how necessary light is to the successful cultivation of medicinal plants, but also the necessity of gathering such plants, if we would have them in their most active conditions, in dry, warm, sunny weather, as under other circumstances, that is, if collected after a succession of dull, dreary, cold, damp, or wet days, their active secretions would be so mixed up with inert unassimilated fluid matters, as sensibly to diminish their medicinal properties, and materially to increase the difficulty of making eligible and stable preparations from them.

Important, however, as the influence of solar light is upon the transpiration of plants, it would soon be found that other changes were dependent upon its action combined with that of the atmosphere which surrounded them. Thus, without the conjoint action of these two agents, no proper formation of organic substances could take place in plants. The pharmaceutist would also learn that in the process of assimilation there were two series of organic compounds produced, one series having for their object the nutrition of the plants in which they were formed, and being directly concerned in their growth and development; and another series called secretions, which played no active part in the plants after their perfect formation, and which were commonly formed at a later period in the life of the plant. These facts ought to teach us how important it is not to manure plants which are used in medicine too freely, as by such a proceeding they are made to grow too luxuriantly, and become as it were fattened; while, at the same time, no increase at all events, but on the contrary, as I believe, in most instances a sensible decrease takes place in the amount of their secretions, and a corresponding diminution of their medical properties. Under any circumstances, the addition of a large quantity of unstable compounds to the juices containing the secretions we require would render such plants, as a rule, ill adapted for the production of eligible and stable preparations. When plants are grown for use, as nutritive vegetables, the opposite plan should be adopted, as our object would then be to form nutritive compounds, and not active secretions. It is very probable, however, that as our knowledge of vegetable chemistry and physiology increases—that is, when we become more perfectly acquainted with the action and uses of artificial and other manures, the medicinal properties of plants may be increased rather than diminished by their judicious use. The above remarks are simply intended to apply to the now commonly adopted plan of indiscriminate and over-manuring of medicinal plants.

There is another important practical fact which was first pointed out by me in a lecture which I delivered at the Pharmaceutical Society, in 1862, "On Plants in a State of Life," which arises from a knowledge of the later development and difference in function of the secretions and products of plants. It is this: it was well known that in the process of flowering and more especially of fruiting, a great supply of nourishment was required; hence it was said by vegetable physiologists, that when the herbaceous parts of plants were required for medicinal uses, they should be taken before the process of flowering; the practical man however came forward and said no, take them when the flowering stage has somewhat advanced, as it is at that period that I can obtain the most active and stable preparations from them. I think we may show that the latter is correct (provided that the flowering stage has not advanced to any very great extent), as follows:—In the process of flowering the only compounds that are taken up in any amount are those which are concerned in the growth and development of new tissues; no further growth, to any extent at least, can therefore take place in the vegetative organs of the plant; but the secretions by the removal of these products become more concentrated, and the organs in which they are produced by being left for a longer period in connection with the plant, have time to elaborate them more perfectly.

At the period at which the lecture just alluded to was delivered, much discussion had arisen as to the propriety of using the young vitally-active parts of herbaceous plants in immediate contact with the leaves, as well as the leaves themselves, in the preparation of extracts, etc.; and as the subject is of much practical importance, I must be excused for referring to it again as follows:—Without leaves or other organs of an analogous nature, no growth to any extent can take place, or any secretions be formed in the plant. Thus the floral leaves, and the green parts of the flower itself, have a similar effect to the leaves; even the young herbaceous parts, from which the leaves and other organs arise, are also directly concerned in the formation of products and secretions. This assimilating power of the young green herbaceous parts is commonly lost sight of, but in reality the structure of these parts is essentially the same as the leaves, except that their tissues are somewhat more compact and differently arranged; hence in proportion to amount of matter they do not expose so large a surface to the action of air and light as leaves, and as the process of assimilation only takes place in the cells immediately below the epidermis, their power of forming products and secretions is somewhat less intense, but the difference between the parts immediately in contact with the leaves and the leaves themselves must be very slight. Indeed, I am by no means certain, but that the young herbaceous parts frequently contain quite as much, or even more active secretions than the leaves; thus, if the latter organs be left on the stem till they have passed their active vital conditions, their secretions will have passed to a great degree into the young stalks in their passage downwards to the main stem, and hence the latter would be then probably more active than the leaves, as they would in such a case not only be assimilating organs, but also the receptacle for the products and secretions formed in the surrounding parts. The most convincing proof that I can adduce of the capability of young succulent parts to form products and secretions, is in the case of Cacti, Euphorbias, etc., which have frequently no true leaves, but the plants are formed of a succulent stem or stems, from which the flowers arise; nevertheless, as is well known, and in the case of some of the Euphorbias especially, the secretions produced are of a very active nature. I might pursue this subject further, but enough has been said to show that in practice, in making preparations from herbaceous plants, we may consider the young vitally active parts in immediate contact with the leaves as not materially differing in activity from them, and that, consequently, they may be safely as well as economically used with them.

Again, a knowledge of the influence of solar light upon the process of assimilation shows us why plants, or parts of plants, when grown in the dark become blanched, and generally deficient in products and secretions; and the same fact explains why the secretions of plants are less perfectly or more sparingly formed in cold dull summers than in light sunny ones, and the consequent greater activity of medicinal plants in the latter seasons. The same cause also explains why plants of warmer regions than our own are commonly remarkable for the more powerful nature of their secretions; and also the reason why such plants when transported to this country and placed in our hot-houses can never be made, in consequence principally of the diminished intensity of light to which they are then exposed, to form their peculiar secretions. We see, also, the cause why such plants as Celery, Endive, Sea Kale, etc., which, when grown under natural conditions, are rank and unwholesome from the formation of their peculiar secretions, become, when cultivated under diminished light or in darkness, useful vegetables.

All the above facts are of great interest, as they have an important bearing upon the growth of plants and fruits for the table, as well as in a medicinal and economic point of view. At present, however, much remains to be discovered before we can be said to have anything like a satisfactory explanation of the causes which influence the formation of the secretions of plants; for it is found that the same plants when grown in different parts of Great Britain, where the climatal differences are not strikingly at variance, or even at the distance of a few miles, or in some cases a few yards, frequently vary much as regards the nature and activity of their peculiar secretions. A striking illustration of this fact is mentioned by Dr. Christison, who found that some Umbelliferous plants, as *Cicuta virosa* (Water Hemlock), and *Œnanthe crocata* (Hemlock Water Dropwort), which are poisonous in most districts of England, were innocuous when grown near Edinburgh. The causes which lead to such differences are at present obscure, but the varying conditions of soil, moisture, and exposure to air under which such plants are grown, have doubtless an important influence upon their secretions. In a pharmaceutical point of view, so far as the active properties of the various medicinal preparations obtained from plants are concerned, this modification in the secretions of plants by such causes is of much interest, and would amply repay investigation, for it cannot be doubted but that each plant will only form its proper secretions when grown under those circumstances which are natural to it, and that consequently any change from such conditions will modify in a corresponding degree the properties of the plant. I cannot but believe that here we have an explanation to some extent at least, of the cause of the varying strength of medicinal preparations obtained from plants grown in different parts of this country, or in different soils, etc.

If future experiments should demonstrate in a conclusive manner that wild plants are more active than those under cultivation, it will be necessary to ascertain what are the conditions of heat, light, exposure, soil, moisture, etc., which are most favourable to the full development of the medicinal properties of each plant, in order that the cultivator may place them, as far as he is able, under such conditions. Many of our medicinal plants are now employed so extensively, that they could not be obtained in any proportion to the demand for them from wild localities, and hence cultivation must be resorted to to keep up the necessary supply; we would urge therefore upon cultivators of medicinal plants to study to place the plants they cultivate, in as nearly as can be ascertained, their natural conditions of growth, and then we have no fear that their medicinal properties will be sensibly diminished; indeed, we see little reason to doubt, but that as our knowledge of vegetable physiology and chemistry increases, when the conditions under which the different secretions of each particular plant have been thoroughly investigated,—we may increase rather than diminish their active properties by proper cultivation.

The above facts have been often before alluded to by me, and I have urged upon the cultivators of medicinal plants and others, the great importance of paying more attention to them, but at present, with the exception of two interesting papers by Mr. T. P. Bruce Warren, read at the Bath and Birmingham meetings of this Conference, no recent investigations have occurred; the subject therefore is still comparatively an open one, and one which when thoroughly worked out must lead to most important results.

Many facts still crowd upon me which show how intimately the study of botany is connected with the practice of pharmacy, but I have now exhausted the time allowed for this address, and I can therefore only conclude with the hope that sufficient has been adduced to exhibit prominently the great advantages which must accrue to pharmaceutists generally from the diligent study of botany. That the liberal and enlightened founders and subsequent promoters of the Pharmaceutical Society were fully impressed with the importance of botany as a branch of the studies of a pharmaceutical student is sufficiently proved by their having made it an important branch of their curriculum of study, and of their examinations. The success of their endeavours in this respect is already becoming evident in the increased attention which is being directed to its study amongst pharmaceutists, and which a glance round this room would abundantly testify, but it is to the rising generation that we must look for the more perfect accomplishment of their efforts, and it has been with a view of forwarding so desirable an end that I have thought it advisable to make it the subject of my address as the President of the British Pharmaceutical Conference.

At the conclusion of his address the President expressed his cordial thanks, on behalf of himself and visitors from other towns, to the Local Committee, for the kind reception given to them, and for the systematic and complete arrangements which they had made for holding the Conference. The President said that they had all had an opportunity of judging how successfully one of the great features of the meeting, the Exhibition, had been carried out. He believed that Exhibition had originated with, and had been almost entirely carried out by, the Nottingham Committee. He must allude to one other matter before he concluded. They had before them the bust of one of the noblest, the most liberal, and the most unselfish of men that ever lived. It must be a great satisfaction to them—all more or less connected with the pharmaceutical profession—to know that that man was one of their own body. He was sure that all the members, especially the younger ones, would be pleased to have an opportunity of seeing the bust of the lamented Jacob Bell, and they were all much indebted to Mr. Hills for forwarding it to the Exhibition. He (the President) had enjoyed Mr. Bell's acquaintance for nearly twenty years, and he felt sure that had he been amongst them at the present time, no one would have taken greater interest than he in the proceedings of that Conference.

Mr. Carteighe (London) moved the best thanks of the meeting to the President for his able and interesting address. He thought that he had fully established the case he had laid down, of the necessity to the pharmaceutist of an adequate knowledge of the science of botany. Whatever limitations might be agreed upon to the extent to which its cultivation should be pushed, there could be no doubt that its study was an essential part of the education of our profession.

Mr. Lewis (Nottingham) seconded the motion, and expressed the pleasure which the members resident in Nottingham would feel in looking back upon such a gathering as now met in their town.

Mr. Ince (London) also supported the motion, which was warmly carried.

Mr. Atherton, the hon. local secretary, on behalf of his fellow-townsmen, expressed the pleasure they felt that their endeavours, as alluded to by the President, to promote the comfort and convenience of the members of the Conference, were held to be successful.

The President acknowledged the vote of thanks.

The reading of papers then commenced.

ON ACONITE.

BY THOS. B. GROVES, F.C.S.

Of the two questions relating to aconite, on which I have undertaken to report, the first is, "Does Aconite owe any of its activity to the volatile acrid body said to exist in it?" I cannot find that this acrid body *said* to exist in aconite has yet been isolated. Its existence has simply been *inferred* from certain circumstances observed in the pharmaceutical treatment of the plant, and from analogy.

M. Geiger was the first to start the theory that aconite owed its acridity to one body, its narcotic property to another; and affirmed that the former was easily destroyed, the latter not so easily. This ready destructibility is supposed by M. Geiger to be a sufficient reason for its non-production; but Mr. Wesse states that ordinary aconite, containing, as he also asserts, the two principles intimately combined, can be purified from the acrid principle by several solutions in acid and precipitations by alkali. He did not, however, succeed in isolating it. Query, whether he did not really, by this mode of procedure, simply lose the greater portion of the aconitine (which is well known to be soluble in 150 parts of cold water), leaving only the inert matter with which the commercial article is so largely contaminated.

Volatility has been accorded to this supposed acrid body, in consequence of the ready dissipation, as some have affirmed, of the activity of aconite by simple drying or by boiling in water. But Christison denies the former statement as regards *Aconitum Napellus*, asserting, on the contrary, that when carefully dried, either by water-bath or spontaneously, its activity is not much impaired; on the other hand, travellers report that the Swedes eat as a pot-herb one species of aconite when boiled. It seems to me that these views may have their origin solely in the ready destructibility of aconitine (a fact no one will gainsay who has occupied himself in its preparation), aided by the argument from analogy of some of the other *Ranunculaceæ*. The genera *Clematis*, *Anemone*, *Ranunculus*, furnish volatile, acrid, oily, or concrete bodies, which fairly represent the powers of the plants whence they are derived. Of these the *Anemonine* has been fully described, and its composition and reactions tolerably well ascertained; of the others little is known. None appear to be alkaline, but if otherwise than neutral inclined to acidity. They do not contain sulphur, and are comparable with the acrid principle of the *Arum* rather than that of the *Cruciferæ*.

My experiments on the question have been limited to distilling one batch of the plant and one of the fresh roots, my crops of aconite having been comparative failures. The simple distillation of the green plant with water having already been tried without result, I distilled mine with the addition of lime, for the purpose of isolating any basic body of a volatile nature, but held down by acid. The distillate I obtained was from the first distinctly alkaline, had an herbaceous flavour, but was quite limpid. The alkalinity continued during the whole course of the operation, which suggested to me a gradual decomposition rather than a simple elimination. The distillate neutralized with oxalic acid was carefully evaporated at a low temperature to a few ounces. It was then turbid and slightly coloured. It gave no indications of the presence of an alkaloid when tested by the usual reagents; and when redistilled with an excess of lime, in order to remove the little organic matter that had come over with the first distillate, it presented the characters of liquid ammonia pure and simple.

The distillation of the bruised roots was conducted in the usual way, water only being added. The distillate was neutral to test-paper, slightly opalescent, but entirely devoid of acridity. It of course smelt and tasted strongly of the plant. The liquid contained no alkaloid, but on applying the usual reagents it clearly manifested the presence of ammonia in minute quantity. It was therefore treated with an excess of pure carbonate of potash, and evaporated with the view of ascertaining the nature of the acid with which the ammonia was combined. When brought to a small bulk the carbonate was neutralized with sulphuric acid and rectified spirit added. The filtrate and precipitate, on examination, showed conclusively that no organic acid was present, but that the salt of ammonia was no other than the hydrochlorate in very minute quantity.

After drawing over sufficient distillate for the above purpose, milk of lime was added to the contents of the still. The distillate then assumed a different character, being decidedly alkaline, as in the case of the green parts of the plant, but the yield of ammonia was much greater.

Some experiments were made with the view of ascertaining if the ammonia could possibly have been derived from the decomposition of aconitine by lime. I found, however, that lime-water gave a distillate decidedly alkaline to test-paper, and that the introduction into the retort of a little aconitine made no appreciable difference. It is, moreover, to be remembered that the roots distilled without lime gave an ammoniacal, though neutral, distillate, and that the quantity of ammonia obtainable by the use of lime, though small, is far greater than could possibly be accounted for on the above supposition. The only principle other than aconitine that I am able to suggest as capable of accounting for the difference observed between the physiological action of aconitine and that of the dried root, is the acrid resin with which the roots may be said to abound. I have no doubt that body does exert an important action when applied topically. The loss of strength observed in drying aconite plants is doubtless due (as I have before said) to the very ready destructibility of the alkaloid aconitine.

My conclusion, "that *Aconitum Napellus* does *not* contain a volatile acrid body to which may be attributed a part of the poisonous effects of the plant," is one that I had anticipated, for the analogy of the other *Ranunculaceæ* seemed, in my opinion, to point that way. It is true, as some writers have insisted, that Anemone and Ranunculus furnish acrid volatile principles; it is no less true that they furnish nothing else of much activity. Aconite, on the other hand, has been long known to furnish the alkaloid aconitine—a body sufficiently acrid and energetic to account for the poisonous character of the plant; and it seems to me but probable that in Aconite it occupies the place which in Ranunculus and Anemone is filled by the volatile acrid bodies to which I have referred.

Aconitine.

Since the discovery of this alkaloid by Geiger and Wesse, in 1833, it has, from its extreme activity as a poison, and the great difficulty of obtaining it pure, much attracted the attention of pharmaceutists. As a *tour de force*, its preparation possessed a charm for me, so that during the last ten years or so I have made several attempts to obtain it.

Dr. Turnbull was one of the first to introduce it into the medical practice of this country, and himself published several processes for preparing it. The following is his first method,—expressly designed, one would imagine, for showing "how not to do it:"—

"Procure fresh roots of Aconite, dry, and powder; mix one part of root with two parts of spirit, and digest for seven days. The warm tincture filtered, carefully reduce it to a fluid extract. To it add Liquid Ammonia, but not too much, 'as in some instances the product appears to have been decomposed by inattention to this circumstance.' The precipitated mass is now boiled with Alcohol or Sulphuric Ether to remove the alkaloid, or treated with cold water to remove the extractive, etc., which last method the doctor prefers, in which case the residue is purified by solution in Alcohol. The light brown or grey powder thus obtained is extremely poisonous,—one-third of a grain caused the death of a guinea-pig in a few minutes."

This process was afterwards somewhat improved by adding cold water to the spiritous extract, filtering off the precipitated resin, and precipitating from the filtrate the alkaloid by ammonia. The purification is effected by washing repeatedly with cold water. The product is said to be white.

This modified form is very nearly that prescribed in P. L. 1826. The P. L. of 1851 entirely omitted both its description and preparation. It is not surprising to find that by following these methods the products of different laboratories were by no means alike, either in activity or chemical characteristics, whilst more frequently the alkaloid was altogether missed. Thence its preposterous price (3*s*. 6*d*. a grain), and the discredit, so uncertain yet at times so frightfully active an agent began to find attached to it. Thence, also, the contradictory accounts of writers on the subject, some affirming it to be crystallizable, others not so. Similar differences as to its effect on the pupil are not yet settled. The preparation of Mr. Morson is stated to be the only one to be relied upon for purity, but possibly this is not so true now as it was twenty years ago, when Dr. Pereira swallowed a full grain of a French so-called aconitine, without experiencing from it any effect whatever, whereas Mr. Morson's preparation had caused danger to a patient taking $\frac{1}{50}$th of a grain only. Dr. Von Planta, writing in 1850 of Merk's aconitine, found it contained both resinous and earthy matters.

A good deal has lately been written about the chemistry of aconite,—more, in fact, than I care to transcribe. I will, however, point out a very good process for preparing aconitine, devised by MM. Liégois and Wattot. It may be found at length in the forty-fourth volume of the 'Journal de Pharmacie et de Chimie.' It may be described shortly thus :—

"Macerate for eight days the coarsely-powdered root in sufficient rectified spirit, acidulated slightly with sulphuric acid; express, distil off the greater part of the spirit, and allow the liquid to cool; remove from its surface the floating oil and resin, continue the evaporation to a syrupy consistence, wash lightly with sulphuric ether to remove all traces of resin; add magnesia, agitate several times with sulphuric ether, to remove the alkaloid; evaporate the sulphuric ether, dissolve the residue in a slight excess of sulphuric acid, precipitate gradually by dilute ammonia, rejecting the first portions which are coloured. The latter portions are perfectly white, and, in the opinion of the inventors, respond to all the requirements of pure aconitine." This preparation, nevertheless, shows no tendency to crystallize, and hence differs from most of the aconitines of commerce, which more frequently than not are partly crystalline. It is said, also, to differ from them in possessing much greater activity. The medicinal dose has been fixed at half a milligramme = seventy-seven ten-thousandths of a grain.

The process for aconitine contained in the British Pharmacopœia is a great improvement on its predecessor, and with slight modifications would give fair results.

At the Exhibition of 1862 every pharmaceutist must have noticed with surprise and pleasure the magnificent specimen of aconitine in perfectly defined large crystals contributed by Mr. Morson. That fact must be admitted to have settled the question of crystallizability. Moreover, at the same Exhibition I showed small specimens of the same alkaloid crytallized in its free state, as hydrochlorate, hydriodate, and nitrate, which some two years before I had prepared by a process which I will proceed to explain, first observing that it is one of general application.

I prepare a strong tincture of aconite, by macerating for about a week 5 lb. of coarsely-powdered aconite root in 1 lb. of methylated spirit, acidulated with $2\frac{1}{2}$ oz. of strong hydrochloric acid. The materials being of less value than my time, I simply express the fluid (leaving about one-sixth in the marc unrecovered), add to it half a pint of water, and distil off the spirit. During the distillation the resin and oil gradually separate, leaving the basic matters in possession of the acid watery fluid left in the retort. It is poured from thence to an open basin, and the last traces of spirit chased off. When cool, the clear liquid is separated by pipette and filter from the thick oily mass floating on it. This operation requires both time and patience, but it is advisable to do it well, and completely purge the liquid of matters insoluble in acidulated water. To the clear liquid add a slight excess of a strong solution of iodohydrargyrate of potash; heat gradually the resulting thick creamy fluid to about 100°, stirring the while, and separate the concrete resinous mass that results. In this way I have got on the average an ounce of crude iodohydrargyrate, to decompose which is the next business. The best way to do this is to dissolve it in hot methylated spirit, and add a slight excess of nitrate of silver in hot watery solution. By this means the whole of the iodine is removed in the simplest way, but, it may be objected, not in the most economical, as a slight loss may be expected when the iodide transferred to the silver bottle arrives at its appointed time for reduction. The loss, however, is so small as not to be worth consideration when the process is followed on an experimental scale only. In the large way I should treat it first with sulphide of ammonium, then with acetate of lead. It is necessary to use both, as I find the lead alone removes only half the iodine, the remaining half interfering greatly with the subsequent operations. But by first removing the mercury as sulphide, and then using the lead, the liquid is completely cleared of that troublesome element. I could not at first understand the product I obtained by adding ammonia to the liquid containing the aconitine in the presence of iodine, and washing with sulphuric ether, nor at all comprehend why an alkali of some sort did not precipitate the alkaloid from such a solution. It appeared, however, that the hydriodate of aconitine is not decomposable by alkalies, and that when such a mixture is shaken with abundance of sulphuric ether the hydriodate in a pure state is the only thing taken up. An additional embarrassment is felt by the inutility of shaking the sulphuric ether holding the hydriodate in solution with acidulated water with the view of recovering the alkaloid as a muriate or nitrate.

To return from my digression. The liquid filtered from the iodide of silver contains now nitrates of mercury, of silver (in minute quantity), and of the alkaloid, and the latter may at once be obtained in a pure state by adding an excess of carbonate of potash, and washing two or three times with ether. But I prefer first removing the mercury by sulphuretted hydrogen, as it renders the washing with ether so much easier and neater. The ether evaporated or recovered by distillation leaves a residue of a pale brown colour, which is partly crystalline, partly translucent like a fused resin, and exhibits a strongly alkaline reaction. On the average I obtained of this rather more than ten grains per pound of root, or, making allowance for that remaining in the marc, twelve grains per pound.

The aconitine is then dissolved in water with a very slight excess of nitric acid, filtered, and set aside to crystallize. This it commences to do at once, one-half or thereabout of the aconitine being so obtainable. I find it crystallizes much more easily as nitrate than as sulphate or hydrochlorate. The crystalline form of the nitrate appears to be the rhombic prism, commonly with dihedral summits. They readily effloresce when heated, losing their transparency, as is the case with the specimen exhibited, which was accidentally exposed to the direct rays of the sun. The nitrate does not dissolve readily in cold water; from its solution in hot water it crystallizes with unusual facility.

Tried on the eye of a cat, it produced during the first half-hour no effect beyond irritation of the neighbouring membranes; after an hour it caused permanent dilatation of the pupil. Its colour-test reactions are neutral, nothing marked about them. It *is* precipitated by bichloride of platinum. From this nitrate the pure crystalline alkaloid is obtainable by the ordinary method—precipitation by ammonia and solution in spirit. It may be objected that this crystalline body is not aconitine. I can only say that it possesses in a high degree the poisonous properties of the root; for some years ago, not being in a position to repeat the experiment quoted by Orfila from Matthiolus, viz. the administration of Aconite to *four* highwaymen,—the mediæval response to the proverb "Fiat experimentum in corpore vili,"—I took a dog of medium size, and gave him $\frac{1}{40}$th of a grain of these crystals. He vomited within an hour after, foamed at the mouth, was purged, with great apparent irritation of the anus, but recovered sufficiently to have a second dose of $\frac{1}{20}$ grain a few days after, or the next day, I forget which. This, notwithstanding his great efforts to remove the poison from his stomach by vomiting, would certainly have killed him had I not interposed with emollient drinks and careful nursing. The crystalline variety of aconitine ought, I think, to be solely used for the internal administration of Aconite, superseding the present dangerous preparations of root and leaf which now are used so rarely because so unreliable. I would suggest for this purpose a powder of aconitine reduced with sugar of milk to a convenient degree, and also a watery solution with sufficient spirit to keep it from moulding. Half a grain to the ounce—about a thousandth part—would perhaps be a convenient proportion for each.

I ought not perhaps to omit to mention the discovery of Napellin, announced many years ago in the 'Écho Médicale de la Suisse.' It is described as differing from aconitine in being very sparingly soluble in ether, and not precipitable from acid solution by ammonia. I can only say I have never met with it.

I must say the same of Messrs. Smith's discovery of Narcotin in Aconite Root. I have not heard the discovery confirmed; and as nearly all the processes of late years adopted for the preparation of aconitine would serve equally well for the search for narcotin, as the latter body is also so readily distinguishable from the former by its splendid reaction with nitro-sulphuric acid, contrasting with the negative result, I cannot but think the case in which it is said to have occurred perfectly exceptional; in fact, were it announced from any other laboratory than that of Messrs. Smith, one would be tempted to ask whether or no, by accident or mischievous design, some narcotin had not been introduced into the aconite preparation.

The President remarked upon the highly interesting nature of the inquiry as to the existence of a volatile acrid principle in aconite, as had been so confidently asserted in some quarters. Mr. Groves's results appeared to set this matter at rest.

Mr. Giles thought that in speaking of the doses of the more potent alkaloids and other active principles, we should recognize how different were their actions upon different individuals. He had known half a grain of extract of belladonna produce all the symptoms of poisoning. The results of such idiosyncrasies should be borne in mind, and impressed upon physicians who prescribed the more active remedies.

Mr. Groves could not but reiterate the objections that he had already expressed to the use of galenical preparations of indefinite strength, consequent upon variations in the plants used.

NOTES ON IMPURITIES.

BY B. S. PROCTOR.

The following instances of impurity in articles used in pharmacy have casually come under notice during the past twelve months.

Treacle.

A lady having observed, with some alarm, that several of her children were passing black fæces, sought to know if it was the probable effect of some poison or some disease.

On making inquiry, the only unusual food they had had was treacle, and an examination of this showed the presence of iron in sufficient quantity to account for the effect observed. The quantity of iron was not determined, but the precipitated sulphide, on settling for several hours, occupied a space equal to the bulk of the treacle from which it had been precipitated.

A second sample of treacle, which had been purchased for pharmaceutical use, was compared with the above, and yielded a precipitate of sulphide of iron, of about half the bulk. No indication of lead was found in either.

Potash Water.

A sample of "potash water" from one of the best makers, having been objected to because it tasted of soda and not potash, was subjected to examination, and it was found, contrary to my expectation, that the palate of the consumer had given a correct judgment of its merits. "It was very good soda water, but contained no potash." The high position of the makers suggested a mistake in the labelling rather than a fraud, but former experience indicates that such mistakes are not uncommon; on referring to my notes, I find, in February, 1862, a hamper of "potash water" had been returned to us, the purchaser stating that "it tasted so strong of lime." On testing, it was found to contain only a trace of lime, but it was soda water instead of potash.

Another sample, purchased from the same makers (a local firm of good standing), was found to contain both potash and soda; excess of tartaric acid and the addition of alcohol having yielded a precipitate which gave a strong soda flame, till washed with alcohol, when the potash flame became equally distinct.

Spirit of Nitrous Ether.

Several commercial samples of spirit of nitrous ether having been examined by the Pharmacopœia tests and found wanting, further samples were obtained from two of the best makers, with the view of purchasing, if possible, a spirit of nitrous ether which would stand the Pharmacopœia tests; but, like the others, they were not found to yield any film of nitrous ether after agitation with twice their bulk of a saturated solution of chloride of calcium.

It is to be hoped the new edition of the Pharmacopœia will give a process for this preparation which, with ordinary care, will yield a product answering to the tests the Editors may see fit to append.

11, *Grey Street, Newcastle.*

REPORT ON THE "DRIED ALUM" OF COMMERCE.

BY MR. JOHN WATTS.

The "Alumen Exsiccatum" of the British Pharmacopœia, no longer possessing the composition assigned to it in that work, and being of little practical use in medicine, seems by its presence to clog the way, and to fill a space which a more useful and well-assured remedy would better occupy. However, in the opinion of some practitioners, "burnt alum" still holds its ground, and we frequently find, even now, lotions and collyria prescribed in which it forms the principal ingredient. To ascertain to some extent whether this opinion was well grounded, by examining into the composition and quality of the commercial article, and to see also whether that article corresponded with the one ordered in the British Pharmacopœia, the following analyses were undertaken.

To prepare "dried alum" the Pharmacopœia orders us to take pure potash alum, to ignite it till watery vapour ceases to be disengaged, and then to preserve the exsiccated residue. This seems all very plain, but unfortunately potash alum cannot in any way be obtained now as a commercial article; indeed I completely failed to procure a specimen to work upon, and was consequently obliged to prepare some specially by dissolving alumina in oil of vitriol, and adding an equivalent of potassic sulphate.

It is from the ammoniacal liquors of the gas-works that the alkali is obtained which now enters into the composition of alum; ammonia from this source is cheaper than potash, and answers here equally well: for the uses to which alum is put in the arts being solely for the sake of the alumina, it is obvious that the alkali present is comparatively immaterial. But even commercial ammonia alum is never perfectly pure; that is, it cannot be said to have the formula $Al_2O_3, 3SO_3 + NH_4O, SO_3 + 24HO$, which would give it a percentage composition of—

$$\begin{aligned} Al_2O_3, 3SO_3 &= 37{\cdot}78 \\ NH_4O, SO_3 &= 14{\cdot}56 \\ 24HO &= 47{\cdot}66 \\ \hline & 100{\cdot}00 \end{aligned}$$

For potash derived from natural sources is, in small quantity, nearly always present, amounting generally to about one or two per cent.; this is a well-known fact, and is proved also by what follows. The ammonia was estimated here, as well as in the subsequent analyses, by combustion with soda lime, and is shown as sulphate.

	Sulphate of ammonia.	Theory.
A.	1·1355 grm. gave ·136 = 11·97 per cent. . .	14·56
B.	1·4155 ,, ,, ·169 = 11·23 ,, ,, . .	14·56

These two samples were quite distinct.

"Potash" is easily recognized in a specimen, by adding chloride of ammonium and caustic ammonia to the solution of the alum in water, filtering off the precipitated alumina, evaporating to dryness, and igniting to get rid of ammoniacal salts; if there is any residue, it must be potash: by dissolving this in water and adding perchloride of platinum, its presence or absence is immediately ascertained. Dried alum then is, of course, always made from the ammonia variety, and five specimens were procured from different houses in order to ascertain the composition of the commercial article; they were quantitatively examined for ammonia and water, and qualitatively for potash: the results are given in percentages.

	HO	NH_4O, SO_3	KO, SO_3	Remarks.
I.	16·35	14·07	Present	Completely soluble in water, no opacity.
II.	38·92	None	None	Scarcely soluble in water all.
III.	45·51	10·57	Present	Partially soluble, solution presenting an opaque appearance.
IV.	37·86	6·29	Present	Solubility exceedingly slight.
V.	43·05	12·57	Present	Completely soluble, no opacity.

From this we see that the proportion of ammonia varies considerably in different specimens; in one case only does it nearly come up to the correct number, viz. 14·56 per cent., and as I happened to ascertain the history of that particular sample, I conclude, by the manner in which it was exsiccated, that the remaining 16 per cent. of water had never been driven off, for, having been kept in a stoppered bottle and rarely opened, it could not have reabsorbed the water from the atmosphere, as the other specimens had done;

the potash also in it was very minute. No. II. consisted entirely of basic sulphate of alumina, and was insoluble in water.

These results are, I think, about what one would expect when operating on ammonia alum. According as the heat used be more or less intense or long continued, so larger or smaller quantities of sulphate of ammonia will be volatilized, and one would not be surprised to find a carelessly prepared specimen consisting of little else than alumina.

Acting upon these considerations, I endeavoured to dry with the utmost care the sample previously noticed as "A," so as to see how much ammonia I could possibly retain, and yet deprive the alum of the whole of its water. It was therefore dried in an oil bath till it ceased to lose weight, and then carefully heated over an air flame in a platinum crucible; keeping it continually stirred, so as to prevent the lower portions becoming more heated than the upper layers. When it had lost $47\frac{1}{2}$ per cent. in weight the residual ammonia was determined:—

	After drying.		Before drying.
A. 2·4 grm. gave	10·1	. . .	11·97 per cent.

It had lost 1·87 per cent. of sulphate of ammonia.

In the previous analyses each specimen will be noticed to contain a large proportion of water. Now I do not in any case, except that of No. I., suppose this to be water of crystallization, but moisture which has been reabsorbed subsequent to exsiccation. Alum in this state is exceedingly hygroscopic.

Blücher mentions that "burnt alum exposed to the air in summer absorbs 18 atoms of water in 47 days, and the absorption does not cease even then." This also tends to upset the idea that, weight for weight, dried alum is much stronger than the crystalline. Soon after drying this may be the case, but in most instances they will be found of about the same strength.

The United States Pharmacopœia orders potash alum, but foreseeing that ammonia alum would be used, orders 450° F. to be the highest heat employed, and checks the operation when nearly all the water has been volatilized, as indicated by the weight of the residue. If potash alum be used, 474·5 grains should yield 258 of dry salt; that is, 4 per cent of water is to be left behind. This is evidently the proper way to prepare it: it prevents the loss of sulphate of ammonia, as well as of sulphuric acid from the alumina, and ensures at the same time uniformity of product, and solubility in water.

Burnt alum takes a long time to dissolve in water; in fact, when freshly prepared and anhydrous it is insoluble. Alum thrown into water immediately after it has been burned and become cool, remains almost entirely undissolved after many months; but if it has been previously exposed to the air for several days, it regains its peculiar taste and dissolves with ease.

We have seen, then, that dried alum always is, and probably now always will be, made from ammonia alum (the only potash alum now procurable being an entirely natural product obtained in the vicinity of Rome); that unless very great care be used in the application of heat, which should not exceed 450°, no two products will be alike; and further, that owing to the rapid re-absorption of water after preparation, it scarcely seems worth the trouble of previously exsiccating it. In fact, the only advantage that I can see possessed by dried alum over the crystalline variety, is that in its limited application as an escharotic to fungous ulcers it is in an amorphous state, and possibly less likely to irritate than angular fragments of crystals. It seems absurd to drive off the water and then to redissolve it again in water for use in lotions or similar applications.

57, Baker Street, Portman Square.

Mr. SUTTON (Norwich) confirmed the statement that certain samples of this salt were insoluble from being so completely deprived of water, and recovered their solubility in some days by the absorption of water of crystallization.

Mr. DEANE and Dr. ATTFIELD spoke strongly against the retention of this inconvenient and irregular preparation. It caused annoyance to the dispenser, who could not tell whether it would prove soluble or not, and it did not appear to have a single merit.

EXPERIMENTS ON THE ACTIVE PRINCIPLE OF HYOSCYAMUS.

BY WILLIAM A. TILDEN, F.C.S.

The plants of the Natural Order *Solanaceæ*, to which the *Hyoscyamus* belongs, present in general well-marked narcotic properties, and their active principles have, for the most part, been pretty completely studied. Henbane, however, seems to have been comparatively neglected, notwithstanding that it is in common and extensive use in the form of extract and tincture. It was on this account that I undertook some experiments upon the chemistry of this plant, hoping to have been able to establish the existence or non-existence of the alkaloid it was said to contain, and, if possible, to add to our existing knowledge by submitting the base itself and some of its compounds to analysis. The former is the only part of my original intention that hitherto I have been able to carry out. Either from the excessively minute quantity of the principle contained in the plant, or from its facility of decomposition when under the influence of chemical agents, I have been able to prepare at present a quantity only sufficient for its identification, and for making out some of its principal reactions.

I first of all attempted to prepare "hyoscyamine" by operating upon the seeds of *Hyoscyamus niger* by the process adopted by Geiger, and described in the fourth volume of Gerhardt's 'Chimie Organique.' In this manner, however, I obtained only equivocal results. I then made another experiment upon the seeds, employing the process recommended by Sonnenschein for the detection and elimination of organic bases. This process is briefly as follows: —The juice of the plant is collected, acidified with sulphuric acid, and heated to coagulate albuminous matter, or an extract is prepared by means of acidulated alcohol or water; by either plan a liquid is obtained, which is evaporated to a small bulk, allowed to stand, if necessary again filtered, and then mixed with excess of the acid mixture of phosphate and molybdate of sodium, for the preparation of which directions are given.

A precipitate is formed which contains the base in combination with the "phospho-molybdic" acid; it is collected, slightly washed, introduced still moist into a flask, and excess of caustic baryta added; a cork is then fitted, and heat applied. Should volatile bases be present, they are distilled into a set of bulbs containing dilute hydrochloric acid.

The non-volatile bases which remain are afterwards obtained by rendering the excess of baryta insoluble by a stream of carbonic acid, and then extracting with alcohol, which gives a solution of the base nearly in a state of purity. Here, again, I was unsuccessful, possibly because the hyoscyamine was altered by the caustic earth, with evolution of ammonia, a kind of change to which it is very subject.

I next procured a quantity of freshly-prepared extract of the leaf, which was kindly furnished me from one of the first pharmaceutical establishments in London. Half a pound of this extract (corresponding to about 14 lb. of the leaves) was dissolved in about three pints of water, mixed with a very small quantity of milk of lime, and filtered; to the clear liquid was then added carbonate of potash till it was strongly alkaline, and the whole thoroughly agitated with about a pint of chloroform. After standing all night, the chloroform subsided as a slightly greenish oil, which was separated by a funnel, filtered into a bottle, shaken up with some water acidulated with sulphuric acid, and then the chloroform recovered. This aqueous liquid gave an abundant precipitate with Sonnenschein's reagent: it was rendered alkaline with carbonate of potash, and shaken up with ether. The ethereal solution contained all the base, as was indicated by the fact that the aqueous portion, upon reacidification, no longer gave a precipitate with the phosphomolybdate. The ether, which was colourless, was then shaken up with acidulated water, and the whole distilled in a water-bath. The acid solution remaining gave an abundant yellowish precipitate with Sonnenschein's reagent; neutralized with bicarbonate of soda, a dirty white precipitate with tannin, soluble in acetic acid; a yellow flocculent precipitate with chloride of gold: a brown precipitate with solution of iodine in hydriodic acid; an orange-yellow precipitate with protochloride of iodine; no precipitate, however, was observable either with perchloride of platinum or with solution of corrosive sublimate.

The base itself is a substance very soluble in alcohol, ether, chloroform, and even in water. Its aqueous solution possesses a strong acrid and bitter taste, and when suffered to evaporate spontaneously over oil of vitriol, has been observed to crystallize in radiating groups of needles, though this is not always the case, and it is generally obtained as a colourless gummy mass. It has a slight odour quite different from that of the plant, and is very decidedly alkaline to test-paper. Caustic alkalies destroy it rapidly, especially on application of heat, the solution becoming brown, and an alkaline vapour, probably ammonia, being evolved. Several of the characters here described agree with those given by Geiger, and mentioned in the 'Organic Chemistry' of Gerhardt.

Mr. Groves had made some experiments upon this alkaloid a few years since. His method of operation had differed from the author's. He boiled the leaves of hyoscyamus with olive-oil, and then agitated the product with hydrochloric acid and water. From this he obtained a small quantity of a liquid principle with alkaline properties, which he regarded as the active constituent of this drug.

Dr. Attfield thought that after this statement we must recognize two principles as being present.

Mr. Reynolds suggested that the root should be used in future experiments.

Mr. Sutton alluded to Professor Donovan's experiments as showing that the tincture of henbane was an inert preparation. He had swallowed it in doses of half an ounce without finding any inconvenience.

The President remarked that the physiological question could not be followed far in that room, from its merging into considerations that were more within the province of the physician.

Mr. Deane gave it as his opinion that the sedative effects of even small doses of henbane were beyond doubt in many cases, and he could not help thinking that some peculiar circumstances must have influenced the cases in which very large doses had been taken with impunity.

Mr. Carteighe had made some preliminary experiments on the active principle of henbane, and as far as they went they confirmed Mr. Tilden's results.

ON SYRUP OF PHOSPHATE OF IRON.

BY CHARLES UMNEY, F.C.S.

Syrup of phosphate of iron was first introduced to the profession as a remedial agent, in 1851, by Dr. Routh, in a communication to the Medical Society; its mode of preparation was subsequently given by Mr. Greenish, at a meeting of the Pharmaceutical Society.

Dr. Routh's process for the formation of the syrup consisted in first making superphosphate of iron, by dissolving phosphate of iron in boiling metaphosphoric acid, and of this salt making a syrup. The syrup, however, when made in this manner, was found to be an unsatisfactory preparation, yet it continued to be prescribed until 1860, when the subject was investigated by Mr. S. Gale, whose successful experiments resulted in the production of a syrup uniform in strength and in the main satisfactory. It was from his formula that that of the British Pharmacopœia was framed. But the preparation in question has been found to gain a reddish colour by age, which renders it unsightly, and possibly less efficacious. It was to ascertain the cause, and, if possible, to prevent this change, that I made the following experiments.

The first opinion one would naturally form would be, that the change of the syrup from white to reddish-brown was due to the partial or entire peroxidation of the iron present, and that the component parts of the syrup had possibly had a material influence in either setting up or assisting this decomposition. The only bodies present in the syrup being phosphoric acid and sugar, the latter probably would be the body taking any part in setting up a direct change; as phosphoric acid is one of the most stable acids, and not likely under such circumstances to become reduced and impart its oxygen to the protosalt of iron. The supposed influences most likely to aid in peroxidation or formation of other bodies, would be air and light.

With these hypotheses as a starting-point, my experiments were conducted with a view, if possible, to prove that such suppositions were not unfounded, but really existed. I accordingly made the syrup according to the British Pharm. formula, taking care to well wash the precipitated phosphate of iron, at the same time avoiding exposing it to the air any more than necessary. The syrup being colourless and transparent, I placed it in selected bottles of dark blue and also of a light green colour; these were arranged as follows, and any change undergone by them was carefully noted through a period of five months:—

(*a*) One of each of the coloured bottles was placed in the light of an ordinary window (with a north-eastern aspect), being quite full to the cork.

The change in colour was very slight; the syrup in the green bottle, however, seemed to be much darker than that in the blue: upon testing it I found oxidation had taken place to the extent of 13·9 per cent. in the green, but in the blue only very slightly.

(*b*) Two corresponding ones were also upon a roof, exposed to the direct rays of the sun.

These had not gained colour even in five months, neither was there a perceptible difference between the blue and the green: upon testing these oxidation was found to have taken place only slightly. From this it would seem that direct light exerted somewhat less influence over the syrup than the light transmitted through the window.

(*c*) A bottle was also enveloped in dark blue paper.

This was scarcely altered, and had become to a small degree only oxidized.

(*d*) Two bottles (blue and green) were half-filled with syrup, and placed facing the window as before.

Both these had changed into a reddish-brown colour, and had thrown down a precipitate which, on examination, proved to be phosphate of iron. Oxidation had taken place to the extent of 61 per cent., but in the blue to 23 per cent. only. Having noted the change in this latter syrup, and seeing that it had altered to such a great extent, whilst the others had only so slightly, I attributed it to the effect the atmospheric oxygen had upon the iron, as the bottles were only half-filled when placed for observation. To confirm this—

(*e*) A small quantity of syrup was put into a bottle, and the bottle filled with oxygen.

After seven days had elapsed, it was as dark in colour as the previous syrup exposed for five months. To confirm this by taking its opposite—

(*f*) A bottle containing a small quantity of syrup was filled with carbonic acid.

This prevented the oxidation to a very great extent. I had then clearly made out one cause at least of change. I then sought to determine whether the phosphoric acid exerted any action upon the sugar.

(*g*) A syrup of the phosphoric acid and sugar was made without the iron, and bottles were filled and placed under similar influences as with the iron syrup previously remarked upon.

These I found had not only gained colour, but an action had set up such as I anticipated, namely, grape sugar had been formed by the action of the phosphoric acid upon the sugar. The bottles, however, of this syrup which were half-filled, corresponded in colour to those filled to the cork. It was therefore evident that air had not produced the change in colour.

(*h*) A syrup of iron, acid, and grape sugar was made, and bottles placed in the various positions as before.

These remained unchanged, or at least nearly so, except in those half-full.

(*i*) A solution of phosphate of iron in the phosphoric acid was also made without the addition of sugar.

This merely deposited phosphate of iron, but did not gain colour.

(*k*) The same series of experiments were also tried upon a compound of iron, acid, and glycerine.

This apparently was less liable to change than any of the preceding syrups, whether of cane or grape sugar, either with or without the iron.

These experiments prove:—that the main cause of change in syr. ferri phosph. from a white to a reddish colour, is chiefly due to exposure to air (exp. *d*, *e*, *f*); or, in other words, to being kept in bottles only partially fitted; that this effect is somewhat influenced by light (exp. *a*, *d*), apparent from the syrup in the green bottle having become oxidized 38 per cent. more than that in the dark blue bottle, and that oxidation is promoted, colour produced, and no doubt with it chemical action upon the iron effected, by the conversion of the cane into grape sugar (exp. *g*).

This may be seen from the fact that the liquor of acid and iron only decomposes but slightly (exp. *i*), depositing a small quantity of phosphate of iron; it does not, however, gain colour even in nine or twelve months.

To entirely prevent change is a difficult task, as it has been shown that the bodies themselves forming the syrup, even when placed under the most favourable circumstances, act upon each other, viz. the acid upon the sugar, and the air, sugar, and light upon the iron.

For the better preservation of this syrup, I should suggest that it be kept in bottles of convenient size for use, so that after use the bottle may not be left partially filled, thereby, perhaps, exposing it for some time to the action of the air contained in the bottle.

That part of the process for the production of the syrup, which occupies the most time, is washing and draining the precipitated phosphate of iron; it is therefore desirable to do this as seldom as possible,—consistent, that is, with the final production of the compound in the state it is intended. If, therefore, it is known that the preparation, when made, will have to be kept long, it would be preferable to preserve it in the state of liquor, making from it the syrup in small quantity or in such quantity that will last but a short time, adding the sugar in powder in the cold, and allowing it to dissolve, when the syrup will be complete, and far superior in colour to syrup kept for three months, even if the liquor from which it has been made has been preserved for many months.

40, *Aldersgate Street, London.*

Mr. Stoddart thought that this preparation was in its very nature an anomaly—in fact, a compound contrary to all laws of nature. The action of phosphoric acid and other acids upon solution of sugar, when more or less heated, was known, and yet we were employing such a mixture in a case where stability was essential.

Mr. Heathfield referred the change of colour to the presence of traces of nitric acid in the phosphoric acid, due to its mode of preparation by the plan formerly in the Pharmacopœia. When the syrupy phosphoric acid prepared by the combustion of phosphorus was used, the syrup being dense and solution effected in the cold, he believed that change would very seldom occur.

Mr. Baldock attributed great importance to the preparation of the precipitated phosphate of iron, which should be dense when its washing was more readily effected. He advised that the sulphate of iron and phosphate of soda should be fused together in their water of crystallization, when this dense precipitate would be obtained, and might be dissolved in syrupy phosphoric acid, and mixed with the cold solution of sugar.

Mr. Giles acknowledged the valuable remarks of the last two speakers. He also pointed out that the experiments of the author upon presumed "non-actinic" bottles of blue glass were not conclusive, since such glass had not the qualities assumed.

Mr. Rimmington corroborated Mr. Heathfield's statement as to the presence of nitric acid in commercial phosphoric acid. He was in the habit of removing this by heating it with starch or sugar.

Mr. Reynolds remarked upon the irregularity of the decomposition complained of, as supporting Mr. Heathfield's view that some impurity, variable in its amount, was the cause. He differed from some previous speakers as to a dense syrup being more stable, and had found, on the other hand, that the more dense syrups threw down the white insoluble precipitate sooner than weaker ones. He suggested that this syrup might properly be coloured by cochineal, as was Parrish's chemical food.

Mr. Deane also favoured the use of a weak syrup.

ON VALERIANATE OF IRON.

BY FRANCIS SUTTON, F.C.S., NORWICH.

More than two years have passed since I accepted the subject of Valerianates for investigation, but owing to pressure of other business matters I have been until now unable to present any report thereon. That which I now have the honour to present to the Conference is not nearly so complete as I could wish.

With respect to valerianate of iron, the question proposed was—

What is the best process for the preparation of the salt? What are its characters? How may its purity be best ascertained?

We will first take into consideration the characteristics of the salt as described by previous authorities.

Pereira says, "Valerianate of iron, prepared according to the Dublin College, is a tile-red loose amorphous powder, with a faint odour and taste of valerianic acid. When heated it first fuses, then evolves its acid, and is converted into sesquioxide of iron. At a temperature of 212° it gives out part of its acid; it is nearly insoluble in water, does not mix well with cold water, but repels it like lycopodium, and boiling water gradually extracts the acid from it. It dissolves in alcohol and acids."

Wittstein, who seems to have given some attention to the subject, says:—"The valerianate of peroxide of iron obtained by precipitation is a dark brick-red loose amorphous powder, smelling and tasting faintly of valerianic acid; it will not mix with cold water even when rubbed continuously with it, but is instantly wetted by warm water, and gives up a portion of its acid to it." The same authority says:—"The affinity between the oxide of iron and valerianic acid is so feeble that a gentle heat will suffice to abstract the greater portion of the acid, consequently the precipitation should only take place in the cold. Even continued treatment with cold water gradually abstracts the acid, and at the same time removes a little of the oxide of iron, so that the precipitate must not be washed as long as the water passing off has an acid reaction."

The descriptions of the salt here given agree pretty closely with the preparation as met with in commerce, with the exception of the solubility in alcohol. Although I have examined about a dozen specimens procured from various houses in London, and some in the provinces, I have found none, with the exception of a specimen sent me by an esteemed member of this Conference, Mr. Daniel Hanbury, which would dissolve in any appreciable proportion in alcohol.

The bulk of the samples examined consisted mainly of peroxide of iron, with small quantities of valerianic acid in the compound. No two preparations were precisely alike in composition, owing no doubt to the fact that as prepared in the way usually directed, and dried by artificial heat, the loss of valerianic acid was considerable.

The specimen sent me by Mr. Hanbury was in the form of a soft extract, smelling very strongly of valerianic acid, and of a transparent ruby colour,—agreeing, in fact, precisely with a specimen I had myself prepared some months previously, but had not been able, owing to business engagements, to investigate. It is best, perhaps, here to say that when following the usual directions for preparing the salt, I had invariably obtained the brick-red powder described by Pereira and Wittstein.

About three weeks ago I resolved to make a closer examination of these two preparations of valerianate of iron, namely, Mr. Hanbury's and my own, in order to see wherein they differed from the powdery kind usually found in the market. As they were both found to be identical in composition eventually, the description of one of them will suffice. I will describe the sample sent by Mr. Hanbury.

A small quantity of it was spread out thinly upon the lid of a platinum basin and weighed. The quantity was 13·42 grains; the first thing to be done with it was to remove any excess of moisture in the compound. Fearing that heat might dissipate some of the valerianic acid, the vessel was placed under the receiver of a large air-pump, together with a dish of sulphuric acid, and kept in vacuo for twenty-four hours, when the loss was found to be 2·7 grains, equal to 20 per cent. It was then exposed to the same influences twelve hours longer, but with no further loss. In order to ascertain whether any acid would be lost by artificial heat, it was then transferred to a water-bath, and kept at a temperature of 212° until the weight remained constant; the loss was then 3·41 grains, or very nearly 25 per cent., but no change had taken place in the appearance of the substance, and no apparent loss of acid by smell or otherwise. It had now lost all stickiness and become quite firm, so that it might readily be chipped off the vessel in thin transparent scales, like the usual citrate or tartrate of iron. A few of these scales were treated with alcohol, and were found to dissolve readily to a clear deep ruby liquid, but they were quite insoluble in water, and if water is added to the alcoholic solution the valerianate is immediately precipitated.

A quantity of the dry scales, weighing 9·1 grains, were then gently heated over a gas lamp, when they immediately began to melt, and give off copious fumes of valerianic acid, which readily ignited and gave a yellow brilliant flame. The residue, which appeared to consist of oxide of iron, weighed 2·31 grains; this was dissolved in a little hydrochloric acid, and the oxide of iron precipitated with ammonia. The weight of precipitate so obtained was 2·03 grains; the loss of weight between this and the ignited residue was due to sulphate of soda not thoroughly washed out of the valerianate.

I had no time to ascertain the quantity of valerianic acid actually present in the salt; but assuming that the loss from ignition was due to this acid alone, the formula of the salt would be as near as possible $Fe_2O_3+3\,Va$, or a neutral anhydrous valerianate of peroxide of iron, containing three equivalents of valerianic acid$=279$, and one equivalent of oxide of iron$=80$; and this is the formula given by Wittstein, but which he says he was not able to produce, his explanation being as follows:—"If a neutral solution of valerianate of soda is added to one of perchloride or any persalt of iron, a dark brick-red precipitate of valerianate of iron is formed, together with a sulphate or chloride of sodium, according to whichever iron salt has been used. In the case of perchloride of iron—

$$3 \text{ atoms } NaO+Va \text{ and } 1 \text{ atom } Fe_2Cl_3$$

form

$$1 \text{ atom } Fe_2O_3+3Va \text{ and } 3 \text{ atoms } NaCl.$$

The neutral compound of valerianic acid described above does not, however, precipitate," he goes on to say, "but decomposes as soon as formed into a basic salt, in which, if the formula of the neutral salt is tripled, two atoms of acid are replaced by two atoms of water, forming a salt $3Fe_2O_3+7Va+2HO$ and free valerianic acid, which, holding a portion of the basic salt in solution, gives to the supernatant liquor a slightly yellowish-red colour." This basic salt is therefore the substance generally found in commerce, and I suppose is the only valerianate of iron which it has been hitherto thought could be obtained. The neutral valerianate is in ruby scales, will dissolve in its own weight of alcohol, and will bear heating to a temperature of 212° without decomposition. Not only in these respects but in appearance it differs completely from the brick-red powder hitherto known to us, and I doubt not will be found a much more reliable article for medicinal use.

The next question for our consideration is the preparation of the salt, and herein seems to lie the secret of the difference between one salt and the other. My experiments in this matter have not been so extensive as I could wish, but so far as they go they seem to show that the use of dilute solutions of valerianate of soda and iron necessitate the production of the basic salt, and *vice versâ*, with concentrated solutions. Another thing is of great importance, namely, that the valerianate of soda used should be entirely free from carbonate or caustic soda, a thing of rare occurrence with the usual commercial article apparently, more especially the carbonate; this may be known at once by its solution effervescing with an acid. If the valerianate of soda is contaminated in this way, the result obtained is unsatisfactory, owing to the admixture of hydrated oxide of iron.

Mr. Hanbury, in writing to me respecting the preparation of the salt, says: "We prepare it by decomposing a strong solution of persulphate of iron by one of valerianate of soda. Upon mixing the solutions a copious precipitate of an extractiform substance of a brick-red colour is formed, with which is mixed a considerable quantity of sulphate of soda in small crystals. The precipitate is easily washed by kneading it in distilled water until the latter almost ceases to be affected by a solution of baryta. The resulting product requires no drying beyond the pouring off, as far as possible, of the water which somewhat gradually exudes from the mass; it remains in the form of a soft extract, which becomes harder after some months. We never attempt to dry it."

The method I have adopted myself in preparing the specimen now before you is, to take any convenient quantity of valerianic acid which is to be exactly saturated with a concentrated solution of carbonate of soda, heating the mixture in a water bath so as to dispel all the carbonic acid; the fluid is then suffered to cool and into it is poured, as long as any precipitate is produced, the liquor ferri persulphas of the British Pharmacopœia,—about the same quantity by measure is required of the iron solution as has been used of valerianic acid; after some little mixing with a glass rod the precipitate settles down into a semi-fluid extract, which may be repeatedly washed with distilled water by a sort of kneading process, until the sulphate of soda is entirely removed; it is then spread out as thinly as possible upon glass or porcelain plates, and suffered to dry either by simple exposure to the air or by a gentle heat, then chipped off and preserved in bottles. The salt so obtained is not in the slightest degree deliquescent.

The best test of its purity is its complete insolubility in water and the ease with which it dissolves in spirit of wine.

Valerianate of Zinc.

The question proposed for solution in the list of subjects now under the notice of the Conference in connection with this substance is:—Describe an easy method of determining the purity of valerianate of zinc as found in commerce? In answer to this, I wish to say that I have not had time to carry out any great number of experiments on the subject, but I find that pure valerianate of zinc dissolves readily in a dilute solution of citric or tartaric acid, without separation of the valerianic acid, as is the case when sulphuric or hydrochloric acid are used. Oxide of zinc is insoluble in dilute vegetable acids, so that supposing a sample were tested which had been made by rubbing up valerianic acid with oxide of zinc, the specimen would remain insoluble. If acetate of zinc had been used as a substitute, this would dissolve, but it would also dissolve in water. Therefore, if a specimen is tested and found to be insoluble in water but dissolves pretty readily in a cold weak solution of citric or tartaric acid, we may infer that the preparation is pure.

A Member remarked that he had been told by a manufacturer that it was a common practice to prepare valerianates of iron or of zinc, and then to add a further portion of the oxides of those metals.

CHLORATE OF QUININE.*

BY CHARLES R. C. TICHBORNE, F.C.S., ETC.

We have determined upon bringing before the British Pharmaceutical Conference, a *résumé* of our experiments upon what promises to be one of the most useful of the quinine salts.

The chlorates and perchlorates of the organic bases have not been so far much investigated, although some of them seem stable compounds, easily crystallized, and are, many of them, of great beauty.

Composition.—This point was determined (as regards the neutral salt) by the estimation of each component,—each serving as a check upon the other. The results may be formulated as follows:—

$$4\,(C_{20}H_{24}N_2O_2, HClO_3)\,7\,H_2O.$$

The centesimal composition being:—

		Theory.	Practice.
Quinine		73·65	73·9
$HClO_3$	H	·23	
	Cl	8·07	8·04
	O	10·90	10·53
HO		7·15	7·18
		100·	

The above analysis was made, of the salt, after drying twenty-four hours over sulphuric acid or well-dried in the air. On continuing the drying over sulphuric acid, it gradually lost nearly the whole of the water. The loss of water at 100° C. was constant.

The quinine was estimated by Professor Jelletts, with the aid of his saccharometer. We may remark that the accurate estimation of quinine can only be accomplished in the above manner, or by the combustion of the carbon,—it having been lately pointed out that even the determination of the nitrogen cannot be relied on.

Chemical and Physical Properties.—Chlorate of quinine presents many of the characteristics of the alkaline chlorates, only in a less marked degree. When pure, it crystallizes from a watery solution, in small mushroom-shaped masses, which, on examination, are found to consist of filiform snowy-white crystals. Some chemical salts, and many well-known minerals, are found to take this character. They present the appearance of an amorphous mamillated exterior, perfectly devoid of crystalline structure, yet, when broken through, are found to consist of exquisite geometrical forms, which are produced by needles or prisms radiating from some axis or point towards the amorphous circumference. The beautiful and well-known mineral wavellite may be cited as a specimen of this characteristic crystallization. Many of the quinine salts present the same peculiarity, and none more so than the chlorate. When a boiling solution of *pure* chlorate of quinine is allowed to

* Chlorate of quinine was made at the request of Dr. Lyons for some experiments performed at the Whitworth hospitals, Dublin, in connection with two or three cases of "Black Death." It has since been employed by that gentleman with great success as a new febrifuge. *Vide* Dr. Lyon's Clinique, 'Medical Press and Circular,' vol. i. p. 653. In its therapeutical effects, it must be borne in mind that the particular advantage that it possesses over the other salts of quinine, is supposed to arise from the fact, that over ten per cent. of the salt assimilated is available oxygen, and that from the fact of its being a chlorate of an organic base, it will be a more probable yielder of oxygen to the system than such a salt as chlorate of potassium.

cool, the solution becomes quite milky, not, as might at first sight be supposed, from a deposition of minute crystals; but, as the microscope shows, by the deposition of the salt in the form of oily globules, which, on cooling, become vitreous balls, then in a short time change to fine filiform masses of crystals. In this form the salt is again deposited upon the outside periphery of the mass, in an amorphous condition; but at the same time becoming crystalline in the interior, as the process continues. A slide from which micro-photographs were procured, by Mr. J. Woodworth, was produced by allowing the solution of chlorate of quinine to cool slowly upon the glass, and when the globules were sufficiently collected to dry rapidly under the receiver of an air-pump; by this means the chlorate was retained in its vitreous condition, otherwise it became crystallized. The globules seemed to arrange themselves in a symmetrical form, so much so as to produce a rather pretty microscopic object, each large globule being surrounded by a series of small beads. The vitreous quinine does not polarize, whilst the crystalline does. When the amorphous salt is once dried, it retains that character permanently, but on submerging it in a cold saturated solution of the salt, it very slowly and imperfectly regains its crystalline form.

When the mushroom-shaped masses are broken up, they resemble the ordinary salts of quinine in appearance.

The chlorate crystallizes readily from spirit, in which it is very soluble; the solution gives a salt retaining the same number of atoms of water of hydration. Heated gently upon a spatula, it gradually melts, and, after a little time, goes off with a vivid combustion, which sometimes amounts to explosive violence. The combustion is generally attended with a cloud of carbon, a carbonaceous residue being also left upon the spatula. Treated with hydrochloric acid and gently warmed, it evolves chlorine. On adding ammonia in excess to this mixture, a green colour is developed. It is very soluble in boiling-water, and soluble in 78·5 parts of cold (15·5° C.). It is also very soluble in water acidulated with the stronger acids, including perchloric.*

It crystallizes much more readily from its solution if it is impure, viz. if it contains a trace of sulphate or hydrochlorate, the crystals in each case retaining the character of the impurity.

Tests.—Chlorate of quinine, when dissolved in water and acidulated with nitric acid, should give no precipitate with chloride of barium, and none, or only a faint opalescence with nitrate of silver. It should give no precipitate with diluted sulphuric acid, the ordinary tests for quinine being applicable to the base. It is always necessary to ignite a portion which should leave no appreciable residue. A sample of the so-called chloride of quinine, submitted to us, consisted of chlorate of potassium and sulphate of quinine.

Process for making Chlorate of Quinine.—The following process and precautions have been adopted by the writer in the manufacture of this preparation:—310 grains of chlorate of barium are dissolved in a small quantity of boiling water, 2 ounces of Howard's sulphate of quinine are mixed with about 12 ounces of hot water, at a temperature of about 90° C., in a porcelain dish. Double decomposition takes place immediately on mixing the two solutions.

$$2\,(2\,C_{20}H_{24}N_2O_2, H_2SO_4)\,15\,H_2O + 2\,(2\,BaClO_3, H_2O) - 10\,H_2O = \\ 4\,C_{20}H_{24}N_2O_2, HClO_3)\,7\,H_2O + 2\,Ba_2SO_4.$$

It is intended that so far there should be a slight excess of sulphate of

* For the internal administration of this salt, it is soluble enough in water (probably the most efficacious method of exhibiting it). It is incompatible with the mineral acids, as they form the ordinary salts of quinine; it is for this reason that Dr. Lyons has hitherto prescribed it in conjunction with perchloric acid, itself a valuable oxidizer.

quinine to ensure the precipitation of all the barium. This excess is evidenced by a slight scum, consisting of crystals of the undecomposed sulphate, floating upon the surface of the liquor. The dish is then transferred to the lamp and precipitated carbonate of barium added whilst stirring, and in small proportions, until the last trace of sulphate is decomposed and the *crystals are replaced by a fine oily pellicle.* This simple index serves to point out a state of absolute purity as regards the liquor, providing that the salts used are pure, *i.e.* it will be found to contain neither sulphuric acid nor barium. The mother-liquor, evaporated over a water-bath, yields a further crop of crystals. The crystals should be air-dried or dried at a gentle heat. These is none, or, under certain circumstances, only a partial decomposition between sulphate of quinine and chlorate of potassium. Indeed, a solution of sulphate of potassium is capable of decomposing chlorate of quinine.*

(*End of First Day's Sittings.*)

SECOND SITTING.

Wednesday, August 22nd, 10.30 A.M.

PHARMACEUTICAL ETHICS.

BY MR. JOSEPH INCE,

ASSOCIATE OF KING'S COLLEGE, LONDON.

"*Ethics.* The doctrines of morality, or social manners, the science of moral philosophy, which teaches men their duty and the reasons of it; a system of moral principles and rules for regulating the actions and manners of men in society."—*Caird.*

Certain ethical practices which result in social virtues are common to humanity—such are prudence, diligence, punctuality, honesty, sobriety, with other kindred excellences. It would upset the moral government of the world to live without them.

Those who would go to the root of this subject have only to turn to the pages of Aristotle's 'Ethics,' that marvellous book which has for centuries moulded the world's thought; that book which consciously or unconsciously has acted on the mind of every man in this Association—that true book, for it is one before which the profoundest scholar bows with reverence, and one which may form the never-wearying delight of the humblest apprentice in Nottingham.

It is assumed at once that the Pharmaceutist knows and practises these true ethical principles: it is taken for granted that he, neither more nor less than those around him, must regulate his conduct by the observance of accepted ethical laws; and therefore, while thanking many in this Conference, whose advice has most liberally branched out in that direction, I am compelled to dismiss this section of the subject altogether, and I must sum it up in an old Latin motto which has been kindly forwarded by my valued friend Mr. William Huskisson: "Pietas, scientia, temperantia, vigilantia, et studium assiduum ornant pharmacopœum."

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* From this reason, physiologists might imagine that by giving sulphate of quinine and chlorate of potassium in solution together, the same therapeutical result would be obtained as by giving chlorate of quinine, but it will be seen that in this case the oxygen acid would not be combined with the organic alkaloid.

But while there are ethics which concern humanity in general, there are others which belong specially to pharmacy. I confess I have felt no small difficulty in constructing the framework of this essay. There is a great danger of crowding the main theme with details, useful and important in themselves, but relatively of minor interest.

I have preferred assigning to these a stated place so as to give connection to the thought, but leaving them with little, or even with no description; and I have done this of set purpose, in order that a few grand ethical principles which materially concern us should be prominently brought forward.

Let me introduce the subject by some remarks on—

Section I.

THE ETHICS OF THE SHOP.

Pharmacy is a trade. When a man buys goods at one price to sell them at another, gaining the advantage of the difference in tariff, being further influenced by the known law of supply and demand, he is engaged in trade. When he buys in undivided bulk, to sell again in undivided bulk, he is a merchant, but still engaged in trade. When he purchases in undivided bulk to vend in large though in divided bulk, he is a wholesale tradesman. When he buys articles in divided bulk, to sell again in small divided bulk, he is a retail tradesman; nor does it make the slightest difference whether he sells hats or Turkey rhubarb, nor whether the seller of the rhubarb be Sir Humphry Davy.

The artist, on the other hand, is a professional man. One painter buys so many feet of canvas, together with so much paint; he places possibly upon that canvas something which may not increase its value. A second buys the same amount of canvas, inch by inch, on which he puts the same amount of colour, ounce for ounce, and the result may be "The Immaculate Conception."

He places on the canvas that which he cannot buy—God gave it him, and without any phrase of poetry he exercises the gift divine. Neither is the true artist influenced by the necessities of competition, nor by the trade fluctuation arising from supply and demand.

A hundred artists more or less would not alter his position; a hundred paintings on the same subject would not detract from the merit of his own. Its value is intrinsic, and not relative. But the pharmaceutist buys his stock whether of drugs, chemicals, or sundries, in order to sell again,—he is a tradesman.

But other influences are at work to modify the general fact—the awakening claims of universal education, the long unfaltering teaching of our own Society, the actual pressure from without. Then there is the influence of locality: the West End customer *will* have more than shop dexterity, and in my own neighbourhood the mere tradesman would find himself gazetted.

There is the influence of individual character. The master, fortunately for himself and those around him, has higher than trade instincts, from which circumstance his trade assumes more or less a strictly professional character; but it no more ceases to be a trade, than the orchid which counterfeits so strangely shapes of natural beauty ceases to be a plant.

Never forgetting the essentially trade nature which belongs to pharmacy, we at once come to the first ethical rule of the pharmaceutist, namely, the necessity for the absolutely genuine character of his drugs. No drug or remedy should be admitted into his shop other than that which, in case of dangerous illness, he would not hesitate to supply to the inmates of his own family circle. He cannot be expected to keep the whole range of Materia Medica, nor is he to be blamed for applying for eclectic remedies elsewhere. This is an affair of means and circumstances; but in no case should any trade casuistry induce him to lower the standard of excellence of whatever he may possess.

The pharmaceutist who bears this rigidly in mind will be in no danger of degrading himself by the adoption of low and ruinous prices. Whoever has committed this transparent trade mistake must not afterwards blame the public for exacting the continuance of a state of things to which he has himself voluntarily stooped. On this topic I have great pleasure in giving you the opinion of your excellent treasurer, Mr. Brady:—"The principle which ought to guide the pharmaceutist in the regulation of his charges is that remuneration should increase in proportion as the class of article makes greater demand on the knowledge obtained by his professional education. If he sells articles dealt in by other classes of tradesmen, he must submit to the same rate of profit. In drugs proper, which require an educated judgment, power of testing and the like, he is entitled to a much higher rate; whilst in all matters of dispensing, his charges should be professional in their character, and not calculated on the cost of employed materials at all. We cannot materially increase the quantity of medicines sold by reducing the price; hence any of us endeavouring by low charges to increase his business, must recollect that he does it to the direct injury of the body, in reducing by so much the amount of money that might accrue from its legitimate practice. In large towns the responsibility of prices charged rests with one or two leading men, and if they are true to their professional instincts the calling can scarcely fail to prosper."

I agree with the above, and I may add that the pharmaceutist saves himself an immensity of trouble, and will most probably prolong his days, if he will once have the courage to adopt one uniform fixed price, else he is subjected to continual petty annoyance. Having determined to be the master of his own business, he will be content to abide by his own regulations, and not on the one hand place himself at the mercy of the competing pharmaceutist who trims his sail to every wind that blows, or, on the other, to the caprice of the customer, who not always truthfully asserts that he has obtained articles of definite commercial value at a starvation price.

Not only his regard to self-respect, but to his trade interest, will be his guide to a third ethical observance, viz. to supply the public with the precise articles for which they ask. This point strikes me not so much as a question in ethics as in a purely business light; but I have been requested to bring it forward, and I am bound to do so.

The rule of every well-regulated establishment is to supply faithfully and implicitly whatever in the whole range of pharmacy a customer may require—to obtain it if not in stock, whether English or foreign, and to spare no pains that it shall be the identical thing desired.

To do otherwise seems to me not to warrant so fine a phrase as a trade error, but a pure shop mistake. Does the customer want liquor bismuthi, Schacht, he is supplied from Clifton; does he send for Browne's chlorodyne, he receives that made by Mr. Davenport; if quinine be ordered, salicine must not be substituted; and so with the list of similar preparations, whether demanded as a retail order, or as forming an ingredient in a physician's recipe. This course of action is due, not to any particular keen sense of honour, but to trade expediency, precisely as a wise fisherman spreads a well-made net in order that the fish should not slip through. Any house in town or country adopting such a principle must and does gain a reputation which infinitely counterbalances the small extra remuneration to be made out of fictitious articles. Confidence brings trade, and trade puts money in the till,—a more practical result than might have been anticipated from the study of pharmaceutical ethics.

This subject may have been proposed in consequence of some of its details not having been clearly grasped. On the one hand, there is a great waste of misapplied ingenuity in the constant attempt to produce colourable imitations of preparations, secret or otherwise, which have gained reputation for some particular chemist. Against this there is no human law; but the moral law, which is the law of God, says such practices are fraudulent, and beneath the dignity of every upright man, and they betray a paucity of inventive power, and it is moreover certain that the same skill might find more creditable as well as more remunerative employment.

Still some pharmaceutists are in bondage to a groundless fear; they hesitate, under a strained sense of honour, to enter upon what they think pre-occupied, and therefore forbidden ground. "Why," writes Mr. Giles, "should there be any speciality in pharmaceutical production? The same laws will protect an invention in pharmacy as in mechanics, and when the law professes to deal with the matter, it is a question whether any other protection is needed. You may say ethics shall do what the law does not, and so it should in cases too refined for the law to deal with; but here the law does operate." From the foregoing it is clear that while no one is justified in the fraudulent imitation of a patent right either in or out of the pale of pharmacy, yet no pharmaceutist can claim the exclusive manufacture of any special article in perpetuity, simply because a particular mode of working originally suggested itself to his mind. There is no law in trade or ethics to prevent a man making liquor opii to the best of his ability, any more than in the case of morphia and meconic acid. The most scrupulous and conscientious chemist may get quinine and cinchonine from bark. What casuistry shall assign an arbitrary limit forbidding him to make a liquor? The whole world may make magnesia, light and heavy, calcined or carbonate, although Battley and Howard and Henry have been beforehand in the field. Let not the pharmaceutist shrink from the lawful use of the experience and labours of the past; which is no reason why he should sink into a mere copyist, and should not, like Columbus, sail out of the beaten track in search of land not hitherto discovered.

There is a major ethical consideration that can only be treated in a minor key,—perfect civility to, and careful attention to the smallest wants of the poorest customer,—a civility that should be expressed by words and manner. The ethics of civility to rich customers need scarcely be discussed: in that case, for ethics, read advantage.

Our American brethren have taken the lead in drawing up a regular Code of Ethics. You will find the document in the 'Pharmaceutical Journal,' Vol. XII. p. 369.

They have also, I think, been most successful in giving directions about the last topic I have to mention in connection with shops ethics,—the mutual relation between the master and the assistant.

For general rules I refer you to a paper republished in our Journal, called the "Pharmaceutist as a Merchant" (vol. vi. p. 655, second series). The idea is admirable, and the literary execution quite equal to the design.

Mr. Frederick Stearns, the author, seems to have steered most successfully between the Scylla of the high and dry, and the Charybdis of the goody-good.

I refer you also to some excellent rules published at the end of Parrish's 'Practical Pharmacy;' it contains one difficult proposition, p. 676:—

"Second General Regulation of the Store. During business hours all hands must be on their feet."

Rule XIII. is beyond our present standard. "Every apprentice will be expected to become a graduate of the College of Pharmacy, and will be furnished with tickets of the College, and every opportunity for availing himself of the honour of the degree of that institution." I do not feel called upon to dilate upon this question. There is such a wide difference in individual character, that special rules seem to be impossible. After all, we shall scarcely get further than the inspired direction, "he that ruleth with diligence."* One point I am compelled to notice, that ethics concern the assistant quite as much as they do the master. I have no intention of adding to the already hard position of the former by harsh remarks, but I say deliberately that neither our current literature, nor the general tone of sentiment expressed in private, bears sufficient trace of the recognition that a code of ethics extends beyond the master. Let the assistant feel that he has a part to play, just as difficult and just as important as his employer; that on his side he must exercise consideration and adopt the high tone of feeling which characterizes the English gentleman, and he will do more to render pharmacy endurable, and to promote its social welfare, than whole reams of essays written on the subject. It is painful to recollect that those identical assistants who complain the most bitterly about long hours, close confinement, and other ills incident to pharmacy, are sometimes, when once in business on their own account, the very men to perpetuate and to extend the evil, and practically to rivet another link to that chain with which we are darkly bound. Solely for this reason, I have had no faith in the efforts that have been made occasionally with regard to early closing. The ethics have been invariably on one side. Once the king of animals was asked his opinion on a work of art. The painting represented a man smiling and self-confident, who, with the most perfect equanimity, was slaying the noble beast.

"Wait till *I* paint," said the lion.

As matters stand, masters are to shut up, and assistants to improve their minds. I have never seen my way out of this question (nor has any one else); yet I believe that in an establishment where there are two or more assistants, if they would calmly set to work to see how far earlier hours could be adopted without injuring existing business; if, in so doing, they on their part would carefully weigh the master's interest, and be as ethical towards him as they wish him to be towards them; and if, instead of calling him hard names and making excited speeches at a London tavern, they would bear in mind that he is quite as much interested as they; I guarantee that he would be found a willing listener, and there would then be the first and only fair chance of which I know, of both being set at liberty at more rational hours than they are at present.

Before leaving the shop altogether, may I press upon your consideration the desirability of calling it "a Pharmacy." The word is English, not fanciful; it is used in the same sense throughout France and Belgium, is highly expressive, and is on all grounds to be recommended.

Section II.

SOCIAL ETHICS.

The behaviour of the Pharmaceutist with regard to those in the same line of business as himself.

Strictly under this head is a special duty in connection with the choice of an apprentice, and I must again give you Mr. Brady's views. "The recent tendency amongst all professional bodies to look more closely to the school education of those

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* It is constantly overlooked that both master and man are overruled by an exacting public, and the public by an equally exacting master—the habits and customs of society.

Young men, while resisting the orders and regulations of their employers, are apt to overlook the circumstance, that the regulations have been deliberately and carefully framed to meet the exigencies of business long before they sold their labour for a salary; hence the antagonism between master and man, and the shipwreck of sound morality.

Young men complain of the little time the business affords for reading: "where there is a will there is a way;" let them employ that little time in reading wholesome standard works of religion, morality, and science, and the standard of ethics would soon be raised above petty considerations arising out of the details of business.—*Note contributed by Mr. Deane.*

aspiring to take place in their ranks, is a most important consideration to us. It is true that the Pharmaceutical Society has its classical examination, but it is a matter in which every individual pharmaceutist owes a duty to his neighbour. The present indiscriminate mode of taking apprentices and pupils saps the very foundation of the professional superstructure we desire to raise. If we consistently declined to take pupils below a certain age—made Virgil and Euclid our touchstones, and thereby left to pursue their proper avocations the half-educated shop-boys who offer themselves to us, and too often are accepted, we should soon rid ourselves of one great cause of the multitude of third-rate chemists' shops which are established round us, and do so much injury to the legitimate pharmaceutist, compelling him to add all sorts of articles to his stock because he cannot make a living out of his proper calling. Parliament may perhaps, in its wisdom, some time give compulsory powers tending to this end; but meanwhile it is a matter in which we can, if we will, help ourselves and each other."

Let me reverse the picture, and insist on the strict ethical duty we on our side owe to the apprentice. We expect a fair amount of education and general respectability, and yet it is well known that there is an increasing habit prevailing in large establishments of refusing apprentices altogether.

They are driven, therefore, to houses of lesser standing, where both the premium and the cheap services are a consideration.

What should we do in pharmacy with regard to the future training of the apprentice? I have asked a question which I cannot answer, and I leave it for more experienced pharmaceutists to decide.

Mr. Deane's opinion is as follows:—"There is much to be said on both sides of this difficult question. The experience of the Board of Examiners of the Pharmaceutical Society is that at least two-thirds of those who go up for the classical examination are very imperfectly educated both as regards Latin and the first rules of arithmetic as far as vulgar fractions. Yet they are not necessarily deficient. It is their misfortune, perhaps, that their friends have not been able to extend their education, and at the same time reserve a small fee to give with the boy as an apprentice. This class generally go to small shops, where they probably learn to be more industrious than scientific, and many of them ultimately make good, active, business-like assistants. The more educated few mostly have friends who can pay a fee of £200 or £300, and these get into houses of higher reputation; their advantages are more supposed than real, for the knowledge only to be acquired by the routine drudgery of the business is likely to be despised. The really useful men of this more educated class are very few, and they either speedily enter into business for themselves, or, being dissatisfied with too small a remuneration, enter on more profitable and congenial occupations."

Besides this general duty to our neighbour, there is the law of mutual accommodation. As regards the country I should be sorry to express any opinion, but I am afraid that the most lenient and rose-water observer would allow that some improvement might be made in this particular in what is called the metropolis. I have been ashamed of things that have come before my notice, and in my own person I have had my share in breaking the system of non-accommodation down.

The law of mutual accommodation leads also to the refusal by remark or otherwise to take advantage of any mistake that may have occurred elsewhere. Those who have most business to transact will be the least likely to sin in this particular: they best will know that it is a standing wonder, considering the multiplicity of the engagements of the druggist, that so few mistakes should happen; they also will know best that the most vigilant care, the highest exercise of skill, the aid of the most willing and accomplished assistants, cannot in all cases provide immunity from accident. But there are a crowd of minor instances, palpable to the pharmaceutist, though inexplicable to the customer, where there is no mistake whatever. A few words of sensible explanation will clear the difficulty, and confidence be restored. May I ask you, when such a complaint is brought against a brother chemist, not to be too mysterious on the grand occasion, and leave suspected what you dare not hint?—for should the true nature of the case transpire, the customer will not easily forget the circumstance, and your most effective attitudes will be carefully reproduced with comic exaggeration before many a domestic audience.

There is a point which would suggest itself to few writers, but it is one with which I have been personally thrown in contact. Many excellent pharmaceutists are exceedingly fond, on the slightest provocation, of perishing at the stake: their principles are so rigid, that nothing short of Smithfield is equal to the most trivial occasion. There are floating about certain foolish formulæ, chiefly of French and German extraction, which from time to time find their way to distressed dispensers. The originals may be found in antique English works, and in that disgrace to modern pharmacy, the Paris Codex of 1837. I once had piles of such recipes in my possession, amounting to several folio manuscript volumes, which it was the wisdom of a former age to copy, as it would have been the folly of this to keep. When these outrageous formulæ, with their multitudinous ingredients, come to be dispensed, what is the duty of the pharmaceutist? I say he has no duty to perform; he must arrange as best he may between the customer and himself. If the handwriting be to him a mystery, and he has no knowledge of the main ingredients, let him say so honestly, but in a manner that will in no way reflect upon his personal capacity as a competent dispenser.

There is no call for the martyr spirit, or for an overstrained high notion of strict pharmacy; and if a brother has ventured on a task which he himself was unwilling to undertake, let him not be too virtuously indignant should he chance to find that some utterly useless ingredient has been misunderstood; and if a dried viper more or less has been wanting in the precious medley, let him reflect *humanum est errare*, and by a shade of pleasantry, or a grain of tact, let him both smile away the discrepancy of his own preparation, as well as screen the reputation of a fellow-worker, who was doubtless profoundly inconvenienced as to the best method of proceeding.

The law of accommodation runs into another subject, the possibility by mutual concession of the establishment of an universal tariff. The idea is grand, most profoundly ethical, and theoretically a great boon. I believe it myself to be impossible, and practically most undesirable. I am aware that such a system is successfully carried out abroad, for definite reasons not applicable to ourselves, and into which I cannot enter, as I mean to stick to English Pharmacy. I am aware also that an approximative tariff has been attempted by some London houses, but they happened to have similar trade instincts, and were not altogether unequal in reputation. I have further been informed that the plan has been tried in Scotland, though perhaps the less we say about that the better.

Allowing all this, certain facts remain,—

1. The varying estimation of the money value different men place on their own skill and exertions.

2. There is the great abstract truth that the cost of producing and supplying power varies according to geographical and local circumstances, of which we, as pharmaceutists, have a well-known instance in the price of coal. Let three manufacturers of equal ability and care attempt to work a still. The one at Nottingham will surpass the most economical arrangements of his London brother, if, indeed, the latter be not altogether extinguished on learning how little Newcastle gives for coals.

This is the very principle of manufacturing industry. Certain counties are noted for special branches of commercial enterprise, not by accident, but because resident men of genius have turned natural local capabilities into practical advantage.

Now, as the cost of production must necessarily vary, so also must the cost of the thing produced. This variation is not limited to extensive commerce, but it runs through an infinity of minute particulars, and the truth of the general fact will become more apparent the more it is studied in detail.

With regard to the variation in the cost of supplying power, it is absolutely regulated by local circumstances. There is not a single large pharmaceutical establishment in town or country that cannot supply some one particular article more advantageously than its neighbours.

3. In England there is an intrinsic as well as a commercial difference in the value of the preparations offered by different pharmaceutists. One man builds a laboratory and spends time and money, to which he adds whatever skill he may possess in selecting the best form of apparatus for making extracts; he gets a sample of *Conium maculatum*, strips and rejects the stalk, presses out the juice from the flowers and leaves, and thus obtains an exquisite, though, as far as amount goes, a very unproductive article.

Another writes an order to some cheap export wholesale, buys extract of hemlock ready made, and sells at a lower price than that at which the first could make it: both preparations bear the same label, but both are surely not to be included in one universal tariff. I prefer, however, simple and every-day illustrations. Take powdered cuttle-fish as an example. A few manufacturers reject the whole of the outside hard shell, using only the inner soft interior substance. The product is light, soft and delicate to the touch, and white. On one unfortunate occasion I was compelled to order a few pounds ready made; it was yellowish and heavy; it was likewise—sent back. A second time the buying experiment was repeated from necessity. The powder forwarded was white, but heavy and flinty to the touch, evidently the whole cuttle-fish bone finely ground. These three specimens all bear the same label, are all sent out as powdered cuttle-fish; are they on any principle of ethics to be retailed at the same price? The first sample is worth twice the third, and three times the second sample.

It therefore, as a practical pharmaceutist who has to get his living, refuse at once and utterly to join in the universal tariff.

4. In England there are diametrically opposite modes of trade, influenced, often determined by locality. One man, in the roar of the full tide of a great thoroughfare, has a rapid retail and comparatively little on his books; another (and we suppose them equal) lives in the extreme dreary grandeur of the squares. One turns his money over perhaps four times a year, the other will not receive more than a fourth of his income during the current year. Are those two men to charge alike? Can they, I put it to your common sense, adopt one universal tariff?

5. A pharmaceutist, wishing that his expenditure should not exceed his income, goes of his own accord into a cheap neighbourhood. He there gets a good large house, with space and much convenience, at a very moderate rate. He sells accordingly—his own immediate neighbourhood requires an approximative profit. Another pharmaceutist, for business purposes, takes an expensive house, where his taxes are about equal to the other's rent. His own immediate neighbourhood expects, and practically insists on a certain higher price. Are these two men to sell at the same rate? In the first case, too high a price would ensure rejection, and in the second, too low a price would accomplish the same result.

Until we all stand together on one educational basis, and are prepared to make things according to one recognized standard (which we never shall); until we can equalize our own social position, our rents and taxes, and likewise equalize the pecuniary position of our customers; and until we are further, to some extent, protected in our trade rights, there can be no universal tariff.

Section III.

MEDICAL ETHICS.

The behaviour of the Pharmaceutist with regard to the Medical Profession.

Thanks to the educational pressure from without, added to which is the sense of personal responsibility, the pharmaceutist is daily ceasing to be the mere vendor of his drugs; unconsciously, by recognizing the necessity of thoroughly understanding the nature and properties of remedial agents, he is working out the ethics of his trade. "The maintenance of the public health" (I condense from Mr. Howden) "requires the service of three separate offices. 1. The sanitary office, which enforces the observation of natural laws. 2. The physician's office, which investigates the nature of disease and studies the method of subduing it. 3. The pharmaceutical office, which consists in the skilful selection and preparation of remedies, and their direct application according to the physician's method. By virtue therefore of his own position, and his mutual relation with at least this second health officer, the pharmaceutist cannot worthily discharge his duty unless by deliberate cultivation he has made himself the fit companion and seconder of the physician."

It has been stated that the medical profession look with a jealous eye on the intellectual advance of the modern pharmaceutist. This is directly contrary to my own experience, and I believe it to be sheer nonsense. Why a professional man should tremble because his directions are likely to be understood and properly carried out, is beyond my feeble logic to explain. The one least likely to interfere with him in a professional career is the man who knows most of the varied action and the strength of drugs, and the therapeutic value of remedial agents. Such a pharmaceutist may be too nervous, but he will never be too rash, and the physician may rest in perfect confidence that the educated, intelligent dispenser will be the last to rush in where angels fear to tread.

I cannot conceal the fact that in some communications which have reached me, the question of the mutual bearing, or rather of the boundary-line that marks off the medical man and the pharmaceutist, has not been fairly stated. Either under pressure of a felt grievance or from limited observation, strictures have been passed on the profession which are scarcely to be justified, and the matter has been argued too exclusively from our own point of view.

Reasoning from the broad abstract theory, it is better for the surgeon to confine himself entirely to professional practice; but when we descend into ordinary life, there does not seem to be any valid reason why he should not be (if so he chooses) his own dispenser. This neither includes nor justifies the establishment on his part of an open retail, a proceeding which exacts its own Nemesis. The man degrades the shop, and the shop degrades the man. What confidence can the patient feel in an adviser who has so little in himself?

But that a surgeon should be debarred from compounding his own remedies is unfair to him and would often be unjust to others. The plan may have been dictated from motives of dispatch; in hundreds of outlying districts, from necessity; nor let it be forgotten that it may have been suggested also from the desire to have excellent and first-class preparations. Nor can I share the opinion that the private dispensary is a term synonymous with negligent dispensing and cheaply selected drugs. I am personally acquainted with some establishments which are models of what in pharmacy we might be content to imitate. The evil (if such it be) will in time work out its own remedy; for just in proportion as the recognized open pharmacy assumes a higher standing, and offers more professional facilities, will the private dispensary be felt by the proprietor to be a thing irksome and unnecessary, and, following the law of all progression, it will eventually disappear. But, on the other hand, there is a wretched practice which, wherever it exists, must stifle the ethics of the profession and the trade. I allude to those disreputable and most unprofitable compacts, where, under the guise of a percentage, or an accommodated tariff, or any other occult arrangement, the pharmaceutist dispenses *for* the surgeon, and is robbed of the profit of his labour.

From my very heart I reprobate a system, the discovery of which is always a source of anxiety to the surgeon, from its unprofessional nature, and which, as far as the pharmaceutist is concerned, is the introduction of an unhealthy and underhanded trade; miserably unremunerative, and too often a late-hour slavery, where there is not even self-respect with which to gild the fetters.

There can be no true companionship where there is no esteem; deduct the element of mutual respect and honourable relationship between the medical profession, and pharmacy is at an end. But whose the fault? For should the pharmaceutist fail to be the helper and fit companion of the physician, he has not rightly understood either the dignity of his calling or its moral responsibility. At first, this dread feeling of responsibility hangs over him like the sword of Damocles, but with the fear comes also a sense of honour, the very inspiration of all that is high and excellent.

The true pharmaceutist will always be the helper, for it is his to know the mechanism of the healing art, to develop new remedial agencies, to enter upon untried regions of experiment, to utilize the dreams of theory, and to bid science wait on the wants of daily life. In all these things the true physician will gladly be instructed, nor will he refuse advice nor withhold his friendship from one who, though working in a humbler sphere, is yet able to enlarge the basis as well as to guide the exercise of his professional skill.

So between these two men grows up a thorough sensible understanding, founded on personal advantage, deepened by common sympathy, and cemented by mutual respect. Let us rejoice that this is the bare statement of every-day experience, and not mere elegant writing.

Long may the profession and the trade work in perfect harmony together—their ethics are the same.

Section IV.

ETHICS OF PUBLIC LIFE.

The Behaviour of the Pharmaceutist as a Member of his Society.

Fortunately for most of us we have at least one interest other than the business in which we are engaged, and that is the society to which we may happen to belong. A society is a great foe to rust, to mental and moral stagnation. I hardly think the man acts wisely who never leaves his counter, nor do I fall into the popular error of considering him an eminently practical business man. Why should he be immured for thirty years behind a section of mahogany only to have *hic jacet* sculptured upon his tombstone when he is finally immured elsewhere?

The very organization of a society, with its wider and more generous impulses, changes the grey colour of his life, while it presents solid pecuniary advantages quite irrespective of more ethical considerations. As a member of society, he is bound when convenient to give at least some personal attendance; nor can he pass through a year without encountering some subject on which he can furnish useful information. He is not bound to divulge any mere business secret, on which subject I need say nothing, as I have elsewhere said so much: still less on its part is any society justified in dragging into pseudo-learned discussion trade technicalities of manufacture which were determined more by the exigencies of the till than the formulæ of the Pharmacopœia. But besides the personal gathering together of the members (in itself an unspeakable advantage), there are various scientific journals, some pharmaceutical, some more strictly chemical, some botanical, and in our day many more or less connected with our own pursuits. It is the strict ethical duty of a pharmaceutist occasionally to contribute to some one of these. If, like the Master of Ravenswood, he bides his time, he can without question furnish something that will promote his own interest, if only by way of reputation, as well as aid the general advance of science.

Now just as it is a capital mistake to consider that ethics concern masters only, and not assistants, so also is it another to consider that ethics apply simply to the writer while an editor is exempt.

I am not going to plunge into the troubled waters of the periodical press, but I cannot refrain from stating that there is one ethical obligation on the part of an editor which is of vital importance: he should, as far as possible, bring himself into contact with and become the personal friend of his contributors, and should sometimes write, not from his office desk, but from his own arm-chair.

The chiefs of general literature are proudly conspicuous for their true ethical behaviour; the warmest greeting, the heartiest shake of the hand, and the most cordial invitation come from the London editor, while who does not know that many a journal has been created into a sound commercial speculation not only by the genius but by the contagious affability of its respective editor?

One thing more—an editor should pay special attention to his young contributors. A practised eye can tell about how much a communication may be worth; if it has good stuff in it, tell the writer so, and he will nerve his full strength to surpass his former effort. There is a wonderful passage in Ruskin on this point. I cannot find the reference, but I believe it to be in the first critique on the paintings of the Royal Academy. I have also totally forgotten the wording, but I can convey the sense of the passage in my own weaker phraseology.

Praise the young man whose hopes are yet but hopes, and whose aspirations are as dreamy and uncertain as the cloud drifted before the wind. A few words of kindness may give a purpose to his mere imaginings, and may stimulate him to high endeavour. Praise the young man; for when once success has crowned his efforts, and the laurel wreath has entwined his brow, you may praise inch thick, and he will simply ponder in his mind how much or how little your praise is worth.

Section V.

PERSONAL ETHICS.

The Behaviour of the Pharmaceutist as an Individual.

Let us bask for a few moments in the gleam of sunshine which this subject offers, and let this section be what a learned Divine has termed an Eirenicon. Should any, therefore, have been offended that I have uniformly called pharmacy a trade, I here make amends by allowing them to be as professional as they choose. In the first place a man should cultivate a love for his own business—its exercise should be to him a source of pleasure, and its various occupations should contribute to his happiness. In other words he should put his *heart* into the handle of the trowel. With some men this is natural, thrice happy is their lot; others must acquire the gift, for the heavy discontented spirit is the most sapping of all malign influences. Go to Haarlem and see how the careful florists get their roses out of manure and sand; a flower all beauty from so strange a soil; and then go home, and though the prospect be not always cheery, set a bold face on it, have a courageous heart, get to like your occupation, and you may beat the Dutchman yet.

Let me respectfully suggest that this love of your own business need not place you at any extreme angle from the interests of other people. It is a just reproach against those engaged in pharmacy that they seem to care exclusively for their own concerns. Surely under the benign influence of this association such a charge will vanish.

Now, the love of business in our own case involves the love of study, and this is the strictly professional part of our character. Of that study which concerns our own immediate necessities, such as the laws of chemistry, the knowledge of plants, the range of Materia Medica, I say nothing, as the subject is so frequently brought before you that I have taken it for granted. I confess I have a strong leaning to that class of mind which goes beyond this, and loves literature and learning for their own sakes. Nothing in my own career has more brightened toil, and lessened the irksomeness of manual labour than the recollections of a classical education. I know I shall be charged with affectation—that I cannot help.

When I first entered business, never having been apprentice, I was at the mature age of twenty-one. I loathed it in every fibre of my existence. In those first dark commencing years, no words can express the solace to my mind of many a splendid passage from old Roman prose and verse, and many a strophe and antistrophe from the Greek. The pleasure is as vivid now as it was fifteen years ago. You exceedingly practical men who will read this at your own fireside and pronounce it rubbish, try it in your own experience. I am so far behind the age as to believe at the present moment that there is no finer poetry in existence than that contained in the four books of the Odes of Horace. You recollect where, in bidding farewell to Virgil, he addresses the ship bound with the poet for Athens, as if it were a living thing, and implores it to bring back his friend in safety (Od. lib. i. 3. 5):—

> "Navis, quæ tibi creditum
> *Debes* Virgilium, finibus Atticis
> Reddas incolumem, precor;
> Et serves animæ dimidium meæ."

Or shall I remind you of the exquisite lines in praise of Augustus? In an age gross in its tyranny over the poor, and fulsome in its laudations of the rich, Horace simply says that nature herself seemed to rejoice at the presence of the Emperor (Od. iv. 5. 5):—

> "Lucem redde tuæ, Dux bone, patriæ:
> Instar Veris enim vultus ubi tuus
> Adfulsit populo, gratior it dies
> Et soles melius nitent."

So, like the brook, we might go on for ever, but a shade passes this way—the figure of a man whose hair is iron-grey, in face and dress and general aspect not unlike the Nelson portrait, and he is ten years older than his age. That was my father—some amongst you knew him. He was brought up at Witton, where he had a wretched education, if that might be dignified with such a name which had to be all unlearnt. He got a place at Chester, which was as wretched as his schooling; from thence by a bold flight he went to London, where his prospects culminated in a hole situated somewhere in the Barbican. None ever entered upon pharmacy or education under more repulsive circumstances. But fortune grew tired of frowning, and placed him at once and for his life under the guardian wings of a classic phœnix, supposed to be the patron bird of the Hon. Robert Boyle, but which in truth was fashioned by a modern artist years after that distinguished philosopher was gathered to his tomb. He was the type of the man ethical. He loved his business with an unaffected passion—he deliberately preferred it to any other walk in life; yet every successive year he loved books more and more.

First, he was ashamed of his scanty stock of Latin, and held it a sort of dishonesty to know only set passages of that dreary compilation then in use in Bloomsbury Square. Night after night for months did he hammer at his task, until he ended by being a fair reader of average Latin prose.

He joined the Westminster Book Society; the members met at each other's houses, and proposed works of history, travel, biography, and general literature. From that date no Oxford student was a more constant reader; and when in due time more liberal circumstances allowed him a wider range, he added another ethical practice of sacred origin, he was given to hospitality, at some periods of the year keeping literally open house.

Fights there were—moral, not physical—for those were the days of O'Connell and Sir Robert Peel, the Romish Question and Scriptural Geology; and just to show you the superiority of those times, of all the young men, whether doctors or embryo clergy, rising chemists, incipient missionaries or students at the courts, there was not one who was not capable of settling any of the great questions of the day without a moment's hesitation.

Before the shade passes, one last word.

The Chester apprentice just before his death stated his profound satisfaction that he had been able to read Humboldt's 'Cosmos,' understanding its allusions. Peace to his memory! he is gone where the Tower of Babel shall no more distract him.

"Multæ terricolis linguæ, cœlestibus una."

Section VI.

ETHICS OF TRADE EXTENSION.

There is another subject of paramount importance and of extreme difficulty, to which I ask your attention. I cannot do better than introduce it by reading a letter I received from Mr. T. W. Gissing, of Wakefield:—

"Dear Sir,—In the above subject I think one point should be particularly considered, and that is the increasingly mixed character of the business conducted by most of the best educated chemists. My belief is that this feature will become every year more marked, and I believe one of the main reasons of the development is the comparatively miserable incomes that even the best businesses yield when confined entirely to drugs.

"The most intelligent men (especially if they have a little capital) are the first to rebel against the restricted form of business: they feel disgusted to see men around them in other businesses with no education (compared with their own) amassing wealth easily, whilst they may go on through a long life and barely live.

"Whether any law compelling surgeons to give up dispensing would alter it, will be much discussed. My opinion is that *that* would affect only a few, and that the great mass of pharmaceutists and non-pharmaceutists would still be left in the same condition. As it is, the thing crops out in every form. One man makes soda water; another indulges in oils and colours; another does a private wine trade; another pushes some proprietary article; others become manure makers; and so on. But it all tends to one thing, and that is to prove the discontent of the most intelligent members of our business with their remuneration."

With regard to one paragraph I can only answer it from a London point of view. It would make not one straw of difference to us whether such a law as that alluded to were passed or not. When a London surgeon so far forgets himself as to keep an open retail, his business is rarely of such a character as to excite apprehension in the mind of the most timid pharmaceutist, and he is naturally looked down upon by the trade on the one hand, and the profession on the other. But this leaves the great question untouched, the acknowledged existence of small remuneration and consequent distress, coupled with the equally acknowledged fact that pharmaceutists resort to various expedients in order to increase their trade returns.

Does this most undesirable condition belong to pharmacy as such, or can we trace out a definite explanation? Let me call your attention to the following advertisements; they are selected with no care, and similar announcements may be found in the daily and monthly press, thick as leaves in Vallombrosa. I have retained the original print to show that they were no invention of my own:—

TO SURGEONS and CHEMISTS.—For Immediate unreserved SALE, an established neatly-fitted SHOP, principal northern thoroughfare. Good opportunity for an active practitioner. Good house. Rent low. £42. Price £120. Stock reducible to £100.

TO CHEMISTS and DRUGGISTS.—For Disposal, in Nottingham, a snug little Drug Business. Owner leaving on account of ill-health. This is an excellent opening for a business man. Price £120.

FOR IMMEDIATE DISPOSAL, a Light Retail and Prescribing Cash Counter Trade; well situated in one of the principal Market Towns of the West of England; commands a large neighbourhood. Capable of great increase by an energetic young man. Rent £30, could be more than half covered by subletting. Price, including Household Furniture, £250.

TO BE DISPOSED OF, in an increasing neighbourhood of a populous Town on the South Coast, a Drug and Prescribing Business; established three years. Returns from £5 to £6 per week. Rent £18. Incoming £160.

TO CHEMISTS and DRUGGISTS.—For Immediate Disposal, a beautiful SHOP, with an excellent Business, near the Wandsworth Road, Vauxhall. Amount required £250.

IN a beautiful Watering Place on the South Coast, an excellent and rapidly increasing Business, with valuable Lease of Premises. Price £150. The opportunity is specially worth the attention of a Gentleman from one of the leading London Houses.

IMMEDIATELY, the Business of a Chemist and Druggist, situate in one of the best thoroughfares of a large Town in the Midland Counties. Established twenty-one years. Price about £120.

IN a First-class Agricultural District. A fine opening for a Young Man of tact. Stock and Fixtures nearly new, and of the best description, at Valuation. No Goodwill. Incoming about £200.

£220. To be disposed of, in consequence of severe indisposition, a Retail, Dispensing, and Prescribing Business, situated in the best part of a pretty Town in Surrey. Established twenty-five years.

A SMALL Retail and Prescribing Business, well situated in a leading thoroughfare of a good Market-Town. The prospects of increasing Trade are excellent. Price £115.

IN a populous neighbourhood at the North End, a Prescribing and Light Retail Business. Profits large. Rent low. Price £120.

IN a great thoroughfare and populous district, a good Retail and Prescribing Business, well suited for a Medical Man, with a branch Post-Office attached. Purchase, £250.

AT the South End, a neat Dispensing and Prescribing Business. Price £200.

A BUSINESS in a leading thoroughfare in the City of London, returning £8 weekly. Entrance £150.

AN excellent opportunity for a man with small Capital. A profitable Prescribing Business, in a large Manufacturing Town in Lancashire. Present returns £250 per annum, capable of increase. Profits large. Rent £14. Incoming £70. Satisfactory reasons for disposal.

A RETAIL and Prescribing Business, complete for £40. Rent £20 per annum.

There is no special providence watching over pharmacy; certain causes produce certain effects, and it is true in pharmacy as in every other trade whatever, *ex nihilo nihil fit*, of nothing nothing comes.

When a pharmaceutist will commence life on so narrow and poverty-stricken a scale, he deliberately courts misery and invites distress; he must accept the consequences, and he has no right to blame pharmacy for that for which it is in no way responsible. But you will justly make the remonstrance, these are mere business statistics; these are not ethics. Certainly they are not, but before we can rightly understand what ethics are, they must be clearly and broadly marked off from what they are not. The one point I want to bring home to you, and the one point I wish you to carry home from Nottingham is this, that the best code of ethics under heaven will not stand in the place of a sound judgment and trade common sense. There is a grand ethical deliverance to be worked out by an agency of which more hereafter.

Let us carry the same subject out to its inevitable results, the rather as it is one of which most writers are afraid. There is a certain buoyancy and elasticity in youth; there is also a healthy charm in novelty; but months roll round, and the new proprietor of a mistake in commerce gradually looks his business in the face. It is too small; it presents too little scope for either his industry or his intelligence. In most of these cases the master is single-handed. Hard life; hard times. This is the dark side of pharmacy; and if there were more things in heaven and earth than were dreamt of in the philosophy of Horatio, certainly there are more urgent cases where seasonable assistance might be availing than those registered on the list of our Benevolent Fund.

And now (please to notice this) the routine of weary hours, and the tyranny of the pressure of small means and petty claims exert their baneful influence. By slow but sure degrees the man's sympathies become contracted, and his aspirations blunted. Here comes in the hopeless battle against impossibilities. The pharmaceutist ends with losing heart, detesting pharmacy, and railing at every trace of ethical endeavour as so much childishness.

Meanwhile, the shop is either sunk in neglected dirt, or has become more and more pretty. Vain task to attempt to jewel the holes when the mainspring is wanting!

Cheap and flashy sundries have usurped the place of the little pharmacy there was, and the doomed establishment has sunk down into the weakest phase of a bazaar. Not only this, but to recruit an atrophied exchequer, marvellous nostrums, which reflect no credit on the inventor, are gradually introduced, recommended by flaming placards and mendacious labels. We mourn for pharmacy, but we grieve most for the pharmaceutist. Sir Isaac Newton, standing behind that counter, goaded by similar pressing wants, and weighed down by similar quick necessities, might be tempted to do the same.

Let us not write elegant essays, tricked out with points and phrases, but let us talk plain common sense. What forces such a proprietor on a course no thinking man can justify? Has he ceased in his heart of hearts to be a pharmaceutist? Has he sunk his sense of self-respect? Was he born to fritter away life in this unhealthy littleness? Come round this way and I will show you. You see that nasty-looking animal; it is called a wolf, and he simply wishes to keep it from his door.

We have seen that the question is complicated by an extraneous difficulty; on the one side we have ethics and *their* claims, on the other the stern truth, *Necessitas non habet leges*,—necessity has no laws. Having thus cleared the subject of one of its embarrassments, we come back to the original proposition,—Is there a true, legitimate, *i. e.* ethical method for the development of the legitimate business of the pharmaceutist? What is, you may ask, legitimate business? And there I am afraid we shall not agree.

Firstly, I deny, and always have denied, that pharmacy is just so far legitimate as it is connected or unconnected with dispensing. This is one branch, and by that branch exclusively I get my living.

Secondly, I deny that that man is equal to his position who has no wider range of thought than the subjects necessarily suggested to him by the demands of a retail trade. If either of these theories be true our Society has been one long farce, and has taught us a heap of useless things. But a pharmaceutist must be a chemist; he is infinitely advantaged if a good botanist, and he is in no way injured if he have a fair acquaintance with Materia Medica. If, moreover, he has some practical skill in quantitative and qualitative analysis his chances are still brighter; while in many districts it is to his extreme advantage to be well up in assaying.

No one man shines in all these things, let each to the utmost of his ability follow out the bent of his own mind. To talk of the restricted nature of the druggist's business seems to argue some ignorance of the subject. "The true reason," says Mr. Deane, "why so many shops exist by which the owners fail to get a living arises from their profound ignorance, not only of the common principles of trade, but of the merest elements of their business. Young men with little experience, either from books or practice, who scarcely know a dandelion when they see it, who cannot tell marshmallow from henbane, and whose chemical knowledge will not enable them to explain the difference between an acid and an alkali, open shops in the most unlikely situations, which could scarcely under any circumstances command success. The swarms of such hopeless pharmaceutists are the children of low education and a neglected apprenticeship."

The smallness of returns is another point, the very difficulty with which we wish to cope. There is at least one means of help. Let the pharmaceutist study first, though not exclusively, his own immediate neighbourhood,—its wants, manufacturing, medical, sanitary, social, or strictly local. If by his skill he can meet any of these in part or altogether, he is a truer and more ethical chemist than the man who that morning has made an eight-ounce mixture, and then gazes into vacancy for the chance of making another.

May I remind you of those two admirable sets of Cantor Lectures, delivered by Crace Calvert before the Society of Arts. The first was entitled "Chemistry applied to the Arts;" the second, "On some of the most important Chemical Discoveries within the last Two Years." This second series comprised arts and manufactures, agricultural chemistry, physiological chemistry, rocks and minerals, metals and alloys. I cannot conceive two more useful courses, or more directly adapted to the immediate purposes of the druggist. I also can testify from sorrowful experience to the painfully overcrowded state of an audience which thoroughly appreciated the value of the lectures. I am told that giant manufactures swamp individual effort; to some extent, and in the case of certain things, they do; but I have yet to be convinced that from such a wealth of objects the pharmaceutist might not find something on which to bestow his special care, and might not in so doing increase his reputation and augment his till to a much larger extent than he does at present.

It is therefore with extreme satisfaction that I notice the somewhat new introduction of Liebig's dietetic preparations,—his various foods and concentrated meats, and other preparations of the same class. It is the direct business of the pharmaceutist to produce them, and it does not militate against the argument to say that this is but one avenue of income, and could not support universal pharmacy: no more would one particular stone give stability to a tower.

One thing is certain, that in our day he who assiduously combines chemistry with physiology seems most likely to have a chance of ultimate commercial success. I have faith in high-class pharmacy. With regard to villages and provincial towns I am not prepared to give an opinion; but with regard to densely populated districts and large commercial centres, notwithstanding many plausible arguments to the contrary, my creed is still unchanged. Yet there is the stereotyped answer, a small business cannot afford pure pharmacy: the sheet-anchor of commercial enterprise rests in well-selected sundries. But when in London we see certain houses, all known by name, not one of which has found pharmacy a despicable source of income; not one of which sprang ready-made from behind the clouds, but by patient unwavering perseverance in one definite course worked out its present eminence, we may infer without presumption that their mode of conducting business is neither romantic nor irrational.

The question of advertisement, as a means of trade extension, is such a marked feature of modern times, that it cannot be altogether passed over, more especially as it is a distinctly ethical consideration. You will find the whole subject most impartially discussed in a little work called 'La Pharmacie,' by M. Fumouze, a review of which appeared some time back in the pages of the Journal. He decides in favour of advertising. The right use of advertisement is best illustrated by showing what is *not* right. When a man advertises his own private nostrums for the cure of all sorts of complaints which in the very nature of things are not likely to be cured or even relieved by one and the same remedy, it is an abuse of the advertising privilege. When he represents a medicine as "Oil of this" or "Extract of that," knowing that is only partially so, or perhaps not at all, it is an abuse. Mr. Edward Wood has summed up the exhibition of such fictitious articles as "wholesale prescribing of the worst kind, viz. the giving of advice unsought to a person unseen by a person incompetent." There is no objection to a man having private nostrums, but the upright man will act uprightly with regard to them.

With regard to English pharmacy, the following are the arguments against:—

1. It is not consistent with the professional character of the pharmaceutist. No medical practitioner dare advertise, directly or indirectly, without fear of losing social and professional standing.

2. It is well known that many great houses of established reputation have never availed themselves of advertisement as a trade expedient.

3. Many world-known names have been created without resort to this particular agency.

On the other hand, the arguments in its favour are as follows:—

1. Given as a problem to define accurately what is advertisement and what is not.

2. Many of our leading men, including more than one who has occupied the presidential chair, are most persevering and systematic in its use.

3. It has been occasionally, though not systematically, employed by houses governed by the severest and most rigid regulations.

4. Competition is now in so keen a phase that there is a danger in our modern times of being swept away through its neglect.

5. In the highest of all professions, the clerical, we are made aware of any special service by the medium of advertisement, and we learn by the direct agency of a column in the 'Times,' that the Right Reverend the Lord Bishop of Oxford, or that Monseigneur Manning will appeal to the sympathy of the public.

On these grounds, in spite of my antecedents of theory, practice, and education, I am inclined to decide that the right use of advertisement is not contrary to the true observance of the ethics of pharmacy.

I cannot leave the subject without repeating my too often expressed opinion, that a working laboratory is a great source of power as regards trade extension.

I still think that some of the good money employed on decoration, on splendid windows and architectural embellishment, might be better spent on a selection of useful pans, a moderate-sized still, and a few convenient forms of apparatus. I still think that whoever once has tried the plan of making his own preparations would ponder long and deeply before he ventured on the doubtful economy of purchasing them elsewhere.

But while I have been talking about ethics, I have felt deeply all along how feeble and unsatisfactory was the argument. For what at present is English pharmacy? A name—a label that may be stuck with equal legality on a man like your late President, or on some stray discontented grocer.

And our own Society is a grand amateur effort, highly benevolent in its intentions, but impotent in carrying them into any tangible result,—a sort of kind father who educates his children, and then has to turn them out unprotected on the world.

I have talked about the misery of a section of our brother druggists, and here comes out in terrible relief the weakness of our corporate position; this misery is complicated and aggravated tenfold by the absolute facility by which our ranks may be recruited. Listen for a moment to a communication from Mr. H. Sugden Evans:—

"The absolute freedom of the drug trade is its curse; no skilled labour is more unprotected; even the bricklayers, stonemasons, carpenters, coopers, and shoemakers are more jealous of their rights. This absolute freedom attracts needy men without knowledge of the trade, who, wholly dependent for their supply upon the wholesale dealers, do not and probably could not make or teach their apprentices how to make the simplest extract, infusion, or tincture, and by luck rather than cunning avoid serious or fatal blunders in dispensing. These needy men are glad to get apprentice fees, to make a drudge of him, and turn him upon the world in innocent bliss of his own ignorance. He seeks a situation as journeyman, and can give no satisfaction; he rolls from place to place; then, finding all disappointment, if he chance to command slight means, or a little credit, he opens for himself as master, and thus perpetuates this demoralized state of things. But if he feels his inability to fill a dispensing situation, he seeks to occupy a subordinate post, anything with a prospect of advancing, in the wholesale, where his practical deficiencies may remain unobserved."

What can stop this? Is there never to be a barrier thrown between the man and misery, between the business and degradation? I have spoken of a great deliverance. I believe our sole hope is in a stringent Act of Pharmacy, on the one basis of compulsory examination.

The following is the calm and lucid statement of Mr. Orridge:—

"In reply to your note I can only suggest, as bearing on your inquiry, that beyond all doubt the passing of the Apothecaries Act of 1815 removed apothecaries from a low position to a high one, and by making education compulsory reconciled the public to paying good fees (charged in one line) instead of the miserable little details of an old doctor's bill. The ethics of the medical profession in fact were improved by taking away the temptation to charge exorbitantly for physic, and substituting a just demand for skilled labour.

"Precisely the same result, I believe, would follow, if the examination of chemists were made compulsory prior to their undertaking to compound prescriptions. The public would pay a good price for skilled labour, and every pharmaceutist of legitimate position would be better remunerated. In short, the temptation to quackery would be lessened, and the inducements and incentives to gain a scientific reputation increased."

Not that any legal measure will at one stroke, like the wand of an enchanter, transmute the incompetent and nondescript pharmaceutist into an intelligent and higher being. Every Government measure must respect existing rights, and assign a date from which its operations must commence. The first visible effect of the passing of such an Act will be to flood England with little druggists' shops and materially to swell the ranks of mediocrity. Time, the great restorer, will set matters right, and in due course we shall have men of superior culture and known ability. Then, and not till then, may we truly talk of ethics, not as polite observances but as a code.

Then may we make "Virgil and Euclid our touchstones" for a preparatory examination, for we shall have solid advantages to offer our apprentices in return; then may we ask the student to pass through his curriculum, because it will be the passport to an honourable career, the rewards of which will not be snatched from his grasp by charlatanism on the one hand, or by impudence on the other; and then we may with confidence invite our sons to enter on pharmacy as a vocation worthy of their previous training and their after ambition.

I was once present at a panoramic exhibition where the hack lecturer gave as usual the population of the different towns depicted, together with scraps of information from the guide-books. The scenery was most magnificent, and it ended with a glorious view of Rome and the surrounding country. Suddenly the lecturer, who had known better days, forgot himself, and looking at the glowing landscape, he exclaimed, "Oh that it were real!"

I also have talked about better things, and as subject after subject has passed in rapid succession, I have thought on them with a faint and desponding heart. These are things which go to make up what pharmacy might be, they are not the elements of a pharmacy which exists.

May that day come quickly, when the strong and intelligent hand of law may give reality to these shadows.

The reading of the above essay by Mr. Ince was followed by speeches from the leading members present, the subject occupying the whole of the day. The discussion, together with the following papers, a Report on the Exhibition of Objects relating to Pharmacy, and the remaining business, will be given in the next number of the Pharmaceutical Journal.

Papers read Thursday, August 23rd:—

"On the Results of the Micro-Chemical Examination of Extract of Flesh." By H. Deane, F.L.S., and H. B. Brady, F.L.S.

"On the Spirit Value of a few Purchased Tinctures." By John Attfield, Ph.D., F.C.S.

"On the Calamine of Commerce." By Mr. R. H. Davis.

"Note on Plasma." By Mr. G. F. Schacht.

"On Relations of Pharmacy to the Revenue." By Mr. R. W. Giles.

"On the Proposed Introduction of Two Systems of Chemical Notation in the British Pharmacopœia." By Mr. J. C. Brough.

"On a new Macerating Apparatus." By Mr. R. W. Giles.

"On a new form of Stirring Apparatus to promote the Evaporation of Liquids." By R. Reynolds, F.C.S.

"Note on Eupatorium Sp., and Croton Humilis." By Mr. T. Harvey.

"On Weights, Measures, Coins, and Numbers." By Dr. Attfield.

The Exhibition was open daily from August 20th to 25th, and from the 27th to the 30th. It was considered to be successful beyond the most sanguine anticipations of its promoters. On Friday the resident members entertained the visitors at a dinner at the Lion Hotel at 5 o'clock P.M. Between fifty and sixty gentlemen were present.

ORIGINAL AND EXTRACTED ARTICLES.

SYRUPUS CODEIÆ.

BY A. F. HASELDEN.

Although the medicinal employment of codeia or codeine has hitherto received no decided encouragement in this country, yet within the last four years some attempts have been made to give it a position in the shape of codeine lozenges by Messrs. T. and H. Smith, pâte and sirop de codéine by M. Berthé, of Paris; and, in addition, I have had prescriptions in which syrupus codeiæ was the chief, and indeed only ingredient, but without any intimation as to strength or individual preparation. Now in these railway times it is obvious that whilst a customer is waiting and expects to leave London by a certain train, the dispenser cannot rush off to the prescriber, granted that his initials are known, to inquire what strength or whose preparation is intended. Some of the difficulty might be avoided by simply stating the strength, as thus—℞ Syrupi Codeiæ (gr. i, ii, or iv, to ℥j) ℥iij. This plan I have known adopted in other things, to wit solutions of the sulphate and acetate of strychnia, long before the introduction of the present liquor in the P. B. After all, this does not equal an authorized or generally recognized form, and for this syrup of codeia I have been unable to find any two forms corresponding exactly in point of strength. The late Dr. Pereira, in his valuable work upon 'Materia Medica,' gives the following form:—Codeia, 24 grains; distilled water, 4 ounces; sugar, 8 ounces: dissolve the codeia in the water, with the aid of heat if required, and add thereto the sugar. He supplements it with the observation that it is given in hooping-cough, and a child of seven years of age may take a teaspoonful for a dose. Beasley directs:—Codeia, 20 grains; water 4 fluid ounces; sugar, 8 ounces. And later still, Mr. Squire, in his 'Companion to the Pharmacopœia,' gives the following:—Codeia, 6 grains; water, $\frac{1}{2}$ an ounce; syrup, 8 ounces: triturate the codeia with the water, add the syrup, and heat until solution takes place. Now it will be perceived at once that in neither of these forms is the codeia in a quantity convenient for rapid calculation as to dose. Pereira's form has about $2\frac{3}{4}$ grains to the fluid ounce, Beasley $2\frac{1}{4}$, and Squire $1\frac{1}{2}$ grains to the ounce. For three or four years past I have prepared and constantly used when required a syrup which contains exactly 2 grains of codeia to the fluid ounce; this is readily calculated, and for that reason, in my opinion, preferable to the others. Should it not be thought desirable to authorize such a syrup by its introduction into the Pharmacopœia, it may be well to know what others are doing.

More recent writers upon Materia Medica, namely Drs. Farre, Garrod, and Royle, although mentioning codeia amongst the products from opium, give no form for a syrup. Possibly they may not think its action sufficiently marked to warrant a preparation of it; but as others evidently consider it worth a trial, the perplexed dispenser would rejoice at finding a way out of the difficulty.

Magendie, writing in 1835, three years after Robiquet's discovery of codeine, as he named it, says the injection of a grain of codeine into the jugular vein of a middle-sized dog caused almost instantaneously a deep sleep, which however was easily interrupted, again to be renewed and to be continued for several hours, after which the animal was perfectly well. But on making the same experiment with the hydrochlorate of codeine, the animal, after sleeping five or six hours, died. A whole year's experience, he continues, of its use has shown me that a single grain, given in two doses, in general produces a calm sleep, not succeeded, as is often the case with morphia, by lassitude and heaviness of the head. I have reason to think that a grain of codeine is equivalent in action to half a grain of pure morphia; two grains of codeine cause nausea, and even one cannot be long continued in with convenience. The hydrochlorate I have found more active than simple codeine. Two grains induce vertigo, nausea, and vomiting; but I have found most obstinate facial and ischiatic neuralgia yield to it when all else had been tried; being less active than morphia, it should precede it as a remedy.

Independently of what may be considered in some sort the uncertainty of the action of codeia as compared with morphia, the small ratio in which it is produced, and its greater cost, will always militate against its general employment;

but it is just that rareness of use which makes it all the more desirable that when a preparation is ordered there should exist some guide for the dispenser; and though it is not his province to say what remedies are to be used or in what shape, it may be allowed him to suggest a form which may be more convenient, and so likely to find a more general sanction, and on this score I would submit that syrup of codeia should be made with two grains of codeia to the fluid ounce.

Every one who dispenses prescriptions, even in an open shop, does not meet with unusual forms, and those who do must be more or less perplexed at first; but if all would relate such experiences as they have had to encounter, undoubtedly much interesting matter might be written, and much information gained.

ON THE SALE OF METHYLATED SPIRIT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Believing that many chemists are still under the erroneous impression that methylated spirit, when sold as such, may be sold without a licence, may I ask you to publish in your next number the following letter I wrote to, and reply I received from, the Commissioners of Inland Revenue?

I am, Sir, yours respectfully,
J. E. Eastman.

"*Tottenham, August* 16, 1866.

"Gentlemen,—May I, on behalf of my brethren in the trade, ask you for a reply to the following question?

"May methylated spirit, when sold as such, for burning or for making varnish, polish, etc., be sold without a licence?

"I am, Gentlemen, your obedient servant,
"J. E. Eastman.

"*To the Honourable Commissioners of Inland Revenue.*"

"*Inland Revenue, Somerset House,*
"*August* 21, 1866.

"Sir,—I am desired to acquaint you, in reply to your inquiry of the 16th inst., that methylated spirit cannot be sold by any person for any purpose without a licence.

"I am, Sir, your obedient servant,
"Adam Young.

"*Mr. J. E. Eastman.*"

COOPER'S SINAPINE TISSUE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In reply to some observations upon my sinapine tissue in your last number, by Mr. H. N. Draper, allow me to state that mustard is employed in its preparation, and is its chief ingredient; and also that there is abundant evidence of its presence. It has been submitted twice to analysis by experienced and careful operators: *vide* 'Medical Times and Gazette,' March 3rd, 1866, and the 'Medical Mirror,' April, 1866. There is capsicum in its composition, which I have never desired to suppress or deny, and is no doubt a great advantage, as it is on that account less likely to vesicate, and is antagonistic to gangrenous ulceration; hence the value of capsicum locally in malignant sore-throat, etc. For further information allow me to refer you to Pereira's 'Materia Medica' for the therapeutic effects of capsicum and mustard. My sinapine tissue has been fairly tested for upwards of two years, during which time I have received more than fifty testimonials from physicians and surgeons of the highest standing in Great Britain and different parts of the world, and have never till now received other than the highest commendation of its action and utility. I may also state that there is no remedy in the Materia Medica but what has found some individual to whose idiosyncrasy it is inimical. In short, I am quite satisfied both with its name, which is no misrepresentation, and with its efficacy, which has stood the test so long, and has found but one to object to its action and its use.

I am, Sir, yours respectfully,

ALBERT COOPER.

Kensington, August 22nd, 1866.

ON THE ASSAY OF COAL, ETC., FOR CRUDE PARAFFIN OIL, AND OF CRUDE OIL AND PETROLEUM FOR SPIRIT, PHOTOGEN, LUBRICATING OIL, AND PARAFFIN.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

(Read before the British Association, Nottingham.)

The enormous increase, during recent years, in the use of oils of mineral origin for lighting, lubricating, and other purposes, has so stimulated the demand for these liquids, that analytical chemists are often required to determine the value of a specimen of coal, shale, lignite, etc., as a source of crude paraffin oil, or the value of a specimen of the oil itself, or of the allied substance of natural origin termed petroleum. Hitherto there has not been published any detailed method of conducting these examinations. The author, therefore, having from time to time had occasion to make a large number of such assays, ventures to supply the deficiency.

First, with regard to the assay of coal and other carbonaceous matters for crude oil. The method of manufacturing crude oil on the large scale consists, as is well known, in simply heating the coaly matter in large retorts; oil, water, and gas then distil off, and are collected in suitable receivers, while coke remains in the retort. Now the object of the analyst in experimenting on small quantities of oil-yielding materials of unknown value must be to accurately imitate this process, while, at the same time, he provides for the collection of products of all possible variety of character. It has been stated that a good indication of the value of such materials may be obtained by placing ten or twenty grammes in a porcelain crucible, imbedding the latter in charcoal contained in a much larger common crucible, and heating the whole in an ordinary furnace for an hour or two. Volatile matters then pass off, and coke, prevented from burning by the surrounding charcoal, remains in the inner crucible. When cold, the coke is weighed, and the difference between this and the original weight of coal used gives the proportion of volatile matters. The facility with which such an experiment may be made has led to its frequent performance; the result is that one may see in books, etc., devoted to this subject, long columns of figures showing the proportion of volatile to non-volatile matter in a large number of oil-yielding substances. Probably, however, but little confidence can be placed in such results. A very small percentage of volatile matter would, of course, at once indicate that the substance operated on was of no value as a source of oil. Under all other circumstances the experiment is of little or no value, for I have found that the relative proportions of oil, water, and gas in volatile matter vary so greatly, that of much volatile matter but little may prove to be oil, and of a small percentage of volatile matter nearly all may be oil; and, again, the difficulty of applying a low and regular heat to such an arrangement of crucibles is so considerable, that I have met with differences of 10 to 15 per cent. of coke from the same sample of broken and previously well-mixed coal. In one experiment four porcelain crucibles were placed in one large common crucible, the first porcelain crucible being placed near the bottom and the three others in the upper part, and all charged with the same prepared specimen of coal. After ignition, the lower crucible yielded 9 per cent. more coke than the others; owing, mainly, doubtless to its receiving more heat than they—a high temperature, as is well known, causing decomposition of some of the hydrocarbons, of which oil and gas are formed, with separation of solid carbon.

Rejecting, then, the experiment of subjecting the coal, etc., to a preliminary coking operation, the material is at once submitted to distillation. This I usually perform in a piece of common iron gas-piping, a metre and a quarter long, and five to eight centimetres internal diameter. Two or three kilogrammes of the coal, properly sampled, is then broken down, to the size of peas or hazel-nuts, avoiding the formation of dust. The fragments are well mixed together, and from one-half to one kilogramme weighed out for distillation. This quantity is poured into one end of the iron tube, a diaphragm of wire gauze, suspended by a long wire at about thirty centimetres from the other end of the tube, preventing the coal from falling through. The coal so placed occupies half a metre or more of the tube, leaving a free space of thirty or forty centimetres at either end of the tube. The region of the tube occupied by coal is now heated by a series of gas-jets until the lowermost part of the iron is just visibly red in a darkened room, the gas-jets being turned off during the moment of observation of the temperature. To heat the tube equally and not too highly by charcoal is difficult. A Hofmann's gas-furnace, two-thirds of a metre long and having three rows of burners is perhaps the most convenient for the purpose; it should be just fairly alight along its whole surface. These arrangements are, in my opinion, those most convenient for quantitative experiments; if the object be merely the production of oil, a wider tube and a furnace of five rows of burners may be used. For experimental purposes, the iron tube and furnace should, I think, in nearly all cases be inclined downwards from the horizontal position at an angle of ten or fifteen degrees. Indeed, one office filled by the wire-gauze diaphragm already alluded to is to prevent the falling of the coal out of the region of the furnace when the iron tube is inclined as just stated. The advantage of inclining the tube is, that while nothing is lost which could possibly be formed in or obtained from a retort of the usual form, some of the paraffin and heavier vapours, which might under other circumstances remain about the source of heat, and become decomposed mainly into gas, at once flow off downwards from the region of danger. The condensation of the vapours produced in the distillation is effected in a common bottle of one or two litres' capacity, partially immersed in a vessel of cold water, a wet cloth covering the upper surface of the bottle and dipping into the water. This arrangement is usually sufficient even for the condensation of oils from coals containing a considerable amount of moisture. The iron retort-tube is connected with the bottle by a hollow tin cone about a third of a metre long, the larger orifice fitting loosely over the end of the iron tube, the smaller passing through a cork into the condensing bottle. The neck of a broken retort, commonly used as an adaptor in laboratory distillations, may be used in place of the tin cone, but is more than usually liable to fracture. The tin is luted to the iron by plaster of Paris, or, still better, linseed meal, which, being some distance from the source of heat, is more effective than might be supposed. The opposite end of the iron tube is closed by a cork, which also, being from twenty-five to thirty centimetres from the furnace, is scarcely charred in several operations. The cork of the condensing bottle should be perforated by a second hole for the insertion of a glass tube for carrying off gas, or for connection with a second condensing bottle. The second bottle may, in the distillation of coal yielding much very volatile matter, be connected with a Liebig's condenser. But if the operation be conducted slowly, extending over about two hours, the whole of the product will, in nearly every case, be found in the first bottle. The gas produced in the process may be conducted into a chimney, burned at a jet, or collected in a gas holder for measurement and experiment.

I have had constructed other forms of retort than the long iron tube just described, but have not found them to possess any particular advantage. In one, the furnace being placed horizontally, the tube at the point where it emerged from the source of heat on the condensing side was bent upwards for about ten centimetres, and then downwards, so as to resemble the neck and beak of an ordinary glass retort. In some comparative experiments this form of retort yielded oil somewhat better in quality, but slightly smaller in quantity, than that given by the inclined straight tube. This result was probably simply due to the exclusion of the heaviest hydrocarbons, an effect said to be sometimes desired by the manufacturer, but to be generally avoided by the experimentalist, who should be careful to obtain from a coal, etc., everything volatile that it can in any way be made to yield. Another retort, similar in form to the last mentioned, was provided with a tube for the admission of steam, under the conjecture that the escape of oil-vapour as fast as produced might be thereby facilitated, as in the corresponding operation for the extraction of the ready-formed volatile oil of seeds, fruits, etc. But an experiment with the same coal as used in the other cases showed that the use of steam did not cause a better yield of oil, and was attended by some inconvenience, owing to the necessity of adopting adequate condensing arrangements. The use of superheated steam has been proposed, and is used to some extent, I am told, in the distillation of oil from coal on the large scale, no external heat being applied to the retorts. What direct or indirect advantage is thereby gained I am unable to state, not having performed any experiments in this direction. It may assist in the escape of the heavier vapours, but for this purpose the analyst will find carbonic acid gas preferable, as will be presently seen. Should the use of steam at a temperature approaching redness ever be demonstrated to cause such an increase in the yield of oil as to counterbalance the increased cost of condensation, it would be easy for the analyst to imitate the method on the small scale, by passing steam generated in an ordinary flask through a heated coil of metal pipe before entering the retort containing the coal.

The distillation of the coal completed, the source of heat is removed, and the weight of the condensing bottle and its contents noted; from this weight that of the bottle, previously ascertained, is deducted, and the weight of the crude oil and water yielded by the coal thus determined. The separation of the oily from the aqueous portion of the distillate is generally easy of accomplishment. The bottle is placed in a vessel of cold water, which is then heated to from 30° to 60° C. for an hour or two, and allowed to cool slowly. If complete separation of oil and water has apparently occurred, the latter may now be siphoned off, or, if the oil is semi-solid, the water may be simply poured off, and the weight of the two be respectively determined. If desired, the water can then be examined for ammonia, etc. Sometimes the separation of oil and water is not so decided as is necessary for analytical purposes.

Under these circumstances, a portion only is removed for examination, and a strong aqueous solution of common salt poured into the bottle ; the whole is then well shaken, and again heated as before described. The superior specific gravity of the brine now enables the oil to rise to the surface. After standing a few hours, the brine is carefully removed by a siphon. The weight of the oil deducted from the weight of the original distillate, gives the weight of the water. The retort having cooled, the coke is removed and weighed, and a portion burnt for ash, or otherwise examined. And now the difference between the combined weights of oil, water, and coke, and the quantity of coal originally taken gives the weight of the gases evolved in the operation. From these weights the percentage or any other proportions are easily calculated. In English commerce, conventionality requires that the oil-value of a coal be stated by giving the number of gallons of oil yielded by one ton of the coal. This is readily accomplished by calculating from the centesimal proportions the number of pounds of oil per ton of coal; the specific gravity of the oil is then ascertained in the usual way ; and now the number of pounds, divided by the figures representing the specific gravity, indicate the number of gallons afforded per ton.*

The value of the crude oil is next determined:—A specimen of natural mineral oil, or petroleum, requires similar treatment. This is a matter of fractionation with or without previous distillation, with or without previous purification. As a general rule it is best to at once distil about fifty cubic centimetres of the rough oil in a small glass retort, a thermometer being inserted in the liquid and the distillate allowed to flow into a cubic centimetre measure. By watching the thermometer, and roughly noting the amount of products yielded at different temperatures as the thermometer rises to 250° C., and, after removing the thermometer, at temperatures above 250° C. a fair indication of the character of the oil is obtained. A specimen of 'once-run' oil is also thus secured, the appearance and specific gravity of which should be observed. The residue in the retort should have been so heated as to be but a carbonaceous, friable mass: when cold it may be removed and weighed. If the residue form only two or three per cent. of the crude oil, and the latter was not of very dark colour, then the crude oil may probably be submitted to the process of purification without previous distillation, but if the loss is ten or twelve per cent. it is an indication that the crude oil should be 'once-run' before purifying. Sometimes the contents of the retort towards the close of this first experimental distillation assume the appearance of melted pitch; in that case a portion should be removed by a glass rod, and if, when cold, it is hard, black, and lustrous, the distillation should be stopped, and the amount of the pitch (asphalte) ascertained by weighing the retort and contents and subtracting therefrom the weight of the retort previously noted; or, if the retort has not been already tared, as much of the contents as possible may be poured out, the retort then cleaned with naphtha, and, when dry, weighed. If the first specimen of pitch removed from the retort does not become hard, the distillation should be continued some time longer. The vapours which are evolved above 250° C. are very heavy and only distil with difficulty from such a retort as just described, even though the glass be in direct contact with an air-gas flame. After removing the thermometer, therefore, I usually insert in its place a glass tube, through which a current of carbonic acid ga

* The heavier the oil the smaller amount of photogen it will yield, for the specific gravity of the latter should range as low as from 0·790 to 0·825 : crude oils above 0·900, or "once-run" oils above 0·880 are not yet viewed with much favour in the market, unless, by their solidity, obviously containing much paraffin. Their value as lubricating oil will however probably rise to that of burning oil when the use of the latter becomes more extended.—J. A.

is passed; in such an atmosphere the heavy paraffin and other vapours rise and flow off better than in a current of steam. A fifth of a litre of the once-run oil, or of the crude oil or petroleum, if not of very bad odour or colour, is now mixed with about ten cubic centimetres of strong sulphuric acid and agitated frequently during a period of from two to three hours. The mixture is set aside for the oil and acid to separate, the oil poured off from the thick, treacle-like deposit ("foots"), washed two or three times with water, and then shaken with about the same quantity of a strong solution of caustic soda (sp. gr. 1·3 or 1·4) for an equal period. The soda solution having subsided, the oil is poured off and washed by agitation with water. If the oil is still of bad odour it is again treated with acid and soda as before, at a moderately warm temperature (30° to 35° C.); and sometimes a third treatment is necessary. Sometimes, also, the oil is best treated by soda first and acid afterwards. It is now redistilled in the manner already described, three chief fractions being collected separately, the volume of each noted, and its specific gravity taken. The fraction of lowest boiling-point, the "spirit," may in this first fractionation have a specific gravity of 0·750; the next, the burning-oil or "photogen," of 0·850; the "lubricating oil" will be the fraction coming over at the highest temperatures. Each of these fractions may now be once redistilled: the spirit will yield some photogen, which may be mixed with the photogen first obtained; the photogen will then, at the commencement of the distillation, yield a little spirit, and, towards the end, some lubricating oil, which may be mixed with the lubricating oil first obtained; the lubricating oil will then yield a little more photogen. The *spirit* should finally have a specific gravity only a few degrees above or below 0·730, and the *photogen* be within ten or fifteen degrees of 0·805 and not give off inflammable vapour when at a temperature of about 40° C.* The specific gravity of the *lubricating oil* will vary. A fifth of a litre of crude oil having been used, the number of cubic centimetres of the three fractions divided by two will of course give the percentage volumes (in England, gallons) of each product, the difference between these and 100 being the *loss* that has occurred during purification or "refining." In some cases this loss may be decreased by boiling together the two residues or "foots" of the acid and alkaline treatment and well washing the resulting "coarse grease" with water. The lubricating oil may also, if semi-solid at temperatures between 15° and 20° C., be further separated into oil proper and *paraffin*. To this end one hundred grammes are distilled so long as the distillate, tried in quantities of two or c. c. at a time, gives no crystals of paraffin on being cooled to 5° C. When this point is reached, the residue in the retort is poured out into a cup and cooled. The resulting solid fat ("lubricating grease") is then removed, wrapped in a sheet of unsized paper, and placed in a small press having hollow metal face-plates. Ice-water is now passed through the press-plates, and when sufficient time has elapsed for the fat to become cooled gentle pressure is put on the plates and the force increased slightly from time to time during a period of twelve or twenty-four hours. The paraffin will now be in a solid cake, the weight of which in grammes will be the percentage proportion yielded by the lubricating oil from which it was obtained. The proportion

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* Photogen, as usually met with in commerce, does not begin to boil till heated to 170° or 180° C. Some liquids yielded by coals, treated as above described, have a much lower boiling-point and much higher specific gravity. In four recent experiments with common household coals (Silkstone, etc.), which had been carefully distilled at a temperature just below a low red-heat, I obtained products boiling at 115° to 120° C., and having specific gravities of 0·880 to 0·920. They closely resembled the "coal-naphtha" of the coal-tar obtained in distilling coal at the high temperatures of gas manufacture. Shales found in the neighbourhood of such coals, also, often yield naphtha instead of photogen.

of lubricating oil to crude oil being known, the amount of paraffin in the crude oil is readily calculated. The paraffin ("paraffin scale") thus obtained is not quite pure, retaining some colouring and odorous matters. By subsequent treatment with sulphuric acid and soda, or recrystallization from petroleum-spirit, it may be obtained colourless and inodorous, but this operation is generally unnecessary of performance by the analyst, as but little by weight is lost in the purification. Its melting-point should, however, always be determined, as the higher this is the more valuable the paraffin. For this purpose a small quantity of the melted paraffin is drawn up into a capillary tube ten or twenty centimetres long and about half a millimetre in diameter, the tube immersed in cold water and the vessel containing the water heated until the minute cylinder of paraffin changes from the condition of an opaque solid to a transparent liquid. By means of a delicate thermometer placed in the water the point of change can be determined to the tenth of a Centigrade degree: it varies from 40° to 60° C.

In conclusion I would recommend that in reporting on the oil-value of a coal, etc., the chief products be described respectively only by the terms "spirit," "photogen," "lubricating oil," "paraffin," and "coke," and that the specific gravity, at 15°·5 C., and boiling-point of each of the liquids, and the melting-point of the paraffin be always given. The term "spirit" is already common for this the liquid of lowest boiling-point, and is sufficiently indicative of its use as a substitute for spirit of turpentine. "Photogen" is definite as a distinctive name for the burning-oil or 'light-producer,' and already more restricted in its application than its synonyms "paraffin-oil," "lamp-oil," "illuminating-oil," "heavy naphtha," "solar-petroleum," "solar-oil," etc. etc. In the International Exhibition of 1862 (see Juries Report, class II. section A.) solar-oil was in one place described as the coal-product having a specific gravity of 0·833 or 0·835, in another as the product containing no oils of less specific gravity than 0·870 or more than 0·920. Such discrepancies are most confusing, and should be avoided. If the results of the examination of coal, lignite, shale, etc., and petroleum be reported in the manner above indicated, the amount of acid and alkali used and the loss in distillation and in purification being also given, there will not be much difficulty in determining the money value of the raw material, as the cost of precting and maintaining oil-works can now be readily ascertained, and the erices of all materials and products are almost daily published.

17, *Bloomsbury Square, London.*

ON THE SPONTANEOUS COMBUSTION OF PYROTECHNICAL COMPOUNDS.

BY THOS. ARNALL, M.P.S., WEDNESBURY.

In the year 1843, I forwarded a note upon this subject to the editor of the 'Pharmaceutical Journal,' which was printed in vol. iii. page 38.

At that time I had not leisure to continue the experiments I purposed to make, and the subject appears to have rested since; at all events, little information has been published, so far as I am aware.

Since the above date I have had to make these "coloured fires" by the hundredweight, and having had several accidents I think I have detected some of the causes, and can also explain the comparative immunity of firework establishments from accidents arising from this cause.

The compositions which are liable to this spontaneous action all contain chlorate of potash and sulphur, with nitrates of strontia and baryta, oxide of copper, etc., as colouring agents. I have frequently kept small quantities of these compounds in a dry place for 12 months. I have had them almost in a paste from damp, and have restored the latter to its original efficiency by drying, without any tendency to ignition; and, on the other hand, I had spontaneous ignition in less than six hours.

The cause of this action I believe to be (in most cases) *acidity*, either of the sulphur or of some other ingredient used. It is well known that most of the flour of sulphur, as met with in commerce, has a slightly acid taste. This acidity has been attributed to atmospheric oxidation from long exposure, but more probably is caused by partial combustion during sublimation. Now, supposing sulphur containing a slight trace of sulphuric acid to be mixed with chlorate of potash, it will liberate a corresponding quantity of chloric acid: this at once oxidizes more sulphur, and so the mutual reaction goes on until the mixture ignites. But we have also nitric acid in combination, and the nearly anhydrous vapours of these two acids will sufficiently account for the heating and ignition of the compounds in which they are evolved.

I have been informed by practical pyrotechnists that they *never use* sublimed sulphur, but buy it in *roll* and powder it for use as wanted; and I believe that latterly the sulphur has been superseded for indoor uses by a mixture of shellac and resin. This has the merit of comparative safety, although the brilliance of the colours will not bear comparison with those formulæ where sulphur is used.

The above remarks do not apply to a most dangerous compound for purple fire, the formula for which I gave in the first-mentioned paper. This contains chlorate of potash, sulphur, nitrate of strontia, and anhydrous sulphate of copper. Although the colour is exceedingly beautiful, yet I can enumerate five deaths from explosions, in addition to other cases not fatal, where this formula was in use; and I have had it ignite four times in my own experiments; in this case *no* acidity of the ingredients seems requisite.

I am disposed to attribute the ignition, first, to the anhydrous sulphate of copper attracting moisture from the air, next to double decomposition of the copper salt and chlorate, ultimately forming chloride of copper (possibly dichloride) with evolution of chloric oxides or chloric acid. I have substituted black oxide of copper for the sulphate, and the mixture has not shown any tendency to ignition.

I believe that disaster may be frequently averted by first mixing a few drachms of the ingredients in a mortar. If the ingredients are *pure*, no smell should be perceived; but if acid be contained either in the sulphur or other ingredients, a peculiar, somewhat ozonic odour will arise, which may be considered as indicative of danger.

ON THE COMBUSTION OF GAS FOR ECONOMIC PURPOSES.

BY HENRY LETHEBY, ESQ., M.B.

[*A Lecture delivered before the British Association of Gas Managers, at St. Martin's Hall, London, on Wednesday, May* 23, 1866.]

At the close of the last lecture which I had the honour of delivering to this Association at the meeting in Birmingham,* I referred very briefly to the general phenomena of gaseous combustion, and to the principles of the economic use of coal gas. It was my intention, indeed, to have entered fully into this matter; but so much time was occupied in the examination of the chemical and physical properties of the most important constituents of coal gas, that little was left for the consideration of this part of our subject. I have therefore been requested to make it the especial subject-matter of this

* See pp. 281 and 326 of the last volume of this Journal.

evening's lecture; and in order that you may follow me through the various details of the inquiry, it will be necessary to pursue it from the beginning.

The phenomena of visible combustion are always the results of energetic chemical action; and the heat and light which characterize it are the consequences of the violent collisions and rapid trembling of the combining atoms. When this collision occurs by the showering down, as it were, of gaseous atoms upon a solid, as you here see in the combustion of carbon and of iron in oxygen gas, and of antimony in chlorine, there may be a very intense ignition of the solid, but there is no flame. On the other hand, when the conflict is entirely among the particles of gaseous or vaporous matter, or matter in a finely divided and mobile condition, the phenomena are altogether different; for although, as before, the atoms or molecules of the burning body are intensely heated, yet from their mobility they give rise to that appearance called flame.

In all cases, therefore, we must regard flame as gaseous, or vaporous, or very finely divided matter intensely heated. That the particles of the gas or vapour must be themselves bodily and intensely heated to produce flame is evident from this—that when I burn hydrogen, or coal gas, or the vapour of ether, or alcohol by means of a finely divided solid, as I do here with a rosette of fine platinum wire, you see how the wire glows; but there is no flame, for the combustion is limited to the thin layer of gaseous matter which immediately surrounds the metal, and the temperature of the combustion is comparatively low. But if I raise it to a higher temperature, as will sometimes happen of itself, then the whole mass of escaping gas or vapour is thrown into a state of ignition, and it bursts into flame.

Let us pause for awhile to study the complicated nature of this phenomenon. Whenever a gas or vapour burns in an atmosphere of another gas or vapour, as we here see in the flame of the burning gas and candle, the phenomena are very complicated. At the points of contact which are now at the outside of the flame, the collision of the particles, because of their rapid chemical union, is most violent; and here, therefore, we have the highest temperature; but as a portion of the outer atmosphere penetrates for some distance into the burning gas, it extends the conflict into the body of the flame, and there finding itself in the presence of complex particles, it closes with those whose energies are most active. In this manner the hydrogen of the hydrocarbon is burnt first, and the liberated carbon, standing for awhile in an ignited state, forms the luminous shell of the flame; and within, waiting for the presence of air, or rather passing out to take part in the conflict, is the unchanged gas or vapour. Every common flame, therefore, consists of at least three parts—the inner layer of unchanged gas or vapour, next the shell or cone of luminous matter, and lastly the outer shell of perfect combustion. That there is always an inner portion of gas or combustible vapour in every common flame may be proved by drawing it out with a glass tube and burning it at the end. See how I do it here with the flame of burning ether, and the same may be done with all other flames.

And now we are prepared to ask why it is that different substances burn with such different degrees of luminosity. The answer is clearly to be found in the circumstance that different substances contain, or evolve, or produce different amounts of solid particles. In all these flames of hydrogen, and sulphur, and carbonic oxide, there are no solid particles to be heated; but in this gas, and candle, and paraffin lamp, the particles of soot or carbon are very numerous; and if it so happens that the products of the combustion are also solid particles, the intensity of the light is so much the greater. Look at the splendid combustion of phosphorus in oxygen, and of magnesium in air. In both cases you will notice that the products are a white powder, every particle of which at the moment of its formation is intensely heated. It follows from this that every circumstance which increases the number of solid particles, within a reasonable limit, or which prolongs the time of their ignition, or which exalts the temperature of it, increases the light of the flame, and conversely everything which destroys the particles or lowers their temperature will also destroy the light.

If I throw the solid particles of lime into this almost invisible flame of oxygen and hydrogen, you will notice how vividly I bring out the light; and so also if I give the vapour of a hydrocarbon as benzole, which is rich in carbon, to the hydrogen by merely passing it through a tube packed with tow and moistened with naphtha, you observe how brightly the hydrogen burns. In the same way we can increase the illuminating power of coal gas by passing it into a chamber containing naphtha; and experiment shows that with common 13-candle gas the illuminating power is increased about 4·5 per cent. by every grain of naphtha to the cubic foot.

On the other hand, if I destroy the solid particles by hastening their combustion, the light of the flame is diminished. Here, with a common Argand burner, I merely increase the flow of air to the gas by lengthening the glass chimney, or by enlarging the central aperture, or by driving the gas by great pressure through small openings, and you see how I destroy the light; and worse still if I mix air with the gas, so that the particles of carbon find themselves at once in the presence of atmospheric oxygen—there is no light at all. Let me blow out the gas-flame from this Argand burner, and put a piece of wire gauze upon the top of the glass chimney. The gas will now draw in the air and mix with it before it reaches the top of the chimney, and see how the light is destroyed. The same is the case with this burner of Professor Bunsen. It is a metal tube of 5 or 6 inches in length and from $\frac{1}{3}$ to 1 inch diameter; the gas is admitted through a small aperture at the bottom of the tube, and just below this point there are four or five openings for the admission of air. As the gas issues from the jet and passes up the tube, it draws in the air, and this, mixing with the gas, burns at the top of this tube without any light, but with great heat. This indicates to us the disadvantage of allowing air, even in small proportion, to get into the gas; in fact, experiment shows that with common 12-candle gas the loss of light with different proportions of air will be as follows:—

Loss of Light from Air in Gas.

Per cent. Air.	Loss per cent.	Per cent. Air.	Loss per cent.
1	6	8	58
2	11	9	64
3	18	10	67
4	26	15	80
5	33	20	93
6	44	30	98
7	53	40	100

The practical conclusions from these inquiries are, that gas must be burnt with such a proportion of air as that, on the one hand, the particles of carbon shall be intensely heated, and shall remain as long as possible in an ignited state, and, on the other hand, they must not escape unburnt.

The difficulties in arriving at these results are almost insuperable, for every illuminating agent has its own particular conditions, and requires its own special appliances to bring out the fullest effects.

Take for example the effect of different kinds of burners, each burning at its best, with the same gas (13-candle).

Relative Luminosity of different Burners, calculated for the same Consumption.

Kind of Burner.	Pressure at Burner.	Relative Value per Foot Gas.
Single jet	0·50	100
Fishtail	0·25	146
Bat's-wing	0·18	153
Argand	0·17	198
Bengel	0·13	214

Again, the same kind of burner, but of different sizes, will give different values.

Relative Luminosity of Jets of different Sizes, calculated for the same Consumption.

Size of Jet, Inch.	Pressure at Burner.	Relative Value per Foot Gas.
0·040	0·87	100
0·056	0·35	120
0·083	0·12	136
0·100	0·04	150
	Fishtails.	
0·036	0·47	100
0·045	0·39	194
0·056	0·24	293
0·062	0·39	319

Bat's-wings.

0·008	1·19	100
0·012	0·49	184
0·016	0·24	232
0·020	0·16	293
0·024	0·11	313
0·028	0·09	322
0·032	0·07	316
0·036	0·04	310
0·040	0·03	307

Argands of 15 *Holes and* 7-*inch Chimney, consuming* 5 *Cubic Feet of Gas per Hour.*

Size of Inner Hole.	Pressure, Inch.	Relative Value per Foot Gas.
0·70	0·66	100
0·57	0·46	108
0·48	0·17	117
0·44	0·17	120
0·43	0·17	115
0·42	0·17	110

And, again, the same burner with different pressures, and therefore different rates of consumption, will give different values, when calculated for the same quantity of gas.

Relative Luminosity of the same, Jet (0·04 *in.*) *at different Pressures, calculated for equal Consumptions.*

Consumption per Hour, Cub. Ft.	Pressure, Inch.	Relative Value per Foot Gas.
0·88	0·28	100
1·31	0·43	156
1·80	0·87	195
2·33	1·38	240
2·83	1·97	264
3·53	2·68	270

Fishtails (0·03 *in. holes*).

2·00	0·17	100
3·00	0·34	109
4·00	0·50	111
5·00	0·74	110
6·00	1·00	95

Bat's-wings (0·015 *in. slit*).

2·00	0·13	100
3·00	0·21	109
4·00	0·29	135
5·00	0·45	128
6·00	0·53	122
7·00	0·68	121

Sugg's Argand 15 *Holes* (0·45 *Internal Diameter; Hole* 0·05 *in.*).

2·0	0·04	100
3·0	0·08	143
4·0	0·12	183
5·0	0·17	202
5·5	0·18	201
6·0	0·19	196

And so, also, with cannel gas, although in many cases the variations are not so great as with common gas, yet they are sufficiently considerable to be serious. This is seen by the following table, which I have drawn up from the experiments of Mr. King, of Liverpool:—

Relative Illuminating Power of Cannel Gas, when burnt from different Burners and in different Quantities from the same Burner.

Power in sperm candles (120) per foot of gas.

Kind of Burner.	1 Foot per Hour.	2 Feet per Hour.	3 Feet per Hour.	4 Feet per Hour.	5 Feet per Hour.
Single jet	2·64	—	—	—	—
Lancashire fishtail (No. 2)	3·23	3·59	3·66	—	—
do. do. (No. 4)	3·59	3·95	4·11	4·0	—
London do. (No. 2)	3·49	3·61	3·89	3·85	—
Bat's-wing	3·09	3·76	4·05	4·11	4·16
Sixteen-hole Argand	0·26	1·74	2·43	3·53	3·68
Winfield 28-hole Argand	0·28	2·04	3·09	3·57	3·77

What, then, is to be done in the apparent confusion of all these facts, and can any useful generalization be made of them?

In the first place, we perceive that, of all kinds of burners, the single jet is the least effective.

Secondly, we notice that, although the bat's-wing and fishtail burners are not subject to so great variations in power as others, and are therefore best suited for common use, yet they require certain precautions to be fully effective. The best burners are those which consume from 3 to 5 cubic feet of gas per hour, and the slits and holes should be so graduated that the gas issues at the pressure of from 0·08 to 0·12 of an inch for very poor gas (12-candle), and from 0·20 to 0·40 for 14-candle gas, and from 0·4 to 0·6 inch for cannel gas.

Thirdly, we find that Argand burners are only fit for gas of less than 18 or 19 candle power. For very poor gas (up to 13-candle), the best form of Argand burner is the porcelain Argand of France (the Bengel), which has the following measurements—

Bengel Burner (Argand) of 30 *holes.*

Total height of burner	3·150	inches.
From gallery rest to top	1·220	,,
External diameter	0·886	,,
Internal do.	0·354	,,
Diameter of circle of holes	0·650	,,
do. of holes	0·024	,,
Height of glass	7·87	,,
External diameter of do.	2·00	,,

The flame is protected from currents of air by a cage or basket of porcelain below, which is pierced with 109 holes of the 0·118 of an inch in diameter. This burner requires a pressure of from 0·15 to 0·25 for the proper consumption of the gas, and the rate at which it burns never exceeds 3·5 cubic feet per hour. This is the standard burner for France, and, compared with the best English burners, the value of the light for 5 cubic feet of 13-candle gas is as 113 is to 100.

In this country the best form of Argand burner is the 15-hole steatite burner of Mr. Sugg. The measurements of it are as follows:—

Sugg's Steatite (Argand) of 15 *holes.*

Total height of burner	3·00	inches.
From gallery rest to top	1·10	,,
External diameter	1·10	,,
Internal ,,	variable, according to quality of gas.	
Diameter of circle of holes	0·80	,,
Diameter of holes	0·06	,,
Height of glass	7·00	,,
External diameter ditto	2·00	,,

The flame is protected by a perforated metal disk placed under the gallery, the perforations being 0·08 inch in diameter, and 8 in the inch linear.

The diameter of the inner hole or air-channel should vary according to the power of the gas, thus:—

For 12-candle gas	. . . .	0·44 inch.
„ 14 „	. . . .	0·48 „
„ 16 „	. . . .	0·55 „
„ 18 „	. . . .	0·60 „

All these Argands have the holes the 0·06 of an inch diameter, and the pressure is only 0·07 of an inch instead of 0·17, as with the old Sugg of 0·04 diameter. Above 18 candles the bat's-wing is the best burner for educing the light, and it should be regulated from 4·5 feet to 4 feet, according to the richness of the gas. And now, before I leave this part of the subject, I will show you some of the contrivances which have been proposed for increasing the illuminating power of a poor gas.

You have already seen that the single jet gives proportionably less light than the double jet or fishtail, and this is because of the larger surface of the flame exposed to oxidation. In this experiment, when I bring the jets together, you will notice how the light is at once increased, the proportion of increase being shown in the diagram.

Relative Illuminating Power of Jets separate and together.

Size of Jet, Inch.	Pressure, Inch.	Relative value per Foot Gas. Separate.	Together.
0·067	0·24	100	164
0·083	0·20	100	190
0·100	0·12	100	184

But the pressure may be such as to spread out the flame too much, and then it is over-oxidated. To check this there are the contrivances of Hart, Williamson, and others, which are fishtail burners attached to a box stuffed with wool, or having a small aperture within, as compared with the aperture without. This offers resistance to the flow of the gas, and by making it tail a little it thickens the flame and brightens the light; but the same effect would also be produced by altering the tap, provided the tap is placed, as it always should be, at a distance of about 18 inches from the burner: in fact, if it is nearer than this, as is generally the case, there is no space or chamber for the equalization of the pressure, and the gas always burns at a disadvantage.

Again, there are contrivances on the outside of the burners—as caps, and rings, and thickenings of the top of the jet—whereby the flow of air to the gas is checked and oxidation diminished.

Even with the Argand burner, if the gas is over-oxidated, as by burning it with too large an inner aperture, or with too high a chimney, or at too small a rate, the light is improved by checking the draught of air; and this may be done, as you see, by putting a cap of wire gauze over the chimney. In fact, the whole of these contrivances have for their object such an adaptation of the gas to the air, or the air to the gas, as that the flame is just short of smoking. Under these circumstances, the solid particles remain as long as possible in an ignited state, and yet at last they are perfectly consumed.

And now I am anxious to draw your attention to the effect of rarefying the atmosphere, for it has been noticed that the intensity of a flame is much less at high altitudes than at low. This was particularly observed by Dr. Frankland and Professor Tyndall in the autumn of 1859, when they were making experiments on the combustion of candles at the top of Mont Blanc. They noticed that although the candles burnt at the same rate as they did in the valley of Chamounix, yet the flames were blue, and large, and feeble. Dr. Frankland was so much struck with the phenomenon that he afterwards made it the subject of careful investigation. He found, indeed, that a gas-flame, like that of a candle, gave less and less light with the rarefaction of the air in which it was burning; and his results show that the loss of light is about 5·1 per cent. for every inch of diminished mercurial pressure, up to a rarefaction of 14 inches. If, for example, the light of a flame be equal to 100 at 30 inches of the barometer, it is but 94·9 at 29 inches, and 89·8 at 28 inches; and so on up to 14 inches, when it is only 18·4 per cent. of the original light. Fortunately, in our photometrical inquiries the loss of light is equally great with the gas and the standard, or the variations of atmospheric pressure from day to day, or even from hour to hour, would show a marked difference in the value of the light. As it is a variation of 3 inches of the barometer must cause a difference of more than 15 per cent.; and it is not improbable that this may have something to do with visible variations in the light of the public lamps. Certain it is that the same gas in places at different altitudes will have very different values. The gas, for example, which in London has the value of 100, would be but 91 at Munich, and only 61·5 in Mexico. Indeed, the difference would be greater than this, for not only is the light actually less for equal consumptions, but as the volume of the gas expands with the rarefaction and temperature, the real value of the same quality of gas as measured by the meter in Mexico would be only 46·2. Even in London the difference in the value of the light when the barometer is 31 as compared with what it is at 28 is fully 25 per cent.; and it may well be that this difference is noticeable.

If the rarefaction of the gas and air are carried to a very great extent they cease to burn. The flame of coal-gas, as well as that of a candle and of spirit of wine and ether, is extinguished at a rarefaction of about 1-6th of the atmosphere; hydrogen, at 1-7th; sulphur, at 1-15th; and phosphorus, at 1-60th. On the contrary, if the atmospheric pressure is increased, the luminosity of a flame is also increased, and it would seem that up to considerable pressures the rate of increase is in the observed proportion of 5·1 per cent. for every inch of mercurial pressure; and by doubling the atmospheric pressure the light of a gas-flame rises from 100 to 252. So marked is this on the luminosity of flame, that it is not difficult to make a spirit-lamp glow like a candle, or even to make it smoke.

And then there is another circumstance which influences the light of a flame, namely, the temperature at which the combustion is going on. If the temperature is lowered, the light is also proportionally diminished. This is noticed in the flame of a candle which requires snuffing, when the charred wick and the head of sooty carbon radiates the heat and lowers the temperature of the flame. But if by any means the temperature is increased, an opposite effect is produced. I have here a contrivance which was originally designed by Mr. Bowditch, and which has been somewhat modified by Dr. Frankland. It is a common Argand burner and glass, with another glass around it; and it is so arranged that all the air which supplies the burner must pass down between the glasses and be heated before it reaches the flame. The temperature which it thus acquires is from 500° to 600° Fahrenheit, and it passes to the flame as a sort of hot blast. The result of it is that the light for the same volume of gas is increased about 67 per cent. and for equal lights it is found that there is a saving of 46 per cent. of gas.

Illuminating Power with and without the external Glass in Sperm Candles of 120.

Consumption per Hour. Cubic Feet.	Illuminating Power without Glass.	Illuminating Power with Glass.
2·2	—	13·0
2·6	—	15·5
3·3	13·0	21·7
3·7	15·5	—

These are the results with cannel gas, but I do not find there is a like increase of power with common gas.

(*To be continued.*)

THE TREATMENT OF CHOLERA.

The Lords of her Majesty's Privy Council having by their medical officer, Mr. Simon, addressed a letter to the College of Physicians relating to the expediency of issuing instructions to captains of merchant vessels "how they should act when proper medical attendance cannot be procured, so as to provide for the health of their crews against attacks of cholera," the following is the substance of the reply forwarded by the College:—

"Their lordships request to be informed 'whether, in the opinion of the College, any, and if so, what suggestions might be issued as representing the present state of medical knowledge and experience with regard to the drugs which should be given, or other treatment which should be adopted, in attacks of cholera, and especially in the beginning of the disease, when proper medical attendance cannot be procured.' Their lordships, at the same time, submit to the College a copy of the instructions issued on previous occasions.

"With reference to that part of the instructions on which their lordships particularly request the opinion of the College, viz. that which relates (1) to the necessity of avoiding purgative medicines during the prevalence of cholera, and (2) the measures to be adopted when cholera appears on board ship, the committee think—

"1. That when opening medicine is required, the mildest should be selected, as castor oil or rhubarb. Glauber's salts and Epsom salts are dangerous. The common belief that prolonged costiveness should not be interfered with during the prevalence of cholera is erroneous.

"2. That the master should ascertain by inquiry, morning and evening, whether any of the crew are labouring under diarrhœa, and if so the following recommendations are subjoined for his guidance:—

"3. That if a man be attacked with diarrhœa, he should, whenever it is possible, be sent to bed and kept warm, and some aromatic and astringent medicine, containing a small quantity of opium, should be given to him at once, and should be repeated every hour or two, according to the severity of the purging.

"It is suggested that ten grains of the aromatic powder of chalk and opium (of the British Pharmacopœia) should be so given in half a glass of peppermint water or weak brandy and water. Should this medicine not be at hand, five measured drops of laudanum may be substituted for each dose of the powder.

"Large doses of opium or of ardent spirits should be avoided.

"If the diarrhœa should result from bad or obviously indigestible food, or if the discharges are unnaturally offensive and attended with griping pain, it would be desirable to give a dose of either of the gentle laxatives above named before administering the opiates.

"The diet should consist mainly of beef-tea or broth, gruel, or rice.

"If the discharges become colourless and watery (the purging being of the kind commonly called 'rice-water purging') and be accompanied with vomiting and coldness, the opiates should no longer be persisted in, and spirituous liquors should be avoided. The patient should be strictly kept in the recumbent position, he should be allowed to drink water freely, and should be abundantly supplied with fresh air. Warm applications should be used to the feet and legs, and a mustard poultice should be applied to the pit of the stomach. Cramps may be treated by rubbing the affected parts with the warm hand.

"In all cases, medical advice, when obtainable, should be obtained as soon as possible."

The following, in a communication to the 'Times' of August 3rd, is recommended by Sir John Fisher, late chief surgeon to the metropolitan police:—

"Aromatic confection, six drachms; tincture of opium, one drachm; tincture of catechu, two ounces; aromatic spirit of ammonia, one ounce; chloric ether, two drachms; peppermint water, thirteen ounces: mix. Three tablespoonfuls to be taken every three or four hours, until the diarrhœa ceases."

The writer observes, "This medicine may be said to have been invariably successful when taken on the first appearance of diarrhœa, and I have had in one season 2000 or 3000 cases. It was found in the seasons of cholera to prevent diarrhœa running into that disease."

Similar treatment, with slight modification, has been advocated by numerous writers in the daily papers and in the medical journals; but there are two eminent exceptions to this mode of treatment, one advocated by Dr. George Johnson, the other by Dr. Billing. The former, in 'Notes on Cholera,' so far from striving to stop the diarrhœa by opiates or by astringent drugs, advocates what is called the "evacuant plan," and gives a dose of either castor oil or rhubarb to promote the expulsion of the morbid secretions, after which, if found necessary, an opiate may be given. Dr. Billing, 'On the Treatment of Asiatic Cholera,' on the other hand, looking upon cholera as a *species of fever*, is in favour of what is called the "indirect treatment," and gives the following remedy:— Water, half a pint; tartar emetic, two grains; sulphate of magnesia, half an ounce: mixed. The dose is, for an adult (from fifteen years upwards), a tablespoonful every half-hour; for a child of a year and a half or two years, a teaspoonful; and for the intermediate years, a proportionate dose. When the above cannot be quickly obtained, the following may be substituted:—Water, half a pint; a large tablespoonful of common salt; a large tablespoonful of flour of mustard: mixed. The doses the same as of the former.

COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS IN JULY, 1866.

The following are the returns of the Metropolitan Association of Medical Officers of Health :—

Names of Water Companies.	Total Solid Matter per Gallon.	Loss by Ignition.*	Oxidizable Organic Matter.†	Hardness. Before Boiling.	Hardness. After Boiling.
Thames Water Companies :—	Grains.	Grains.	Grains.	Degrees.	Degrees.
Grand Junction............	17·49	0·70	0·60	13·0	2·5
West Middlesex	16·77	0·80	0·76	12·5	2·0
Southwark and Vauxhall	17·10	0·58	0·49	13·0	3·5
Chelsea	16·60	0·68	0·60	13·0	2·5
Lambeth	18·39	0·75	0·72	13·0	2·5
Other Companies :—					
Kent	27·86	1·00	0·02	18·0	8·5
New River.................	17·16	1·90	0·20	13·0	3·0
East London	18·16	0·80	0·40	13·5	3·5

H. Letheby, M.B.

The analysis of the metropolitan waters during the month of July shows that in every case there is less than the average proportion of saline and organic matters, and the reduction of the latter, which is the most important constituent of potable water, is most marked in the waters derived from other sources than the river Thames; for while the amount of organic impurity in the latter has ranged from 0·49 to 0·76 of a grain per gallon, that of the former had been from 0·2 to 0·4 per gallon; indeed, the quantity of organic matter in the Kent water has fallen from an average of 0·2 of a grain to 0·02; that of the New River from 0·46 to 0·2; and that of the East London from 0·53 to 0·4. These reductions in the quantity of organic matter are chiefly due to the care with which the processes of filtration are conducted; and if these analytical results are compared with those of a few years ago the improvement is still more remarkable. It is very probable, however, that the most perfect processes of purification, so far as they can be used at the works of the water companies, will never be sufficient to ensure such a purity of water as the complete removal of those subtle agents of disease which even the most refined appliances of the chemist have failed to discover. It may, therefore, well be that all discoverable traces of organic matter may be removed from water, and yet it may still contain enough of the minute germs of disease to manifest its morbific action wherever it is used. Experience, indeed, teaches us that it is not the quantity of organic matter in water so much as its quality which determines its dangerous properties; and, if it be true, as modern pathological science has almost demonstrated, that the real agent of such diseases as infectious fevers, cholera, the rinderpest, and other allied zymotic maladies, are living germs, and not a gas or vapour, or dead organic miasm, it must rest with the physiologist rather than with the chemist to decide on the means which are best suited for their destruction; and it is more than probable that the chemist would be putting forward very dangerous propositions if, by relying on his science alone, he ventured to dogmatize on so difficult a subject. That which has been abundantly proved in respect of smallpox and some other infectious diseases is very applicable to the pre-

* The loss by ignition represents a variety of volatile matters, as well as organic matter, as ammoniacal salts, moisture, and the volatile constituents of nitrates and nitrites.

† The oxidizable organic matter is determined by a standard solution of permanganate of potash—the available oxygen of which is to the organic matter as 1·8; and the results are controlled by the examination of the colour of the water when seen through a glass tube two feet in length and two inches in diameter.

sent inquiry, in so far as it relates to the more than possible existence of choleraic germs in the water we drink. The agents of those diseases are unquestionably living germs capable of remaining dormant for an uncertain but nevertheless not indefinite period, and then springing into activity and multiplying themselves without limit directly they find the conditions necessary for their active development. But whether these germs are susceptible of oxidation, like common dead organic matter passing through its final stages of decay, is more than chemical science alone can determine. The analogies in physiology are against such a supposition, and they warn us not to receive it even as a possible fact. That which we do know, however, is that these germs are destroyed by the temperature of boiling water; that they are killed by all caustic substances, as chloride of zinc, chloride of iron, etc.; and that they cannot resist the action of certain agents, as sulphurous acid and its salts, carbolic acid, which act on them after the manner of specific poisons. We must, therefore, look to these agents rather than to processes of oxidation for reliable prophylactics; and in the case before us the only agent on which we can confidently rely is heat, for if the infected water be boiled the choleraic germs will be rendered innocuous. That the destruction of decaying organic matter in water is of the greatest importance there can be no doubt, for experience has proved that it also is productive of disease. It is, moreover, certain that organic matters of this description are rapidly oxidized by permanganate of potash, and by filtration through animal charcoal, and charcoal mixed with certain compounds of iron, but it is more than doubtful, even if it were practicable, whether such processes of purification should be used by the water companies at the sources of supply, seeing how many causes of pollution exist between those sources and the consumer. Besides which it must not be forgotten that only a very small part of the water delivered by the company is used for primary domestic purposes, the great bulk of it being employed for flushing closets, drains, and sewers, for watering streets, and for various manufacturing operations. It would, therefore, manifestly be an unnecessarily wasteful application of a tedious and expensive process, to do that at the works which can be so easily, so surely, and so much more economically done at the point of consumption.

But after all the most important consideration at the present time is the means of obtaining a constant water supply, so that the prolific sources of contamination and of real danger to the community, the filthy butts and cisterns, may be entirely abolished. The very first step towards the attainment of this object must be made by the public themselves; for it is idle to expect a constant supply while there is the present imperfect condition of almost every household service. If, indeed, such a supply were at once given to us, it would assuredly fail, for all the water of the Welsh hills would be insufficient to maintain it. The daily supply of water to London is at the rate of about 30 gallons per head, whereas experience has proved in many instances that with a well-regulated constant service it need not exceed 20 gallons a head. As a matter of economy, therefore, as well as of public health, it is high time the consumer should make preparation for such a supply, in the way that the Act of Parliament directs, and then there would be no difficulty in applying processes of purification at every point where the water is used for domestic purposes.

At the present juncture it is advisable that all water stored in butts or cisterns should be boiled before it is drunk, and, where it is practicable, it should be previously filtered through animal charcoal, or charcoal associated with proper compounds of iron; and, failing this, it may be treated with a little of Condy's solution of permanganate of potash, until it retains a very pale but decided tint of rose-red. In all cases, however, it should be boiled.

THE PURIFICATION OF WATER.

Dr. Frankland has made the following communication to the Registrar-General:—

"*Royal College of Chemistry, August* 4, 1866.

"Sir,—In compliance with your request I have made a special analysis of the water supplied by the East London Company, and collected on the 1st instant. The following are the results, together with those yielded by the water supplied by the same Company on July 1, and on the average of a whole year:—

	Solid matter in 100,000 parts.	Organic and other volatile matter in 100,000 parts.	Oxygen required to oxidize the organic matter.	Degree of hardness.
East London Company's water, collected August 1, 1866	Deg. 26·14	1·44	·0328	17·7
East London Company's water, collected July 1, 1866	24·38	1·94	·0344	16·6
East London Company's water, average of one year	27·98	1·62	·0504	21·12

"It is the amount of organic matter contained in this water which is of especial importance in connection with the outbreak of cholera in the district supplied by this company. The above results that, in this respect, the water supplied on August 1, is considerably better than that supplied on July 1, when the amount of this ingredient was markedly above the average. Chemical analysis, therefore, although it shows a larger quantity of organic matter than ought to be contained in water used for drinking purposes, does not reveal any exceptional degree of pollution in this water. It must be borne in mind, however, that chemical investigation is utterly unable to detect the presence of choleraic poison amongst the organic impurities of water, and there can be no doubt that this poison may be present in quantity fatal to the consumer, though far too minute to be detected by the most delicate chemical research.

"It is thus that the occurrence of cases of cholera, or of choleraic diarrhœa, upon the banks of any of the streams from which the water-supply of London is so largely derived, may at any moment diffuse this poison over large areas of the metropolis. For the prevention of such a catastrophe there is a method which deserves considerable confidence. In my last three monthly reports to you on the metropolitan waters I have shown that filtration through animal charcoal (bone-black) removes practically the whole of the organic matter from the New River water; and in numerous other experiments I have ascertained that this process is equally efficient even when applied to the foul waters of ponds and ditches. I have also proved that its action continues unimpaired for three months, and will probably last for a year, even when very large volumes of water are passed through it. Animal charcoal alone has this power, vegetable charcoal being perfectly inert.

"I would, therefore, most earnestly recommend that during the prevalence of cholera the whole of the water supplied to the metropolis should be passed through animal charcoal immediately before transmission to consumers from the reservoirs of the respective companies. For this purpose 300 tons of bone-black, in the condition in which it is used by sugar refiners, would be required to purify the total supply of the Metropolis, as I find that water passed at the rate of 1,000,000 gallons in twenty-four hours through three tons of bone-black, is completely purified. This operation, even when performed upon the water-supply of London (100,000,000 gallons daily), would be neither formidable nor expensive. Three or four days would suffice to fix the necessary filtering boxes, whilst the animal charcoal, being an article which is now manufactured on a very large scale, can be had on the shortest notice. It is scarcely necessary to add that the water should be passed through the animal charcoal after it has undergone the usual process of filtration.—I have, etc., "E. Frankland."

In another letter, addressed to the Secretary of the East London Water-Works Company, Dr. Frankland has recommended the immediate use of permanganate of potash to be applied after filtration, and immediately before the water is transmitted to the consumer.

EARLY CLOSING.

The following notice has been circulated by some of the chemists at the west end of London:—"This establishment will close every evening at eight o'clock. Families are most respectfully solicited to send their orders as early as convenient prior to this hour."

MISCELLANEA.

Poisoning by Carbolic Acid.—At Liverpool, the relative of a patient in the hospital, who had died from cholera, went in a state of intoxication to see the body. Perceiving a bottle of carbolic acid that had been left in the room, he mistook it for rum, and swallowed a quantity. Death took place almost immediately.

The Explosive Force of Nitroleum, or Nitro-glycerine.—A highly-interesting official report has just been made by Colonel Shaffner of a series of experiments conducted by him at Washington for demonstrating the use of nitroleum (which, it should be explained, is the new and far preferable name by which the Colonel designates the compound which has hitherto been called nitro-glycerine) in the explosion of mines. The results fully confirm the fact that the explosive qualities of nitroleum are far in advance of gunpowder. Two similar cast-iron pieces, weighing each 300 lb., had a hole 1 in. diameter and 15 in. deep bored in them, and were charged, one with powder and the other with nitroleum. The powder discharged through the fuse-vent, $\frac{3}{16}$ in. diameter, did no injury. The nitroleum tore the iron to pieces, the force extending downward from the bottom of the charge, leaving a cone with its apex at the bottom of the drill-hole. Four musket barrels were placed in wrought-iron cylinders, two filled with gunpowder and two filled one-third full with nitroleum. The musket barrels charged with powder were exploded by electricity; they burst open, tearing the iron to pieces. The explosion of the barrels charged with nitroleum produced a very different effect; they were flattened, and not so much broken to pieces; the force was so sudden and great that after the barrel had irregularly broken up and down the iron appeared like rolled plate, even and polished. The experiments appear to demonstrate that nitroleum can, with ordinary precautions, be handled and employed without greater danger than is common to gunpowder, and for blasting operations, at least, it presents undoubted advantages.—*Mining Journal.*

The Danger of using Metropolitan Pump-water.—The following letter, signed by Dr. Miller and Professor Frankland, appeared in the 'Times' of July 30:—

We have just heard with surprise that the Broad Street pump, after having been closed for several months, has been again opened to the public since the outbreak of cholera in the metropolis.

The water from this pump has been repeatedly analysed and pronounced unfit for drinking and domestic purposes. One of us examined it as lately as July, 1865, and found it to be little else than filtered sewage, notwithstanding its brightness and freedom from offensive smell and taste.

We have no hesitation in saying that the use of this and other similar pumps in the metropolis, supplied as they are by surface and sewer drainage, is at the present juncture fraught with extreme peril to the community. It is well known that the pump in Broad Street was, in the cholera visitation in 1854, the centre of a terrible outburst of the disease; while an isolated fatal case in Hampstead was clearly connected with the use of Broad Street pump water.

During the autumn of last year a startling outbreak of cholera occurred on the borders of Epping Forest, to which attention has again recently been called in the daily papers. The disease appears to have been brought to the spot by a member of a family who had been travelling in the west of England, and in this case it rapidly attacked other members of the household with great severity. All these persons used water from a particular pump, and it was ascertained by one of us, from the chemical analysis of the water, that it was largely contaminated with drainage from the water-closet. Independently of this analysis, a leak from the closet into the well was discovered by the medical officer sent down to examine and report upon the case.

The instances just cited distinctly show the danger of allowing the discharges from cholera patients to find their way into waters used for dietetic purposes. Indeed, it can scarcely be doubted that a single case of cholera occurring within the drainage area supplying the Broad Street pump would, owing to the infected discharges from the patient finding their way into the well, provide the certain means of spreading disease and death among the surrounding inhabitants.

For similar reasons we would most earnestly recommend the closing of all pumps in the metropolis during the continuance of cholera, since most of them derive their water from sources similar to that of Broad Street. With the supply of water now furnished by the drinking-fountains such a temporary closing of these surface wells could not occasion any serious inconvenience, and might be the means of saving thousands of lives.

It cannot be too strongly insisted upon that pollution of a nature to spread infection often really exists without sensibly affecting either the taste or the appearance of the water.

Citrate of Soda in Diabetes.—We learn from the 'Lancet' of July 7th, that M. Guyot-Danecy, basing his practice upon the theory that diabetes arises from imperfect combustion of the glucose of the blood, proposes to employ citrate of soda in order to supply the alkaline carbonate which is necessary to the progressive chemical change of the glucose. He substitutes the citrate for the carbonate, because, he says, it does not affect the function of digestion. The salt is given in doses of from 4 to 8 grammes. His analyses, he alleges, demonstrate that sugar disappears from the urine after the administration of the citrate. Citrate of soda may be mixed with food instead of salt, and with it the use of ordinary bread and starchy matters ceases to be objectionable.

BOOKS RECEIVED.

On Epidemic Diarrhœa and Cholera: their Nature and Treatment. By George Johnson, M.D. Lond. London: Robert Hardwicke, 192, Piccadilly. 1866.

On Cholera: its Nature and Treatment, being the Debate in the Harveian Medical Society of London. Edited by Dr. C. Drysdale, Honorary Secretary to the Society. London: Robert Hardwicke, 192, Piccadilly. 1866.

On the Rational Employment of Mercury in the Treatment of Syphilis. By Dr. Colomiati Meredyth. London: Robert Hardwicke, 192, Piccadilly. 1866.

The Medical Acts and the Proposed "Medical Acts Amendment Bill." London: printed by C. Mitchell and Co., Red Lion Court, Fleet Street. August, 1866.

TO CORRESPONDENTS.

Our readers are reminded that the Patent Medicine Duty becomes due on September 1.

C. B. H.—Benzoated zinc ointment. See vol. xiv. page 207.

"*Patientia vincor*" (Manchester).—(1) *Chlorodyne.* Dr. Ogden's formula, see vol. iii. (2nd series) page 584. Mr. Squire's formula will be found in his 'Companion to the British Pharmacopœia,' page 69. (2) It is quite an open question; no rule is observed by the chemists in London at present, but an effort is being made by some to close their shops at eight o'clock.

Mr. Machon (Saffron Walden) is thanked for his communication. The word "liquor" has obviously been omitted in the prescription referred to.

"*Sigma*" (Manchester).—It is not intended that the precipitate should be separated from the lotion referred to.

"*A Subscriber.*"—*Colours for show-bottles.* See vol. vi. page 391, and vol. x. page 92.

J. J. (Glasgow).—*Remedies for cholera.* See page 170.

T. P. B.—1. Geum urbanum. 2. Melilotus officinalis.

Student (Manchester).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

C. P. (Strood).—Not liable to duty.

Several articles are deferred this month for want of space.

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. VIII.—No. IV.—OCTOBER, 1866.

WHAT HAS EDUCATION DONE?

A quarter of a century ago the founders of the Pharmaceutical Society established, for the first time in this country, a school for completing the education of those engaged in the practice of pharmacy. There had not previously been any special provision made for the instruction of pharmaceutical students in those branches of science most closely connected with the knowledge involved in their business pursuits. Men called themselves chemists without possessing a knowledge of even the elementary principles of the science of chemistry; and they styled themselves druggists without knowing anything of the natural history of drugs. These men were mere dealers in articles which passed through their hands under names by which they were known in commerce, just as another class of tradesmen dealt in tea, coffee, tobacco, and snuff, without knowing the botanical names of the plants yielding them, the processes to which they had been subjected, or the active constituents upon which their efficacy depended. But, although possessing no scientific knowledge on these points, the grocer knew how to distinguish between good and bad tea or tobacco, and, exercising this knowledge with discretion, there was no ground for complaint, nor any dissatisfaction expressed with his qualification. So also the chemist and druggist, without the aid of science, could supply good drugs, and become, to some extent, expert in discriminating between good and bad. But the qualities of drugs used in the treatment of disease cannot be determined as easily as those of grocery, and deficiency in the strength, or alteration in the qualities of medicines may be of far greater importance than variations, such as are likely to occur, in articles of diet. Moreover, the chemist and druggist has something more to do than merely to sell drugs; he has to prepare from these a variety of products, in the production of which chemical and other scientific knowledge is often involved. The advancement of medical science has led to the use in medicine of many very powerful substances, produced by chemical processes from natural products; and the use as well as the production of these substances is attended with much danger, if entrusted to persons unacquainted with their physiological and chemical effects and properties. Loss of life and injury to health have been caused by the ignorant exercise of the art of preparing and administering medicines. At the period already referred to there was a well-grounded complaint of the want of systematic education among those engaged in the practice of pharmacy, to which deficiency many defects and evils attending the sale and administration of medicines and drugs were ascribed. This deficiency was felt and admitted by those to whom it specially applied, and by them also the remedy was undertaken. The Pharmaceutical Society was organized by the leading chemists and druggists of the day, and one of the principal objects of the Society was to advance pharmacy by extending the knowledge and improving the general qualification of those who devoted themselves to it as a profession or business. Lectures were established on chemistry and pharmacy, botany and materia medica; and subsequently practical instruction in laboratory operations was provided for those who desired to avail themselves of such assistance in their studies. This system of instruction was organized upon a liberal and efficient scale; and it has been thus maintained for twenty-five years, to the credit of those who, at a yearly cost of hundreds of pounds, have continued to afford to the rising generation advantages which they had not themselves enjoyed. The credit of having persisted in this course has been the greater on account of the opposition that has from time to time been offered to it. Sometimes the cost to the members of the Society, who were not personally partakers of the benefits, has been urged as a ground for discontinuing the school, while at other times it has been represented that the standard of instruction was raised too high or made too scientific to prove useful to men of business. Evils have been predicted as likely to result from imparting to our young men a love of science, the application of which, it has been contended, was not likely to find remunerative scope in the field of legitimate pharmacy. It was asked, would not all this learning raise expectations that would be doomed to disappointment? Would it not give young men notions that were inconsistent with habits of business, make them despise the apron and neglect many essential operations of the shop that might be thought to be mere drudgery? You may raise up a class of philosophers, it was said, but will they be satisfied with the monotony, the drudgery, and the sparing remuneration which the practice of pharmacy presents? If you retain them as members of your body, which is doubtful, will they not become conceited and overbearing to those who have helped them to their position, and contributed to make them what they cannot themselves hope to be? But many, if not most, of them, after partaking of your generosity, instead of remaining ornaments to the profession of their early choice, will apply their acquired knowledge in more promising pursuits than that of pharmacy, and thus the contemplated object will be frustrated.

Now, after a lapse of a quarter of a century, it may be asked, how far have these predictions been realized? What has education done? Have we progressed or gone backwards? If, as will readily be admitted, there are notable signs of progression, has the general advancement been marked by attendant evils, either incidental or pertaining to the means that have been adopted?

We shall not attempt to give explicit answers to these questions; it forms no part of our object on the present occasion to do so. What we have purposed is to induce a general inquiry among those concerned with reference to the past, so that they may the better judge of the fitness of means already tried for accomplishing what is required in the future. With an institution firmly established, and objects the importance and desirableness of which cannot be gainsayed, we need not fear to look the case fully in the face, nor to meet those who may be disposed to cavil on minor points of detail, while we can refer to great and obvious results.

We are about to enter upon a new session, and those who avail themselves of the means of instruction provided by the Society may profitably take example from those who have preceded them as students, and who now occupy prominent positions as promoters of whatever tends to the advancement of pharmacy. The means of instruction provided are designed to supply the knowledge which, in addition to that acquired only at the counter, forms the necessary qualification for an accomplished pharmaceutist. Scientific instruction is furnished as an accessory to that which is practically acquired in the shop, and is not intended to supersede it, nor should it be looked upon as more important. There may be, and, no doubt, have been cases in which the love of science has led to the neglect of those habits upon which success in business so much depends. The acquirement of scientific knowledge, especially while it is confined to a portion only of those of kindred pursuits, is likely sometimes to puff up the possessors with false notions of superiority, and to engender a distaste for the dry, plodding work that must form part of the occupation of a man of business. A little science may make a weak man vain and conceited, and indisposed to appreciate sterling qualities in men of the older school, who, although deficient in some scholastic accomplishments, may excel in the knowledge of what is more essential in a practical point of view.

These are possible, although by no means necessary, results of the extension of education, and especially upon its first introduction. That there have been occasional instances in which such results might be traced to the influence of education as provided by our Society cannot be doubted; but we do not think they can be justly ascribed to any defect in the system adopted, or that the evil exists to any serious extent. Still it behoves those who are entering upon their scientific studies to beware of prejudicial influences to which they may be subjected, and to avoid and discourage results which might prove injurious to their own interests, and bring unmerited discredit upon an institution from which great benefits are resulting to all those engaged in the practice of pharmacy in this country.

THE OPENING SESSION.

Easy circumstances are an excellent institution. Wisdom is a defence, and money a defence; not the least protection afforded by the latter, being that broader and more intelligent range of thought, which arises from unvexed leisure, as also a large measure of independence with regard to external sources of enjoyment. To all whom thus fortune has exceptionally favoured, a Society (though by them specially appreciated) is a matter of secondary importance, but no man less than the Pharmaceutist in a somewhat straitened way of life, can dispense with its stimulating influence. Necessarily to none more than himself does the routine of business appear in a less attractive garb. Long hours *versus* scanty remuneration, form too often the dreary equation of his existence. His surroundings are constant and the reverse of cheerful,—too much gas and too little money,—too much labour and too few returns.

When we write elegant essays, some flowers of rhetoric may be excused; but when we stand face to face with stern and unwelcome truths, we are bound honestly to state them. What can be more dismal than mere shop pharmacy on a small scale? What task at once so hopeless and so monotonous? Men following other callings, though in an equally narrow range, have abundant counterbalancing resources, the sum of which may be expressed by saying that they have shorter hours. But the druggist, trying to solve the mystery of how to make ends meet, is chained to his occupation. What truer benevolence can be exerted than that which places within reach, not only those means of trade extension which have never yet proved ineffectual, but something on which his mind may feed without grinding upon itself.

To a man in the position just described, paradoxical as it may appear, the teaching of the Professor of Chemistry is of paramount service; he moreover (and it is no strained sentiment) is the very character who would be also most advantaged by placing himself under the immediate influence of the Professor of Botany.

We are not at this moment advocating those higher and more abstruse walks of science which attract the few, for not to every one is it given to scale the Alps physical or mental; but we allude to the obvious gain which must inevitably result from the possession of a fair average acquaintance with the things which constitute the occupation of the pharmaceutist.

Granted that in a certain sense there might be no direct, that is commercial, utility in recollecting the exact chemical constituents of Epsom salt; granted that the business might still prosper, though the botanical distinctions between Monkshood and Horseradish might not be recognized, we draw an argument from another source, and point to the known alternative of protracted and scarcely intelligent labour as it exists before our eyes. Thus far, at least, will be conceded that *any* change would be probably for the better, and that any rational mode of effecting it is worthy of serious attention.

Nevertheless there is a strange objection. No sooner is the subject mentioned to those who are most concerned, than they express their disapprobation in no measured terms. The whole thing is scouted, and held up to ridicule in extremely Saxon English. Philanthropists must not be annoyed if the expected gratitude attendant on their laudable exertions is not in every case forthcoming. It might excite surprise that men weighed down and hemmed in by circumstances apparently so uncongenial, should be passively indifferent to change; but it is only another proof of the tyranny of habit. In like manner, the dog sleeps by the anvil while the sparks fly in all directions, and the smith hammering out the red-hot iron makes noise enough to wake the dead. But if knowledge, that stock in which there is no bankruptcy, be thus desirable, not less do the claims of a Society stand out in bright relief. It is not possible for a set of sensible men to meet together without doing each other good. All the books yet written cannot equal the electric influence of personal contact. Deduct the element of mental culture and of experience gained, there yet remains this strong inducement, namely, that companionship lifts a man out of his own weak circle of ideas, and saves him from himself. But when the intellectual and the social element unite, there can be no question as to the personal claim of a Society.

Such an organization is provided, and at the opening of a new session we would urge these brief considerations in the strongest manner. We would implore every pharmaceutist, for his own sake, as far as in him lies, to profit by the opportunities now offered. We commend the subject respectfully but urgently to every master, hoping that to his utmost he will place the advantages of the opening session within the reach of his apprentices and assistants; business will flourish quite as steadily, and no slight domestic misery will be avoided.

During the past year new arrangements have been made with regard to laboratory work, to which special attention is invited.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *5th September*, 1866,

Present—Messrs. Bird, Deane, Haselden, Hills, Ince, Morson, Orridge, Randall, Savage, Squire, and Waugh,

Robert Palmer was unanimously elected a Member of the Council in lieu of John Baker Edwards, resigned.

BENEVOLENT FUND.

Subscriptions received during August and September:—

Country.

	£	s.	d.
Birmingham, J. T. D.	0	10	6
Bury St. Edmunds, Portway, John	1	1	0
Horsham, Williams, Philip ...	0	10	6
Lincoln, Woodcock, Page D.	0	5	0
Liverpool, Evans, H. Sugden .	2	2	0
„ Evans, Sons, and Co.	2	2	0
Lower Tooting, Medcalf, E....	0	10	6
Rochdale, Mercer, Thomas W.	0	5	0
Scarborough, Whitfield, John	1	1	0
Strood, Picnot, Charles.........	1	1	0
Thornbury, Ellis, Richard......	0	5	0
Wolverhampton, Hamp, John	0	10	6
Wymondham, Skoulding, Wm.	0	5	0

London.

Attfield, J., 17, Bloomsbury Sq.	1	1	0
Baker, A. P., 374, Old Kent Rd.	0	10	6
Bird, A., Shepherd's Bush ...	2	2	0
Borchart, H. T. G., Dalston...	0	10	6
Davenport, John T., 33, Great Russell Street	2	2	0
Elvey, Thomas, 8, Halkin St.	1	1	0
Henty, H. M., St. John's Wood	0	5	0

Donation.

Evans, Alfred John..................... £1 1 0

Erratum, p. 57.

For Pratt, Edmund 0 10 6
read Pratt, Edmund 1 1 0

PROVINCIAL TRANSACTIONS.

PRESENTATION TO DR. J. BAKER EDWARDS AT LIVERPOOL.

During the past few months it had become generally known that John Baker Edwards, Ph.D., F.C.S., was about to leave Liverpool and take up his residence in Canada; and there being a general desire expressed by his friends resident in that town that some compliment should be paid him prior to his departure for the western hemisphere, a meeting was called, and, after some discussion as to the manner of carrying it into effect,—some gentlemen advocating an invitation to a public dinner, while others considered that something permanently useful would be more appropriate,—the following resolution was agreed to:—

"That this meeting approves of the suggestion of the presentation of a timepiece, or some other *souvenir*, to Dr. Edwards on his departure for Canada, as a token of the esteem of his friends in Liverpool; and that a committee, composed of Dr. Ginsburg, chairman, Dr. Nevins, treasurer, Rev. William Banister, Rev. Enoch Mellor, Messrs. John Abraham, Henry Walter, and John Shaw, be authorized to make arrangements for carrying out the above object."

The Rev. Mr. Banister and Mr. Shaw having undertaken to act as honorary secretaries, a beautiful work of art and science was brought to the notice of the Committee, and was selected as the one for presentation. It consists of a stand of black marble, polished, and about 16 or 18 inches in height, and of the same width; in the centre of the upper portion is a timepiece with pendulum, and on one side is a Réaumur's and on the other a Fahrenheit's thermometer. Below these, on one side is an aneroid barometer, on the other is a dial, the hand of which indicates the month of the year, and two smaller ones indicate the day of the month and the day of the week; the changes of the moon are also shown;—the whole of these movements being regulated by ingenious mechanism, and forming a useful as well as an ornamental acquisition to the dining-room or library.

A considerable sum of money having been subscribed in Liverpool, and gentlemen in London and elsewhere with whom Dr. Edwards had been intimately associated, principally in connection with the Pharmaceutical Society,—the Pharmaceutical Conference and the British Association, having heard that some compliment to their friend and colleague was intended, at once requested to be allowed to join in the tribute of respect.

The presentation took place on Tuesday evening, September 4th, at the Royal Institution, Colquitt Street, and the whole of the subscribers and their friends were invited on the occasion. Amongst those present were the Rev. C. D. Ginsburg, LL.D., Rev. E. Mellor, M.A., Dr. Nevins, Dr. Moore, Dr. Higginson, Messrs. J. A. Picton, J. Abraham, William Crosfield, jun., R. Sumner, A. Redford, D. Wharrie, E. Davies, J. Shaw, M. Murphy, J. Dutton, S. Banner, G. Barber, W. J. Baker, D. Marples, etc. etc. The Rev. W. Banister, one of the honorary secretaries, was unavoidably absent. Tea, coffee, and other refreshments having been duly discussed, and conversational regrets and good wishes with the guest of the evening ended, the chair was taken by the Rev. Dr. Ginsburg, Vice-President of the Literary and Philosophical Society, who spoke as follows :—

Gentlemen,—You all know the occasion which has brought us together this evening. We are to express to our friend Dr. Edwards our appreciation of his past services both here in this town and throughout the country, as well as to express our deep feeling at the loss which we are to sustain at his departure from Liverpool. Liverpool is the last place in England, I was going to say, as a large town, which can well afford losing a scientific and literary man like Dr. Edwards. We are not overcrowded with such scientific men as he is, and the few that exist we are sorry to find are diminishing gradually year after year. In addition to those who have lately left us, we are now about to sustain another loss in the person of Dr. Edwards. He is well known to us all, and requires no commendation from any one of us. But whilst we thus express to him our gratitude by the things which we are now to present to him, we, at the same time, cannot forget that we shall henceforth lose him from our midst. Recent discoveries and achievements, however, make the local loss of a man not so great as otherwise it used to be. In Canada he will be able to speak to us in a minute or two, and I am sure he will not forget his Liverpool friends. I wish we in Liverpool had something permanent to detain literary and scientific men. If we had any institutions, scientific, literary, or artistic, whereby permanent offices or other things might be assigned to these individuals, they would have, as it were, a place of fixture here. However, as it is, merchants in town make their money rapidly. With the increase of money there is an increase in the expense of living which scientific and literary men cannot keep up or compete with. They therefore stand, in a town like Liverpool, pre-eminently at a disadvantage. Conventionalism in society has often succeeded in entrapping men of science and literature; and hence literary and scientific men, who cannot live upon their inventions and contrivances, but, like ordinary mortals, must live upon bread-and-cheese, are, like other men, driven to go to that part of the world where they can comfortably settle, rather than remain among those to whom they are allied by the ties of nature, and to whom they might look for consolation and comfort. These circumstances have driven from Liverpool several of those whom we looked up to as literary and scientific men, and whom we loved. I therefore trust that in future we shall try not simply to express our esteem for a man when he leaves, but to keep him if we can. If by any means our societies could associate and establish something permanent, whereby a few such men might be kept, the few would form a nucleus for more. As it is, every one here feels as a solitary planet and sometimes he becomes an erratic star, and takes his departure altogether. In expressing to Dr. Edwards our appreciation of his scientific and literary qualifications, and of his high moral character and other social qualities, we beg him to understand that we do not intend these expressions as a bait for others to go. We would rather increase them if you, Dr. Edwards, would remain. However, in a long letter you can often let us know what you are doing in the other part of the world, and thereby keep up your communication with us, and we shall be always only too glad to respond to any expression of friendship or of sympathy from you whenever you make any communication to us. Our indefatigable secretary, Mr. Shaw, who has so distinguished himself in the matter of this memorial, will now read some letters which he has received.

The first letter read was from the Rev. H. Stowell Brown, regretting his inability to be present on the occasion, and stating that he had long held Dr. Edwards in great esteem, and considered that his departure from Liverpool would be a great loss, and ending with his best wishes for Dr. Edwards's prosperity.

Mr. Shaw observed that he had received many other very complimentary letters in reference to Dr. Edwards, and amongst the number he would beg to read one from the President of the Pharmaceutical Society of Great Britain, as follows:—

"47, *Piccadilly*, *London*, *August* 29*th*, 1866.

"Dear Sir,—I am very glad to find, by a circular received from you this morning, that Dr. Edwards is to have a token of esteem from *his friends in Liverpool* before leaving England; and I feel assured, by the known spirit of your city, that it will be worthy of the occasion.

"Am I to regard this intimation as a personal favour to give me pleasure (which it assuredly does), or to infer from it that Dr. E.'s Liverpool friends are willing to permit others to join in their testimonial? If the latter be the case, I, for one, would gladly contribute. "Believe me, dear Sir, faithfully yours,

"*John Shaw*, *Esq.* "GEORGE W. SANDFORD."

Mr. Shaw having replied to the above, Mr. Sandford, in another letter, enclosing a contribution, adds:—"We shall, I assure you, miss him (Dr. E.) very much in the Council of the Pharmaceutical Society, where it has long been my privilege to meet him."

The next he would read was from Joseph Ince, Esq., also a Member of the Council of the Pharmaceutical Society,—a gentleman whose talents and business qualifications are well known to all Pharmaceutical Chemists by his contributions to the 'Pharmaceutical Journal.' One of his latest, entitled "Pharmaceutical Ethics," and read before the Conference recently held at Nottingham, was published in the Journal for this month. Mr. Ince writes:—

"I have unfortunately mislaid your circular, and in consequence I cannot tell where to address this note. I will not subscribe sixpence to any testimonial silver teapot, inkstand, or ornamental timepiece. In the first, tea will never be made, the second will never hold ink, and as to the third, the Doctor, when I last saw him at the Midland Railway, had a watch.

"But I will most willingly and cordially give my guinea towards presenting Dr. Edwards with a certain sum of money to be placed at his own disposal, together with a complimentary letter. In any case I should be extremely sorry not to bear my part in any public acknowledgment to my good friend and fellow-student, Dr. Edwards.

"Ever yours most truly,

"JOSEPH INCE."

Mr. Shaw also replied to the letter, giving every information as to what had been done, and that the surplus contributions would be handed over to Dr. Edwards as a purse of money.

Mr. Ince, in his second letter, says:—"The testimonial seems most judicious, and I am obliged to you for allowing me to have a share in so well-deserved a courtesy."

Numerous other letters, referring in equally complimentary terms to Dr. Edwards, might be quoted.

The letter of the Committee accompanying the presentation was next read, as follows:—

"*To John Baker Edwards*, *Ph.D.*, *F.C.S.*

"Dear Sir,—A few of the members of the various learned societies in Liverpool, and other of your friends, being desirous, on the occasion of your leaving Liverpool, of expressing their high regard for you, have resolved to present you with some small *souvenir*, as a token of their admiration for your private and social character, and for your scientific attainments. Accordingly, while expressing our regret at the loss we sustain by your removal, we beg your acceptance of the accompanying timepiece, etc., as an expression of our sincere wishes that you may be long spared successfully to prosecute your scientific researches.

"We are, dear Sir, yours very truly,

"CHRISTIAN D. GINSBURG, LL.D., *Chairman*.
"JOHN BIRKBECK NEVINS, *Treasurer*.
"WILLIAM BANISTER, B.A. }
"JOHN SHAW } *Hon. Secs.*"
(Followed by eighty-eight additional names.)

After reading the above, the Chairman, in the name of the subscribers, presented the timepiece, etc., and a purse of gold to Dr. Edwards, accompanied with their best wishes, for his welfare.

An inscription, engraved on a gold plate and fixed in front of the timepiece, was as follows:—

"Presented to John Baker Edwards, Ph.D., F.C.S., on the occasion of his removal from Liverpool, by a few friends in token of their estimation both of his private character and of his eminent scientific abilities.

"*Liverpool, September*, 1866."

Dr. J. Baker Edwards, in response, said,—I feel very grateful to you all for the very handsome and munificent present you have made me, and also for the form in which you have made it. Of course it is with a very mixed feeling that I meet you on such an occasion as this. On the one hand, I have the pleasure which your kindness conveys to me; on the other, I am continually reminded that it is a parting pleasure, and that it is one which may in all probability never occur to me again. With respect to the testimonial itself, it is extremely beautiful. I cannot say that it is with great surprise that I see it on this occasion, for the Committee were kind enough to consult me with respect to its purchase. It is one of the most beautiful specimens of mechanism that I have ever seen, and certainly I think there is a great deal in it appropriate to the present occasion, and I will just make it a peg on which to hang a few fragmentary remarks. It is a wonderful thing that human ingenuity could construct the idea of such a thing as this, and it is perhaps even more wonderful that human ingenuity should be able to complete the mechanical details of it. Here we have an instrument which shows us every passing second, and while it does so it records to a certain extent the result of that second. It passes on to chronicle the minutes as they fly, and the hours as they roll by. It tabulates the days, the weeks, the months, and the years. I am told that it does not even omit leap-year in its wonderful mechanical powers. In the mechanical passing moments we are reminded that every moment and every second that is going away is a part of one great organization, and that we are called upon to recall these moments and think upon them. At the same time we see that there is what Mr. Groves, President of the British Association, calls a continuity in all. Not only does it record the movements of the heavenly bodies, but it also reminds us of the changes of life, for there is a barometer there, and storms pass over us occasionally. We have sometimes fair and sometimes foul weather in this world; and we are reminded here that such must be our fate also—that we must have moments of high temperature and of low temperature—sometimes a breeze and sometimes equinoctial gales; but still there is a unity about all this, and there is but one movement here which works the whole. It also reminds us that there is a chronicle of these fleeting moments. It would be but a very poor piece of mechanism if it recorded but the moments; but each moment, as it passes, is but a portion of each hour, and each hour is a portion of the month, and each month a portion of the year. Each moment is a portion of our lives, the results of which we hand down to posterity. It is but a moment, and will soon be past. There will be a chronicle of this moment in my life which I hope will never be effaced, and which in the course of my history may bring kindness to others, and so may form a portion of my future life. I came to Liverpool with only one friend in it. That kind friend brought me to Liverpool as a stripling, 19 years of age, and he placed me in the charge of a friend whom I deeply honour,—Mr. Abraham. He and others encouraged me to improve, and they remain now my dearest and best friends. I should be very sorry to think that any friends I had formed in Liverpool should have turned away from me. I do hope that, whatever friends I have had the pleasure and honour of making in my stay in Liverpool, I should never lose. I may part with them, may never see them again, but it would grieve me very much to lose their friendship. If I ever had an enemy, I should like to take him by the hand to-night and pray to be forgiven, as I forgive him. The chairman has referred in very complimentary terms to my scientific position here; but I would prefer, among such cordial friends as these, to tell you that my real position is not that of a scientific man, that I was apprenticed to a trade, and that I have exercised that trade the whole time that I have been resident in this commercial community. In such an aspect as that, it is no very great matter for surprise that I should seek a market more productible. Also, as a manufacturer of that which the public require, if

I could find a better and a larger market for those commodities, I follow the commercial principle so well recognised in Liverpool, in taking my goods to the best market. I have never despised the apron of the shop or the calling of the pharmaceutical chemist. I have endeavoured, in the first place, to improve my own knowledge of the subject in which I was engaged as an apprentice, and finally as a master myself; and it has only been collaterally that I have ventured here and there into science; and if I have been at all successful in learning, I have always been willing to teach. At the same time, this pursuit of commercial matters is greater than I have had before, and I am proceeding to Canada. I do hope, with respect to that future which I have before me, that I shall be able to associate the education of youth with the production of commodities which are required in that country. I delight in teaching what I know, and I would rather point to my own instance as an encouragement to the pharmaceutical apprentice, or a young man without friends or without any very great amount of money, to push his way in life. I would rather say, "That man is an example in which a man might raise himself a little bit above his apron and yet still stick to a shop." In acknowledging the very handsome timepiece, I have to acknowledge still further a very handsome and acceptable present in the current coin of the realm. I am very much obliged to you for this, and with your permission I will enclose it in a casket and hand it to a lady whom some of you know, and I love her better to-day than the day I married her. She is the companion of my future and past, and I hope her health will be better hereafter than it has been at Liverpool. It is difficult to say all that one would like to say on an occasion like this, but if you are not tired I should like to tell you what sort of a place I find Canada. In the first place, the climate appeared to me to be exceedingly beautiful. Politically, Canada is undergoing very considerable changes, by the alterations of tariff. They are gradually approximating to a tariff which more nearly resembles, in its customs features, our own. At the same time, they impose heavy duties upon imports, for the purpose of encouraging manufactures there; and I must say that I was surprised, considering the advance to which pharmacy has been carried in the United States, to find that there were no manufactories of chemical products there. The resources of the country have been developed by the Government, by sending scientific men out to pioneer and examine very thoroughly the geological features of the country. The geological museum in Montreal is a perfect marvel of rich treasure. It is true that there is a lack of coal in Canada proper, but in the abundance of oil-springs and timber there is no lack of fire and fuel. They have iron and copper in abundance, and yet, with all their materials, they have no manufactory of soda or salt or sulphuric acid. Every drop of oil of vitriol has to be imported from Glasgow or St. Helen's, and has to undergo the perils of a passage across the Atlantic. Then with regard to pharmaceutical articles—ether, chloroform, or ammonia, which are consumed in large quantities,—they have to pay a very heavy rate as import duty; so that there is a very great encouragement for any one to take out apparatus and manufacture there. Until recently, the Canadians supplied themselves with these articles very much from the States, but now they have levied duties upon everything, and their resources are very much crippled. The Americans put very heavy export duties on these articles, so that they are as heavily taxed as the import duties from England would be. There is therefore great inducement to manufacture these things in Canada. The union of Upper and Lower Canada has conduced very much to the consolidation of the law and to the consolidation of those questions which were vexatious because local; and the federation of the whole provinces into one government will give a very great impulse indeed to trade, and there is no doubt that the resources of the country will become of very much greater value to us, and there will be greater merchandise than ever there was before. Dr. Edwards resumed his seat after again thanking the meeting.

Mr. Town-Councillor Picton, chairman of the Literary and Philosophical Society, said it gave him very great pleasure to be present that evening, when the respect which was due to their excellent friend, Dr. Edwards, had been expressed so warmly and so practically as it had been by the presentation that night. He (Dr. Edwards) deserved all the respect and esteem which they could bear towards him, and he (Mr. Picton) was very much pleased to find that in his expatriation, if such it could be called, he was going to another world, in one sense, and they hoped it would be a better world; but they were sorry to part with him. He had distinguished himself amongst them not only by his scientific attainments, the reputation of which had extended far beyond the limits of this town and neighbourhood, but also by his geniality and kindness as a friend and brother; for wherever his company had been it had always brought with it sunshine and smiles, and wherever he had gone he had adorned the society in which he had moved, and contributed very much to its pleasure and comfort. He (Mr. Picton) trusted that the same geniality on the other side of the Atlantic would have many opportunities of displaying itself; he was sure, in fact, that it would. He was glad that Dr. Edwards was going to Canada rather than to the United States. He bore no grudge to the United States, but at the same time he was very glad that Dr. Edwards was still to sail under the British flag. No doubt the other side of the Atlantic was the country of the future. They could not conceal it from themselves that, as the song said, "the star of empire glitters in the west." They might regret it, but though it was not yet an accomplished fact, it had yet to be accomplished. Though England was not "chawed up," as the Yankees said, yet we were so crowded up here, so little room to move, so little scope for a man to exercise his energies, that he did not wonder that young men, —young, enterprising, and active,—should go abroad to where there was a boundless territory, and where a young man with strength on his side, and brains in his head, had an opportunity of raising his family to the position which they ought to occupy. He believed it to be the order of Providence that it should be so. In that way the great designs of the Creator in peopling the earth and disseminating peace and happiness throughout the world would be completed. Though they were sorry to part with their friend, yet they all knew that if society on the other side of the water was to be pervaded by intelligence, education, refinement, and progress of mind, it was by the immigration of men like Dr. Edwards that that great consummation was to be achieved. Therefore what might be our loss was their gain, and we might rejoice with them in it. It was always pleasant that the bonds of union and common interest should be drawn closer between America and England; and there was scarcely a family in the world—he believed there was scarcely a gentleman present—who had not relations and friends in America. Intelligent and active scientific men going forth and taking their position on the other side of the Atlantic, augured well for both the one country and the other. He was sure Dr. Edwards would carry with him the best wishes of his friends on this side, and he trusted they would have the opportunity of hearing of his success. It would be a pleasure to the Doctor in Canada to feel how he had been appreciated here, and in that way it might smooth his path a little in his way to distinction, to eminence, and to success. They all cordially and heartily wished him God speed.

The Rev. Enoch Mellor also referred to the high character which Dr. Edwards had always sustained amongst a large circle of friends in the town, and the service he had rendered in his professional capacity to the cause of science.

The Chairman then intimated that the first part of the business of the evening had now been disposed of, and that an address from the Lecturers of the Liverpool Royal Infirmary School of Medicine would now be presented by Dr. Nevins, who, on rising, said that as Dr. Edwards's eldest colleague in the medical school, he had to present to him the address, with good wishes, which had been prepared and signed by the whole of the school. Long before his (Dr. Edwards's) connection with the Medical School, he had the pleasure of being associated with him in various ways; and he should add to that record of long association this statement, that if, instead of happening to be joint lecturers, they should now be separated, the same feeling of friendship would continue to exist between them. He was sure that if Dr. Edwards should be so fortunate as to be associated with education, it would be a great gain to those among whom he laboured.

"*From the Lecturers of the Liverpool Royal Infirmary School of Medicine.*

"*July* 17*th*, 1866.

"TO J. BAKER EDWARDS, PH.D., F.C.S.

"Dear Sir,—In parting from a colleague with whom we have been associated for twelve years in the Liverpool Royal Infirmary School of Medicine, we gladly take the opportunity of expressing our hearty good wishes for your prosperity in the land which you have selected as your future home.

"In the important subject of chemistry you have shown your extensive knowledge and your zealous interest by the readiness with which you have lectured in many of the public institutions in this town; and the brilliancy of your experimental illustrations, both on this subject and on that of experimental philosophy generally, has gained you a well-deserved reputation.

"You have shown yourself ready to appreciate and to exhibit all that is new in these subjects, and those who are interested in them have often been indebted to you for an acquaintance with the most recent discoveries and experiments in science.

"We heartily desire your success, whether you may devote yourself hereafter to chemistry in its commercial relations, or to science as a public teacher.

"We are, yours sincerely,
"A. T. H. WATERS, M.D.,
"*Chairman of the School and Lecturer on Physiology,*

"E. R. BICKERSTETH, F.R.C.S. J. B. NEVINS, M.D. Lond. A. DAVIDSON, M.B. Lond.
J. CAMERON, M.D., M.R.C.P. EWING WHITTLE, M.D. Lond. JOS. SNAPE, D.S.
R. H. TAYLOR, M.D. Edin. F. T. ROBERTS, M.B., B.Sc. Lond. JAS. LONG, F.R.C.S.
A. B. STEELE, M.R.C.S. G. H. RAWDON, M.D. THOS. INMAN, M.D. Lond.
R. GEE, M.D., M.R.C.P.

"REGINALD HARRISON, M.R.C.S.,
"*Secretary and Registrar.*"

Dr. EDWARDS said he thanked Dr. Nevins very much for his kindness in making that presentation, and he most heartily wished success in every way to that school with which he had been so long connected, and from which he was so very sorry to part. He might add that there was not one gentleman with whom he had been connected in that school as a colleague that he did not leave with very great regret.

The CHAIRMAN next called upon Mr. Abraham to present the Address from the Council of the Pharmaceutical Society of Great Britain. Mr. ABRAHAM, before reading the Address, gave a brief history of the Society from its establishment up to the present time, and his own views as to the character of the legislation required in connection with the practice of pharmacy in this country. He also referred to Dr. Edwards's abilities, and the great loss which would be sustained by his removal from Liverpool, more especially by the Chemists' Association.

"*From the Council of the Pharmaceutical Society of Great Britain.*

"*August 1st*, 1866.

"A letter having been read from Dr. John Baker Edwards, announcing his intended departure for Canada, and his consequent retirement from the Council of the Pharmaceutical Society, it was unanimously

"Resolved: That in recording the resignation of Dr. John Baker Edwards of his seat at this Board, the Council desire also to record their high appreciation of the services he has rendered to the Society, and to the science of pharmacy, during his long connection therewith; registered as an apprentice in 1843, he availed himself assiduously of the opportunities offered by the Society, pursuing his studies under its Professors, and taking honours in the Examinations in the Session 1846-47.

"Dr. Edwards immediately enrolled himself as a member of the Pharmaceutical Society, and has ever been unremitting in his efforts to extend its advantages and strengthen its position; in his own locality he was active in establishing the Liverpool Chemists' Association, of which he was the first Secretary, and for several years President; in 1853 he was elected a Member of the Council of the Parent Institution, wherein no man has worked more earnestly, and to none have his colleagues looked more confidently for an opinion to guide them on difficult questions; his retirement therefrom, as well as from the Board of Examiners, of which he has been an able member, must therefore be a matter of deep regret.

"The estimation in which Dr. Edwards is held by the Society at large, has frequently been proved by the position he has occupied on the poll at various annual elections.

"In taking leave of Dr. Edwards, the Council feel that, in whatever country he may reside, the Pharmaceutical Society of Great Britain will be honourably represented; and they earnestly trust that the same success which has attended his exertions on behalf of pharmacy here, may be extended to him in any future field of operation.

"(Signed) GEORGE W. SANDFORD, *President.*
"T. H. HILLS, *Vice-President.*
"DANIEL BELL HANBURY, *Treasurer.*
"And by all the other Members of the Council.
"ELIAS BREMRIDGE, *Secretary and Registrar.*"

The next Address presented was that from the Council of the Liverpool Chemists' Association, which had been very beautifully written on vellum, and tastefully illuminated; the artistic execution being greatly admired. It was read by Mr. REDFORD, the President of the Association.

"*Royal Institution, Liverpool, August 9th,* 1866.

"TO JOHN BAKER EDWARDS, ESQ., PH.D., F.C.S.

"Dear Sir,—Your letter to the Council of the Liverpool Chemists' Association, resigning your seat at our Board, has caused us deep regret. When we look back upon the seventeen years of your connection with the Society, dating from its origin, when you were its first Secretary, subsequently for three years its President, and for many years teacher of practical pharmacy, now that the union by your removal to Canada is about to terminate, we experience a sense of loss difficult to express.

"The ability and zeal you have displayed, and your valuable aid both in the Council and in the Lecture-room, can hardly be over-stated. We feel that much of the success of our Association is due to you, and on those occasions especially, when the public have met us, you, more than any other individual, by the variety and advanced character of your illustrations, contributed to make such occasions distinguished.

"Your love of science, and ardent efforts to promote its advance, have given an impetus to our body which we fear may suffer by your absence, though we hope that, as an Honorary Member, we may sometimes hear from you and see you. We cannot allow this opportunity to pass without expressing our admiration of those talents which have raised you as a toxicologist, a chemist, and a pharmaceutist, to honourable distinction.

"Your scientific and practical knowledge of pharmacy has enhanced the value of your exertions to raise that art to its proper position; and we testify with great pleasure to your valuable services in the cause of pharmaceutical education, and also to the watchfulness you have manifested of events affecting the interests of the general body of chemists in this country.

"Your intimate relation with the Board of the Pharmaceutical Society has supplied a link which has been the chief medium of the friendly intercourse between that Society and our Association. On important occasions, when the interests of the body generally have been involved in legislative measures, you have done essential service as our representative. You have made a name of which we are proud; and you have also, in numerous ways, endeared yourself to the Members of the Chemists' Association; and none among your large circle of friends will hold you in more cherished remembrance.

"We bid you farewell, with united and cordial good wishes for your happiness and prosperity.

"We hope that your influence may be widely felt in Canada, and that through the press we may frequently witness your labours on behalf of science, and especially for the promotion of pharmaceutical science.

"We are, dear Sir, very truly yours,
"(Signed) ALFRED REDFORD, *President.*
"ROBERT SUMNER, *Treasurer.*
"MARTIN MURPHY, *Secretary.*
"And by all the Members of the Council."

Mr. REDFORD said he fully indorsed the complimentary remarks in reference to Dr. Edwards, which had fallen from the preceding speakers.

Dr. EDWARDS, after expressing his obligations for the Address which had just been read, said: In the period alluded to—twenty-five years ago—it was a very difficult thing to get half-a-dozen chemists to speak to each other, and it was unquestionably a very happy thing that the result of the labours of the last twenty years had been to bring such a cordial and sympathizing feeling among such men as those whose names were attached to that document. Instead of keeping their secrets locked up in their breasts, they were now proud to come forward and consult each other. He had met at the Pharmaceutical Conference men who had come something like an aggregate of 1800 miles, with such kind brotherhood and with such interchange of views. He was proud that Liverpool had an organization among the chemists, which had been able to sustain itself with such an amount of spirit and solidity, with regard to the character of its museum, of its library, and of the instruction given in its laboratory. No other town in the kingdom did so so successfully as Liverpool. He thought, in the first place, with reference to taking apprentices, that it was necessary that young men entering such a business as that, should be educated, and should have opportunities of thoroughly learning their business, and that these opportunities should be extended over a series of years. In the second place, with regard to those who did take apprentices, was it not a matter of conscientious duty to insist that those apprentices should educate themselves by such means as were within their reach, and that their parents should be fully informed as to the importance which it would be to them in after life, that they should pay for such instruction as was actually required for their education?

Mr. Sumner, in commenting upon the remarks made by Dr. Edwards, referred young men to him as an example of what they might, by diligence, attain to. He (Mr. Sumner) had known Dr. Edwards from the time of his apprenticeship, and had watched his progress with considerable interest; and he further suggested the desirability of principals enjoining the full amount of education upon all their apprentices, so that the character of the profession might be fully sustained. He then proposed a vote of thanks to the Chairman and Secretaries, and congratulated them on the success which had attended their efforts.

The Chairman, for himself and Secretaries, acknowledged the compliment, and the meeting broke up.

BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT NOTTINGHAM, 1866.

SECOND SITTING,

Wednesday, August 22.

(*Continued.*)

It was resolved: That the following be appointed a Committee to prepare a systematic Report upon the Exhibition of Objects relating to Pharmacy, viz.:—Messrs. Brady, Brough, Carteighe, Commans, Deane, Ince, Fitzhugh, Stoddart, Sutton. Moved by Mr. Deane, seconded by Mr. F. White.

Mr. Ince's paper upon Pharmaceutical Ethics having been read, (*vide* Pharm. Journ., September)—

The President, in opening the discussion, characterized the paper of Mr. Ince as admirable, not only in its literary composition, but for the comprehensive and common-sense manner in which a most difficult subject had been handled. Mr. Ince had said a great deal upon the ethics of the shop, and upon the point whether pharmacy was a trade or a profession; but he (the President) thought that while they retained among them such men as Mr. Ince, it was of little consequence what name they applied to their calling. He was proud to know that the paper was the composition of one who was, like himself, an old Associate of King's College, London; it contained matter for most interesting discussion on subjects in which pharmaceutists were concerned.

Mr. Giles claimed to have listened to the paper with an element of satisfaction greater than that of any other person; for when it was originally proposed to bring forward the question of ethics, it was suggested that the paper should be undertaken by himself; but he was sure they must now all be glad that it was not, as he could not have handled the subject in anything like the style of Mr. Ince. He felt much greater pleasure, therefore, in being a listener than an expatiator. The first section of Mr. Ince's paper was directed to the fact that pharmacy was styled a trade. It was quite right that they should manfully face that rather disagreeable—as he was disposed to regard it—point in the subject. Now one of the characteristics of the present day was, that while the practice of pharmacy was consistent with the idea that those professing it were men of liberal education and scientific attainments, it did by no means follow that the man exhibiting himself to the world as a pharmaceutist possessed those necessary qualifications. At the same time they did feel ashamed to write themselves "chemists and druggists;" but nevertheless it was, he supposed, a thing to which they would be obliged to submit, till that good time came when compulsory education would be in force, and when a man intending to become a pharmaceutist would be required to go through a certain curriculum before he could bear the impress of professional character. At present matters were as Mr. Ince had so well and clearly pointed out. The pharmaceutist called himself a chemist and druggist, and so could every huckster and grocer. One bad feature of pharmacy was the number of small shops established on ridiculously small capital. A great many who started in business opened simply with the fixtures and a few common drugs—without any provision for a laboratory, and consequently their efforts were chiefly directed to competition and under-selling one another. This class of men, as a rule, took no pride in the quality of the articles they dispensed, and therefore they were nothing more or less than hucksters or chapmen in drugs—not pharmaceutists. He was anxious to see the time when it would be made a necessity that every pharmaceutical establishment should have its own laboratory—that every proprietor should be provided with the appliances for manufacturing a great many of his own articles. That, he thought, would be one means by which they might rapidly emerge from the condition of mere tradesmen—not but that they would remain tradesmen to the end of time; for they could not dissociate an open establishment with trade; but he did trust that the time would come, and that speedily, when the pharmaceutist, if a tradesman in reality, would not be what he might call a mere tradesman, and when he would by his scientific attainments claim to be classed among the ranks of professional men. It had occurred to him that it would be well for the paper of Mr. Ince to be followed by a resolution. He should be disposed to accept a resolution to the effect that the Conference considered legislation was required. The question of proprietory preparations was one of considerable difficulty, and depending for a true interpretation entirely upon special circumstances, and upon their own good feeling and personal sense of what was right and just. He condemned the practice of dispensing for medical men as being an unholy alliance, —an alliance which was in every way calculated to perpetuate the jealousy formerly existing between the two professions, which was one of the greatest promoters of late hours, and which was not profitable. He was therefore glad to find that the relationships which had hitherto existed were being severed. Speaking upon the subject of apprentices, he said it was a very unfortunate fact that the best houses, and therefore the best qualified to teach youths and bring them out as technically educated men of business, would not receive apprentices. That was one thing adverse to the introduction of good youths into the business. He recommended that, in order to prevent the admission of incompetent youths to the profession, it should be made an indispensable condition that every person taking an apprentice should have a laboratory; for it was a most essential thing that a young man should have a practical knowledge of the qualities and properties of drugs before he was put to dispense them. A probationary period in a laboratory would be highly instructive to an apprentice; it was not instructive for him to have to dust bottles, and he thought such work should not be expected of him. (Oh! oh!) The speaker then referred to the great interest which the late Jacob Bell took in the question of apprentices, and said how glad he would have been, had he lived, to hear the ideas that day expressed upon the ethics of pharmacy. He believed that the present increasing scarcity—if he might use a contradictory phrase—of assistants, though not at present felt, would ultimately result in a considerable inconvenience. Touching the subject of a universal tariff, he was strongly of the opinion that it was impossible to adopt one prescribed scale of prices throughout the kingdom; but he was free to think that arrangements might be made in certain localities. He thought, too, that if an article was of sufficiently good quality to be reliable, there was no reason why it should be rejected, or why it should not be sold for persons demanding lower prices. It was very important, however, that the leading houses should take their stand upon fair and remunerative prices, not only for their own sakes, but for the sake of others.

Mr. BRADY said, his name having been mentioned once or twice in Mr. Ince's paper, he felt bound to say a few words in connection with the subject. He was exceedingly glad to hear Mr. Ince's remarks upon the practice of calling their places of business "shops." The word "pharmacy" was obviously the right term, and if they wished it to be adopted they must instruct the public in it. As long as they called their establishments shops, so long would the public call them so, and so long would they be shopkeepers. Now, it was all very well to say, "What's in a name?" There was a great deal sometimes in a name. A story to the point was told by Holmes, an American writer, who, being a musician, was called upon on one occasion to listen to a performance upon a great organ. After a little time the organist turned round to him, and said, "There! what do you think of that stop?"—"Well," replied Holmes, "what do you call it?"—"What do you think of it? I asked you," returned the organist. "What's in a name?"—"I tell you there is a great deal in a name," said Holmes. "If you call that stop a railway whistle, it is exceedingly mild and pleasant; but if you call it a *vox humana*, it's an awful thing." Therefore there was something in a name; but he repeated that the change in the nomenclature of their establishments must rest with themselves. There was one other point connected with "the ethics of the shop" to which he wished to allude, and that was the long hours. He believed a great deal was in the hands of pharmaceutists themselves. He knew from his experience that circumstances varied so much in different localities that no absolute rule could be laid down; but the same spirit could be observed, and he was quite sure that those who shortened their hours of business would feel it a real advantage; it would be an immense advantage to their staff, and an unspeakable advantage to the pharmaceutist himself. He would very strenuously urge that pharmaceutists should not look at it as what it might appear at the moment, viz. an obvious loss, for it did not in the long-run turn out a disadvantage,—at least, that was his experience. Don't let them wait to see what their neighbours would do, for the force of their example would go very far to secure the object they had in view; and he was sure, if the change was conducted with reason, the pharmaceutists would find themselves very little, if anything, out of pocket; and that, on the other hand, it was productive of everything that was good. There were one or two other matters to which he might allude in connection with the subject before them. The first was the Virgil and Euclid question. In writing to Mr. Ince, he did not for a moment suppose that any remarks of his would be considered of sufficient importance to be inserted in his admirable paper; but, at the same time, he was strongly impressed that too much attention could not be given to the preliminary education of apprentices. If they took a youth into the business simply with the view to set him up in the position of a chemist and druggist,—which was generally supposed to carry a little capital, and, without asking him any questions as to his previous attainments, he looked upon it that they were doing a direct injury to the whole profession. For himself, he thought the time was coming when they should look upon Virgil and Euclid as the standard of education; but he did not intend at that moment to lay down any positive test, he wished simply to draw their attention to the fact how essentially necessary was the previous thoroughly good education of the young man. Another question deserving of their consideration was that of a universal tariff. There were probably many difficulties in the way of the adoption of the scheme, even if it were desirable; but he must confess to holding opinions on this question little different to those of Mr. Ince's. Now, in Edinburgh, the system of a local tariff had answered admirably. He knew how convenient the little price-book periodically issued from that place had been to himself in business; but, at the same time, he should not bind himself to its standard, especially in cases of dispensing. It was simply a trade standard, and not in any way a professional standard. If there was any department in which a professional standard might be introduced, it was that one, on which the largest amount of previous education had been brought to bear. That would, however, in all probability, be infinitely better done by the leading chemists of any district than through a general or national body. He could not, at the same time, quite overlook the desirability of having something like official sanction; but altogether, under present circumstances, he thought it was not likely that an attempt to establish a universal tariff would succeed. He could readily believe that in London no such standard could possibly be set up, as there the variation of circumstances was infinitely greater than in any other districts. Addressing himself to another point raised in the paper, he said he entirely agreed with Mr. Ince, that the medical profession, as a body, did *not* look with a jealous eye upon the education of pharmaceutists; but, at the same time. he could not be blind to the fact that there were those in the medical profession who *did* look with jealousy upon any improvement in the class of men which they considered next below them. These were men, however, for whom, as a rule, they had the least to care,—men who did as much drug business as they could in addition to their legitimate calling. From the educated medical man they had no reason to fear jealousy; he would do all he could to show that he approved of increased education, and it was manifestly to his interest to do so.

Mr. CARTEIGHE said, that the few observations which he should offer would be, to some extent, theoretical rather than practical, inasmuch as he was not able to speak from the large amount of experience which Mr. Ince possessed. There was one point upon which he cordially agreed with the author of the paper, and that was concerning the quality of drugs. They must admit the fact that it was easy for them to exercise a professional skill in examining the quality of the drugs which formed part of their trade; and, while he would give every consideration to the poor in the shape of low prices, he deprecated any difference in the quality of the goods, which should not be inferior to those supplied to persons better able to pay. He knew several places where poor persons going in to ask for a really good thing in ordinary preparation would be received with courtesy, and given to understand that the price was as low as it could be consistent with quality; but, at the same time. they would be positively served with an inferior article. These cases might be rare, but several had actually come before his own eyes, and that which had the appearance of charity was no charity at all. Then, with regard to obtaining specialities from head-quarters, he might say that the views of Mr. Ince represented precisely his feeling in the matter. There was nothing which would so much raise a man in the estimation of the public as the endeavour to provide them with facilities for procuring specialities from head-quarters. He was afraid that many of their wholesale friends were frequently obliged, if even at an evident pecuniary loss, to provide customers with goods which it would be much better for all should be obtained from original sources. The substitution of "pharmacy" for "shop," would, he thought, be universally admitted to be an improvement; but there was one point in connection with the proposed change to which he wished to draw attention, and that was, that in many places establishments where drugs were sold were nothing more than mere shops. The early-closing movement was a question in which their country friends did not perhaps take the same amount of interest as they in London, where the hours of business were, no doubt, felt more than in the provinces. He believed that the hours in the metropolis might be reduced very materially. To effect that, it would require a certain amount of conciliation both on the part of the master and on the part of the servant; but he believed, notwithstanding, that it was quite as possible for many of them living at the west end of London to close at eight as it was for them at that present moment to close at nine. Not many years ago a large number of good places of business actually kept open till ten o'clock, but now some shut entirely at eight and the majority at nine. He did not hesitate to say, then, that, looking to the exertions which were being made, not only by the tradesmen but the aristocracy, to shorten the hours of labour, if the question were discussed in a conciliatory spirit by masters with the assistants,—and, if need be, with their customers,—they would find themselves able to close at eight, if not earlier. They might even go so far, he believed, as to close in London for the half-day on the Saturday. They would be astonished to know that the effect of closing the drapers' shops on Saturday, strange as it might appear from a professional point of view, was to prevent persons from bringing prescriptions to be made up: he knew several instances in which that circumstance had induced masters to put up their shutters at six o'clock on the Saturday. All would admit that there must be some one upon the premises at all times; and, that being so, it did seem that it was hard if the amount of labour could not be so regulated as to allow their assistants in turns to have an outing for the recreation of their bodies and the improvement of their minds. He felt certain, however, that the time would come when chemists in certain localities would be able to close at seven, and the majority at eight.

Mr. DEANE said, that, from the fact of his name having been mentioned in connection with the subject, it must be obvious to them that he had taken a great interest in its introduction; but, as it was quite impossible for him to discuss the whole of the points raised in the able paper of Mr. Ince, he should confine himself simply to two or three topics. In the first place, with regard to the duties of assistants, he thought he might premise that it was an ingredient in the human nature of those who served to fancy themselves placed in antagonism to those by whom they were engaged. He did not know why it should be so; but it was nevertheless a positive fact that in almost every household and establishment there seemed to exist a species of antagonism on the part of servants towards masters. The reason was, he believed, that the parties did not clearly understand each other. Some of the different causes had been very clearly pointed out by Mr. Ince in his paper; but with regard to assistants, he might say that he thought they were under a misapprehension as to their position, and also the position of their masters. The employer was not his own master,—that fact the assistant did not seem at all to understand. His business is perfectly distinct in itself, and is conducted under conditions which have been forced upon it by persons patronizing the establishment, the services of which were regulated according to the requirements of the public as they were placed before the master. Now, when an assistant, or young man, engaged himself to an employer, he positively sells his services. It was most important for every assistant to bear in mind that, having engaged himself, he has sold his services, and that it was his absolute duty to give a *quid pro quo* faithfully and honestly. He must, at the same time, bear in mind that if his employer was a hard task-master, that he (the employer) had a much harder task-master in a very exacting public in the habits and usages of society. Therefore, whatever arrangement was attempted to be made they must take into consideration all the various circumstances of the community in which they lived. Now, what he would urge upon assistants was, that they should bear in mind all these conditions, and not take the one-sided view of the case which they commonly did, and which had been so admirably pointed out by Mr. Ince. At the same time, he most sincerely sympathized with the apprentices and assistants, who were sometimes placed in very trying circumstances, the greater part of them going through their labours pretty much as a horse worked a mill. Therefore it was their duty to promote their rational enjoyment, and to enliven their energies by every means in their power. The system adopted by himself he found to operate very well. From the very nature of his business it was impossible his assistants could be allowed to go out in the evening, and therefore he had made arrangements by which every young man had an entire day on alternate weeks, which appeared to give them much satisfaction, and certainly caused him no inconvenience. Another point upon which he wished to say a few words was that of the mixed nature of the business. It was impossible to go into the whole subject, as it would afford matter for a lengthy essay; but he would just observe that, at the time of the passing of the Apothecaries Act, the apothecaries of that day were pretty much in the same condition in which they themselves were at the present time. Their businesses were mixtures of the barber's and the apothecary's, for they sold perfumery, hair-brushes, and other things not directly connected with their trade. When the apothecary—or the general practitioner, as he was now termed—came to be supported by Act of Parliament, it left the chemists and druggists in their present condition. He was inclined to think from the multitude of advertisements continually appearing that one-half of the chemists of this country did not return more than £200 a year by the legitimate exercise of their business. This was, no doubt, a very serious state of things; and they ought to bear in mind, in discussing the question, that it was clear that a person, however well qualified, could not live by such a business alone. The chemist was therefore obliged in many cases—as he knew, and no doubt all of them more or less knew—to introduce things foreign to his business, till he sold, not only combs, hair-brushes, perfumery, and things of that sort, but even haberdashery, mouse-traps, and nobody knew what. And if the man so dealing in drugs and chemicals, and calling himself a chemist and druggist, was a properly-qualified man, he could see no reason why he should not deal in mouse-traps, or anything else by which he could get a living. That was an entirely different thing to a man rushing straight from the grocer's, the huckster's, or the haberdasher's shop into the line of pharmacy, and setting himself up as a judge of things of which he knew nothing at all. They *had* a right to complain that these men were allowed to interfere with educated men. He made these remarks because he was very desirous of pointing out the difference between the two classes. The one was the legitimate pharmaceutist, chemist, and druggist brought up to his business, and more or less well educated for any purposes; the other was the grocer, huckster, and the haberdasher, who rushed into a business of which he knew nothing at all, nor was likely to. He might say a good deal upon the other points raised in the paper, but he would content himself with observing that they were points upon which he had felt very strongly for a number of years.

Mr. Stoddart rose to speak with some diffidence, because of the superior experience of Mr. Deane, who had many more opportunities for observation than himself; but there was one thing in regard to assistants, not mentioned in Mr. Ince's excellent paper, which to his mind was the cause of the antagonistic feeling towards the employer alluded to by the last speaker. For many years past he had acted upon a rule founded upon his own impressions, and had found it to operate exceedingly well; in fact, he did not remember a single assistant who had exhibited the slightest antagonism to himself. His acquaintance with the business of a chemist and druggist had shown him that there was an impression among assistants that they were not what their name implied, but a kind of slave; the master himself did not do the work, but simply left it for the assistant to do. The proper duty of the assistant, however, was to assist the master. He thought, if that fact were more borne in mind by masters, they would find less of the spirit of antagonism among assistants. With regard to the early closing of shops, it was always a source of great pleasure to him to act with those in his own business; but he must tell them that it would be a very difficult thing for him to fall in with the movement. He had even gone so far as to close his shop at seven in the evening; but he was obliged to give it up, and he had no doubt that Mr. Giles, Mr. Schacht, and others living at Clifton, would bear him out as to the necessity of keeping open longer. Both at Clifton and at Bristol, the better class of customers did not come into town till late in the afternoon, and if they closed their shops entirely, the inference drawn would be that they did not care about their patronage.

Mr. Halliday said, that in Manchester the principal shops had adopted a little better habit, closing about eight o'clock as a rule. The question of closing at seven or eight was simply one of neighbourhood. He thought, too, that it was quite as possible to get shops closed on Saturday as on Sunday, if they cared to make the effort. Shops in other trades continued to carry out the system, and he saw no difficulty whatever why the druggists should not follow their example. He thought that it was a question worth consideration, if shopping after business hours could not be discouraged by making a small extra charge for everything supplied. This would be of no consequence to those really requiring medicines, and would lessen other demands.

Mr. Schacht, after eulogizing the manner in which Mr. Ince had dealt with the whole subject of pharmaceutical ethics, said there were two points upon which his personal experience might be considered, perhaps, to give him a right to say a few words. The first was the practice prevailing more or less among them of dispensing for medical men. Now, when he went into business, he inherited an arrangement made between his predecessor and a certain medical firm; that alliance had lasted upwards of twenty years, but he was happy to tell them that it was now at an end. At first sight, there appeared much to be said in favour of such arrangements. Many chemists thought they were profitable, and brought business. That was, no doubt, a very debatable point; but so far as his experience went, he was inclined to think that these arrangements were not invariably profitable. The prices which he received were liberal, and the connection had always been very agreeable; but after calm consideration he came to the conclusion that the person dispensed for and the person dispensing were placed in false positions. Upon the dispenser rested all the responsibility; to him, and not to the medical man; attached the blame and discredit of sending a late bottle of medicine, and how much people thought of such a thing! It gave the appearance of carelessness and inattention, and faults much worse than those were often insinuated; but they all knew that lateness in sending out medicine might be due to lateness on the part of the principal in issuing the prescription. Another point to which he wished to refer was the fact that many medical men would not send their prescriptions to dispensers known to be under arrangements with other medical men, for fear of being betrayed. He had, therefore, deliberately come to the conclusion never to enter into such a compact again; and he had always been careful to avoid a repetition of the mistake of his predecessor. There was one more topic in Mr. Ince's paper to which he should like to allude, and in respect to which he had been made an illustration of the author's position, viz., the obligation which they should all feel themselves under to supply genuine proprietary medicines when ordered. He thanked Mr. Ince for the distinct expression of his opinion as to the duty of pharmaceutists in such cases, viz. that the original preparation, by which the reputation of the medicine had been established, should be always supplied unless it was otherwise stated.

Mr. Sutton remarked that the past ten years had seen an extraordinary progress in pharmacy—a progress which he believed would go on faster and faster as time passed on. He would just say one word with regard to apprentices. He thought it rested very much with the present generation as to what kind of men were introduced to the trade for the time to come. The aim should, of course, always be to obtain, if possible, youths thoroughly well educated; but at the same time their success depended not so much upon what they had learned at school, as upon their capacity for acquiring knowledge. With regard to what had been said about proprietary preparations, he would observe—without intending to impute any unfairness—that there was too often an unwillingness shown by London houses to procure special articles made by their brethren in the country.

Mr. Ince said he might mention here that a little while ago they received an order for a certain elixir, which was made by some one in a place they did not know. They spent three weeks in trying to discover the proprietor, and ultimately they found out that he was a little baker at Rouen. They got the elixir from him, and the customer was perfectly satisfied.

Mr. J. H. Baldock, London, looked upon the unsatisfactory relations of masters and assistants as phases of the antagonism between labour and capital.

Mr. Atherton thanked the author of the paper for the opportunity of listening to it. He could assure any young men who might be present that they would find a preparation for the present examinations of the Pharmaceutical Society invaluable; and even if they could not devote a whole term to the course of instruction in the laboratory, they would act most wisely in going there for a shorter period. As to counter prescribing, which was often charged against chemists as an offence, it was but retaliation against surgeons who dispensed. He expressed his opinion that it would be impossible to establish a regular code of prices, and deprecated the practice of chemists dispensing for surgeons by arrangement.

Mr. Richardson said that as far as his humble opinion went, the only practical way to bring about the reforms they needed was by compulsory legislation. He believed that in the most important of the provincial towns a local tariff might be adopted to advantage. He frequently heard of persons being charged three different prices on three different occasions, and the inference to be drawn from that fact was that they had three different classes of customers.

Mr. Reynolds spoke to the question of medical opinion towards pharmaceutical progress. He quoted an article by Professor Christison on the Wooler poisoning case, published a few years since. In this it was pointed out that the difficulties of the case were due to the medical attendants relying upon themselves for the chemical detection of poison, which they had reason to suppose was being administered to their patient. Professor Christison gave it as his opinion that the claims of other studies in a medical curriculum, made it hopeless to expect from medical men, as a class, proficiency in chemistry or toxicology. The recent experience of the Leeds Chemists' Association might be brought forward as showing a very satisfactory advance in the good feeling of the medical profession towards our body. About four years ago the association ventured to apply to the Council of the Leeds School of Medicine for the use of a room for some lectures, but received a refusal. Within the past three months a similar request had been renewed, in order to accommodate the class attending a course of readings in botany by Mr. Abbott. This time the application was most courteously received, and the lecture theatre, gas, etc., were lent for two evenings in each week without any charge. Mr. Reynolds referred to the subject of ethics having been treated in the 'Pharmaceutical Journal' on several occasions when it was edited by Mr. Jacob Bell. In a leading article in vol. 15 he found that a proprietary article, which had been frequently named in that meeting, was spoken of as undistinguishable in an ethical sense from Holloway's pills. Now, he trusted that in their meetings they would not allow the money success of any such nostrums to make them blind to their true relations to pharmacy. Dr. Christison went on to say, "There is no probable remedy, so far as I can see, except the division of labour; by which chemico-legal duties, separated from the medico-legal, may be put into the hands of the pharmaceutical chemist, to whose province such duties will be appropriately attached, so soon as his education and his position in society in this country shall be elevated. This is the rule abroad, in France and Germany—in Germany particularly, where there is scarcely a little town without a pharmaceutic chemist who would have settled the Darlington case in a short time."

Mr. Rimmington said, with regard to the early closing of shops, he was of opinion that the thing *should* be done, and also that it *might* be done if proprietors were but willing to step a little way out of the beaten track. In Bradford, the half-day-holiday movement had made such a difference that the Saturday evening practice was literally dying out, and he ventured to say that ultimately they might be able to shut up altogether. He did not mean to say that closing entirely would not look very much like telling the people they did not want their custom; but at the same time he believed it was not by any means necessary to keep open till ten or eleven o'clock on Saturday night, as they used to do. With regard to apprentices, he should be very glad to see his way clear to endorsing the opinion of Mr. Brady, that they should insist upon a good previous education; but when he considered that youths with such an education could make much better headway in other businesses, and for less expense, with the prospect, too, of larger incomes than could be obtained from the practice of pharmacy, he must confess that he had very little faith that any advantage would arise from adopting the recommendation of Mr. Brady. He had attempted it, but, as he grew older, he lost faith in the matter. The establishment of an universal tariff was simply a question of position and circumstances. One man did his business better than another, and charged accordingly; and again, it was not possible to get in one neighbourhood, prices which he would get in another, inasmuch as businesses were conducted upon different styles in different localities. With regard to dispensing for surgeons, he agreed with Mr. Schacht, that the arrangements referred to were not exactly the thing, and said he thought the opinion among some, that it brought trade, was founded in error.

Some conversation here ensued as to what steps should be taken for the publication of Mr. Ince's paper, and in the end it was understood that the matter should be left in the hands of the Executive Committee.

Mr. Giles then moved the following resolution: "That this meeting considers that the practice of pharmacy requires to be limited to fully qualified persons, and that it is necessary, in order to attain this result, that an appropriate examination should be enforced by legislative authority."

Mr. Ince seconded the motion. Such a resolution, he said, was the object which the whole paper aimed at, and without something of the sort their proceedings that day would all come to nothing.

The President put the resolution of Mr. Giles to the meeting, and the same was unanimously carried.

THIRD SITTING,

Thursday, August 23rd, 10 A.M.

The reading of scientific papers was resumed.

ON THE RESULTS OF THE MICRO-CHEMICAL EXAMINATION OF EXTRACT OF FLESH.

BY H. DEANE, F.L.S., AND H. B. BRADY, F.L.S.

Since the introduction of the so-called "*extractum carnis*" of Liebig, so sudden and unexpected a demand has sprung up for concentrated preparations of flesh, that they have become, or are likely to become, important articles of export from those portions of the world where the value of cattle is small and means of transport easily available.

As there are few chemical operations requiring greater nicety of manipulation than those in which the unstable compounds constituting or contained in animal tissues are concerned, and as the manufacture of the extract must necessarily be subject to variation from this cause, it becomes a matter of importance that we should possess some means of estimating, with a certain amount of accuracy, the relative value of different samples. Commercial reasons also tend to increase, rather than diminish, this variation, for the larger product which is often sought to be obtained can only result from a proportionate deterioration of the extract.

Having in previous years presented to the Conference some notes on a method which we are in the habit of employing in the estimation of the value of vegetable extractives, we propose on the present occasion to offer the results of experiments which we have been engaged upon from time to time during the last fifteen months, on the micro-chemical characters of these flesh-extracts.

We may repeat in general terms, that the microscope may be made use of with advantage in the examination of almost any extract, or solution containing extractive matter, in which the active or valuable portion assumes a crystalline form on inspissation. The fewer the active constituents and the more characteristic their crystalline forms, the more readily are they recognized and their relative proportions determined. Not only does the non-crystallizable extractive matter itself afford no drawback to the applicability of the process, but in many cases it really facilitates the separation of the crystalline constituents on evaporation. The number of active bodies which exist in large proportion in any vegetable or, we may add, in any animal extract, so soluble as to remain in an uncrystallized state on the evaporation of a large quantity of solution to a nearly solid condition, is exceedingly limited, and even these may be detected, as we shall presently show, by an after process. The one essential in the practical application of this method of determining the relative values of a series of specimens is, that we shall understand clearly what appearances the preparation ought to exhibit, and be able to identify the different constituents in the mixed condition in which they present themselves to our notice. Nor is it sufficient that we should know the forms and crystalline characters of the *pure* salts and principles alone; we must ascertain in addition how far the presence of extractive or viscid matters may influence their mode of separation. It is obvious that, at the outset, a certain degree of familiarity must be acquired with the appearance of specimens, the relative value of which has been determined by other processes, and only such previously-tested specimens should be used as standards of comparison. It is impossible to argue with any degree of certainty what appearance any compound extractive should have under the microscope, and we have never succeeded in obtaining precisely the characters we have looked for, when endeavouring to prepare, for comparison, any of the complex bodies we have worked upon, by the artificial admixture of the constituents. The plan we have adopted in the investigations about to be detailed has been almost identical with that pursued with reference to preparations of opium: that is to say, portions of the various extracts have been either mounted for the microscope in the condition in which they are found in commerce, or reduced to a syrupy consistence with hot water, placed on the glass while still warm, and allowed to stand until crystals were fully formed. In some instances other menstrua than water were used for the better determination of the crystalline bodies, and Professor Graham's process of Dialysis was employed to determine the relative proportion of crystalline and colloid constituents.

The samples of extract of flesh on which observations have been made are as follows:—

(1.) and (2.) Specimens made by ourselves as standards of comparison. One of these was made by cold water, the other with water heated to 160° Fahrenheit. Both were prepared from the finest quality of English beef which could be procured, and on a sufficiently large scale to ensure a practical value to the result.

(3.) A specimen prepared in the Royal Pharmacy at Munich, kindly given to one of us by Professor Pettenkofer, on a recent visit to that city. This we look upon as having the seal of official sanction.

(4.) The South American extract, prepared by Herr Giebert and sold with the approval of Baron Liebig.

(5.) A portion of the first importation from Australia.

(6.) The extract prepared by our friend Mr. Reynolds, from English meat.

(7.) That supplied by Messrs. Gillon and Co., of Leith.

(8.) The "extract of meat lozenges," introduced by the same firm.

We propose to offer a few remarks on the general characters of these extracts before proceeding to describe in detail their microscopic appearances.

(1.) Our own cold-water extract was prepared by simply macerating carefully selected lean meat, cut very small, in water at 60° Fahrenheit, for twelve hours, and evaporating the liquid obtained, at a temperature considerably below the boiling-point, to the consistence of a soft extract. This was purely an experiment made for the purpose of future reference, and as the amount of extract obtained did not exceed 2 per cent. on the meat employed, it obviously could never answer in a commercial point of view, the cost being nearly 34*s*. per pound for the flesh only, without any allowance for fuel and labour. The resulting extract is light-coloured, very fragrant, readily soluble, and highly hygroscopic in damp weather. The solution is pale, and of very pure flavour.

(2.) Our hot-water extract was prepared similarly, by first macerating the meat in cold water for twelve hours, and then transferring the whole to a water-bath heated by steam. The temperature was afterwards gradually raised to 160° F., the fluid strained off while still hot, and evaporated carefully as before. The product is perceptibly different from the former, being somewhat darker in colour and containing a small but sensible proportion of gelatinous matter. The flavour and odour were similarly unexceptionable, and the tendency to absorb moisture nearly as great as in the former sample. The weight of the product bore the relation of about 3 per cent. to the meat employed.

(3.) Professor Pettenkofer's sample was prepared according to the process contained in the Bavarian Pharmacopœia, and at first was very similar in colour and flavour to our own hot-water extract.

(4.) The South American preparation was a fair sample of what is at best a somewhat variable article. The colour is darker than our own, the amount of gelatine notably larger, and neither the smell nor taste at all equal to those above enumerated.

(5.) The only sample imported from Australia which we have at present seen is similar to the South American, but not equal to it in point of flavour and colour. It has a muddy appearance, and contains, as we shall presently have to observe, a large proportion of uncrystallizable extractive.

(6.) That prepared by Messrs. Harvey and Reynolds is in point of flavour and general character very similar to the specimen we have described from Munich, and leaves little to be desired as a commercial article.

(7.) Messrs. Gillon and Co.'s extract is worthy of note as a fairly satisfactory sample, but we have been somewhat disappointed in its microscopical reactions.

(8.) The "extract of meat lozenges" are pretty well known. We shall have a few remarks on these in another portion of the paper, chiefly in connection with statements made by one of us at the last meeting of the Pharmaceutical Conference.

In making these observations it is our object not to intrude commercial or personal considerations, nor, further than is necessary with a scientific end, to institute comparisons between the various manufacturers. The names of the two British houses which we have introduced have been selected as producing samples of excellence,—a number of other specimens of home manufacture which have come under our notice, of varying degrees of goodness or badness being omitted, inasmuch as no good end would be answered by criticism upon them.

We may now proceed to consider the chemical constituents of flesh extract, and these may be classed under two heads, inorganic and organic. The inorganic matter consists of alkaline (and earthy?) phosphates and chlorides, principally phosphate of potash and chloride of potassium. If phosphate of magnesia be present as stated by some authors, we believe it to exist in extremely small proportions. It is quite possible that ammonia may occur as the base of a phosphoric acid compound. The organic portions of the extract are kreatine, possibly kreatinine, and the colloidal matter consisting of gelatine and extractive. We have used the term "gelatine" for want of a better word, to include, in a general sense, the viscid, gluey portions of the uncrystallizable extractive which are precipitated by tannic acid and infusion of galls. Theoretically, true gelatine should not exist in extract of flesh, and it is not unlikely that the gelatinous matter consists chiefly or in part of chondrine, a closely allied substance, giving very similar reactions, which is found largely in cartilage. The remaining uncrystallizable matter, alluded to as "extractive," is probably in part derived from the decomposition of the gelatinous principles by the heat employed in the preparation of the extract. This idea is confirmed by the fact that one of our samples, of inferior quality and containing a large proportion of colloids, gave only a small precipitate with the tannic acid test. Lactic acid probably exists in some proportion in combination with one or other of the bases referred to. We shall confine our attention to those of the salts and principles we have above named whose presence may be readily recognized and may be regarded as essential to well-made extract, especially to phosphate of potash, chloride of potassium, kreatine, and colloids. It is necessary to bear in mind the distinction between "juice of flesh," the analysis of which is given in many chemical works, and the extract now under consideration. The former is merely the fluid portion pressed out of the muscular tissues; the latter includes all the substances that hot water will dissolve out, in the condition in which they are left after evaporation, and altered as they may be by the application of continued heat.

Acid orthophosphate of potash (tribasic) $PO_5\left\{\begin{matrix}KO\\2HO\end{matrix}\right.$ is readily soluble in water, insoluble in alcohol, the crystals taking the form of prisms with obliquely wedge-shaped ends, or of some modification of that form. It is a beautiful object under the microscope, and most brilliant when viewed by polarized light. Figure 1 of our plate represents orthophosphate of potash crystallized from its aqueous solution. Fig. 2. The same, from a solution to which a small proportion of vegetable extractive had been added.

Chloride of potassium (KCl) exists in considerable quantities in *extractum carnis*, but from its extreme solubility in water is never conspicuous in microscopic preparations of the extract itself.

Our Fig. 2 *a* represents the crystallization from an aqueous solution. Fig. 2 *b*, crystals from alcohol. In order to observe the influence of extractive matter on the mode in which the crystals are deposited, a small quantity of vegetable extractive was added to a saturated alcoholic solution of the chloride, which was then allowed to evaporate spontaneously; the result is shown at Fig. 2 *c*. The characters of the crystals under the different conditions are remarkably uniform, varying chiefly in size.

Chloride of potassium is somewhat more soluble in water than common salt, scarcely at all soluble in absolute alcohol. It crystallizes in cubes, often prismatically elongated when formed slowly, but when more rapidly deposited on glass from a thin film of water, it takes the form of minute square plates, commonly aggregating in fours, or spreading into arborescent groups. Belonging to the cubical system, it is not affected by polarized light, and may thus be distinguished from the phosphates, kreatine, and the other organic salts of *extractum carnis*.

It has been stated that chloride of sodium is occasionally added to adulterated or inferior specimens of extract to make up the quantity of saline matter. We have never experimented on a sample which we had any reason to believe to be so adulterated, but there is no doubt that difficulty would arise in distinguishing the two salts in such a case. The resemblance of their crystals, and their similar solubility in water and alcohol, would necessarily give rise to uncertainty. At the same time, if common salt were artificially introduced, the quantity present would probably lead to suspicion of the fact.

Kreatine ($C_8N_3H_9O_4+2HO$) is one of the most abundant, as it is also the most important of the crystalline bodies present in meat extract, so far as our knowledge at present extends. In the pure state it exists in prismatic crystals, modified variously into rectangular plates and parallelopipeds (?). It is a neutral base, soluble in hot water, less so in cold, and sparingly soluble in alcohol. The appearance of the crystals, when viewed with polarized light, is remarkably beautiful. Fig. 4 is taken from a specimen of kreatine prepared by ourselves from the meat we were employing for extract. In Fig. 3 we have copied the drawing given by Herr Otto Funke in the beautiful atlas to Lehmann's 'Physiological Chemistry,' as confirmatory of our own observations.

Another crystalline body was observed, the nature of which we have not entirely made out. A portion of the meat solution made with cold water having been evaporated to the consistence of weak syrup, was allowed to stand for about thirty-six hours in a porcelain basin. On removing it the surface of the porcelain was found coated with adherent, somewhat solid crystals, which on examination were found similar in many respects to kreatine, but still differing from any specimens of that base which we have seen. Whether these be kreatine modified by the nature of the medium from which they were deposited, or whether, as we think possible, kreatinine in combination with an acid (phosphoric ?), we are scarcely prepared to say. On ignition the crystals left a scarcely perceptible residue, but the quantity obtained was not sufficient for analysis.

The question of the existence of ammoniacal salts in the juice of flesh is one upon which we are not prepared to enter; we may, however, incidentally note that in a certain state of the evaporation, that is at about the time when the fluid reaches the consistence of syrup, a certain amount of ammonia or other amine is invariably evolved, and the osmazome (roast meat) flavour is developed. We have thought it possible that this may be due to the splitting up of an ammoniacal phosphate. We have more than once noticed that during this evolution the fluid itself has had an acid reaction. Ammonia is rapidly evolved in the decomposition of the extract. Some, apparently good, samples have given strong ammoniacal reactions within twelve hours from the time a freshly prepared solution was placed in a dialyser.

To obtain a further clue to the nature of the crystalloids, as they appear under the microscope, and in some measure to separate them, advantage may be taken of the different solubilities of the salts in alcohol. Portions of several of the extracts were digested in strong alcohol for some weeks, the alcoholic solutions decanted and evaporated to extract consistence. The remarkable differences which presented themselves in the various examples we shall have occasion to comment upon.

This, or indeed any process by which the separation of one principle from another can be effected, is of great importance, for the resemblance between the crystalline forms of some of the constituents proper to well-prepared extract is so great as to make it, at times, a matter of extreme difficulty, depending even more upon experience and judgment than upon actual chemical data, to discriminate with certainty amongst them. We need not wish a better instance of ambiguity than that afforded by the two most important constituents of *extractum carnis*, namely, kreatine and phosphate of potash. It would be exceedingly difficult to describe the forms assumed by these two bodies in their various modifications, in terms which would not apply almost equally to either; and though a little practice and observation would enable a microscopist to distinguish between them in most cases, one can scarcely help feeling the want of some more positive evidence, if it be only to carry conviction to others. We have, since the greater portion of this paper was written, accidentally alighted upon a fact which may possibly be of value in this way. About a year ago, to avoid some trifling difficulties of manipulation, subsequently overcome by other means, we mounted a series of specimens of extract, having previously mixed them with a little pure glycerine, and set them aside without much intention of again referring to them. On examining them a few days ago, the appearance the slides presented was that of an even film of brown extractive with a few large crystals here and there, evidently all of them of the same chemical nature. By subsequent experiment we found that kreatine is soluble to a considerable extent in glycerine, and we therefore conclude the crystals in question to be those of phosphate of potash. Want of time has prevented our experimenting further in this direction, but the subject merits the attention of future observers.

The reaction of kreatinine with bichloride of platinum suggests a method of estimating the amount of kreatine in meat-extract. A portion of the extract is dissolved in water, acidulated with hydrochloric acid and heated, in order to convert the kreatine into kreatinine, evaporated, and solution of bichloride of platinum added. The double chloride of platinum and kreatinine should separate in long prisms. These we have never obtained to our satisfaction, but the microscopical appearance of the fluid after the addition of the platinum salt and concentration is very peculiar, and we are not without hope that further investigation in the same direction may lead to practically useful results, though as yet we have not had time to complete the inquiry.

Concerning the colloid constituents there is not much to be said. The proportion of non-crystallizable bodies present may be determined by dialysis, and how much this may vary will be gathered from our notes on two of the specimens named. Two hundred and fifty grains of our preparation made with cold water yielded 18·58 grains of colloid, about $7\frac{1}{2}$ per cent. of the whole weight: that prepared with hot water contained a larger proportion. The Australian extract yielded, from 250 grains, no less than 97 grains, or nearly 39 per cent., of colloids. As these represent two extremes in quality, and our other experiments correspond with the indication they give, we may justly infer that dialysis affords a fair means of nearly ascertaining the proximate value of commercial extracts. The diffusate of all the samples yielded, on evaporation, a light brown residue, which became an almost solid mass of crystals.

The colloids consist of "extractive" and "gelatinous" matter; and as the latter is the more variable constituent, the one chiefly affecting the quality of the extract, it is important that some easy plan of determining the amount present should be found. Precipitation by tannic acid would seem to be the readiest method, and if this could be done volumetrically by means of a standard solution the quantity might be easily ascertained. Two or three difficulties present themselves; firstly, that of obtaining a perfectly clear solution of the precipitant; secondly, that of determining the amount of pure gelatine which it represents; thirdly, that of ascertaining the exact point at which precipitation ceases. We are only at present prepared to give a few instances of comparative results. Experiments have been made on No. 1, our cold-water preparation; No. 5, the Australian extract, not the same sample as previously examined, but a much superior one from the same source; No. 6, Messrs. Harvey and Reynolds's; and one other sample of English manufacture not before alluded to. Taking our cold-water extract as a standard represented by 100, No. 5 gave 105; No, 6, 177; and the other sample 301.

This entirely coincided with our expectation, except in the case of No. 5, for the former Australian sample had by dialysis yielded the largest amount of colloidal constituents of any specimen we have examined, but even this seems to contain a large proportion of non-gelatinous extractive. Should the direct quantitative determination of gelatine by means of tannic acid fail, it may still be possible to meet the difficulty by adding the precipitant in considerable quantity; and in a second operation, estimating the excess by the process employed by tanners in assaying their tanning materials.

We are now in position to speak of the actual appearances under the microscope of some of the specimens we have examined. Mere description is of little value, and we have therefore made drawings of the more remarkable aspects which have come under our notice.

In Fig. 5 (our own cold-water extract) may be observed the rectangular plates and oblique prisms of kreatine, and the silvery prismatic somewhat variable forms of what we believe to be phosphate of potash; their frequently irregular ends, showing the laminated structure, remind one strongly of specimens, which every one must have seen, of phosphatic salts eaten away, as it were, in process of gradual re-solution.

In Fig. 9 we endeavour to show the results of the re-extraction by alcohol of the same sample: *a* is the portion which remains insoluble after heating with alcohol; *b*, the alcoholic extract. In the former, kreatine and the phosphate are the most conspicuous objects; in the latter, a portion of the kreatine in smaller crystals may be observed with a considerable quantity of chloride of potassium in its characteristic forms.

Fig. 6 represents our own hot-water extract, which appears under the microscope as a dense magma of crystals, so dense as almost to defy drawing. Its opacity in comparison with cold-water extract is due in part to its slightly higher colour, and is partly owing to the increased thickness of some of the crystal masses preventing the arrangement of a sufficiently thin film. It is similar in its constituents to the cold-water extract, but the crystals are more irregular in shape, and therefore less easily recognized.

Fig. 7 represents Messrs. Harvey and Reynolds's extract, and offers few points demanding remark. Its crystalloids are of a somewhat less decided nature than in our experimental samples, and are not present in quite the same abundance.

Fig. 10. In this we show the Australian extract, and its relations to the alcoholic test: *a* being the portion insoluble in alcohol; *b*, the alcoholic extract. The latter is not arranged, as most of our drawings are, with the idea of showing the appearance of any single field under the microscope, but rather

with the intention of illustrating the different forms of crystals which we have observed in two or three of our mountings; neither can we pretend to identify them with precision, as they do not precisely agree with any of our other specimens. The original sample of extract is somewhat opaque and muddy-looking, and not of good flavour. The diffusate by dialysis yielded a much larger proportion of crystalline salts than its general character would have led us to suppose, resembling in this respect many of the finer samples that we have had opportunity of submitting to a similar test.

The well-known superiority of the Australian breeds of cattle makes us satisfied that our extensive colonies in that part of the world should produce an article equal to anything that can be prepared in our own laboratories. It is in no way remarkable that the first samples sent over should leave room for improvement.*

Fig. 11 illustrates in the same way Professor Pettenkofer's extract prepared from Bavarian beef: *a*, the insoluble in alcohol, is very similar to other good samples, containing kreatine and phosphates in fair proportion; *b*, the alcoholic extract, gives only the crystals we believe to be chloride of potassium.

Fig. 12 is the South American, and is very remarkable for the size of a large portion of its crystals. This is probably chiefly due to the length of time during which it has been left undisturbed in the original packages. The extractive matter in this sample is muddy and somewhat opaque, contrasting somewhat in this relation to the European specimens. The alcoholic extract, *b*, shows nothing but beautiful minute tufts of chloride of potassium.

Fig. 8. In our remarks, when introducing the subject of *extractum carnis* for discussion at the Birmingham meeting of the Conference, the "extract of meat lozenges" prepared by Messrs. Gillon were spoken of at some length; we then stated that they appeared to be a genuine sample of extract thickened with starch, so as to preserve their consistence; but we have been informed since by a member of the firm that they contain no starch except what is used to prevent their sticking to the board in process of rolling out. However this may be, we do not know, but the proportion of the lozenges which we found to be insoluble in cold water, which consisted entirely of farinaceous matter, was such as to justify the belief we entertained, and our Fig. 8 *a* representing the portion of some lozenges (which were previously divested as far as practicable of *adhering* starchy matter) remaining insoluble in alcohol will, we think, convince any one that we had sufficient ground for our statement. Since receiving the explanation referred to, which we are quite ready to adopt, we can only conclude that a much larger proportion of the starch is incorporated than the makers are aware of. In other respects the "insoluble" bears the appearance of a fair, but somewhat gelatinous extract. The portion soluble in alcohol, Fig. 8 *b*, leaves on evaporation minute crystals of chloride of potassium similar to those of the South American extract.

The conclusions to be drawn from our observations are as follows:—

Firstly, that supposing an accurate knowledge to have been previously obtained of the nature of the appearances of a reliable sample, the microscope does afford a ready means of ascertaining proximately the value of *extractum carnis*,—the sensible characters, such as colour, taste, and odour having been, as a matter of course, considered in the first place, and due weight assigned to them.

Secondly, that the value of a sample is in direct relationship to its crystal-

* A sample of more recent importation, since forwarded to us by our friend Mr. D. Hanbury, confirms this opinion. It suffers little by comparison as to external characters with the South American.

loids, and inversely to its colloid constituents, and these may be separated by the process of dialysis. In connection with this we may state that the hygroscopic properties of the extract bear some relation to the amount of crystalloids contained in the samples, as we have found the specimens containing the most gelatinous matter keep their consistence best when freely exposed to the air; but of course the rate of deliquescence depends on the state of the atmosphere.

Thirdly, that in a comparative way the proportion of gelatinous constituents may be readily estimated by a solution of tannic acid.

Any value which these results may have is relative rather than absolute. Our object has been to obtain, if possible, a ready means of testing a complex product otherwise difficult to deal with, rather than to investigate details which could only be worked out fully by those who have time and opportunities we cannot command. There are many amongst our members who have both leisure and ability: to them we commit the subject, as one that will repay their labour.

Finally, we must acknowledge the kind assistance of our friends Dr. Attfield and Mr. A. Freire-Marreco: of the former in our early experiments in dialysis, of the latter in many matters connected with the more purely chemical portions of the subject.

INDEX TO PLATES.

Fig. 1. Acid Orthophosphate of Potash.
- *a.* Crystallized from aqueous solution.
- *b.* Crystallized from aqueous solution, in which a little vegetable extractive had been dissolved in order to observe the influence of viscid matter on the forms of the crystals.

„ 2. Chloride of Potassium.
- *a.* Crystals from aqueous solution.
- *b.* Crystals from alcoholic solution.
- *c.* Crystals from alcoholic solution, in which a small portion of vegetable extractive had been dissolved.

„ 3. Kreatine, after Funke.

„ 4. Kreatine, from specimens.

„ 5. *Extractum Carnis*, prepared as an experiment with cold water.

„ 6. *Extractum Carnis*, prepared with hot water.

„ 7. *Extractum Carnis*, Harvey and Reynolds.

„ 8. "Extract of Meat Lozenges."
- *a.* Portion insoluble in alcohol.
- *b.* Alcoholic solution evaporated.

„ 9. Cold water Extract as Fig. 5.
- *a.* Portion insoluble in alcohol.
- *b.* Portion soluble in alcohol.

„ 10. Australian Extract.
- *a.* Portion insoluble in alcohol.
- *b.* Portion soluble in alcohol.

„ 11. Prof. Pettenkofer's Extract.
- *a.* Portion insoluble in alcohol.
- *b.* Portion soluble in alcohol.

„ 12. South American Extract.
- *a.* Portion insoluble in alcohol.
- *b.* Portion soluble in alcohol.

Mr. Stoddart thanked the authors of this paper for their further elaborate contribution to micro-chemical science. He was struck with the absence of lactates amongst the salts indicated as being found. Their detection did not appear to him to be difficult. He had successfully sought for it in the liquid derived from perspiration.

FIG: 1. FIG: 2.

ACID. PHOS. POTASH. CHLOR. POTASSIUM.

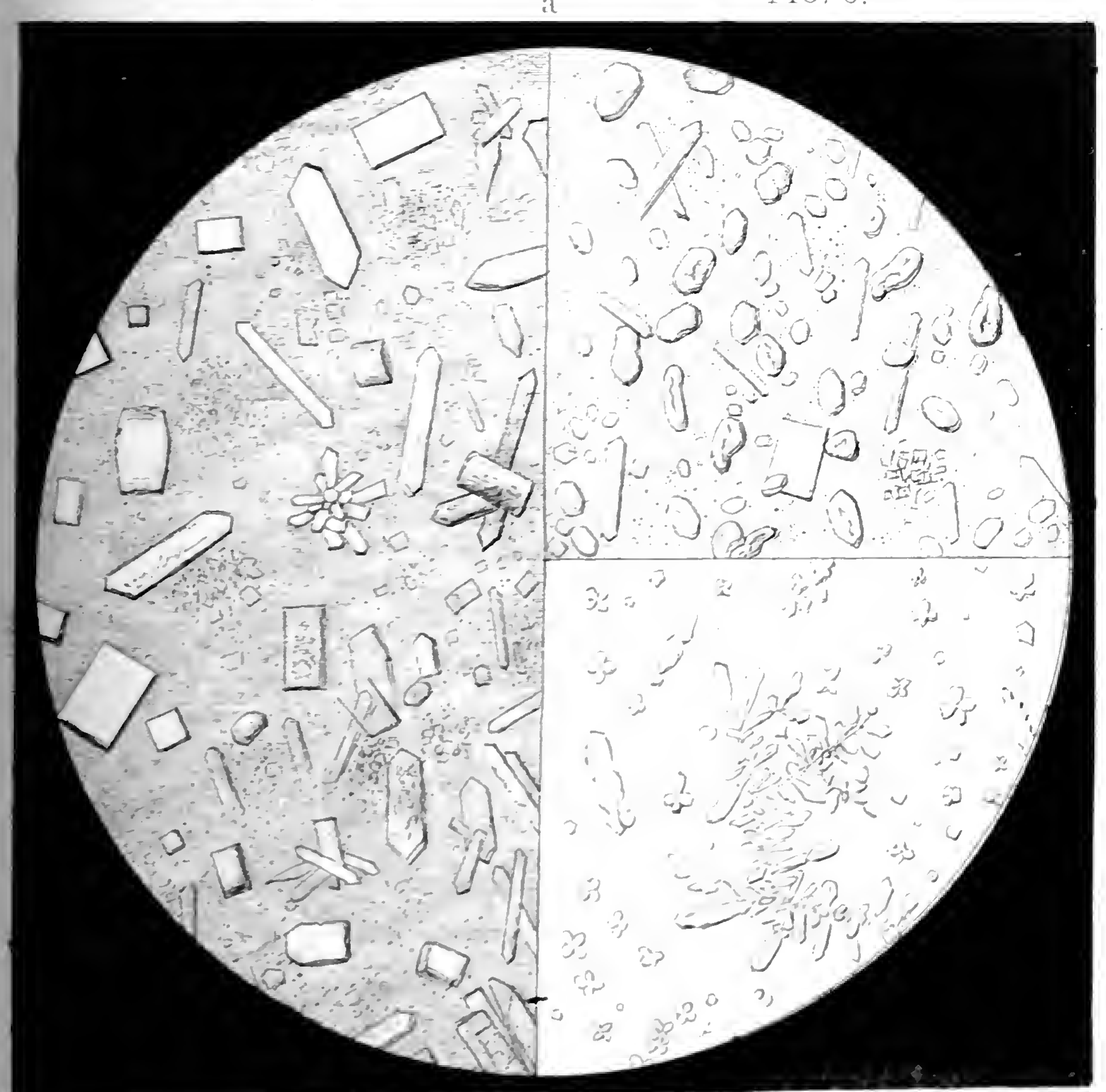
FIG: 3. FIG: 4.

KREATINE, after Funke. KREATINE, (ad nat.)

FIG: 5. FIG: 6.

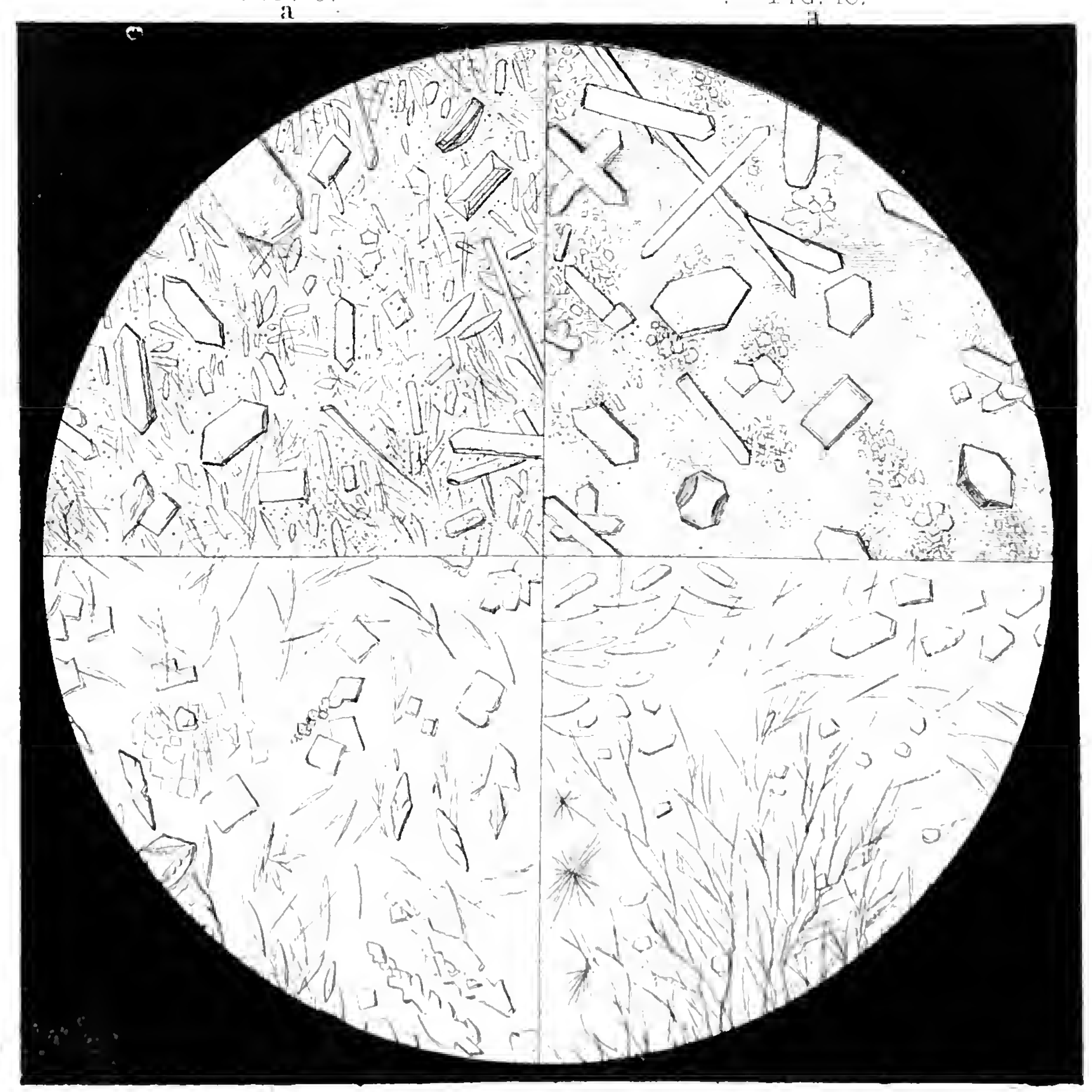
COLD WATER EXTRACT. HOT WATER EXTRACT.

FIG: 7. FIG: 8.



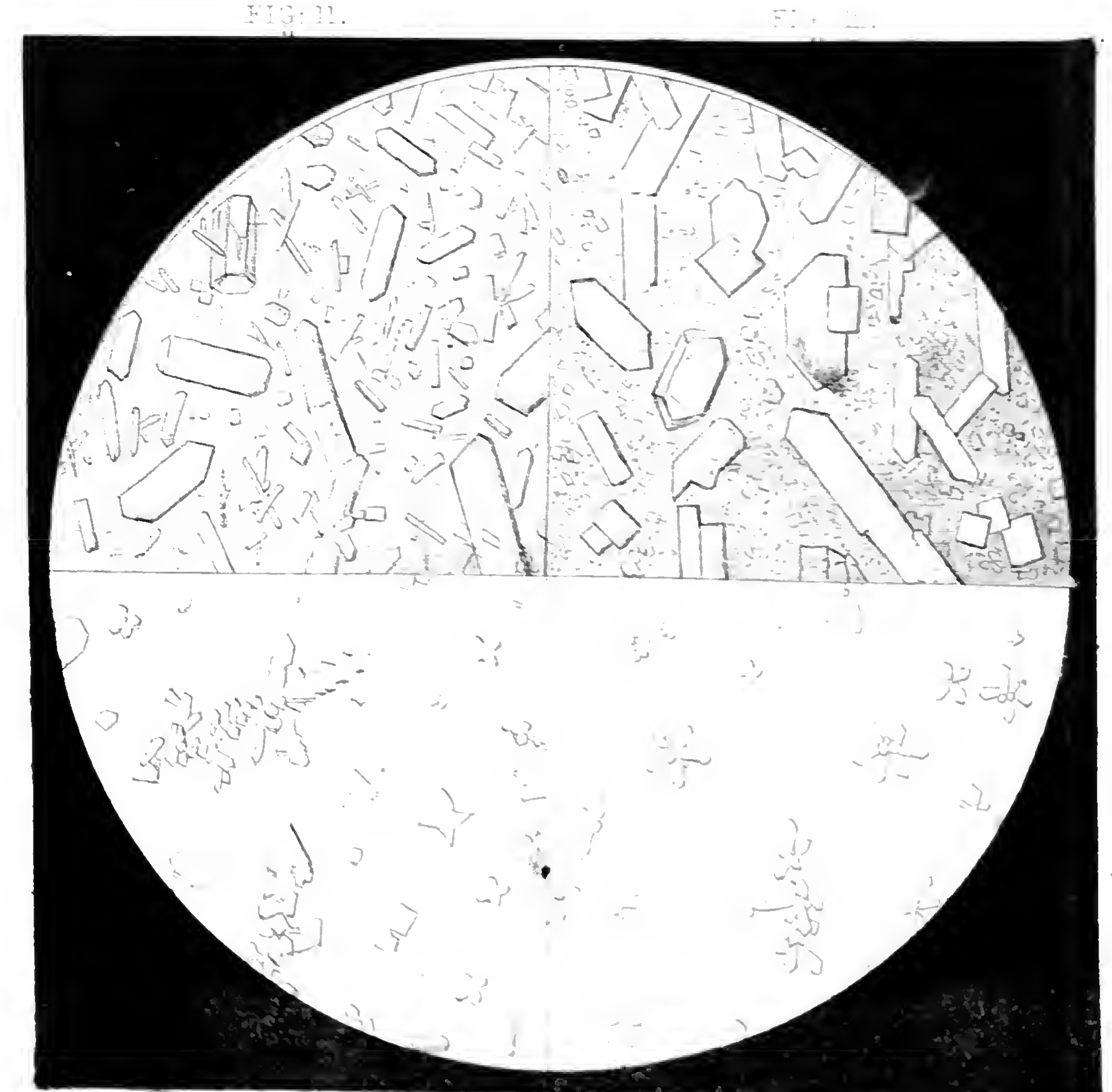
H & R, LEEDS. "MEAT LOZENGES."

FIG: 9. FIG: 10.



ALC. SOL.BLE & INSOL. in Cold Ext. SOL.& INSOL._ AUSTRALIAN.

FIG: 11.



SOL.& INSOL. Prof. Pettenkofer's SOL.& INSOL._ SO. AMERICAN.

H. B. Brady, del. Tuffen West, sc. W. West, imp.

Mr. Deane said the amount of lactic acid in flesh-juice seemed to vary greatly. When flesh that was still warm was cut up, hardly any acidity could be detected in its juices, but after a short time it became distinctly acid. In the evaporation of flesh-juice ammonia was set free at an advanced stage of the process; but a very marked difference existed in the amount of this, and he could not say upon what it was dependent.

Mr. Brady had sometimes thought that the splitting up of triple ammoniacal magnesian phosphate might explain this liberation of ammonia.

Mr. Pooley spoke in reprobation of the use of copper vessels in the later stages of the preparation of the extract, which was deteriorated in consequence.

Mr. Reynolds remarked that if the percentage of crystalloid should be accepted as the absolute test of value of extractum carnis, it should be accompanied by precautions against the artificial introduction of chloride of sodium. Dr. Hassall had published analyses of various samples of South American extract, giving in all cases 21·6 to 22 per cent. of ash. Now, in his (Mr. Reynolds's) experiments, he had found that 16 to 17 per cent. was the maximum amount of ash, whether in English or in South American samples. As to the evolution of ammonia, it certainly might occur, and he had once met with it to a very marked degree, but in most cases he thought that the careful evaporation of the extract was not accompanied by this evolution.

Mr. Giles and also Mr. Brough were disposed to attribute the evolution of ammonia to the decomposition of some organic nitrogenous principle.

Mr. Smeeton stated his experience that it was when the heat was unduly raised that ammonia was evolved to the greatest extent.

Dr. Attfield said that, speaking as a chemist, he confessed to surprise at such a phenomenon as the evolution of ammonia from a liquid having an acid reaction. He hoped that some one would collect and examine the gas given off. The whole subject was one of great interest, and would afford much room for research to any one having leisure. Its treatment might properly be subdivided: for instance, after dialysing the solution, the crystals obtained could be separated by the use of various appropriate solvents, as ether, alcohol, chloroform, benzole, etc., and mechanically by liquids of different densities.

ON THE SPIRIT-VALUE OF A FEW PURCHASED TINCTURES.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY.

The value of the spirit in a specimen of a tincture or other spirituous preparation depends upon the nature and amount of that spirit. The standard of excellence in this respect is, for us, the British Pharmacopœia. According to that book, every tincture should be made with spirit composed of pure ethylic alcohol and water, either in the proportion of eighty-four parts, by weight, of the former to sixteen of the latter (rectified spirit), or of forty-nine parts of the alcohol to fifty-one of the water (proof spirit). The spirit containing sixteen per cent. of water is a common article of commerce; that containing forty-nine per cent. of water is ordered to be made by mixing one hundred volumes of the strong spirit with sixty of pure distilled water. These, at all events, are the proportions of spirit and water with which the proof-spirit tinctures of the British Pharmacopœia are directed to be made. But there can obviously be no objection to making proof-spirit by diluting with water rectified spirit of any other strength than that just referred to—than the "sixty over proof" (60° O.P.), as it is commonly and very conveniently termed. Thus one hundred fluid ounces of a spirit of "seventy over proof" may have seventy ounces of water added, or the same quantity of a spirit of "fifty over proof" may have fifty ounces added. In either or any other similar case the result will be the true proof-spirit of the British Pharmacopœia. These statements may appear trite, but they are made to show that there can be no excuse for the manufacture of tinctures of inferior spirituous strength, a practice which, it is to be feared, is but too common. Of twelve specimens of proof-spirit tinctures recently purchased in different parts of the country and sent to me for examination, not one contained the right proportion of spirit. On being distilled to dryness, they all furnished distillates having specific gravities below that of proof-spirit. The following table shows the strength of each specimen as indicated by the above process:—

Name of Tincture.	Initials of Vendor.	Quantity sold for 4*d*.	Alcohol in 100 parts.
"Tincture of Rhubarb,"	B. & M.	1 fl. oz.	41·
,, ,,	P. W.	1 ,,	36·5
,, ,,	E. C. L.	2 ,,	44·5
"Laudanum,"	P. W.	1¼ ,,	33·5
,,	J. Al.	1¼ ,,	41·
,,	B. & M.	1¼ ,,	34·
,,	H. & Q.	2 ,,	34·
,,	J.		41·
"Paregoric Elixir,"	B. & M.	1½ ,,	39·
,, ,,	P. W.	1½ ,,	45·5
,, ,,	E. C. L.	1½ ,,	39·
,, ,,	J. Al.	2 ,,	45·5
Proof-spirit, B. P.			49·
Rectified spirit, B. P.			84·

From this table it is evident that only three of the twelve contained an amount of alcohol even approaching that of proof-spirit. And even those, instead of forty-nine per cent., contained but forty-four and a half, and two forty-five and a half. Five varied from thirty-nine to forty-one per cent. The remaining four contained only thirty-six and a half, two thirty-four, and thirty-three and a half respectively.

In confirmation of the evidence afforded by the above figures, that the weaker tinctures are frequently made with spirit of inferior strength, several makers have admitted to me that they always mix their rectified spirit and water in the proportion of five to four, a few five to five. One of the latter actually seemed to be under the impression that rectified spirit was the same thing as alcohol, and that as proof-spirit contained forty-nine of alcohol to fifty-one of water, he only saved a little trouble, and at the same time gave the public a slight benefit, by mixing fifty with fifty, "half-and-half" as he termed it. It had not occurred to this individual that in adding (say) fifty fluid ounces of rectified spirit to the same quantity of water, he was mixing only forty-two ounces, *by weight*, of the spirit with fifty ounces, by weight, of water; and that, moreover, the said spirit already containing six and three-quarter ounces of water, his ninety-two ounces, by weight, of mixture only contained about thirty-five ounces, by weight, of alcohol; that, in short, instead of having a diluted spirit containing fifty, or even forty-nine per cent. of alcohol, he was using one containing only about thirty-eight (38·3), and this in the face of the plain statement of the Pharmacopœia that proof-spirit is made from rectified spirit and water in the proportion of five pints to three.

With regard to the nature of the alcohol in these specimens of tinctures, it was in nine cases purely ethylic; the other three contained methylic alcohol. The presence of the latter was indicated by Tuck's iodohydrargyride of potassium, confirmed by Miller's oxidation tests. The three methylated tinctures came from one shop, that of P. W. It is unnecessary to make any remark concerning these three adulterated preparations; the extensive use of methylated spirit in the manufacture of tinctures is well known, the determination of the Legislature to stop the practice will probably be soon equally well known.

The price at which these tinctures were supplied varies, surely, to an unnecessary extent? Two appear to have been sold at the rate of fourpence per ounce, three at about threepence, three at about twopence halfpenny, and three at twopence per ounce. I have before me a retail price list, published in 1865, apparently, by an important and influential "Committee," but having no name, address, or other distinguishing mark, except a trade-price one—"MEL BORACIS,"—in which laudanum is marked at sixpence per ounce, and paregoric and tincture of rhubarb each at fivepence per ounce. The laudanum of the above specimens was only twopence or threepence per ounce, the paregoric twopence or twopence halfpenny, and the tincture of rhubarb twopence per ounce in one case, and fourpence in the others. Knowing but little of such matters, I would simply draw the attention of chemists and druggists to this point; manifestly, however, great inconsistency exists.

In conclusion, I would remark, that the results of the examination of these tinctures must not be taken as indicating the general practice of the trade concerning the manufacture and sale of such preparations. Pharmacies could be mentioned in which only spirit of the officinal strength and quality is used, and where fairly remunerative prices for articles of best quality are readily obtained. It would be equally unfair, however, to name the vendors of good, as of bad articles, mere accident bringing their wares under my notice. Doubtless the honest or fortunate are not more honest or fortunate, nor the dishonest or unfortunate, more dishonest or unfortunate, than hundreds of their brethren whose preparations do not chance to come under the scrutiny of the analyst.

17, *Bloomsbury Square, London.*

ON THE CALAMINE OF PHARMACY.

BY MR. R. H. DAVIS.

The subject I have undertaken to investigate for this Conference is the quality of calamine as now supplied by the ordinary class of dispensing chemists in the kingdom.

Previous examinations have shown that formerly an article so called was almost invariably composed of sulphate of baryta, with small quantities of carbonate of lime and oxide of iron.

	1	2	3	4	5	6	7	8	9
Oxide of Zinc	73·64	67·64	56·25	17·29	13·15				
Peroxide of Iron.........	5·89	3·65	6·43	·51	·57	2·31	1·35	2·00	·90
Oxide of Copper	trace	·54	trace						
Carbonate of Lime	5·30	10·61	10·79	3·46	8·34	4·92	4·74	3·17	1·97
Carbonate of Magnesia	·83	trace	trace	trace	trace	trace	trace	trace	trace
Sulphate of Baryta......				75·56	73·19	86·03	88·69	92·99	94·66
Silica, etc....................	7·05	14·95	23·33						
Water	1·44	2·61	·98	1·80	1·75	1·28	·92	·88	·77
Loss	5·85		2·22	1·38	3·00	5·46	4·30	·96	1·70
Total........................	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00

The results now placed before you will, I think, be gratifying, in exhibiting a great advance in the purity of this preparation, as generally supplied by the retail druggist at this present time.

The analyses I have made of the specimens of calamine are arranged in a table, for convenience of comparison, as follows. The results obtained have been calculated for 100 grains.

No. 1. Purchased in the suburbs of London. 2. From Leeds. 3. From Dr. Attfield, marked No. 10. 4. From a medicine chest, supposed to be about thirty years old. Labelled as from a well-known West-end London house. 5. From Dr. Attfield, marked No. 1. 6. From a London wholesale house, sent out, seven years since, as P. L. 7. From Newcastle. 8. From Dr. Attfield, marked No. 3. 9. From Leeds.

Mr. Challinor, of Derby, a large manufacturer of calamine, kindly communicated to me the following information respecting it:—"The native calamine is met with in Derbyshire, in porous veins 20 inches or less in thickness, and imbedded in a hard kind of sandstone (called dawstone by the miners); frequently a vein of lead ore, and occasionally sulphate of baryta are found attached."

Mr. Challinor concludes by saying—"*The genuine is never sent except when especially ordered.*"

Referring to the table of analyses, Nos. 1, 2, and 3 may be considered genuine; their appearance, as may be observed from the specimens exhibited, is not so pleasing as the salmon-coloured, old-fashioned variety with which the public is familiar.

Nos. 4 and 5 are peculiar, the small quantity of oxide of iron and the comparatively large quantity of oxide of zinc found, give rise to the suspicion that they are special preparations, possibly mixtures of oxide of zinc and the barytic calamine.

Nos. 6, 7, 8, and 9 correspond, and are of the ancient quality, innocent of any admixture with the genuine preparation, and are of a kind which was once universally supplied throughout the trade. Several analyses have been made from time to time of this barytic calamine. Mr. Brett was the first person to publish an account of it.*

At a later period, David Murdoch, Esq., read a paper on this substance before the Philosophical Society of Glasgow.† In 1848, Mr. Edward Moore furnished analyses of six specimens of calamine obtained from the most respectable drug houses in London, with one exception they all correspond in a marked degree with Nos. 6, 7, 8, and 9 in the present table of analyses; the exceptional specimen contained 58·6 per cent. of oxide of zinc.‡

In the same year, Mr. Jacob Bell gave an interesting paper on the same subject,§ in which we are informed that six specimens of calamine procured at some of the most respectable shops in Paris were examined and found to be fair specimens of calamine. The English specimens which had been obtained shortly before from the most respectable houses in London, by Mr. E. Moore, contrast very unfavourably with these supplied by the pharmaciens of Paris.

From the analyses now supplied it is pleasing to note the decided improvement in the quality of the English calamine since that period, and it is to be hoped that when a future examination, after a corresponding period, is made of the calamine of pharmacy, not a single specimen of the barytic compound will be found for sale in any establishment in the kingdom.

Harrogate, August 18, 1866.

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* 'British Annals of Medicine,' vol. i. p. 483.

† Pharmaceutical Journal, vol. iv. p. 31. ‡ Ib., vol. viii. p. 70. § Ib., p. 321.

Mr. T. B. Groves could confirm the author's statements as to the room for improvement in this remedy. He recently obtained calamine from a most respectable source, and found that it contained no oxide of zinc.

Mr. Halliday remarked that such circumstances suggested whether it would not be as well to attain uniformity by using oxide of zinc, to which the requisite tinge of colour might be given.

NOTES ON PLASMA.

BY MR. G. F. SCHACHT.

Early in the year 1858 a paper of mine was read before the Pharmaceutical Society, entitled, "Glycerine, a Proposed Substitute for Oils and Fats in Ointments."

The discussion which followed the reading of this paper (supposing the report in the Journal to have been correct) appeared to me at the time, as it appears to me now, by no means characterized by judgment or candour. It seemed to be assumed that the proposed substitute, "plasma," was identical with a certain something else that had been tried and found wanting, and that therefore there was little hope for plasma. The two things, however, were not alike. Unfortunately I was unable to be present on the occasion, and, as no defence for the proposition was volunteered by any other person, a verdict. on the whole, adverse was delivered by the learned critics. Notwithstanding this damaging circumstance, certain individuals, both in my own neighbourhood and in other localities, were differently impressed, and, having given the preparation something of a trial, arrived at the conclusion to continue its use. And so, after eight years' experience, I am not a little pleased to find plasma not only talked about, written about, and prescribed, but also that a proposition has been made by no less an authority than Dr. Redwood to introduce it into the next Pharmacopœia.

From the date of my paper (February, 1858) to the present moment I have made no further public allusion to the article; I may, perhaps, then be excused if I now once more obtrude it upon my fellow-pharmaceutists.

It is, perhaps, undesirable that I should follow every one who has expressed himself upon the matter; in referring, however, to the opinions and observations of *a few*, I trust to be understood to imply no disrespect for the labours of *the rest*.

I may observe, as a general remark, that those who have *written* upon the matter express opinions favourable to the preparation; the objections to it have usually been uttered in *conversations* and *discussions* upon these more deliberately expressed opinions. The list of tangible objections, however, is not large; it amounts to no more than two. These are serious objections, I admit, if they really exist, but they are not numerous.

The first is, that the preparation becomes softer by exposure to the moisture of the air; and the second, that it is liable to become mouldy by keeping.

With regard to the first, I think we must admit that it *is* a difficulty. I pointed it out in my original paper, and I do not think there is any prospect of our being able altogether to obviate it. We must accept it as a property of all preparations of glycerine, and avoid exposure to moisture as much as possible. But I have not found this property of great practical inconvenience. I have kept plasma in a common covered pot for a long time without apparent change. Here is a sample kept in this way since December, 1865, and it is still of very good consistence. But if the article be really useful, there would be no more difficulty in preserving it in well-closed vessels than many others about which we have to be specially careful.

The second alleged objection to plasma is, that it becomes mouldy by keeping. This statement is backed by the authority of names that command respect. Mr. Dean and Mr. Squire have both recorded this fact against plasma, and it is difficult to discredit anything advanced by observers of so large experience and of such well-known carefulness. But without intending any contradiction of the observations of others, I am bound to assert that I never saw a particle of mould upon plasma, and that since 1858 I have never been more than a few days at a time without plasma in stock. It is possible the mould to which these gentlemen refer may have appeared upon some of the compound plasmas. I admit I have not kept many of these for any length of time, but such as I have kept—*Plasma Zinci* and *Plasma Petrolei*—have remained as free from mould as simple plasma itself. I do not therefore feel disposed, as yet, to admit "a disposition to become mouldy by keeping" as a proved fact against plasma; but, on the other hand, am bold to assert that it has but the one weak point already admitted.

Though I have prepared plasma in batches varying from one ounce to twenty pounds, and have for experimental purposes occasionally modified my formula, I have found no advantage to result from any change, either in the proportions of the ingredients or in the selection of any particular starch-granule. Some experimentalists have supposed considerable differences in the results to have attended the employment of different feculas. My own experience goes rather to constrain me to attribute all variations of result to slightly altered manipulation. For instance, if, after heating the mixed ingredients to the required temperature and for the required time, the vessel be removed from the fire and its contents allowed to cool without further stirring, they will become gelatinous and toughly elastic, a consistence very inconvenient for the required purpose; but by a little judicious stirring during the process of cooling this may be entirely obviated, and an excellent ointment-like consistence obtained. Again; I have observed the translucency of the result to depend a good deal upon the time the mixture is exposed to heat, and the amount of stirring during the last part of the process. I find arrowroot, tous-les-mois, and potato-starch will all give equally good results under exactly similar circumstances; and, on the other hand, they all, under slightly modified circumstances, will yield inferior results. My experience, therefore, leads me to suggest but little change in my original instructions, which were as simple as could well be, viz.:—"Take of starch powder 70 grs.; glycerine 1 fl. oz.: mix the ingredients cold, and heat to 240°, constantly stirring." All I would add to that is, if the batch be large, say 10 lb. or 20 lb., it is better to escape the dreary task of constantly stirring so large a mass, whilst it is being gradually heated to 240° (which must be done if the starch be added at the commencement of the process). This can be accomplished by mixing the starch with about one-twelfth of the glycerine, placing the remainder on the fire, and, when this has become heated to 260° (which will involve no special attention), mixing all together and stirring till complete. I venture then to repeat my opinion that plasma, carefully made, is a very elegant and useful material, possessing features of undoubted advantage over the fats commonly employed for ointments, and is not liable to any serious inconveniences.

I wish now more particularly to refer to some of Dr. Redwood's remarks contained in his paper, "On the Construction of a Pharmacopœia" (April 5, 1865), and more especially to the nomenclature by which he proposes to designate this *solid* preparation of mine and a certain other class of *fluid* compounds of glycerine. He introduces the matter by a kindly and favourable mention of plasma. He says (vol. vi., 2nd series, p. 572):—

"In external applications, also, some improvement has been made. The old form of ointment has often been referred to as one calling for improvement; for what can be more offensive than a rancid unguent smeared over the skin? The so-called *Plasma*, which was introduced by Mr. Schacht, of Clifton, in 1858, is certainly a great improvement in elegance and the absence of repulsiveness upon the forms previously used for similar purposes. This plasma, which is a solution of starch in glycerine, has now been in use for several years, and there appears to be but one objection to it, which is that, if exposed to the air, it absorbs moisture, and is then liable to become mouldy. But it has several recommendations, and it will probably come into more general use as it becomes more extensively known."

He then alludes to a class of preparations in which glycerine acts as a useful solvent, and in which the resulting compounds still retain the fluid form of the solvent. After commending these also as a useful series of applications, he proceeds to criticize the names by which they have hitherto been called. He says:—

"If glycerine is to be thus used, it is desirable that we should have some name that could be conveniently applied in pharmacy as a generic name for solutions where it is employed as the solvent. Some names have been already proposed, but none of them appear to me to be unobjectionable. Solutions in glycerine have sometimes been called *glyceroles*, but this name is suggestive of a property the reverse of that which glycerine imparts. *Glyceroleum* cannot therefore be considered a suitable generic name for a class of preparations distinguished from *olea* and *unguenta* by the possession of entirely different characters. Then we cannot call them *glycerides* or *glycerates*, because these names are already appropriated as chemical names, having different significations from those here intended. I would suggest that the name *glycemate* might be suitably used for these preparations. This name has not yet been appropriated that I am aware of, and it seems to fulfil what is required. The word *glycemate* would be *glycematum* in Latin, and this would apply to solutions of substances such as I have named in glycerine. The solution of starch in glycerine, Mr. Schacht's *Plasma*, would be *Glycematum Amyli, glycemate of starch*. Under this name it would be included among other solutions in glycerine; but as this glycemate of starch may itself become the basis of a class of external applications, while others of the *glycemates* are applicable for different purposes, it would be desirable to have a name that could be used as a generic name for preparations of glycemate of starch with more active ingredients. Thus the glycemate of starch forms a good vehicle for the application of aconitia, atropia, etc., and what name should be applied to such? I would suggest that the name *Glycematum Amyli* should be abbreviated into *Glycemylum*, which would be a synonym for glycemate of starch, and a generic name for preparations consisting of what is now called Plasma, with the addition of other substances.

We should thus have—

GLYCEMATUM AMYLI, Glycemate of Starch. *Synonyms,—Glycemylum,* glycemyle, Plasma. Solution of starch in glycerine.

GLYCEMATUM ALOES, Glycemate of Aloes. *Synonym,* Glycerole of Aloes. Solution of aloes in glycerine.

GLYCEMATUM BORACIS, Glycemate of Borax. Solution of borax in glycerine.

GLYCEMATUM CARBOLICUM, Carbolic glycemate. Solution of carbolic acid in glycerine.

GLYCEMATUM GALLICUM, Gallic glycemate. Solution of gallic acid in glycerine.

GLYCEMATUM TANNICUM, Tannic glycemate. Solution of tannic acid in glycerine.

And then we might have—

GLYCEMYLUM, Glycemyle. *Synonym,*—Plasma. Solution of starch in glycerine.

GLYCEMYLUM ACONITIÆ, Glycemyle of Aconitia. Solution of aconitia in glycemyle.

GLYCEMYLUM ATROPIÆ, Glycemyle of Atropia. Solution of Atropia in glycemyle; etc. etc."

Now, I think the author's strictures upon the names glycerole, glyceride, and glycerate are perfectly fair, and I agree with him in thinking they ought not to be used, but I cannot see that the new ones he suggests are one whit better. In the first place, the words glycematum and glycemylum are very much like each other, the difference not only being slight, but being also one that would by no means easily fix itself in the memory of the prescriber and dispenser. Here are two distinct forms of remedy as different in physical features as an "extract" differs from a "liquor" or an "aqua." Why, then, call them by names which sound and look so much alike? I admit that glycemylum suggests itself as a compound word of glycerinum and amylum, but then that does not necessarily imply that glycemylum is solid, for unless heated the ingredients would remain fluid. But I do not at all see the etymological appropriateness of glycematum. A glycemate might certainly be a correct name for a compound of glycemic acid (did such a thing exist) and a base; but, as this is not intended, I can only suppose the word to be also a compound of glycerinum and pomatum. But that would rather suggest a solid, inasmuch as pomatums usually are solid. But Dr. Redwood applied this term to the fluid class of preparations.

I cannot help thinking that the Doctor has passed over the most simple, the most natural, and the most correct name for these fluid glycerines. When we dissolve small portions of foreign substances in water, we call the resulting fluids waters, aquæ. A little oil of cinnamon dissolved in water constitutes cinnamon water, aqua cinnamomi. A little lime dissolved in water we call lime water, aqua calcis, etc. etc. We do not find it necessary to increase the mystery of the matter by talking of an "aquate of lime," "aquatum calcis," "aquatum cinnamomi;" why not, therefore, call a solution of aloes in glycerine "aloes glycerine,"—*Glycerinum Aloes*,—or a solution of tannin in glycerine *Glycerinum Tannicum?* Such a nomenclature would be too simple and obvious for confusion, and the whole series of medicated glycerines would lie together with the simple solvent at their head.

And with regard to the solid series,—plasma and its compounds,—I cannot help thinking they had better continue to be called by the name under which they were introduced. As godfather to the interesting stranger, I may perhaps be somewhat partial; but I think the name both euphonious and descriptive: it implies something to be spread; it is not more arbitrary than others we employ with great convenience, such as "tinctura" and "emplastrum," and it serves to discriminate peremptorily between the solid and the fluid forms of the glycerine applications.

If, then, these preparations are honoured with places in the new Pharmacopœia, I hope they will appear under the easily-recognized names of "glycerina" and "plasmæ."

Mr. GILES supported the claims of his friend Mr. Schacht to the retention of the original name, in preference to the suggested "improvement."

Mr. INCE concurred in this.

Mr. Baldock and Mr. Carteighe stated that they did not regard the preparation as one liable to become mouldy, even if kept for a year or two. The former gentleman advised that the heat should be raised fully as high as named by the author, as the best guarantee of stability in the preparation.

ON THE RELATIONS OF PHARMACY TO THE REVENUE.

BY MR. R. W. GILES.

In this paper the author laid before the meeting a full account of the recent prosecution to which he had been subjected for the sale of methylated spirit. The particulars have already been published at p. 40 of the current volume of 'Pharmaceutical Journal.' Mr. Giles's appeal to the Recorder of Bristol was unsuccessful. He showed how the excise had set the trap for him, and had followed up their advantage relentlessly, pointing out the technical advantages resting with the prosecution in excise cases.

A discussion followed this paper, in which many members took part, and much sympathy was expressed for Mr. Giles under the persecution to which he had been subjected. The operation of the new Act of Parliament, limiting the use of methylated spirit in medicine, was fully considered. The distinction between medicines for internal and external use was shown to be the foundation of the question at present; and the complications that might be anticipated from this very doubtful distinction were illustrated by the cases of various methylated liniments, as lin. camph. co., and others which were intended for external use, but the sale or possession of which would be capable of construction into a breach of the law, since it could not be denied that they might be taken internally. It was evident that for the same reason a wide door would be opened for fraudulent practices. The unsatisfactory position of the drug trade in relation to methylated spirit, was asserted to be due to its chief corporate control being in the hands of persons more interested in the wholesale or manufacturing departments than in retail business.

The following resolutions were adopted:—

Moved by Mr. Reynolds, Leeds; seconded by Mr. Jones, Leamington,—

"That this meeting has had under its consideration the subject of the use of methylated spirit in medicine, in connection with the recent changes of the law prohibiting the same for medicines intended for internal use. It records its conviction that great injury has happened to the best and permanent interests of the drug trade by the introduction of this compound, devised as it was for totally different purposes, and views with satisfaction the limitation of its use, now imposed by Parliament. With a knowledge of the many devices by which methylated spirit has been brought into unfair and underhand competition with pure and duty-paid spirit, this meeting regards with much apprehension the attempts which are likely to be made to evade the new law, and trusts that the Board of Inland Revenue will vigilantly guard against such evasion."

Moved by Mr. Reynolds; seconded by Mr. Schacht, Clifton,—

"That this meeting desires to lay before the Board of Inland Revenue its opinion that the virtual break-down of the system by which the use of methylated spirit has hitherto been regulated, urgently demands that some new plan should be devised for more securely preventing the conversion of a duty-free spirit into an imitation of pure spirit, on which duty has been paid."

A copy of the resolutions was ordered to be sent to the Board of Inland Revenue.

Mr. Halliday suggested that it would be desirable to make an effort for legalizing the sale of small quantities of pure spirit-of-wine by chemists, when it was required for legitimate purposes.

Mr. E. Bremridge stated his opinion that the late Chancellor of the Exchequer would not have been unwilling to grant this boon, but the insuperable difficulty was that there was no register of all persons engaged in the trade.

ON THE PROPOSED INTRODUCTION OF TWO SYSTEMS OF CHEMICAL NOTATION IN THE PHARMACOPŒIA.

BY JOHN CARGILL BROUGH.

In a letter addressed to the Medical Council on the 19th of March, 1866, the President and Council of the Chemical Society recommended the total exclusion of chemical symbols from the forthcoming edition of the British Pharmacopœia, and suggested that percentage representations of composition should be included in the definitions of the few bodies that might seem specially to require distinctive formulæ. The grounds upon which this recommendation was based were thus stated:—

"The system of notation at present adopted in the British Pharmacopœia is constructed in conformity with views which are rapidly disappearing from chemical teaching in this country.

"The Pharmacopœia is necessarily the text-book on which the examinations of students of medicine and pharmacy in pharmaceutical chemistry are based. It appears, therefore, extremely desirable that no work shall be put forth on official authority, such as that of the Medical Council, which shall be at variance with the views propounded by many of the most active experimental leaders and principal teachers of chemical science; or which shall oblige the teacher to adopt a double numerical system in his exposition of the facts of chemical science to his pupils,—a course which is always a source of embarrassment both to professor and learner."

Though this recommendation proceeded from a Council representing the scientific chemists of the United Kingdom, and was supported by Dr. Christison and Dr. Redwood, the Medical Council, by a majority of eleven against eight, carried Dr. Apjohn's motion:—"That it be an instruction to the Pharmacopœia Committee to give for each therapeutic compound of definite constitution, occurring in the forthcoming edition of the Pharmacopœia, two formulæ,—the first being that in ordinary use at present, the second being one constructed in accordance with the more recent views of what is called the 'unitary' system."

The forthcoming Pharmacopœia will therefore contain two sets of symbolic formulæ, presenting two phases of chemical science, between which there is almost as great a difference as there is between the Ptolemaic and Copernican systems of astronomy. Having long held the opinion that theoretical formulæ are inconsistent with the practical character of the Pharmacopœia, I regret the decision of the Medical Council, and venture to assert that its result will be unsatisfactory to students and teachers of pharmaceutical chemistry.

The formulæ given in the present British Pharmacopœia do not accord with the doctrines of our leading chemists, and are rapidly going out of use. They do not represent the system of notation adopted in Watts's 'Dictionary of Chemistry,' Hofmann's 'Modern Chemistry,' Odling's 'Animal Chemistry,' Williamson's 'Chemistry for Students,' and every other important chemical work that has recently appeared. More than three years ago, Dr. Odling publicly expressed his belief that the old formula for water, HO, would never again be chalked upon the screen at the Royal Institution; yet this formula is the basis of the system of notation which is to be kept before all those who use the forthcoming Pharmacopœia. On the other hand, the system of notation framed in accordance with modern theories is not firmly established, and will doubtless undergo many modifications in the course of a few years. Our chemical reformers are not agreed as to the true molecular constitution of the lower chlorides of mercury and copper, the higher chlorides of iron, chromium, and manganese, and many other bodies; consequently, the formulæ by which such bodies are represented must be regarded as provisional. Still, if symbolic formulæ were indispensable in the Pharmacopœia, those adopted by any leading modern chemist would be far preferable to those based on ideas which are generally admitted to be erroneous.

The double formulæ of the forthcoming Pharmacopœia will necessarily embarrass pharmaceutical teachers and students, and will reflect a transitional state of chemical science which cannot endure long.

I have taken some trouble to ascertain whether the chemical formulæ of the present British Pharmacopœia are essential to scientific precision, and have arrived at the conclusion that a few trifling alterations in the pharmaceutic and descriptive names, or in the definitions, would remove all ambiguity, and obviate the necessity of employing a single symbolic formula. The results of my investigation I now bring before my fellow-members of the British Pharmaceutical Conference.

Chlorides and Hydrochlorates.—The pharmaceutic names of twelve compounds in this group are unambiguous. The names "hydrochloric acid," "chloride of sodium," "chloride of calcium," "chloride of barium," and "chloride of zinc" denote the only known compounds of chlorine with hydrogen and with the metals named. There is but one "hydrochlorate of ammonia," and but one "hydrochlorate of morphia." The two chlorides of mercury are clearly distinguished by their pharmaceutic names, "calomel" and "corrosive sublimate." The name "terchloride of antimony" serves to distinguish the body to which it is applied from the only other known compound of chlorine and antimony, which is a pentachloride; and the name "terchloride of gold," in like manner, serves to distinguish the normal auric chloride contained in the test solution from a monochloride of gold with which we are acquainted. Again, the ferric chloride contained in one of the officinal solutions is distinguished from the ferrous chloride by the well-understood appellation of "perchloride of iron;" moreover, the ferridcyanide test proves that the solution does not contain the ferrous salt. There are, then, but two chlorides mentioned in the Pharmacopœia which are imperfectly designated. These are the chlorides of tin and platinum contained in test solutions. The simple name "chloride of tin" does not inform us that the body to which it refers is the lower chloride of tin, or stannous chloride of modern chemists. Still, as the Pharmacopœia gives explicit directions for preparing the test-solution, the present name, which is recommended by its simplicity, might be safely retained. According to the modern atomic weight of platinum, the compound called "bichloride of platinum" is a tetrachloride. It would therefore, be better to apply to it the unobjectionable name of "chloride of platinum." No mistake could possibly arise from the use of this name, as the lower chloride, or platinous chloride, is insoluble in water, and consequently could not be contained in the officinal test-solution. The symbolic formula of chloride of barium, given in the Appendix, expresses the proportion of water in the crystallized salt; but, as chloride of barium invariably crystallizes with two combining proportions of water, the simple word "crystallized," if substituted for the formula, would imply the hydration of the salt. Again, in the case of hydrochlorate of morphia, the proportion of water of crystallization is expressed by the formula; but the distinguishing characters are only applicable to the hydrated salt, and the prescribed quantitative test accurately denotes the percentage of morphia in the crystals. The fourteen different formulæ representing chlorides and hydrochlorates might, therefore, be safely excluded from the Pharmacopœia; and if the prefix *bi-* in the name "bichloride of platinum" were omitted, and the one word "crystallized" added to the name "chloride of barium," there could be no mistake as to any one of the fourteen compounds named. In place of the secondary descriptive scientific names of calomel and corrosive sublimate,—"subchloride of mercury" and "chloride of mercury,"—it would be advisable to employ the unobjectionable appellations "mercurous chloride" and "mercuric chloride," which are coming into general use among chemists of both the old and the new schools. In the *definition* of "solution of perchloride of iron," a similar alteration might be advantageously made by substituting the term "ferric chloride" for "perchloride of iron."

Bromide.—The name "bromide of potassium" in the Pharmacopœia indicates plainly enough the only combination of bromine and potassium.

Iodides.—The names of the four officinal iodides are sufficiently distinctive. "Iodide of potassium" is the accepted name of the only compound of iodine with potassium. Both mercurous and mercuric chlorides are officinal, but they are plainly distinguished by the names "green iodide of mercury" and "red iodide of mercury." The compound called "iodide of iron" is the ferrous iodide, but, as there is no definite crystallizable ferric iodide, it is unnecessary to indicate the fact by any prefix to the generic name "iodide." According to the formula given in the Pharmacopœia, the crystalline ferrous iodide is a definite hydrate, containing four combining proportions of water. If it be necessary to indicate this degree of hydration, the simple statement that the compound contains 18·85 per cent. of water might be substituted for the formula.

Cyanides.—The names of the three compounds containing cyanogen are unambiguous. "Hydrocyanic acid" is the accepted name for the only cyanide of hydrogen. The compounds called "ferridcyanide" and "ferrocyanide" are well known, and satisfactorily distinguished by their common synonyms, "red prussiate" and "yellow prussiate of potash." The addition of the word "crystallized" to the name of the latter salt would imply what the formula expresses, namely that three molecules of water are combined with one molecule of the anhydrous salt. The crystals of the red salt contain no water.

Sulphides and Sulphydrates.—The sulphide of hydrogen and sulphydrate of ammonium, which are prescribed as tests, are called "sulphuretted hydrogen" and "hydrosulphuret of ammonia," and the formulæ given are unnecessary additions to these well-understood and unobjectionable names. The compound termed "sulphuret of iron" is the ferrous sulphide; and if this fact were stated as a definition, the formula might be omitted. The names "tersulphuret of antimony" and "tersulphuret of potassium," which occur respectively in the definitions of "sulphurated antimony" and "sulphurated potash," do not clash with modern doctrines, and would be perfectly intelligible without the formulæ.

Oxides and Hydrates.—The normal oxides of hydrogen, silver, magnesium, zinc, calcium, and lead are plainly denoted by the names "water," "oxide of silver," "magnesia," "oxide of zinc," "lime," and "litharge." It is true that oxygen unites with silver in three proportions, but argentous oxide and peroxide of silver are unstable compounds. Moreover the quantitative test which shows that 27 grains of silver are left on igniting 29 grains of the oxide, fixes the exact composition of the body. Again, there are several oxides of lead, but the name "litharge" and the characters given in the Materia Medica are only applicable to the normal plumbic oxide. The hydrates of sodium and potassium are individualized by the familiar names "caustic soda" and "caustic potash." The name "red oxide of mercury" satisfactorily distinguishes the officinal mercuric oxide from the unstable black mercurous oxide. The oxide of antimony, which is mentioned in the definition of "sulphuretted antimony," is correctly named "teroxide of antimony," to distinguish it from the pentoxide. The peroxide of manganese is called "black oxide," and therefore cannot be mistaken for the green or the red oxide; and the test which indicates its property of yielding oxygen when heated, serves to distinguish it from the normal manganic oxide. The formulæ given for the pharmaceutic oxides and hydrates of iron do not reveal the exact constitution of these preparations, and are more likely to mislead than inform the student. Thus the formula given for the so-called "peroxide of iron" represents ferric oxide combined with one atomic proportion of water; but it is doubtful whether such a product is obtainable by the Pharmacopœia process. Again, the formulæ representing the so-called "hydrated peroxide of iron" and "magnetic oxide of iron" fail to express the relation which these variable hydrates bear to the normal ferric and ferroso-ferric hydrates. In place of the formula given under "peroxide of iron," some such definition as the following might be inserted:—"Ferric oxide slightly hydrated." For the present definition of "hydrated peroxide of iron," the following might be substituted:—"Ferric hydrate, with a variable amount of uncombined water." And for that of "magnetic oxide of iron," the following:—"An oxide intermediate between the higher and lower oxides of iron, or the ferric and ferrous oxides, with combined water." I am of opinion that the term "sesquioxide," which is used by the new as well as by the old chemists, is preferable to "peroxide" as a pharmaceutic name for the higher oxide of iron, as the latter term is now usually applied to an oxide in which part of the oxygen is in an unstable condition.

Oxygen-Acids and Anhydrides.—The modern doctrine that acids are salts of hydrogen is dimly reflected by the formulæ of the principal acids given in the Pharmacopœia. Thus sulphuric, phosphoric, glacial acetic, benzoic, tartaric, and tannic acids are represented as definite hydrates, agreeing in composition with the bodies to which the same names are applied by the followers of Gerhardt. Citric and gallic acids are also formulated with constitutional water, besides water of crystallization. The names of all these acids, with the characters and tests, are therefore sufficiently distinctive without the formulæ. The "nitric acid" of the Pharmacopœia is represented as a definite compound of two combining proportions of anhydrous nitric acid with three of water; and according to the modern system of notation may be regarded as a compound of four molecules of true nitric acid, or nitrate of hydrogen, with one molecule of water. To express the fact which the old and new chemists set before us in different lights, the compilers of the Pharmacopœia might substitute for the present formula, the simple statement that the officinal acid contains 80 per cent. of anhydrous nitric acid, or nitric anhydride. The true acetic acid of modern chemists is the glacial acid, which is defined in the Pharmacopœia as "monohydrated acetic acid." This definition should, therefore, be excluded with the formula. The name, specific gravity, and volumetric test ought to suffice to distinguish this definite compound. The strength of the ordinary "acetic acid," of specific gravity 1·044, might be expressed by the intelligible statement that it contained 33 per cent. of the glacial acid. The sulphuric acid of the Pharmacopœia is said to have the specific gravity 1·846, and is described as "monohydrated" acid. According to Miller, Ure, and many other authorities, the liquid having this specific gravity is really the monohydrate according to the old notation, or the true acid of modern chemists. Dr. Redwood, however, on the authority of Marignac, states that this specific gravity indicates a slight excess of water. Whether such be the case or not, the term "monohydrated" is objectionable, and should be expunged from the definition. The formula given for the so-called arsenious acid might be advantageously replaced by the explanatory words "anhydrous arsenious acid, or arsenious anhydride containing 75·76 per cent. of metallic arsenic." The compound does not strictly come under the head of acids, but, as it is generally spoken of as "arsenious acid," it would be unwise to alter its pharmaceutic name. The formula given in the definition of "sulphurous acid" represents sulphurous anhydride; but, if it were omitted, the description of the officinal liquid as "sulphurous acid dissolved in water" would accord equally well with old and new theories. With regard to "boracic acid," mentioned in the Appendix, the substitution of the word "crystallized" for the formula given would leave no doubt as to the body prescribed.

Oxygen-Salts.—Thirty-three normal salts derived from oxygen-acids have names which are sufficiently distinctive without the addition of chemical formulæ. These are the hypochlorites of soda and lime; chlorate of potash; iodate of potash; the nitrates of soda, potash, and silver; permanganate of potash; the acetates of soda, potash, ammonia, copper, zinc, and lead; the valerianates of soda and zinc; the sulphates of potash, ammonia, copper, magnesia, zinc, lime, beberia, and quinine; hyposulphite of soda; the carbonates of soda, potash, lithia, and lime; oxalate of ammonia; tartrate of potash; and the citrates of potash and lithia. Many of these salts are formulated with water of crystallization; but, if the formulæ were omitted, there would be but few cases in which it would be necessary to express the degrees of hydration by percentages. In place of the formula for the pharmaceutic "nitrite of soda," there should be a statement to the effect that the compound contains a variable amount of carbonate of soda. The mercuric nitrate and sulphate, which are simply called "nitrate of mercury" and "sulphate of mercury," are distinguished from the lower or mercurous salts by the tests and methods of preparation. The name "pernitrate of iron" indicates with sufficient clearness the ferric salt, and there is also a test whereby the presence of ferrous nitrate would be at once detected in the solution. The name "sulphate of iron" is applied to the well-known green ferrous sulphate, and the characters and tests given in connection with this salt prevent us confounding it with the ferric salt called "persulphate of iron." Again, there can be no doubt as to the ferrous carbonate called simply "carbonate of iron," as ferric carbonate does not appear to exist. The composition of ferrous arseniate called simply "arseniate of iron" is accurately indicated by the quantitative test. The acid salts called "bisulphate of potash," "bicarbonate of soda," "bicarbonate of potash," "bichromate of potash," and "acid tartrate of potash" are well-known definite compounds, and do not need distinctive formulæ. The term "*acid*" introduced in the pharmaceutic name for hydropotassic tartrate is preferable, on scientific grounds, to the prefix "*bi*;" but it is scarcely likely to displace this prefix in the familiar names "bicarbonate" and "bichromate" for years to come. It is a question whether the officinal "benzoate of ammonia," which is represented as a neutral salt by the Pharmacopœia formula, ought not to be termed "acid benzoate of ammonia," for, according to Watts's 'Dictionary of Chemistry,' the process by which it is prepared gives the acid salt. The names of the phosphates need not be altered. The officinal phosphate of soda might be defined as "the ordinary or disodic phosphate." The officinal phosphates of ammonia, lime, and iron appear to be the normal triammonic, tricalcic, and triferrous salts. The "arseniate of soda" of the Pharmacopœia appears to be the disodic arseniate; but, as its composition may be determined by the volumetric test, the formula is not required. The name "borax" indicates a well-known commercial product, and the formula attached to it could safely be omitted. If necessary, the officinal compound might be distinguished from octahedral borax by the statement that it is ordinary or prismatic borax, containing 47·12 per cent. of water, which is given off at a red heat. The formulæ of the basic salts do not appear to throw any useful light upon the constitution of these bodies. The compound called "white bismuth" certainly contains the elements of water, and may be regarded as a hydrato-nitrate, but hydrogen is omitted in the Pharmacopœia formula. The composition of this basic nitrate of bismuth appears to vary according to the quantity of water used and the length of time spent in the washing. Again, the formula given for the so-called "subacetate of copper," or verdigris, implies that an extremely variable product has a fixed composition. The composition of the so-called "subacetate of lead" is intimated by the quantitative oxalic acid test. The officinal "carbonates" of magnesia, zinc, and lead are hydrocarbonates, or basic salts; and if their formulæ were omitted, it would be advisable to give percentage representations of their composition. Thus, taking the present formulæ as correct expressions, the "carbonate of magnesia" contains 41·88 parts of magnesia, 34·56 of anhydrous carbonic acid or carbonic anhydride, and 23·56 of water; the "carbonate of zinc" contains 71·26 parts of oxide of zinc, 12·90 of carbonic anhydride, and 15·84 of water; and the "carbonate of lead" contains 86·32 parts of normal oxide of lead, 11·36 of carbonic anhydride, and 2·32 of water. The "carbonate of ammonia" of the Pharmacopœia, being an irregular compound, might also require a statement of its percentage composition, in place of the omitted formula. It contains 28·81 parts of ammonia, 55·93 of carbonic anhydride, and 15·26 of water. The formula given for the well-known double salt "alum" might be advantageously omitted, as it represents the potash alum, which is no longer a commercial article. The definition also applies to potash alum, and not to the ammonia alum now used in pharmacy. The double tartrates and double citrates are perfectly individualized by their names, characters, and tests, and their formulæ might be safely omitted. The same remark applies to the ammoniated salts which are prescribed as tests in the Appendix.

Miscellaneous Compounds.—The remaining compounds for which chemical formulæ are given in the present British Pharmacopœia are the alcohols and ethers, the alkaloids, the sugars, santonin, pyroxylin, and the substitution-products named "ammoniated mercury" and "sulphate of indigo." The names and descriptions of all those compounds are unambiguous, and their formulæ might be safely omitted.

4, *Norman Terrace, Stockwell, S.*

Mr. Carteighe feared that it was now too late for the forthcoming edition of the Pharmacopœia to be affected by the arguments adduced by Mr. Brough, although their cogency was indisputable. He trusted, however, that future editions of that work would be freed from the incubus of all theoretical formulæ.

ON A NEW MACERATING APPARATUS.

BY MR. R. W. GILES.

The unostentatious arrangement exhibited before the Conference, for the more convenient exhaustion of vegetable substances in a minimum quantity of water, having proved very satisfactory in the preparation of infusum cinchonæ spissatum, and other allied liquors of ordinary and extensive use in pharmacy, I have thought it worthy of a few remarks at the present meeting. I do not desire to see Pharmaceutical Chemists become manufacturers, but I strongly believe that the *natural* mode of advancing the practice of pharmacy amongst *the many* in our profession is to give them a practical interest in the processes of the art, beginning with the most simple; and that the communication of simple forms of apparatus which will have the advantage of rendering ordinary processes easy and profitable, is one of the best means ot attaining this object. I may take this opportunity of saying that the establishment of a Museum of Pharmaceutical Apparatus at Bloomsbury Square has long been an object of solicitude to me; and I trust that the present exhibition may ultimately result in such an institution, which we may hereafter consult with advantage and economy, and the origin of which we may pleasantly associate with this our agreeable visit to Nottingham.

The apparatus needs little description to those who have seen the model. It consists of a series of eight cone-shaped macerators, each provided with its receiver, and the water used for maceration is passed successively through the material divided amongst the eight cones—the material being reduced to a convenient state of pulverization, and each maceration being continued for such periods (varying from 1 hour to 12 hours) as may be appropriate to the character of the particular substance treated.

The advantage of this arrangement is that—with little more water than is required to moisten the whole—each of the eight portions receives eight successive macerations, which is sufficient to exhaust even such stubborn materials as cinchona bark. Other substances are exhausted with greater facility and, of course, require a correspondingly smaller quantity of water. If it is said that a similar result may be attained by a process of percolation in a single vessel, I can only reply that I shall be obliged to any gentleman who will teach me how to avoid the practical difficulties of accomplishing this. I have utterly failed to do so, and out of these failures, and by successive steps I have arrived at the present expedient, which, according to my experience, leaves nothing to be desired.

Subjoined is a table showing the results obtained from the treatment ot 56 lb. of cinchona bark in the manner suggested. It is necessary to say that the progressive increase of density is sometimes affected by disturbing causes (*e. g.* the unequal duration of maceration in certain infusions which have stood all night), and that the success of the operation must be estimated by its general character, without expecting absolute uniformity in the intermediate stages.

Specific Gravity of Infusions recovered successively from Eight Macerating Vessels, each containing Seven Pounds Pounded Cinchona Bark.

	Quantity recovered.	Macerating Vessels.							
		1	2	3	4	5	6	7	8
1st Maceration	1½ gallons	1017·6	1026·0	1034·0	1040·5	1044·1	1052·2	1057·7	1060·5
2nd ,,	1 ,,	1004·6	1012·0	1016·1	1020·3	1025·5	1028·2	1032·3	1038·0
3rd ,,	1 ,,	1002·9	1006·7	1011·3	1013·6	1017·1	1021·3	1026·3	1029·3
4th ,,	1 ,,	1002·6	1005·0	1007·4	1010·0	1012·9	1014·2	1020·3	1021·5
5th ,,	1 ,,	1002·6	1003·8	1005·4	1007·7	1009·7	1012·0	1014·0	1016·5
6th ,,	1 ,,	1001·6	1002·3	1004·3	1006·0	1007·9	1009·9	1011·6	1013·3
7th ,,	1 ,,	1001·1	1002·1	1003·7	1005·7	1006·5	1007·9	1009·8	1010·8
8th ,,	1 ,,	1000·9	1001·8	1003·4	1004·2	1005·2	1006·3	1007·8	1008·0
Total	8½ ,,								

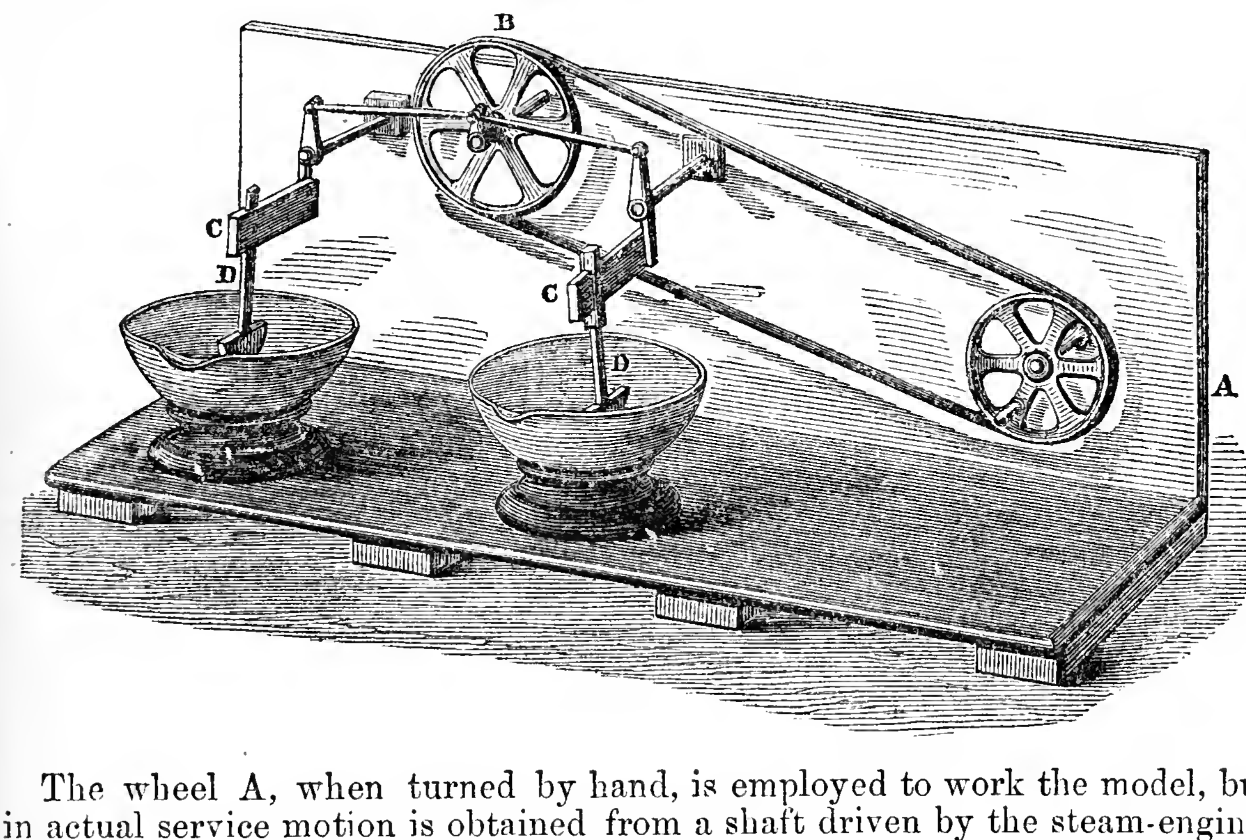
It will be seen that the exhaustion of the bark has been sufficiently effected with $8\frac{1}{2}$ gallons of water in lieu of 84 gallons directed to be used in the instruction of the British Pharmacopœia (although a process of percolation is attempted in that case); and, I may add, that this latter quality, if not actually adopted at Mr. Squire's suggestion, does at least coincide with his practical experience, *that cinchona bark cannot be adequately exhausted with less than twelve times its weight of water.*

Mr. ROBBINS remarked that he had used a similar apparatus with good results.

ON A NEW FORM OF STIRRING APPARATUS TO PROMOTE THE EVAPORATION OF LIQUIDS.

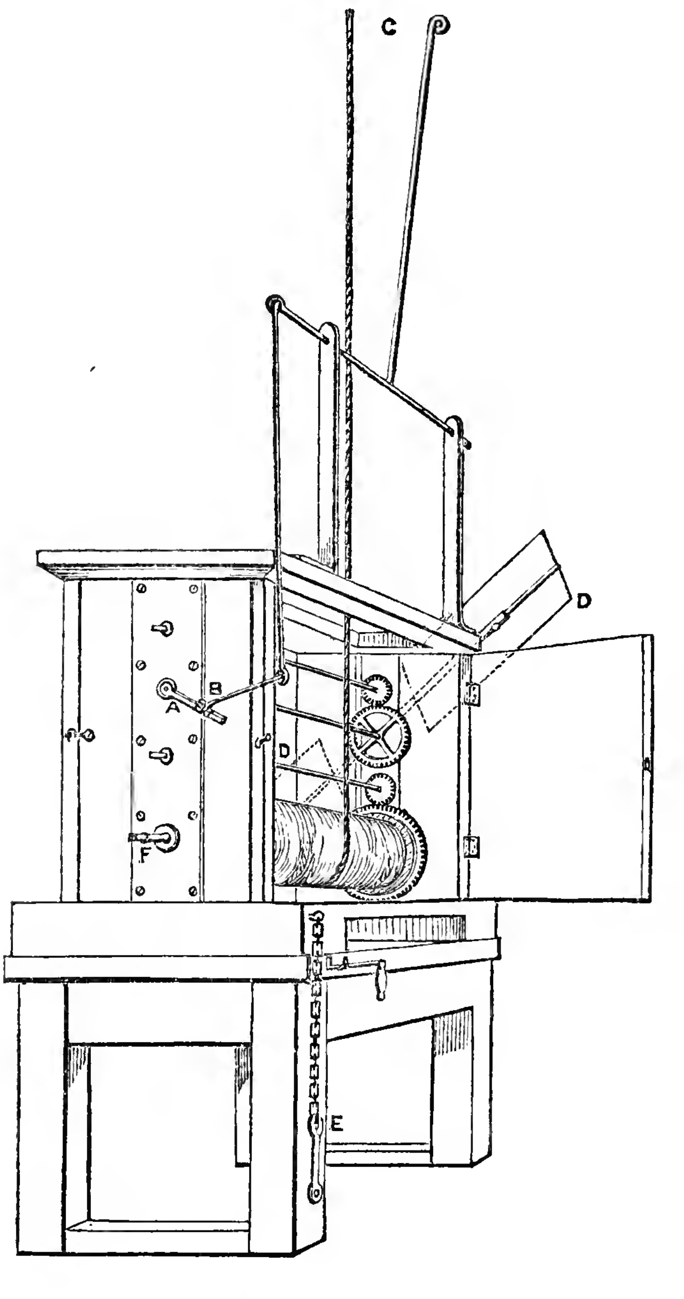
BY R. REYNOLDS, F.C.S.

The author introduced a model of this apparatus, a woodcut of which is now given. It was the result of having to find some substitute for manual stirring when ext. cinchonæ flav. liquidum, B.P., came into use; the tedious operation of evaporating at a temperature of 160° F. requiring to be facilitated as much as possible. Having communicated his wishes and ideas to Messrs. Carrett, Marshall, and Co., engineers, Leeds, the present apparatus was devised. It answered its purpose well, and has since done excellent service in the evaporation of liquors in the preparation of extractum carnis.



The wheel A, when turned by hand, is employed to work the model, but in actual service motion is obtained from a shaft driven by the steam-engine. This motion drives the wheel B by means of a leather strap, and it is on the axle of B that a short crank is fixed, connected on either side with a horizontal rod that terminates at its other end by joining the upright limb of the stirring-arm. The lower end of this limb carries at right angles a strong wooden bar, C, and into a wedge-shaped cut made in this the wooden stirrer D falls, being kept in position without any fastenings, and capable of being lifted out in an instant. It is evident that any number of stirrers, whether in the same line or somewhat removed from it, might be driven by the wheel B, and when a pan is not in use its stirrer is simply lifted out of the wedge-shaped socket.

The woodcut shows instantly *how* the apparatus works in converting a rotary into a reciprocating motion. The latest improvement introduced has been in the shape of the stirrers. These are now made of such a form that their horizontal section gives a shape resembling the letter S, they "take hold" of the water more efficiently than the flat-bladed stirrers, just as the hand when curved into a cup-shape would do so more than when the fingers were extended.



Mr. R, believed that the contrivance now shown was simpler, less costly, and more effective than the plan of employing direct rotary motion for stirring. No part of the metal was over the pans, and thus it was impossible that rust, oil, or other impurity could be so introduced.

Since evaporation at temperatures below the boiling-point can only occur from the surface of the liquid, the agitation of the surface is our object. It must be granted that the backward and forward stroke does this much more completely than a merely rotary movement.

Any other motive power than steam might be employed, where this did not exist.

Mr. Reynolds also described and exhibited drawings of a mechanical stirrer devised by Mr. T. Boverton Redwood. It was shown in action at a Conversazione of the Pharmaceutical Society, in May, 1864, but no notice of it published. Its peculiarities will be evident on examining the accompanying woodcut.

In a short discussion, in which Mr. Giles and Mr. Carteighe took part, it was elicited that what was known of Lenoir's Gas Engine was not sufficiently favourable to promise much for its success as an addition to small pharmaceutical laboratories.

NOTES ON TWO MEDICINAL PLANTS FROM JAMAICA.

BY MR. T. HARVEY.

1. *Eupatorium* (*nervosum ?*), "Bitter Bush."—This native remedy is growing into use and favour with the medical profession in Jamaica. During a

visitation of cholera in 1859 it is said to have proved of great efficacy. At present it is relied on in typhus and typhoid fevers, and in smallpox. Dr. Phillipo, of Spanish Town, considers it superior to taraxacum, as a cholagogue. The decoction is generally employed, being always used cold, as when hot it acts as an emetic. A tincture is also made. It appears to stimulate the action of the heart powerfully.

2. *Croton humilis.*—The stem of this plant has much acrid pungency, and is sometimes masticated as a stimulant in relaxed sore-throat. In Lindley's 'Vegetable Kingdom,' it is stated to be used for medicating baths in the West Indies.

Preparations of both plants having been made, it is proposed to submit them to trial in England.

ON WEIGHTS, MEASURES, COINS, AND NUMBERS.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

I have been at some trouble in collecting actual specimens of metric decimal weights and measures, with allied coins, etc., for temporary display at the Exhibition of Objects relating to Pharmacy now (August, 1866) open at the Assembly Rooms, Nottingham, in connection with the British Pharmaceutical Conference, and for more frequent reference should a similar exhibition be held annually in the towns visited by that Association.* I have done this in the hope of aiding in familiarizing at least one section of the community—Chemists and Druggists—with a system destined, without doubt, at no distant period to displace the present barbarous *confusion* of weights, measures, and coins in use in this country. For, though habit prevents us from fully and constantly realizing the inconveniences attending the use of existing weights and measures, their incongruity with each other and with our monetary and numerical systems is none the less real.

It is now, happily, scarcely necessary to say anything in favour of the universal adoption of the metric decimal system of weights and measures, and a corresponding decimal system of coinage. Most persons who have thought over the matter agree that such a proceeding would be to the immense advantage of education, labour, trade, science, and the general interests of society. Pharmaceutists have frequently indicated their desire for change from the existing inharmonious methods of weighing, measuring, buying, selling, and calculating to a system in which either of these operations should bear a simple relation to the rest. They, in common with other people, recognize the convenience of the relation of grosses and dozens to shillings and pence, that so many sovereigns per ton must be the same number of shillings per hundredweight, etc. etc., and, whenever opportunity has arisen, have agreed to welcome a system which should bind weights, measures, coins, and numbers into one harmonious whole, characterized by a single relation equal in simplicity to either of the two illustrations just mentioned. Every volume of the 'Pharmaceutical Journal' contains allusions to this subject in the form of reports of meetings, discussions, papers, letters, etc., and the Proceedings of our own Conference include an elaborate report on weights and measures, by Mr. Barnard S. Proctor.

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* During the intervals of the yearly meetings, the collection will be open to inspection in the rooms of the Pharmaceutical Society, Bloomsbury Square, London.

What is asked of chemists and druggists, is to aid in promoting the general adoption of a system of weights, measures, and coins which shall be in accord with the existing universal system of numbers. It is, perhaps, impossible to realize, much more express the advantages we enjoy from the fact, that in every country of the world the system of numeration is identical. That system is a decimal one. There are those who tell us an octavial would have been more convenient, but the universality of the decimal method of counting must obtain for it unquestioned preference. 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, 1866) 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 1866, he smiles at the simplicity of the question, and says 1866. How many tens? 186, and 6 over. How many hundreds? 18, and 66 over. How many thousands? 1, and 866 over. But if he is asked how many scruples there are in 1866 grains, how many drachms, how many ounces—he must probably bring out his slate and pencil. And so with the pints or gallons in 1866 fluid ounces, or the feet and yards in 1866 inches, or the pence, shillings, and pounds in 1866 farthings; to say nothing of cross questions such as the value of 1866 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 is, doubtless, possible to decimalize our own weights, measures, and coins, but such a course would be difficult, added to which the day has passed for the consideration of such a scheme. France, Holland, Belgium, Italy, Spain, Portugal, Switzerland, Greece, and South America generally, have all adopted a decimal system founded on a measure of length (about eleven-tenths of our yard) appropriately called the *metre;* the United States,* Austria, Prussia, Switzerland, Sweden, Norway, Denmark, and Russia give indications of adopting it sooner or later, and the same system was legalized by Act of Parliament in our own country in 1864. From the metre are derived the unit measure of weight, the *gramme*, the unit measure of capacity, the *litre*, and the unit measure of surface, the *are*. 1866 metres contain 186 *deca*metres and 6 over, or 1 *kilo*metre and 866 over. 1866 grammes contain 1 *kilo*gramme and 866 over. And so on, the prefixes deca-, hecto-, kilo-, myrio-, indicating multiples, deci-, centi-, milli-, submultiples. The coins attached to the system have a similar decimal relation, and may indeed be used as metrical weights if not much worn. This metrical (*i. e.* metre-ical) system having been adopted in every case in which change has been made, it is incumbent on us to adopt it in preference to any other decimal system.

There are, doubtless, serious difficulties attendant upon a change affecting the daily, nay hourly transactions of every individual in a kingdom,—difficulties caused even more by association than calculation, for the latter is only a matter of education, easily and quickly acquired, while it takes years to

* There is a coin of the United States in the collection, 5 cents in value, 5 grammes in weight, and 2 centimetres in diameter.

associate our requirements of articles with the quantities in which those articles can be obtained. Yet what other peoples have done the English can do. And probably, by an extension of that class of terms which are independent of all systems and compatible with any, such as a *bottle* of wine, a *glass* of beer, a *round* of beef, *half* of this, a *quarter* of that, a *shilling's worth* of one thing, a *franc's worth* of another, so much *per cent.* of a whole, the change will not prove so formidable as it appears. So far as chemists and druggists are concerned, the transition will be comparatively easy, most dispensers having made up French prescriptions, in which the quantities are metrical.

In short, the only questions which probably need be discussed in the Pharmaceutical Conference are, how and when the metric decimal system of weights and measures should be introduced into pharmacy. In the British Pharmacopœia there is a table showing the relations of the system, and in the forthcoming edition of that work we are to have an enlarged table, as well as, I believe, some additional allusions to the system. I trust that the table will include the English equivalents of the metric decimal units and multiples. It is only fair that the formidable appearance of a whole string of figures necessary to show the metric value of a pound, etc., should be balanced by the equally formidable appearance of the string of figures necessary for the indication of the English value of a kilo-, etc. If not in the next, in the third edition let us hope to see metrical equivalents of the weights, etc., given in every formula. There would be no great difficulty in doing this, as already pointed out by Mr. Squire ('Pharmaceutical Journal,' May 2, 1859); indeed it has already been done in a former edition of a Continental Pharmacopœia.

To memorialize the Medical Council, the body under whose direction the Pharmacopœia is published, with a view to the adoption of this course; to resolve that it would be desirable to ultimately use the metric decimal system of weights and measures in pharmacy, to the exclusion of all others; and to constantly, individually, make efforts to promulgate a knowledge of the nature and advantages of the system among friends and acquaintances,—are probably the only ways in which at present the members of the British Pharmaceutical Conference can aid in promoting that desirable object, a simple universal relation between weights, measures, and coins, and the existing universal system of numbers.

17, *Bloomsbury Square, London.*

After some discussion and deliberation the following resolutions were passed:—

Proposed by Mr. Ince, London, seconded by Mr. Robbins, London, and carried:—

"That it is desirable, in the interests of pharmacy, to adopt a system of weights and measures which shall accord with the existing universal system of decimal numeration."

Proposed by Mr. Giles, Clifton, seconded by Mr. Brough, Stockwell, and carried:—

"That it is desirable that the decimal system of weights and measures proposed to be adopted in pharmacy should be the metric decimal system."

Proposed by Mr. Baldock, London, seconded by Mr. Pooley, Bath, and carried:—

"That the Executive Committee of the British Pharmaceutical Conference do memorialize the General Council of Medical Education and Registration in the name of the Conference, to the effect that the metric equivalents of the English weights and measures be given in every formula of future editions of the British Pharmacopœia."

This concluded the reading of papers.

Mr. W. V. Radley, Sheffield, rose to move the following resolution, which was seconded by Mr. Halliday, Manchester, and carried by acclamation:—

"That this meeting tenders its warmest thanks to the Nottingham members of the

Conference generally, and especially to the Local Secretary, Mr. Atherton, for their judicious, untiring, and most successful labours to promote the objects of the meeting, and the comfort and pleasure of those who have attended it."

The PRESIDENT referred again to a letter addressed by Professor Edward Parrish, of Philadelphia, to Mr. Dymond, of Birmingham, and which was read by that gentleman at the opening meeting of the Conference. In it Professor Parrish alluded to the collection of objects illustrative of American pharmacy, very kindly sent by him to the Nottingham Exhibition, expressing the hope that some member of the Conference would be present at the next meeting of the American Pharmaceutical Association, and stating that he hoped to be in Europe in 1867, during the meeting of the Conference, and to have the pleasure of attending its sittings (applause). Professor Bentley expressed the great obligations of the Conference to Professor Parrish, and said that it would give its members much pleasure to welcome him amongst them. The appointment of a delegate to America was attended with difficulties, because they did not know of any of their friends who intended to make so long a journey. Still it was possible that their excellent Vice-President, Dr. J. B. Edwards, who was now leaving England to settle in Canada, might be able to act as their representative next year. Under these circumstances it was determined to leave the matter in the hands of the Executive Committee.

At the conclusion of the sitting Mr. WADE, London, rose and said, that before the President left the chair, he desired on behalf of those who had attended the meeting, to express their hearty thanks for the courteous, genial, and able manner in which he had presided over them. They had always been exceedingly fortunate in their choice of Presidents, and the Conference could not fail to be successful whilst the rank and file were led by energetic officers. It would be particularly gratifying to the President to see so many of the old members of the Conference around him, and to know that so many new names had been added to the list of members. He would not occupy any more of the meeting's time, as he was sure that whatever might be omitted by himself in his attempt to express the feelings of the members would be made up by the acclamations of all present.

Mr. THONGER, Birmingham, seconded the vote of thanks, which was put to the meeting under the temporary presidency of Mr. Jones, and carried by acclamation.

The PRESIDENT said he could not find words to express the feelings with which he received such unquestionable evidence of the approbation of the meeting. He had derived much gratification from his connection with the Conference; and though he might sometimes be prevented from attending the annual meetings, he should always take a lively interest in its proceedings. He was delighted to find that the meetings brought together gentlemen representing different sections of one body, as he was convinced that the familiar intercourse of these gentlemen removed many erroneous notions which they had entertained respecting each other.

FOURTH SITTING.

The concluding meeting of the Conference was held on *Wednesday*, August 29th; Mr. T. B. GROVES, F.C.S., in the chair.

The Proceedings of the American Pharmaceutical Association for 1851, 1852 1855, and 1865, were presented to the Conference by the Association, through Mr. J. M. Maisch, Permanent Recording Secretary, Philadelphia.

The above donation to be acknowledged by the Executive Committee.

It was resolved—"That the annual meeting of the British Pharmaceutical Conference for 1867 be held at Dundee, concurrently with the meeting of the British Association for the Advancement of Science."

Moved by Mr. E. C. C. Stanford, F.C.S., Glasgow; seconded by Mr. S. Parr, Nottingham.

The following were elected, by ballot, as officers for the year 1866–7:—

President.—R. Bentley, F.L.S., M.R.C.S., Professor of Botany in King's College, London; Professor of Materia Medica and Botany to the Pharmaceutical Society.

Vice-President who has filled the office of President.—H. Deane, F.L.S., Clapham Common, S.

Vice-Presidents.—D. Hanbury, F.L.S., Plough Court, London, E.C.; W. W. Stoddart, F.G.S., Bristol; J. Ince, London.

Treasurer.—H. B. Brady, F.L.S., F.C.S., Mosley Street, Newcastle-on-Tyne.

General Secretaries.—J. Attfield, Ph.D., F.C.S., 17, Bloomsbury Square, London, W.C.; R. Reynolds, F.C.S., 13, Briggate, Leeds.

Local Secretary.—

Auditors.—Mr. C. Welch, Mr. W. H. Parker, Nottingham.

Committee.—J. H. Atherton, F.C.S., Long Row, Nottingham; J. C. Brough, Stockwell, S.; G. Dymond, Birmingham; S. Gale, F.C.S., 338, Oxford Street, W.; T. B. Groves, F.C.S., Weymouth; A. F. Haselden, 18. Conduit Street, W.; S. U. Jones, Leamington; G. F. Schacht, Clifton; R, Fitzhugh, F.C.S., Nottingham.

It was resolved—"That power be given to the Executive Committee to fill up the vacancies now left in its number, by the appointment of a Vice-President and a Local Secretary."

Moved by Mr. Fitzhugh, seconded by Mr. Rayner.

The Chairman and other members took the opportunity of again thanking the Nottingham members of the Conference for the cordial welcome they had given it, and for the admirable way in which all needful arrangements had been made.

The Dinner.

The annual circular, setting forth the time, place, and general arrangements of the Conference for 1866, contained an invitation, inserted by request of the Nottingham Local Committee, to every non-resident member, to be present at a dinner on the Friday evening of the Conference week. The *banquet*, as it was appropriately termed in the descriptions of the entertainment by the local newspapers, was accordingly held at the leading hotel, Clumber Street. It was of a most sumptuous, well ordered, and extensive character, visitors and visited mustering to the number of fifty-eight or sixty. On the clearing of the cloth the usual loyal and patriotic toasts were treated in the usual loyal and patriotic manner, after which several excellent speeches were delivered. Had anything been needed, in connection with the meetings of the Conference, to show the attachment of the Nottingham members to their calling, or to exhibit their powers of management and large-hearted hospitality, this last social gathering would have effected the object.

EXHIBITION OF OBJECTS RELATING TO PHARMACY, HELD AT NOTTINGHAM, AUGUST, 1866,

DURING THE MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE.

Concordia soll ihr Name seyn.—*Schiller*.

The proposal for this Exhibition originated with Mr. J. H. Atherton, who was ably seconded by the Nottingham Local Committee. Its success has been beyond dispute, and all who were connected with its executive details may be most warmly congratulated on the gratifying result achieved.

It was felt that there should be some permanent record of an undertaking that must have proved such a just source of satisfaction to its projectors, and of instruction to those who had the opportunity of inspecting the varied collection brought together. At the meeting on Wednesday, the following members were appointed as a committee to draw up a detailed report for insertion in the Transactions, viz.:—

MR. DEANE, *President*,

Messrs. Brady, Brough, Carteighe, Commans, Fitzhugh, Ince, Stoddart, and Sutton.

The Committee beg, now that their task is ended, most urgently to offer one suggestion, viz., that, on any future occasion, no exhibitor should forward articles for exhibition without either an accompanying description, or a few selected notes. By the adoption of this simple plan, an appreciable amount of unnecessary labour would be spared, and the individual interests of the exhibitor would be best consulted.*

The greatest possible care has been taken to include the names of every exhibitor; should any omission have occurred, it is an entirely accidental circumstance.

Whether it would be wisdom to venture on an annual collection, such as the one now under investigation, is open to a doubt, nor should the attempt be made without due deliberation. Manifold advantages have however accrued from this pioneer endeavour: not only has it given a stimulus to manufacturing industry, and to many branches of pharmaceutical research, but it has supplied a personal element of interest to the transactions of the Conference, the value of which cannot be over-estimated. Nor must it ever be forgotten, that if we desire that pharmacy should be recognized by the State, we must show to the world outside that we are in some measure worthy of the honour; and when it is found that we can leave behind us our miserable trade differences, and small grooves of thought, and can meet in friendly union on the higher basis of pure pharmacy, we shall then be in a

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* The Committee would advise these few regulations:—

1. That no Exhibitor shall forward articles without list and descriptive notes.
2. That the manuscript shall be written on one side of paper only.
3. That the Secretary of the Exhibition keep an entry-book ruled as follows:—

Name.	Address.	Nature of object.	Number of parcels.

Each consignment, on arriving, to be carefully entered, and in such a manner as to require no subsequent revision.

better position to claim that respect from others which we have practically shown to ourselves.

Dr. Bence Jones, in his address before the British Association, has not hesitated to allude to the recent progress of pharmaceutical science. One extract will not be out of place :—

"At present, so far from physicians possessing more knowledge of food and of medicine than any other class of persons in the community, the analytical and pharmaceutical chemists are rapidly increasing in knowledge, which will enable them not only to understand fully the nature and uses of food and medicines, but even to detect the first appearances of a multitude of chemical diseases. Their habits of investigation and their knowledge of the nature of the forces acting in the body will gradually lead them to become advisers in all questions regarding the health of the community, and from this they will, like M. Bouchardat, in Paris, become almost, if not altogether, practitioners of medicine. In confirmation of my opinion of the direction in which the treatment of disease is progressing, I may just refer to the cattle-plague, which in 1745 was treated by Dr. Mortimer, at that time Secretary of the Royal Society, and therefore one of the most scientific physicians in the country, with antimony and bleeding. In 1866, two chemists, Dr. Angus Smith and Mr. Crookes, gave the only useful suggestion for combating the disease, namely, by the arrest or the destruction of the poison by chemical agents.

"All our druggists in England ought to be what they are in Germany and in France, chemists capable of any analysis that might be required of them, and able to satisfy themselves and the medical men that the substances they sell are what they profess to be—pure, unadulterated chemical compounds."

The Report at least will show that there are some paths of knowledge which modern pharmaceutists have not feared to tread.

For convenient reference the objects sent may be divided into three main classes.

CLASS I.

OBJECTS REPRESENTING NOVELTIES OR IMPROVEMENTS IN PHARMACEUTICAL PROCESSES, INCLUDING APPARATUS.

Exhibitors.

ASH (MOSES), 4, *Bull Street, Birmingham.*

Two small microscopes.

ATTFIELD, DR. J., 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. Gold, silver, and copper decimal coins current in France and Italy, their diameter, weight, etc., adjusted on the metric decimal system. An American coin, 5 cents in value, 5 grammes in weight, and 2 centimetres in diameter.

In a paper, read before the Conference, "On Weights, Measures, Coins, and Numbers," the exhibitor said his object in showing the articles mentioned above was to aid in familiarizing chemists and druggists with the decimal system of weights and measures, of which a table was given in the British Pharmacopœia, and which would probably soon become generally adopted. In the intervals of the

Exhibitions, the collection would be open to inspection at 17, Bloomsbury Square, London.

BALL, E. W., *Birmingham.*

Gore's gas furnaces.

Bunsen's gas-burners, retort-stands, blowpipes, cork-borers, test-tube-holders, and tube supports.

This furnace consists of a stout cylinder of fire-clay, about 10 inches high and 6 or 8 inches wide, enclosed in a sheet-iron casing, to the lower and back part of which is affixed a short chimney: the casing is supported by three iron legs, about 15 or 18 inches high. Inside the clay cylinder is placed a shorter and thinner clay cylinder or cupola, having three clay pegs projecting from its inner side near the top, for supporting the crucible. Both the cylinders are open at their ends, and rest upon the bottom of the iron casing. The outer clay cylinder is covered at the top by a thick circular plate of fire-clay, with a hole in its centre for inserting or removing the crucible, etc.; and this hole is closed by a plug of fire-clay. The iron casing has a large hole in the middle of its bottom part under the cupola, beneath which is fixed a peculiar corrugated gas-burner; so that the flame passes up inside the cupola, surrounding the crucible, then out at the top of the cupola, and down the outside between it and the outer cylinder, to a hole entering the chimney. The smallest-sized furnace will melt half a pound of copper, or six ounces of cast iron. One ounce of copper has been melted in it in $2\frac{1}{4}$ minutes, one ounce of cast iron in 3 minutes, five ounces of copper in $4\frac{1}{4}$ minutes, and three ounces of cast iron in 5 minutes. The second-sized furnace will melt fifty ounces of copper, or forty ounces of cast iron; it has melted sixteen ounces of copper in 8 minutes. The furnace is portable, requiring no brickwork erections or fixed chimney; it may be used in any situation where gas is available; it is safe in action, free from dust, and produces no smoke. A further great advantage is "the perfect accessibility which it permits to the melted metal, and the protection of the fused metal from oxidation by means of *the layer of flame*, which, during the action of the furnace, plays over the mouth of the open crucible, and excludes the atmospheric air. Thus the advantages of a covered crucible are gained, whilst the contents of the crucible are perfectly accessible to examination or manipulation." This also enables oxidable metals and alloys to be melted in an open crucible without the addition of a flux or reducing agent. The furnaces are suitable for jewellers, dentists, analytical chemists, and all persons requiring small crucibles quickly heated to high temperatures.

BASFORD CHEMICAL WORKS.

Large model of works for the manufacture of Oil of Vitriol and other acids. This excellent model was made by a working man.

BEVAN AND FLEMING, *Liverpool.*

Thermoterion, or heating apparatus for infants' and invalids' food.

BOURNE, STEPHEN.

Patent flexible diaphragm for the preservation of liquids liable to be injured by exposure to air, patent elastic valves for controlling and regulating the passage of air, gas, etc.

It consists of a thin membrane of a pure material, which being attached to the side of the cask or other vessel, divides the interior into two separate chambers of varying capacity. Being formed in size and shape to correspond with one half of the vessel, it lines, or fits tightly to either the upper or lower portion, according as the vessel is full or empty. When full, the diaphragm floating on the surface of the fluid, precludes evaporation, and shields it from contact with the air which is freely admitted above. Descending as the fluid is withdrawn, it protects the remainder to the last, and preserves the empty vessel from becoming foul or musty, so that a simple rinsing with warm water is all that is necessary to fit it for fresh use. The vessel to which the diaphragm is to be applied, must be specially prepared for its reception, but it may be employed with those of wood, metal, glass, china, earthenware, etc.; and these may be made to assume a highly ornamental form, suitable for the table or sideboard; or be of a rough or cheap description, fitted for the cellar or store-room. The diaphragm itself is very durable, is unaffected chemically and mechanically by most liquids, and able to endure exposure to any extent of humid heat. It has been proved by actual experience capable of preserving wine, beer, etc. for a very lengthened period, not only perfectly sound, but entirely unimpaired in flavour. There is attached to the diaphragm an elastic valve. This consists of a small piece of a stouter elastic membrane of suitable shape, so contrived that when distended by the pressure of the confined air or fluid, it becomes porous, and permits the passage through its substance of the superabundant gas. This being effected, it resumes its normal condition, and prevents any further emission. Made in a detached form, this valve can be used without the diaphragm, and becomes a very superior description of the "porous peg" employed by brewers. It may be easily inserted either in the bung or stave of a cask, or over a suitable opening in any other vessel; retaining as much of the products of fermentation as is desirable, and only parting with just so much as may be necessary or advisable, it will preserve the liquid in any state of briskness, which may be required.

Casella, L. P., *London.*

Mural standards of measure, having Metrical and English systems side by side.

Clark, G. E., manufacturer, *Nottingham.*

Case containing elastic silk appliances, chiefly abdominal belts and stockings, chest protectors, trusses, and enema apparatus.

Cliff and Co., *Lambeth.*

Stoneware chemical apparatus, still, water filters, leech jars, infusion and extract pots, stone Woolfe's bottles, stoneware taps, and displacement apparatus.

Deane, Henry, *London.*

Displacement apparatus in copper and stoneware (*vide* Ph. J. vol. v. N.S. p. 544), new gas furnace for economizing heat in Pharmaceutical operations, also a Chinese charcoal stove in biscuit-ware, used by the stall-keepers in the streets of Canton for boiling water for their tea.

Doulton and Watts, *Lambeth.*

Deane's displacement apparatus in stoneware.

Giles, R. W., *Clifton.*

Arrangement for exhaustion of vegetable substances in a minimum of water.

This apparatus was described by the inventor in a paper read before the Conference, and it is specially adapted for the manufacture of liquor cinchonæ.

Harvey and Reynolds, *Leeds.*

Model of mechanical apparatus for stirring liquids during evaporation, to be driven by steam or other convenient power. An ingenious form of stirrer is here exhibited, somewhat like the letter S. The stirrer itself is moveable and can be changed at pleasure.

The inventor read a short descriptive account of the apparatus, the chief merit of which consists in its agitating the liquid more freely than the ordinary shape.

A portable galvanic machine (French) for medical purposes. The elements employed are zinc and carbon, which are excited by moistened persulphate of mercury, giving a constant current.

Haywood, J. S., and Sons, *Castle Gate, Nottingham.*

Case of ebonite manufactures, comprising various forms of syringes, stethoscopes, pessaries, ear trumpets, etc., to which this comparatively new material is applicable.

Elastic bandages and stockings in silk and cotton.

HEATON AND SONS, *Birmingham.*

Specimens of the decimal copper coinage manufactured for Italy. The values accord with those of France, their weights, diameter, etc., being on the metric decimal system.

JOHNSON AND SONS, *London.*

Series of platinum crucibles, platinum spatula for pocket, platinum-wire net for straining and electroplating operations; platinized copper bowl for counter or laboratory use; small and cheap platinum spoons for blow-pipe experiments, especially useful for students; various preparations of platinum; silver crucibles, basins, and funnels.

We would draw attention especially to the platinized copper bowl as a valuable addition to the dispensing counter or laboratory. We understand Messrs. Johnson and Son contemplate introducing to Pharmaceutists dispensing scale-pans, made on the same principle as the bowl, which, for their elegance, cleanliness, and convenience, we expect will be generally adopted by dispensers.

A rare specimen of iridescent metallic Bismuth is included in the series.

KROHNE AND SESEMANN, manufacturers, 241, *Whitechapel Road, London.*

Large series of Dr. Richardson's anæsthetic apparatus, one with reservoir and double tube for major operations. Dr. Clark's spray producer, and Beigel-Siegle's inhalers for aqueous or other vapours, fitted with a variety of heating contrivances.

The honour of originating this new method of treatment belongs to Sales-Girons, who, in 1858, exhibited his apparatus before the Academy of Paris, calling it "Pulvérisateur portatif des liquides médicamenteux." It was made under his direction by Charrière. This instrument, by means of compressed air, forced the medicated fluid through a tube with a very fine aperture against a metal plate, by which the stream of fluid was arrested, broken into spray, and inhaled by the patient.

One portable form for the use of travellers is also exhibited.

The whole apparatus represents a metal tube $4\frac{3}{4}$ inches long and $1\frac{3}{4}$ inches in diameter. The upper part of the tube is occupied by the boiler, which is also provided with a safety valve, the lower parts by a spirit lamp. The space between the lamp and the boiler contains, when the apparatus is not acting, the vessel for the fluid to be atomized. The whole apparatus, together with two of Bergson's tubes, is contained in a morocco case not more than 7 inches long, $2\frac{1}{2}$ inches wide, and 2 inches deep. The spray is produced in the following manner:—When steam is generated and discharged with considerable force through the horizontal tube, the vertical tube is exhausted; the medicine rises to fill the vacuum, and, reaching the capillary orifice at the top, is caught by the rushing column of steam and blown into the finest spray.

Appliances made from the stem of Laminaria digitata, dilating bougies, lachrymal duct bougies and tents, Dr. G. Johnson's laryngoscope, Morell Mackenzie's laryngoscope, stem and ring pessaries in gutta-percha and vulcanite; also new instruments for applying powdered medicaments.

MATHER, HUGH, *London.*

Glass blowpipes, various; gas furnaces, some exhibiting the principle of aerated gas.

It is still a point to be decided as to the exact amount of air requisite to ensure perfect combustion; many experiments have been practically worked out; at present, the question rests between economy of time and that of material, and when the problem has been solved, no slight revolution will occur in the laboratories of manufacturing pharmaceutists.

Heating apparatus; lamps for microscopes, etc.; model of still.

MAW, S., AND SON, manufacturers, 11, *Aldersgate Street, London.*

A large collection of surgical and medical instruments and appliances. Amongst enema apparatus may be noticed the pattern known as Kennedy's, both single and double action, with plated fittings. Eguisier's *irrigateur*, with other well-known forms of brass syringe; globe pessaries in ivory; expanding india-rubber pessary, with syringe attached; ear syringe, with shield and speculum; various cases of surgical machines including a complete major operation case; a set of electro-gilt midwifery instruments of high and exquisite finish; a set of silver catheters; dental and post-mortem instruments; two electro-magnetic machines, on the American pattern, one fitted with single and the other with double magnet; Labordette's laryngoscope; Bank's elastic urinal, the old glass form with india-rubber fitting and stop valve; earthenware inhalers; Clark's pulverizer; Dr. Richardson's apparatus for the application of ether as a local anæsthetic, with electro-gilt tubes arranged with handball and foot bellows. Vaginal specula, tongue depressors, ophthalmoscopes, and breast pumps, complete the series.

MORTON AND SON, *London.*

Spring measuring tapes, with metrical divisions on one side and English inches on the other; pocket pencils and knives, with centimetres and inches side by side engraved thereon.

These contrivances are intended to familiarize the English student with the relations between the French and English systems.

MURRAY AND HEATH, *Jermyn Street, London.*

Pocket microscope, with folding tripod, and English achromatic objective, length $7\frac{1}{2} \times 3$, depth $7\frac{1}{2} \times 2$; also demonstrating class microscope, with lamp attached. Improved portable polariscope.

PARRISH, EDWARD, *Philadelphia, U.S., N.A.*

Improved gas furnace, tin distillatory apparatus, and water-bath, etc., suppository and pessary moulds, and a new shape for spreading breast-plasters.

A small and ingenious vaccinator, which has been patented.

PONTIER (L. ANDRÉ-PONTIER), 24, *Boulevart du Temple, Paris.*

Kessler's evaporating and distillatory apparatus, called by the inventor by the general name of Erorator (*ex-rore*). The name is scarcely happy in its choice.

Kessler's evaporating and distillatory apparatus, consisting of a series of superposed vessels, each connected with a refrigerator common to all and so arranged as to economize the whole of the heat employed and ensure the perfect condensation of the vapour raised, whether of water or alcohol, plain or medicated. It is further adapted for the inspissation of all kinds of extracts at a low temperature, for the crystallization of salts at fixed temperatures, and when made of platinum, for the distillation of sulphuric acid.

The inventor and exhibitor having been at some pains in introducing this novel apparatus, we have thought it right to give the original description. A pamphlet was also forwarded profusely illustrated.

L'Érorateur est un appareil distillatoire destiné à l'évaporation ou concentration économique de tous liquides. Par sa construction, il permet de recueillir les vapeurs formées pendant l'évaporation d'un liquide, et par là, il se prête à la distillation, car la distillation n'est qu'une condensation de va-

The Erorator is a distillatory apparatus for the evaporation or economical concentration of all liquids. It is so constructed that vapour formed during the evaporation of a liquid can be collected, and hence it may be used for distillation, which is but a condensation of vapour. From this it will be understood, that peurs. On comprend donc dès à présent que chaque fois que l'on voudra distiller ou évaporer un liquide dans le but de le concentrer, c'est l'Érorateur qui s'offrira avec le plus d'avantage, réalisant le double emploi. Avant d'entrer dans le détail des différentes pièces de l'Érorateur, on peut se le figurer comme composé d'une bassine surmontée d'un couvercle. Tout le monde a pu voir que lorsqu'une bassine contenant de l'eau, munie d'un couvercle plus grand qu'elle, est sur le feu, il vient se réunir à la partie inférieure de ce couvercle, des gouttelettes qui tombent spontanément, autour et en dehors de la bassine, sur la plaque du fourneau.* Telle a été l'idée originale et vraie qui a servi de point de départ à l'Érorateur, aujourd'hui si perfectionné. Ces gouttelettes prennent leur origine de la vapeur, qui se condense à la partie inférieure du couvercle; ce sont elles que l'Érorateur permet de recueillir sous forme d'eau distillée dans une rigole, située dessous les bords de ce couvercle. Enfin, pour activer la condensation de la vapeur, au fur et à mesure de sa formation, on fait arriver un courant d'eau froide sur le couvercle. De là, distillation permanente d'une part sous le couvercle, et concentration d'autre part dans la bassine.

whenever it is desired to distill or evaporate a liquid in order to concentrate it, the Erorator may be used with most advantage, as it serves the double purpose. Before describing in detail the component parts of the Erorator, it may be considered as a pan with a lid. Every one has noticed that when a pan containing water has a lid larger than itself, and is placed on the fire, little drops come together at the lower part of the lid, and fall spontaneously around and outside the pan on the stove plate. This was the true and original idea from which the present perfect Erorator was formed. These drops come from vapour which is condensed at the lower portion of the lid, and these are collected in the Erorator as distilled water, by means of a channel placed under the sides of the lid. Lastly, to increase the condensation of vapour in proportion as it is formed, a current of cold water is made to play on the lid. Hence results on the one hand, permanent distillation under the lid, and on the other, concentration in the pan.

* "Plaque du fourneau" refers to the invariable closed stove with which the French work.

A convenient apparatus on the above principle, for the assay of wines.
Model of a drying closet to be heated with gas.
Sundry gas-furnaces for use with the apparatus above mentioned.
An ingenious water-bath apparatus for spreading plasters.

Robbins and Co., *London.*
Registered inhalers in porcelain, and Dr. Richardson's anæsthetic spray producer.

Sadler, N., *Birmingham.*
Medical electrical apparatus.

The ordinary form for the production of the galvanic current by means of horse-shoe magnet is shown in two modifications; one similar to that introduced from America, the other contained in an upright box, more complete in its fittings and occupying less standing-room. The exhibitor also sends two machines, compactly arranged, in which the old battery and coil principle is adopted.

Savory and Moore, *New Bond Street, London.*
Improved eye douche and ear douche; portable enema and injection apparatus.

The novelty consists in the addition of an elastic india-rubber bag to hold the fluid to be injected,—the bag being attached to the supply-tube of the syringe by a metallic fitting with bayonet catch.

Scott, Wentworth L.
Apparatus for producing ammonia from air, and alcohol from olefiant gas.

A little pure distilled water, to which a few drops of acid (preferably hydrochloric or hydriodic) have been added, is introduced into the cylinder, the stoppers are screwed in, and the bellows, etc., adjusted, the whole is next filled with *perfectly pure* atmospheric air, and the bellows are then worked for a considerable period. Subsequent examination of the liquid in the well will prove that a minute quantity of ammonia has been formed by the decomposition of water and the union of its hydrogen with nitrogen from the air. The experiment may be varied in several ways, even *substitution-ammonias* being thus obtainable; the introduction of ether, for instance, gives traces of *ethylamine*. This apparatus is adapted, also, for the convenient illustration of many reactions, hitherto difficult to exemplify at the lecture table, and for the preparation of a great variety of substances. Alcohol is readily obtained by filling the cylinder with olefiant gas, and the little well with strong sulphuric acid, before bringing the "diffuser" into play.

SQUIRE, PETER, *London*.

Set of Imperial weights, with metrical equivalents engraved thereon; set of decimal grain weights.

STANFORD, E. C. C., *Glasgow*.

Specimens illustrating Stanford's patent process of treating seaweed by destructive distillation.—Vide paper in Pharm Journ., N. S. vol. iii. p. 495.

These specimens illustrate the method of distilling seaweed, and substituting for a fused ash, called kelp, a highly porous charcoal, the former being a vitreous mass, prepared in contact with air at a high temperature, from which most of the iodine has been dissipated; the latter carbonized at a low red-heat, in closed iron retorts, retains the whole of the iodine existing in the seaweed. This process is carried out by the British Seaweed Company, Limited, in works in the outer Hebrides; one in the Island of Tyree, and another in the Island of N. Uist. The charcoal prepared here is shipped to other works on the Bowling Canal, near Glasgow, and there lixiviated. The specimens illustrate the original sea Tangle, which is thrown up in the winter in large stems, about 8 feet long and 1½ inch diameter; these, when dried, shrink to about ½ inch diameter, and closely resemble horn; after carbonization, these expand to about ¾ inch diameter, forming a highly porous charcoal, containing about 40 per cent. salts. Through the lixiviation of this charcoal, fine colourless specimens of salts are obtained. Those exhibited are all commercial specimens, and consist of muriate of potash, 97 per cent.; sulphate of potash salt, containing 17 per cent. alkali; iodine, bromine, iodide of potassium, and bromide of potassium. The commercial specimens of iodine and bromine are very pure; the latter, the manufacture of which, from this source, was introduced into this country by Mr. Stanford, is now made on a large scale in Scotland. The muriate is obtained unusually pure by this process, 80 per cent. being the usual standard. The salt also contains a large proportion of alkali, 8 per cent. being not uncommon. The products of distillation exhibited are:—Muriate and sulphate of ammonia, tar, oils, and pitch from the tar, and acetone naphtha. Gas is also produced, and used to light the factories in the outer Hebrides. The charcoal, from its high porosity, is introduced as a decolorizer and deodorizer; its chemical composition resembles that of animal rather than that of vegetable charcoal, and the products of distillation are closely analogous to those of bone. This is especially interesting, as tangle, being a pure alga, is close to the border line separating the animal from the vegetable kingdom. For the filtration of water and disinfection of sewage, this charcoal affords a convenient substitute for animal charcoal, at one-fourth the price.

SUTTON, FRANCIS, *Norwich*.

Twelve Mohr's burettes, graduated in cubic centimetres and decems, with Erdmann's floats; two revolving stands of new and convenient shape, to carry six burettes each; stoppered graduated flasks and test mixers; standard volumetric solutions of the British Pharmacopœia; new blowing burette for solutions which are affected by the india-rubber in the usual Mohr's burette, such as permanganate of potash, etc.

The graduation of these instruments is guaranteed to be very correct.

YATES, JAMES, *Highgate, London.*
Dowling's large diagram, on rollers, showing drawings and numerical relations of all kinds of metric decimal weights and measures of both length and capacity; a surveyor's metric decimal land chain and tape; a spring-jointed metre measure; models and tables for use in teaching the metric decimal system in schools.

CLASS II.

MEDICINES SIMPLE AND COMPOUND, DRUGS AND CHEMICALS.

AMERICA.

The committee desire 'with both hands to shake hands' with their esteemed American brethren. They fully appreciate the good feeling evinced towards them by the collection forwarded from across the Atlantic to this the first Exhibition of the British Pharmaceutical Conference, nor could it have come under better sanction than the name so well known in practical pharmacy as that of Professor E. Parrish, of Philadelphia. The list includes:—

1. BAKES, WILLIAM C., *of Philadelphia.*
A volume of American labels, comprising dispensing and other trade labels, together with a great variety used for Pharmaceutical preparations.

2. PARRISH, Professor EDWARD, *of Philadelphia.*
One half-gallon metallic pharmaceutical still; a patent gas furnace for pharmaceutical purposes; breast plaster pattern; vaginal and rectum suppository trays; patent vaccinator; sundry interesting pharmaceutical preparations and specimens of dispensing bottles and boxes, with illustrations of the mode in which medicines are sent out by pharmaceutists in America.

3. SQUIRE AND CO., *of Cincinnati.*
A variety of pharmaceutical preparations.

4. STEARNS, FREDERICK, *Detroit.*
A variety of pharmaceutical preparations.

5. WARNER, WILLIAM R. AND CO., *Philadelphia.*
A handsome case containing ninety varieties of pills, prepared according to the pharmacopœia of the United States, and other recognized formulæ.

The peculiarity which these pills present is, that they are all sugar-coated. This plan shows some important advantages, viz., an attractive taste and clean exterior; but it is chiefly to be recommended as an effective mode for the preservation of the pill from the variable effects of atmospheric change.

BAISS BROTHERS, 102, *Leadenhall Street, London.*
A selection of choice gums, amongst which are ammoniacum (guttæ); assafœtida, guaiacum, myrrh, scammony, and tragacanth. Various samples of Materia Medica, including anisi sem. stellat.; anthem. ang. flor. dupl.; calumbæ rad.; cardam. sem.; cascarillæ cort.; cinchon. lancifol.; dolichos; rhei pulv. E. I.; and ricini sem. Also one chemical, ferri sesquioxyd. prep.

For account of which see 'Lancet,' October 29, 1864.

BARR AND CO., *London.*
Cod-liver oil dragées.

BASS AND SON, *Hatton Garden, London.*
Liquor sarzæ Jam. comp. concent. (1 to 7).

Until this article was introduced by the late James Bass (now more than thirty years ago) the general practice was either to make the fresh decoction, or to dissolve the extract in hot water.

Liquor cinchonæ pallid. (1 to 32).

Presents not only the cinchona alkaloids extracted unimpaired, but also the *resinous* qualities, the medicinal value of which is far greater than has generally been supposed.

Liquor taraxaci, prepared entirely without the aid of heat.

Liquor papav. alb., liquor rhœados, liquor croci, 1 part with 4 parts of syr. simp. form the P. L. syrup.

The great tendency to fermentation displayed by the syrups when made according to the P. L. form induced us to introduce the above, which have been found of great value to the retail chemist, enabling him to dispense with the long, tedious, and cumbrous process which is required for the two first-named syrups, while the tendency to ferment is effectually obviated, and with the greatest ease either small or large quantities can be immediately made, which keep good for years.

Beaufoy and Co., *South Lambeth, London.*

Acetate of lime.

Pure acetate of soda, from which their acetic acid is made.

Acetic acid, British Pharmacopœia.

Glacial acetic acid.

Malt, from which their vinegar is made.

Pale vinegar of normal colour, and coloured vinegar, as the public in general will have it.

Bell, J., and Co., *Oxford Street, London.*

Cases of Suppositories and Pessaries: also samples of Medicated Cottons.

These latter were recommended by Dr. Greenhalgh, who considered that cotton so prepared had a certain advantage over the pessaries, being light and portable and not soiling linen. Iodine was first employed, but several other remedies have since been introduced, such as cotton with iodine and atropine, cotton with tannin, cotton with matico, and cotton with morphia. The list is still capable of extension.

Bishop, Mr., *Mile End, New Town, London.*

Various granular medicinal preparations.

This elegant and effervescent mode of exhibiting certain remedies has been of late much patronized.

Bosley, John L., *Brompton Road, London.*

Case of suppositories and pessaries.

These have already been commented on in the Journal.

Brady, H. B., *Mosley Street, Newcastle-on-Tyne.*

Medicated pessaries and suppositories, prepared with theobroma oil (*Beurre de Cacao*).

Soluble bougies, variously medicated, as recommended by Mr. Henry Thompson, F.R.C.S., for use instead of fluid injections in chronic gonorrhœa and gleet.

For a full account of the manufacture and remedial use of medicated pessaries and suppositories, Mr. Brady's paper (Pharm. Journ. vol. vii. p. 544, second series) may be consulted. Mr. T. H. Hills remarks, that with respect to the material to be used, from his experience, cacao butter, from its low melting-point, and from its being so cleanly, was the best, and without any admixture of any sort.

Sponge tents prepared according to the directions of Dr. Marion Sims. For dilating the *os uteri* Dr. Sims employs sponge saturated with thick mucilage, and compressed into the form of solid elongated cones, about two inches and a half in length, and then dried. After drying, the surface is finished, and rendered quite smooth by means of sand-paper.

Capsules of oil of male-fern, *extractum filicis liquidum*, put up in capsules of gelatine, each containing twenty minims.

DAVIS, *Harrogate*.

A case containing tubes, exhibiting at a glance the relative saline residues of a pint of each of the Harrogate waters.

This case has since been presented to the Museum at Bloomsbury Square.

DAVY, YATES, AND ROUTLEDGE, 100, *Upper Thames Street, London*.

Ferri et quiniæ citras.

In scales of a fine greenish golden-yellow colour, freely soluble in water, and yielding a clear, bright solution. It contains 16 per cent. of pure quina, which is equivalent to 25 per cent. of citrate. The process of the B. P., when strictly adhered to, produces scales of somewhat duller colour than those in the sample above referred to.

Ferri et ammoniæ citras.

Made by saturating citric acid with metallic iron, adding liq. ammoniæ until the white proto-citrate is dissolved, and exposing the solution to atmospheric air until oxidized. The liquor is then evaporated to a syrupy consistence, and scaled by exposing to a temperature of 80° to 100° Fahr. in thin layers on glass or earthenware plates. The scales thus produced are of a garnet red colour, are readily soluble in water, and have a slightly ferruginous taste.

Ferri percitras, in fine garnet-coloured scales.

Prepared by dissolving freshly precipitated hydrated sesquioxide of iron in citric acid, and scaling as described in the remarks respecting ferri et ammon. cit. It has an acid and slightly styptic taste.

Ferri pyrophosphas, in beautiful golden green scales.

Its chemical composition is not, however, accurately represented by the name it bears, it being prepared by dissolving pyrophosphate of iron in a mixture of the citrates of soda and ammonia; the solution is then evaporated to a syrupy consistence, and scaled in a similar way to the ferri et ammoniæ citras.

Iodo-cyanide of potassium and mercury.

Prepared by mixing strong solutions of bicyanide of mercury and iodide of potassium in equivalent proportions. The salt is deposited in white, pearly, crystalline plates. Its chief use is to detect the presence of small quantities of the mineral acids in hydrocyanic acid.

Hydrarg. subchloridum, prepared *à la vapeur*.

Hydrarg. ammoniatum and hydrarg. biniodidum.

Benzoic acid made from gum benzoin.

It occurs in soft, feathery, pearly crystals. When thus made it is much preferred to that obtained from the urine of some graminivorous animals, which cannot altogether be deprived of a disagreeable odour by repeated sublimation.

Potass. permanganas, in fine iridescent needles.

It is valuable as a disinfecting and oxidizing agent, and has lately been much in request as a ready test for the presence of organic matter in water used for drinking purposes. It also affords a ready method of detecting the presence of methyl in alcoholic compounds.

Iodide and bromide of cadmium.

Bromide of ammonium and chloride of gold.

Principally used for photographic purposes. Bromide of ammonium was lately in considerable demand as a remedy for whooping-cough. The iodide of cadmium exhibited is in fine crystals.

Valerianate of iron, made according to the process of the Dublin Pharmacopœia.

It is almost entirely but not perfectly soluble in spirit, which is seldom practically the case when the salt is thus prepared, owing to a slight decomposition which takes place while drying.

Naphthaline.

A constituent of the principal varieties of tar, produced in large quantities in a crude state in the manufacture of coal gas. When purified by sublimation, it forms, as in the specimen shown, large brilliant crystalline plates of a pearly lustre. It is insoluble in cold water, but is easily dissolved in alcohol, ether, and various hydrocarbons. Its sublimation is readily effected. Nitric acid forms with it a long series of very interesting products.

Bismuthi et ammoniæ citras.

Only lately introduced into pharmacy. The specimen exhibited is in minute scales, containing 60 per cent. of oxide of bismuth, and is readily soluble in water, differing in this respect from other salts of bismuth, which are decomposed and precipitated by water. It is prepared by precipitating a solution of nitrate of bismuth with an alkaline citrate, collecting and washing precipitate with water, dissolving it in liq. ammoniæ, and drying on glass plates at a temperature of between 90° and 100° Fahr. If too great a heat be employed, it is liable to be rendered insoluble.

Potassæ boro-tartras (soluble cream of tartar) may be prepared in the form of scales, as exhibited, by dissolving together boracic acid and cream of tartar in water, evaporating to a syrupy consistence, and scaling on glass plates.

Thus prepared, it presents a very elegant appearance, far superior to the amorphous powder which is more often sold as soluble cream of tartar, and which is made from cream of tartar and borax.

Acetate of amyl (essence of pear), valerianate of amyl (oil of apple), and butyrate of ethyl (essence of pine-apple) are the principal ingredients used in the manufacture of the fruit essences, which are now made in such considerable quantities.

By judicious admixture, artificial essences may be obtained, resembling very closely the flavour of almost every kind of fruit.

Podophyllum peltatum, or May apple. Natural Order *Ranunculaceæ*.

A native of North America. Its root has a place in the United States as well as in the British Pharmacopœias, and is administered in the form of powder as a purgative and cathartic.

Podophylline. A resinous substance obtained from the root, or rather rhizome, of the *Podophyllum peltatum*, now an article of the British Pharmacopœia, sometimes called vegetable calomel.

It varies much in colour, from a dark brown to a greenish or yellowish tint, is practically insoluble in water, and soluble in alcohol and ether. It is prepared by exhausting the crushed rhizome with spirit, the greater portion of which is afterwards distilled off, and pouring the concentrated solution into water previously acidulated with hydrochloric acid; the precipitated resin is then collected, washed, and dried at a low temperature.

Assacu bark, a native of Brazil.

Its exuded juice, known as assacu milk, is in some repute among the natives as a cure for various diseases, but little is at present known of its real properties.

Duncan and Co., *Edinburgh*.

Cases of suppositories, pessaries, and white gutta-percha enamel.

Ewen, Messrs., *London*.

A series of clarified fats and purified olive oil.

Groves, T. B., *Weymouth*.

Specimens of aconitia and its salts.

A paper in connection with these preparations was read before the Conference.

Hanbury, Daniel, *Plough Court, Lombard Street*.

A case of medicinal fruits derived from the Order *Scitamineæ*.

Genus *Elettaria.*

1. *Officinal or Malabar Cardamom.*—The cardamom of British pharmacy is the fruit of *Elettaria Cardamomum,* a native of the forests of Southern India. It varies considerably in form, the more rotund fruits being those preferred by druggists.

2. *Ceylon Cardamom.*—The plant which produces this fruit is now regarded by botanists as a simple variety of the preceding, and named accordingly *Elettaria Cardamomum,* var. β. Ceylon cardamoms are used chiefly in Germany.

Genus *Amomum.*

1. *Round or Cluster Cardamom,* the produce of *Amomum Cardamomum.*—This fruit was formerly well known and highly-esteemed in pharmacy, but for many years past it has given place to the cardamom of Malabar. It has been recently imported from Siam.

2. *Java Cardamom,* the fruit of *Amomum maximum.*—It is rarely seen in English commerce.

3. *Xanthioid Cardamom.*—The plant which affords this cardamom is *Amomum xanthioides,* a native of Burmah and the contiguous countries. The seeds of the xanthioid cardamom, freed from the husk, are often sold in the London drug sales as *Cardamom Seeds.*

4. *Hairy China Cardamom,* is derived from a plant very nearly allied to the preceding, and called *Amomum villosum.* This cardamom is used by the Chinese, but is not imported into Europe.

5. *Bastard Melligetta.*—This name is often applied on the West Coast of Africa to those plants of the genus *Amomum* which produce seeds resembling those of the true Melligetta, or Grains of Paradise. The present plant, which is called *Amomum Danielli,* is one of these. As it was figured and described by the late Dr. Pereira, it has been introduced into this collection: but it has never been used in medicine, at least in Europe.

6. *Korarima Cardamom.*—This is the true Great Cardamom of old writers, a drug which has wholly disappeared from the shops, though still an object of commerce among the Arabs and Turks. The seeds have the flavour of the Malabar cardamom, thus differing completely from what are now called *Semina Cardamomi majoris,* and which are derived from the next species. The plant which furnishes the Korarima cardamom is entirely unknown.

7. *True Melligetta, or Grains of Paradise,* are furnished by *Amomum Melegueta,* a native of tropical Western Africa.

8. *Pereira's Amomum.*—The plant thus called is the *Amomum citratum* of botanists. Its seeds are extremely aromatic, having the flavour of verbena or lemon-grass. They are used by the negroes of Gaboon, but have not, in recent times, been imported into Europe.

Genus *Alpinia.*

1. *Galanga Cardamom.*—Two species of *Alpinia* furnish medicinal products, one of them yielding ordinary *Galangal Root,* the other the *Great Galangal.* The latter which is called by botanists *Alpinia Galanga,* supplies the aromatic little fruit named *Galanga Cardamom.*

Botanical origin unknown.

1. *Large Round China Cardamom.*

2. *Ovoid China Cardamom.*

3. *Bitter-Seeded Cardamom.*—These aromatic drugs are employed by the Chinese, but are not objects of trade with Europe. As they are noticed by some pharmacological writers, they are included in the present series.

HARVEY, T., *Leeds.*
Croton humilis, Jamaica.
Eupatorium sp.?, Jamaica.
Gum of cashew tree, Jamaica.
Cassada starch, Jamaica.

This is used for starching linen, the value being about 2*d.* or 3*d.* per lb.

HAYWOOD AND SON.
Bell of carbolic acid crystals.

HEARON, M'CULLOCH, AND CO., 5, *Coleman Street, London.*
A series of the leading drugs, selected from a number of samples forwarded to us by a merchant in China, for the purpose of ascertaining their market value in this country. They have been examined both by Dr. Lockhart and Daniel Hanbury, Esq., who state that although they meet with a ready sale in China, and are considered useful remedies, they possess few properties sufficiently prominent to render them important as medicinal agents amongst ourselves,—none to qualify them to displace those we are accustomed to see prescribed in this country; and must therefore be regarded as mere curiosities. They are mostly infused, and taken in combination in considerable quantities, and possess, in some slight degree, either tonic, stomachic, or demulcent properties. We are indebted to Dr. Lockhart for the names attached, as he kindly undertook to interpret the characters for us. The other specimens comprise ordinary drugs, but marked by some striking feature,—such, for instance, as an original thread of Spanish flies, tied together in one large bunch. There is also an original string of small Vera Cruz jalap, and a selected sample of the same; also a well-defined specimen of the Tampico, etc. etc. The essential oils (otto?) of roses and elder-flowers are curious by reason of their scarcity and costliness,—the product of either being so small, that if the flowers were distilled for the purpose of obtaining these alone, and not as bye-products, their respective values would amount to about £20 per oz. The quantity of otto of roses exhibited is the result of the distillation of about 300 bushels of flowers. Elder-flowers do not yield nearly so much in proportion, and therefore it would not have been commercially practicable to prepare the water as recommended by the London College in their Pharmacopœia of 1836, viz. by using 2 drachms of the essential oil as a substitute for 10 lb. of the flowers, for this would be equivalent to a very much larger quantity. The concentrated infusions, preserved juices, liquid and solid extracts, comprise the leading preparations of both the London and British Pharmacopœias, placed side by side for the purpose of contrast.

HOPKINSON, T., *Grantham.*
Case containing various mineral waters, including those of Ammonia and Bismuth.

INGRAM AND CO., *London.*
A large collection of foreign mineral waters, lozenges, and salts.

Liverpool Chemists' Association.

A fine series of isinglass and gelatine, forwarded from their own museum.

Meggeson and Co., Manufacturers, *London.*

Seventeen specimen bottles of medicated lozenges, including those introduced into the British Pharmacopœia.

Morson and Son, *London.*

A few specimens for exhibition, comprising globules containing pepsine, pancreatine, and charcoal.

These globules are a convenient form for administering these and other medicines. They also exhibited specimens of pancreatine or pancreatic oil in both an acid and alkaline state, with an emulsion formed from the latter, which has the advantage of greater stability and can be kept without change or putrefactive fermentation.

Specimens of Meconine and Narceine.

Two of the least abundant alkaloids of opium, the latter body having recently obtained considerable reputation in France and Germany as a most valuable sedative, applicable in cases in which morphia and other preparations of opium cannot safely be administered. The small quantity of this alkaloid present in opium, and its consequent high price, will of necessity limit its use to cases in which other narcotics are inadmissible.

A specimen of podophyllin or purified resin of the root of the May apple.

A preparation now considered as a valuable addition to the Materia Medica.

A specimen of the oil and seeds of the *Argemone Mexicana.*

Proposed by Dr. Hamilton as a remedy for cholera, choleraic diarrhœa, and other diseases, and described by him in vol. xii. p. 292 of the Pharmaceutical Journal.

A specimen of pepsine prepared by a modification of the process of Dr. Pavy, by which, if carefully followed out, the greatest digestive activity of this body appears to be obtained.

A preparation from the cuticle of wheat, to which the name of Saccharated Wheat Phosphates has been given.

This has been used and recommended for some years by Dr. Tilbury Fox. It may be considered as the active part of bran and as containing a combination of the organized phosphates, and a peculiar digestive principle admirably suiting it, to supply a want in the food of children and invalids, which will probably render it a valuable dietetic. It can be prepared at a reasonable price, and combined advantageously with a great quantity of farinaceous food. The peculiar digestive principle of bran will not, like pepsine, digest animal matter, but seems specially suited for the digestion of farina.

Mottershead and Co., *Manchester.*

Oxy-azotized water.

Ransom, W., *Hitchin.*

Scammony root and resin.

Robbins, J., *Oxford Street, London.*

Anæsthetic ethers, oxygenator, and charcoal capsules.

Savory and Moore, *London.*

Handsome plant of *Datura Tatula*, specimens of cigars, cigarettes, and cut *Datura Tatula.*

Cases of suppositories, pessaries, and soluble bougies, medicated gelatine disks, narcotine, Ellis's anæsthetic fluids, various pancreatic preparations, and Liebig's food for infants.

Schacht, G. F., *Clifton.*

New filter for pharmaceutical purposes.

The apparatus has been already described and figured, Pharm. Journ. vol. vii.

p. 218, N. S., and vol. vii. p. 504. It is manufactured by Messrs. Pearce and Co., Bridge Street, Bristol, in three different sizes—quart, half-gallon, and one gallon. Dr. Attfield has written an elaborate paper on the Physics of Filtration, in which the principle of this apparatus was described.

Plasma.

Two samples,—one recently prepared, the other made in December, 1865, and exhibited for the purpose of showing that, although kept in an ordinary covered pot, it had retained its beauty and consistence well. The formula employed was the one originally suggested by the exhibitor in February, 1858, viz.:—Starch 70 grains, pure glycerine 1 fl. oz., mix cold, and heat to 240° F., constantly stirring.

SMITH, MESSRS. T. AND H., *Edinburgh and London.*

Thebolactate of Morphia.

For account of thebolactic acid, *vide* Pharm. Journ. vol. vii. p. 50, second series.

Gallic acid, nearly colourless.

Tannin, readily and perfectly soluble.

Aloin, crystalline tufts of the cathartic principle of aloes.

Aconite sugar or mannite, obtained according to process given in Pharm. Journal, vol. x. p. 124. These preparations have since been offered to the Museum of the Society.

SMITH AND CO., *Fell Street, London.*

Thirty specimens of medicated lozenges.

Patented perforated liquorice.

Of all the various preparations, the stick liquorice is by far the greatest favourite, but some difficulty is always experienced in cutting it up for use, so much so, that other kinds, inferior in quality, but more convenient in form, are occasionally preferred before it. Desirous of obviating this drawback to its use, the patentees have at last succeeded in originating a method of manufacture, by which the liquorice is still made in the same form, and yet can be reduced at pleasure, withoutlo ss of time or material, to convenient-sized fragments ready for use.

Blight pastille and fumigator.

SOUTHALL, SON, AND DYMOND, *Bull Street, Birmingham.*

Two cases, containing sixteen samples of Opium and nine samples of Scammony, with the following analysis of their most important constituents.

ANALYSIS OF SAMPLES OF OPIUM.

No.	Crude Morphia.	Dry Extractive.	Moisture.	Market Price.*
1	7·5 p. c.	60 p. c.	14 p. c.	12/6
2	6·6	50	20	12/9
3	4	41	20	13/
4	8	30	24	13/
5	5	47	16	13/6
6	7·6	48	21	13/6
7	5·2	44	14	13/9
8	a trace.	34	14	14/
9	11·5	48	18	14/6
10	11	44	18	15/
11	13·3	46	15	15/
12	10·5	50	18	15/
13	10·6	46	23	15/6
14	8·5	48	16	15/6
15	9·7	46	24	15/6
16	7	52	18	16/

* At the time of making the analysis.

ANALYSIS OF SAMPLES OF SCAMMONY.

No.	Pure Resin.	Market Price.
1	18 p. c.	8/
2	14	12/
3	29	15/
4	36	18/
5*	100	26/
6†	100	26/
7	68	31/
8	80	37/
9	76	48/

These specimens were selected as ordinary commercial samples, such as are commonly met with in the English market. The object in making the analysis was to ascertain the relation which the market prices usually bear to the real values of opium and scammony, as shown by the proportions of morphia, etc., and pure resin. The result shows that pharmaceutical preparations, made from these important drugs, are liable to serious variations of strength, unless the drugs employed are uniform in their important constituents, and that the market prices are no guide to the real value of these articles.

This firm also exhibited specimens of some of their Iodine and Bromine preparations, viz. iodide of ammonium, iodide of potassium (both crude, fused, and crystallized), bromide of ammonium, and bromide of potassium.

TUCK, JOHN, *Wilton, Salisbury.*

Samples of adulteration placed at his service by the courtesy of the Hon. Board of Inland Revenue. He has also to thank Mr. Kay, the Principal of the Laboratory at Somerset House, for his kindness in furnishing him with the information concerning them.

1. "Original Indian Essence," consisting of methylated spirit of a strength of 70·1 under proof, and treacle.
2. "Indian Tincture," consisting of methylated sweet nitre and treacle.
3. "The only original highly medicated and cordialized Indian Brandee," cosisting of treacle and methylated spirit of a strength of 47·3 under proof.
4. "Indian Brandee," consisting of methylated spirit, hyponitrous ether, and treacle.

These four samples were sold as medicines under the quoted names, but such compounds are in reality manufactured to be sold for beverages, and extensively used for this purpose in Lancashire and Yorkshire. The presence of methylated spirit in these compounds is clearly shown both by the iodo-hydrargyride of potassium and oxidation tests as detailed in a paper read at the Birmingham Meeting of the British Pharmaceutical Conference.

5. "Whiskee," containing methylated spirit of a strength of 60·0 under proof.
6. Essence of ginger, containing methylated spirit.

These two samples were taken from a large quantity of spirits sold by public auction in Dublin, and when found to contain methylated spirit were seized by the Inland Revenue authorities.

7 and 21. Glucose, consisting of starch, sugar, and gum, and extensively

* Patent Scammony. † Made according to the British Pharmacopœia.

employed in the manufacture of confectionery, and for the adulterations of jams and marmalade.

It comes chiefly from France, and is made from potato- or wheat-starch.

8 and 9. Concentrated ale and porter wort, manufactured by the Concentrated Wort Company of Margate, to which has been given the name of "Grainstone."

This concentrated wort is made of malt and hops in the ordinary way, and reduced by a patent process to a solid hard substance. To convert this substance into beer, porter, ale, or stout, more or less water has to be added, according to the strength required, and, when thus liquefied, it is fermented and racked off into casks in exactly the same way as ordinary beer is brewed. The "grainstone" is exported in the solid state in square tin cases, so that the heavy cost of the carriage of the water in ordinary beer is thus avoided; and, being hermetically sealed up, it will keep good without deteriorating or losing any of its qualities for years. Two pounds of this grainstone to every gallon of water makes a good beer.

10. Adulterant for porter, consisting of treacle extracted from sugar-bags and refuse of sugar refineries.

There is reason to believe that this species of adulteration is practised a good deal both in London and in the country.

11. Beer adulterant, consisting of spent hops which contain a large proportion of grains of Paradise.

12. Beer adulterant, consisting of ground capsicum, starch, and sugar.
This was discovered at Stockton-on-Tees.

13. Cavendish tobacco of foreign manufacture, adulterated with liquorice.
This is found chiefly in seaport towns, and consumed principally by sailors.

14. Roll tobacco, adulterated with cabbage-leaf.
This sample was purchased in Glasgow.

15. Tobacco-leaf in process of manufacture, adulterated with 19 per cent. of sugar.
This was seized in a manufactory at Newcastle-on-Tyne.

16. High-dried or Irish snuff, containing upwards of 20 per cent. of caustic lime.
This was obtained from Belfast.

17. "Snuff" coarsely ground, containing 2 per cent of rhubarb-leaf. The bulk of this "snuff" weighed several tons.

Snuff is most extensively adulterated, and the following are some of the vegetable materials that have been used for this vile purpose, and seized by the excise authorities:—Rhubarb leaves in several cases, acorns, dock leaves, sawdust, spent dyewoods, rhubarb and coltsfoot leaves, the "combings" of malt, rhubarb and potato leaves, coltsfoot, and other plants, British tree leaves, etc. These adulterants are principally detected by the microscope. Amongst the mineral adulterants, the most injurious to health are the salts of lead, and if some of the others, such as salt, red ochre, chalk, lime, silica, etc., are not so injurious, they nevertheless defraud the revenue of considerable sums annually.

18. Hamburg wine, a sophisticated wine made to imitate sherry, and at one time extensively imported from Hamburg and other German ports.
This fraudulent practice is now, however, much checked.

19. Cadiz sherry wine of low quality, containing 50 per cent. of proof spirit, used for the fortification of wine to suit the English markets.

20. Methylated spirit purified from oil, by a process patented by Mr. J. Watson Burton, of Leeds.

21. Glucose, mentioned under No. 7.

WAGNER, Dr., *Pharmaceutical and Chemical Establishment* in Pesth, Hungary. Founded* 1836.

Chemical works for pharmaceutico- and technico-chemical preparations, simple and compound medicines, essential oils and essences for the manufacture of wines, liqueurs, and brandies, elegant assortment of objects for a pharmacy, drugs and minerals, utensils for photography, daguerreotype, and panotopy.

Objects exhibited.

Flores papaveris, F. tiliæ, F. verbasci, Fol. belladonnæ, F. hyoscyami.

These and other medicinal herbs furnish our land in large quantities, and in the best quality. Our export in these objects is very important.

Extractum belladonnæ, extractum cicutæ, extractum hyoscyami.

Supplied according to various formulæ.

Cognac oil, I.; Cognac oil, II.

Distilled from the most selected Hungarian wine lees: they are very convenient for use, and produce at a moment's notice a very fine cognac brandy, retaining the flavour of the wine. Cognac oils are used also for manufacturing artificial wines, and for the amelioration of inferior descriptions. Aqua laurocerasi is three times stronger than the French or Italian.

Oleum Chamomillæ, manufactured from best chamomile flowers.

Used in cases of cholera with great success. This sample exactly corresponds to the original description, of being pale blue when freshly drawn.

Oleum juniperi, oil of juniper berries; the price is very low.
Roob juniperi, a bye-product of the distillation of juniper oil; the price is very low.
Oleum melissæ, finest balm oil, produced from garden balm herbs.
Spiritus terebinthinæ, with very little smell.
Syrupus violarum, very fragrant and of good colour.
Tellur metal, only manufactured in this establishment.

The tellur ore comes from Nagyag, Transylvania, with silver and gold as Tellurblätterer.

Ferrum dialysatum (oxydatum solutum in aquâ).

A reddish-brown fluid of pure astringent taste. Dose in case of diarrhœa or dysentery, one scruple to a drachm.

WHITTLES, *Birmingham.*
Several specimens of nickel and cobalt ores.

YATES, JAMES, F.R.S.
The male cone and two leaves of *Cycas revoluta.*

CLASS III.

THE GENERAL APPLIANCES OF A PHARMACY, DIETETICS, AND MISCELLANEA.

ADAMS, J., *Loughborough.*
Old books relating to pharmacy, amongst which is a copy of Gerard's 'Herbal.'

This fine old folio (dated 1597), is extremely rare. It was printed in an age when men expressed their reverence for a subject by the type in which it was enshrined.

* The original descriptive note has been as far as possible retained.

ATTFIELD, DR. J., *London.*

Stereoscope and eight slides of the institution and grounds of the School of Pharmacy, Paris. Twelve photographs of professors and assistant-professors of the School of Pharmacy, Paris. An album containing portraits of the prominent members of the British Pharmaceutical Conference.

CHEVALLIER, M. A. (de Paris), has forwarded to Dr. Attfield a copy of the third edition of his work on 'The Adulteration of Dietetic, Medical, and Commercial Substances' ('Dictionnaire des Altérations et Falsifications des Substances Alimentaires, Médicamenteuses, et Commerciales, avec l'indication des moyens de les reconnaître').

The object of the work is to enable pharmaceutists to reject any article that may have been tampered with, and sophisticated medicaments. 2. To enable them to give advice when officially consulted, as to the value either of dietetic or commercial substances. 3. To provide tradesmen and all who buy dietetic or commercial substances with the means of detecting adulterations, and of guarding themselves against imposition. This exceedingly useful book, the result of fifteen years' research, is dedicated to M. Dumas.

GARDNER, J. F., Esq., *Leicester.*

Three vases of skeleton bouquets; also a book of dried ferns collected in 1864–1865.

GILLON, JOHN, AND CO., *Leith.*

Case containing preserved meats, including beef, mutton, chicken, and other dietetic preparations. Concentrated meat lozenges are in this series.

GREAVES, A., *Ironville.*

Model label damper.

HADLOW, F. V., *Brighton.*

Patent new boxwood linen markers, with ink and specimens of work.

HARDWICKE, R., *London.*

A collection of scientific and other publications, amongst which may be noticed a table of the elements arranged by J. Carter Bell.

HARVEY AND REYNOLDS, *Leeds.*

Extractum Carnis, prepared by the process of Baron Liebig in steam apparatus from English beef.

Many years ago Baron Liebig obtained a pure essence of meat, which contains its principal nutritive elements. According to his calculations, a little more than one pound of this extract, with bread, potatoes, and salt, would afford an excellent meal for 128 persons. This extract of meat is very different from the product obtained from tendons and muscular fibre, which is chiefly gelatine—a substance that affords little nourishment. The extract of meat contains 80 per cent. nutritious matter, while what is obtained from tendons and muscular fibre contains only 4 or 5 per cent. *One ounce* of the Liebig's extract of meat contains the soluble matters of *two pounds* of fresh meat.

HOWIE, W. L., *Glasgow.*

Poison bottle locks and retail labels for poisons.

The peculiarity in the latter is that the word poison is printed in conspicuous red letters *over* the ordinary label.

INCE, J.

Dispensing knives.

THE LIVERPOOL CHEMISTS' ASSOCIATION send a copy of Howard's 'Illustrations of the Nueva Quinologia of Pavon,' with coloured plates; also an atlas of dried British *Cryptogamia*, comprising *Filices*, *Equisetaceæ*, *Musci*, and *Lichenes*.

MATTHEWS, W., *London*.
Tinted wax papers, as a substitute for tinfoil, to protect pomades and ointments.

MAULL AND CO., *London*.
A series of portraits of celebrated individuals, chiefly pharmaceutists.

THE LIVERPOOL CHEMISTS' ASSOCIATION have also contributed portraits of eminent men.

MR. DEANE, of Clapham, supplied an album containing portraits of leading American pharmaceutists, chiefly officials in their Association.

MAW AND SON, *Aldersgate Street*, *London*.
New form of poison bottle, the peculiarity of which consists in its having a perforated stopper fitted with a spring clamp embracing the neck, and easily worked by finger and thumb.

MERRIKIN, J., *Beaufort Buildings*, *Bath*.
Poison bottle, described in his paper delivered at the meeting of the Pharmaceutical Conference in his own city.

MORTON, G. AND J., 39, *Cheapside*, *London*.
Patent universal siphon for effervescence.

PARSONS, RICHARDSON, AND CO., *Leicester*.
Specimens of gelatine bottle capping as originated and prepared by them.
A writer in 'Temple Bar' is supposed to have quietly appropriated the idea.

REYNOLDS, R., *Leeds*.
Precautions against accidental poisoning, being simply a red paper diamond affixed to a bottle containing a powerful and dangerous remedy, such as Morphiæ Acetas. In the case of strong liniments, an irregular red band is pasted round the bottle so as to be distinctly seen and felt.
Two charts, the one an illustrated comic compendium of domestic medicine (Le Médecin à la Maison), the other a comparative view of the edible and poisonous fungi
Copy of the 'London Pharmacopœia,' 1677, with other early works relating to pharmacy.
'Précis Théorique et Pratique des Substances Alimentaires, et des moyens de les améliorer, de les conserver, et d'en reconnaître les Altérations,' par A. Payen.

REDWOOD, Professor, *London*.
Specimens illustrating his patent process for the preservation of meat by means of a coating of solid paraffine.

RIMMEL, Messrs., *London*.
Vaporizer, Rafraîchisseur, and various toilet articles.

ROBINSON, J. SPENCER, *Alfreton*.
A jar containing Australian snakes, arranged in a spirited manner.

SAVORY AND MOORE, *New Bond Street*, *London*.
Yacht medicine chest made in polished walnut. In addition to the ordinary fittings may be noticed a supply of Duncan's ratan-cane splints.

SHILLCOCK, J. B., *Bromley*, *Kent*.
Patent perforated cage leech vase.
The principal recommendation of this newly-invented vase, are the facilities it affords to the leeches to cleanse themselves by passing through the perforated holes.

and thereby rendering them more healthy; the convenience of removing them without the necessity of putting the hands into the water; its adaptation as an attractive appendage to the counter, and its portability. The instrument consists of a glass jar with perforated zinc cover, having perforated zinc diaphragms fixed on a porcelain tube at unequal distances.

SHORT, J.
Soda-water taps.

SMEETON, W., *Leeds.*
Case of extractum carnis prepared from English beef.

THONGER, Mr. G., *Birmingham.*
Poison labels.

TOMLINSON, M., *Hulme, Manchester.*
Dispensing counter fitted with the improved expedio label rack.

The chief novelty in connection with the dispensing portion of this counter is the system adopted for storing labels. A frame constructed on the same principle as that commonly used in railway offices is adapted for holding a large series of labels, which are withdrawn through a slit in the front of each compartment. A specie jar intended for the chemist's window is shown by the same maker, on his well-known patent principle.

VAN ABBOTT, G., 5, *Princes Street, Cavendish Square, London.*
A large contribution of dietetic substances, among which may be noticed, gluten bread, farina, and chocolate.
Malt flour, sugar of milk, extractum carnis, and a number of wines selected for the use of invalids.

In an exhibition like the present, praise and blame must necessarily, to a large extent, be excluded.

The committee do not constitute themselves censors of the work of their companions. Still, it would be unjust not to state in general terms how thoroughly certain branches of Materia Medica have been represented; nor would it be fair to pass unnoticed the extreme finish of a few surgical instruments. Practical chemists, whose names are household words, have proved fully equal to their reputation; whilst, owing to the unwearied services of Messrs. Atherton, Fitzhugh, and others, the objects so liberally contributed have been returned safe and sound to their respective exhibitors.

The exhibition proves one thing more, that there is a fashion in pharmacy as there is in dress. The present *mode* is undeniably Extractum Carnis; whilst that ingenious instrument called the odorator, appears almost Protean in its applications. It was first a lecture demonstration in the hands of Faraday, then a Paris toy, and of late an English druggist's sundry. Little did those two simple tubes imagine, when they arranged their separate points, and put this and that together, that they would appear in all the glory of scientific apparatus at the British Pharmaceutical Conference.

Thanks are due, and thanks are most willingly paid to our Vice-President, Mr. Hills, for his thoughtful contribution. Some at Nottingham probably saw, for the first time, the features of one to whom pharmacy is so much indebted. There were many present, more fortunate in their private friendships, who could point out to others how well the sculptor had caught and rendered the living expression of the man; both will allow that this report could not more fitly close than with a tribute of unfeigned respect to the memory of Jacob Bell.

ORIGINAL AND EXTRACTED ARTICLES.

NOTE ON THE CULTIVATION AND PREPARATION OF CASTOR OIL IN ITALY.

BY H. GROVES, FLORENCE.

Two species, or more probably varieties, of *Ricinus*, are found growing spontaneously in the kingdom of Italy,—*R. communis* and *R. africanus*, the distinction being chiefly in the stigmata, of which the former has three deeply-forked, and the latter six.

I have not been able to learn at what epoch these plants were introduced, but it would seem probable, from the early use of castor oil, that they have figured amongst Italian, or at least Sicilian plants, from a remote period, choosing their habitat in the moist thickets that abound near the southern coasts.

The cultivation of castor-oil plants for the purpose of commerce, and especially for export trade, has a comparatively recent date, and the introduction of one of the most esteemed varieties dates back but twelve years.

Although the cultivation is carried on in nearly every province in the kingdom of Italy, as well as the Papal States, it is chiefly from the province of Verona that we draw our supplies both of seed and oil. There are other large manufactories at Leghorn, Genoa, etc., but both there as in the Veronese territory it is frequently found necessary to purchase foreign seed to make up for the scarcity of the native supply, which is regulated in great measure by the value of maize and sagina—plants preferring the same soil as that required by the *Ricinus*.

The two principal varieties cultivated south of Verona are the black-seeded, or Egyptian, and the red-seeded, or American. The latter yields a greater percentage of oil than the former, but the oil is not so pale in colour. The Egyptian variety differs also in requiring a rich soil, whereas the American plant prefers a dry soil with plenty of sun.

Speaking generally, the land best adapted for the cultivation of the castor-oil plant should not be too argillaceous, but friable, and well exposed to the sun. In November the ground is ploughed up and allowed to remain all the winter exposed to the frosts and north winds, which are frequently severe. By this means the soil is well broken up, and in the spring a series of deep furrows are made about 5 feet apart for rich soils, or 4 feet for ground of a less fertile nature. In these furrows are deposited beds of stable manure, which are lightly covered up by means of a plough. In May, or before, according to the precocity of the season, the soil in the furrow is well mixed, and the couch grass and other weeds having been uprooted, planting is commenced. The seed, which is carefully selected, is held in the aprons worn by the women, who take up three or four grains between the thumb and two fingers, and thrust them into the middle of the furrow, dexterously earthing up the hole in the withdrawal of the fingers. The distance between the plants should be about $3\frac{1}{2}$ feet. After fifteen or twenty days the young plants will have sprung up to a height of about 2 inches, and the women again visit the fields for the purpose of selecting the strongest plants in each bunch, destroying the others and earthing up the chosen one. After another fifteen days, the plants having attained a height of about 8 inches, a plough usually drawn by two oxen is passed between them, to turn more soil into the furrows, and the women following earth up the plants, leaving only the leaves uncovered. Later, the "*incalzation,*" as it is called, is repeated with the spade, and the plants being now sufficiently strong, are left to themselves.

The seeds begin to ripen early in September, when women with baskets on their arms make a daily gathering, of the ripe grains, passing by each plant every two, three, or more days, according to the intensity of the heat. As soon as gathered the seeds are spread out on an open floor, to ensure their being dry, and, as they retain the outer covering, are called "*Ricino investito.*" To obtain the seeds as they are met with in commerce, the following means are adopted:—A layer of about two inches of "*Ricino investito*" is spread over the wooden floor of the barn, and a man without shoes takes an implement made of a flat piece of wood about twenty inches square, underneath which is attached a layer of cork about two inches in thickness, fitted with a handle springing at right angles from the wood, so that it may be used by the man standing. This implement is pushed backwards and forwards, running gently over the seeds, so as to break up the integument, which is subsequently winnowed away. The seed with double covering yields about 66 per cent. of the commercial article.

As soon as the gathering of the seed is over, the plants are cut down and tied in bundles, which are left out to dry, and used in the winter for fuel. The winnowed integument is also used for burning in stoves, or for mixing with stable manure for vine dressing. Finally, when the land is ploughed up in November, the roots are collected, dried, and used for burning. A certain oleaginous principle appears to pervade the whole plant, rendering it useful as a heat-giving and brilliant combustible.

The height of the Ricinus varies from five to ten feet according to the soil, so that the husbandmen have to take into consideration its probable growth, in order to allow a sufficient space for the development of the branches. It is calculated that the Veronese territory alone yields an annual produce of over five million kilogrammes of seed, being less than the quantity required by the manufacturers, who are thus obliged to use a portion of foreign seed.

The preparation of the oil is conducted with great care, so that even the last integument is removed before the seed is subjected to pressure. For this purpose the grains are passed through a machine consisting of two large revolving wooden rollers, beneath which is placed a powerful winnowing machine for the separation of the seed from the covering, now become broken by the action of the cylinders. As a further guarantee, a number of little girls are employed as sorters, and for this purpose are usually seated, when, placing the seed before them by small quantities, they reject those from which the seed-coat has been imperfectly removed, as well as the damaged and rancid grains, throwing the good ones into baskets placed beneath.

Every manufactory of any importance has at least five or six hydraulic presses, which are placed in a room heated in winter to a temperature of about 70° Fahr. Strong coarse hempen press-bags, about fourteen inches wide, are always kept ready, and in each is placed about three kilogrammes of cleaned seed. The bag, being longer than wide, folds over when in the press, and between it and the superposed one is placed a sheet of iron that has been heated to about 90° Fahr. The presses usually contain from twenty to thirty bags, which have a thickness of rather less than two inches each. All the oil which flows from this pressure is of the first quality. The marc is now ground in a mill, and again placed in the bags; the sheet iron, as usual, is placed between each layer, and the whole gently heated up to about 100° Fahr., when it is again subjected to pressure, the result of which is a further yield of straw-coloured oil, much used in the manufacture of printers' ink, etc. etc. The blanched seeds sometimes yield a total of 40 per cent. of oil. The first quality is kept in a warm place (in summer just beneath the roof) for some days, and deposits a quantity of mucilaginous and fatty matter, after which it is filtered. The filtering bags are made of a cloth found in commerce, and have a capacity of seven kilogrammes of oil. When filled, the mouths of these bags being tied up, they are placed on the tin-lined shelves, disposed in such a manner round a room that, by the aid of tubes, the filtered oil flows from all sides into the vessel placed to receive it. Each room usually contains about 2000 kilogrammes of oil, the temperature being kept at about 55° Fahr. The exhausted marc is used as a manure for hemp and flax, for which purpose it is supposed to be well adapted.

Some little while ago it was proposed to use the marc as a cosmetic in the same way as we employ almond meal, but it did not answer this purpose, as it was found to possess considerable irritant properties. Might not these qualities render it a useful counter-irritant applied as cataplasma? As the marc is readily obtainable in England, it would be as well if some one were to report on its therapeutical value.

Complaints have been made of the difference of quality in Italian castor-oils, and of the tendency in some samples to deposit fatty granules in cold weather; but the oil prepared according to the method just described, which is that employed in the Veronese territory, cannot be surpassed in taste or appearance, and gives little or no deposit in the ordinary temperatures of winter. The deposit complained of is due to greater heat having been employed in the processes of pressure and filtration.

From the large doses of the oil used in Italy,—sometimes two ounces, simple or mixed with almond oil,—it would seem that the comparative tastelessness and brilliancy of the oil are acquired at the expense of its purgative power. I have heard or read that the Chinese use castor-oil in their salads. Surely it can possess but feebly the purgative qualities of other castor-oils, leading one to suppose that climatic influences and mode of cultivation oppose the development of the purgative principle, which is still further lessened in the oil by a careful preparation. It is probable that to some such causes we must attribute the peculiar blandness of true Italian castor-oil.

I am indebted to Signor Valeri for much of the information in the foregoing paper.

Florence, August, 1866.

MORPHIA AND CARYOPHYLLUM COMPARED BY THE NITRIC ACID TEST, ETC.

BY A. F. HASELDEN.

In Dr. Farre's excellent work upon Materia Medica, amongst the remarks upon caryophyllum are the following:—

"Composition and Chemical Characteristics.—Cloves owe their properties to a volatile oil; they also contain tannin, resin, extractive, etc. Nitric acid reddens infusion of cloves; tincture of perchloride of iron renders it blue; the oil of cloves also undergoes similar changes to the infusion. These facts *deserve especial attention* in relation to opium and morphia, on account of the analogous phenomena presented by morphia when acted upon by nitric acid and perchloride of iron. Infusion and oil of pimento are similarly affected."

Assuming that this statement is substantially correct, the question naturally suggests itself,—Is morphia likely to be substituted for clove, and *vice versâ?* Neither the alkaloid nor any of its salts, under ordinary circumstances, could be mistaken for cloves, nor any of the solutions for infusion of cloves; but it is just possible that a solution of the hydrochlorate, acetate, or sulphate of morphia (the sulphate is much employed in America) might in a moment of haste or under one of those extraordinary abnormal conditions of things when an accident occurs, be used instead of a spiritous solution of the oil of cloves or a water flavoured with the oil, aqua caryophylli being frequently ordered, though not in the Pharmacopœia. In the event of intentional poisoning by morphia, a defence might be set up that the colour-test was no reliable proof of the presence of morphia, inasmuch as the same might be the result of the presence of cloves in the stomach after eating apple pie or pudding, cloves being the ordinary spice employed in such cases for flavouring, and with as much or little reason as the presence of prussic acid upon a notable occasion was attempted to be made attributable to the presence of apple pips. Moreover, in intentional poisoning the one might be used to cover the other.

If, after much care, the results of my experiments do not altogether coincide with those of Dr. Farre, and if by my working I am able to point out a marked difference between the two so long as they have been separately employed, or one accidentally substituted for the other; although when mixed the action of the colour-test becomes indistinct, then certainly I feel that in attempting to profit by the Doctor's suggestion, that *these facts deserve especial attention*, I have found a weighty motive beyond my own instruction for so doing.

With morphia and the salts of it, hydrochlorate, acetate, and sulphate, nitric acid produces a brilliant pinkish-red, rapidly changing to orange-yellow, with solutions of the salts of morphia, gr. iv to ℥j fl. Nitric acid gives a bright pinkish-red, changing in the course of an hour or two to yellow. The application of nitric acid to oil of cloves undiluted developes a bright garnet-red, which does *not* change to yellow under ordinary circumstances; with a fresh infusion of cloves a red is produced similar to the solutions of morphia, but darker, and soon changing to yellow; and with an aqueous mixture of the oil a reddish-yellow changing to pale straw. So far, making allowance for difference of shade of colour, and difference of eyesight, there is a great similarity, excepting that the red from the combination of oil of cloves and nitric acid does not change to yellow. But a step further. Add to the different solutions of morphia and nitric acid and cloves with nitric acid: some solution of chlorinated lime, the clove solutions upon exposure to light for some hours become perfectly colourless, whilst the morphia solutions under the same conditions retain a pale straw-colour. Here then, I submit, is a characteristic and distinctive feature, even if the red colours altogether coincided. The tincture of perchloride of iron yields, according to my experiments, results more marked. With morphia and the three salts before mentioned in solution, the tincture of perchloride of iron gives a clear and distinct blue, changing in a few hours, it is true, to pale green.

With a solution of oil of cloves in spirit I obtain, with the tincture of perchloride of iron, a clear and decided green, and permanent for some days; with an aqueous mixture an indistinct yellow, changing to dirty pale brown; with fresh infusion of cloves by the same test, a dirty olive-green solution and a copious deposit; with infusion which has been suffered to stand three or four days upon the marc, I have in appearance a very dark solution, almost black, undoubtedly due to a larger quantity of the tannin present being taken up, but really, when filtered, a dark olive-green-brown with a large precipitate.

Dr. Farre also writes of infusion and oil of pimento presenting similar features. Upon trial I find that nitric acid gives with the oil a blood-red with a rose tint, but not permanent; with the infusion an indistinct pinkish-red, changing to yellow; tincture of perchloride of iron produces with the infusion a dirty-looking olive-green, and a precipitate; with the oil dissolved in spirit a bright green similar to the cloves. If I am correct, and I have repeated my experiments several times, as long as these substances have been used or can be obtained separately, the colour-tests as I have applied them seem sufficient, assisted by other circumstances, such as odour, etc., to distinguish them from each other; but if they should exist in combination, either by accidental or intentional admixture, then considerable obscurity would exist, from the blending of the red or green and blue colours; and no satisfactory conclusion could, I think, be arrived at without the elimination and actual production of the morphia salt. In trying the nitric acid upon some other of the volatile oils, I do not in any case obtain an exactly corresponding tint of colour. To say the least, it appears to me an interesting subject, and as Dr. Farre justly observes, deserving of especial attention.

"Semper tibi pendeat hamus:
Quo minime credas gurgite, piscis erit."—*Ovid.*

18, *Conduit Street*, 10*th September*, 1866.

THE POSITION AND PROSPECTS OF PHARMACY.

BY J. R. COLLINS.

I have read with some considerable interest Mr. Ince's clever essay on "Pharmaceutical Ethics," read at the Nottingham Conference. I admire the literary ability of the author, and can give assent to many of his propositions; but from others I must dissent, believing them to be both unpractical and unsound. That Mr. Ince should entertain such views is by no means surprising, seeing that his trade associations are exclusively with the upper ten thousand; but these scarcely qualify him to pronounce upon the trade customs and interests of the chemists who cater for the outside millions. He takes what I may designate *an aristocratic view* of the question,—one applicable to a few dozen West End establishments; and it is to his scarcely-suppressed condemnation of probably nine-tenths of his metropolitan brethren that I take exception. A pure dispensing business can, without much difficulty, be made and maintained by competent men of means, and well placed in the polite *faubourgs* of Belgravia, Tyburnia, and Mayfair, and also in the great West End thoroughfares,—for this simple reason, that the affluent classes, as a rule, recognizing the advantage of a division of labour, employ prescribing "Doctors," whose prescriptions are compounded by the chemists in their respective neighbourhoods. But in five-sixths of the metropolis (I speak of London as knowing most about it, but doubtless the analogy is applicable to country), where the genus "apothecary" reigns triumphant, where would the chemist be if forbidden to sell soaps, scents, cosmétiques, pomades, tooth-brushes, hair-washes, *cum multis aliis,* down to that last thing out, "the extract of lime-juice and glycerine," and also prescribe whenever opportunity presents itself with safety? Mr. Ince's educational views are, I apprehend, too exalted. Not but that the necessity of improved education must be conceded by all who have felt the elevating influence of a liberal education; but you may have too much even of a good thing, and where much book-learning is required a corresponding amount of time must be devoted to its acquisition. A good sound academic education, up to 15 or 16 years of age, standing an examination test, is all that is required. With some *naïveté,* Mr. Ince states that he escaped the horrors of the "middle passage" from boyhood to manhood comprised in apprenticeship, and that he entered the business with an assured position at the mature age of 21. *O fortunate adolescens!* to be so favoured of the gods and men. It would thus appear that while other young men were obtaining a practical knowledge of the business, the author of "Pharmaceutical Ethics" was studying the arts and sciences under eminent professors at King's College; and, that he made good use of his time, his many excellent contributions to this Journal will attest. But this "style" would never do for the rank and file, who must labour to live. Mr. Ince stands a high-priest of pharmacy after the order of "Melchisedek." Turn it as we may, the business of a compounder of medicine is one requiring continuous labour; it cannot be made a purely intellectual avocation, and any attempt to do so must end in disappointment.

While stating the absolute position of the present practitioners of pharmacy, I am far from saying but that it might be greatly improved if some of the *impedimenta* that now encompass us were either mitigated or removed. I will specially allude to two of the most prominent:—1. The non-exaction, by the State, of a certificate of competency from the professors of pharmacy. 2. The practice of surgeon-apothecaries vending their own medicines. In discussing the first proposition, let me observe that the creation of a monopoly is not what we desire. We don't want our shops licensed and protected, like public-houses; but we wish to establish the principle, that those who carry on business in these shops should have given satisfactory evidence that they could distinguish between oxalic acid and Epsom salts, or between quinine and salicine, and explain the physical properties, medical uses, and doses of any drug, chemical, or compound in use; that this, besides being a great public benefit, would be of infinite service to those carrying on the business, as it would in time get rid of the incompetent, low-minded, and generally cunning men, who, by means of their unscrupulous competition, render it difficult for a conscientious man to get a living. Were all professors of pharmacy educated men, a code, "*leges non scriptæ*," would arise, and, by means of etiquette, influence pharmaceutists in their demeanour one to another and to the public. I trust the present generation may be permitted to see the light shine, if only the faint ray of early dawn; as then the hearts of many of our veterans, who have been long watching and waiting, will be gladdened at the thought of a good time coming for others, if not for themselves.

I will now allude to the purveyance of medicine by medical practitioners. Of course the abstract right of medical men to provide medicine for their patients cannot be disputed, but I unhesitatingly assert the practice to be in towns unnecessary, inconvenient, and wasteful, and at variance with the established usage of nearly the whole civilized world; indeed, in the United Kingdom, Scotland and Ireland pronounce against the system, and in many large towns in England the custom has of late years been for the medical man to prescribe,—Liverpool to wit; at all the principal watering-places the same course is pursued; and why on earth should three-fourths of the medicine consumed in London issue from the private shops of surgeons rather than from the public shops of chemists? The answer is plain,—because the general practitioners will it to be so; and until these gentlemen see it their interest to abandon pharmacy, the present incongruous system will continue, any cause shown to the contrary notwithstanding. Although we all know that the combination of medical practitioner and apothecary or pharmaceutist, arose in the effort of the cheap apothecary to supplant the dear physician, yet few, I should think, would do more than apologize for such an alliance. The very licence of the Apothecaries' Company is a *non sequitur;* it sets forth that the licentiate has been examined on the principles and practice of *medicine*, and has a licence to practise the *art of an apothecary; i.e.* has been examined as to his ability to perform the functions of a physician, and, being found competent, is licensed to practise as an apothecary, or compounder of medicines: about as sensible a statement as if the College of Civil Engineers in their certificate were to state that the possessor had been examined on theoretical and practical engineering, and, being found competent, was entitled to sell onions! I could pursue the subject further, but, having no desire to offend the susceptibilities of general practitioners, will not enlarge. A very important reform is impending, in the supply of medicines to the poor by the guardians instead of medical men. A large metropolitan parish supplies medicines and medical appliances to their workhouse infirmary at a cost of several hundreds a year, instead of adopting the usual practice of farming out the supply of medicines to the medical man for a fixed sum; in addition, the district medical officers who attend the outside poor are furnished with any quantity they may require of cod-liver oil and quinine; and I trust, before long, guardians will be compelled (instead of, as now, permitted) to supply all medicine to paupers, paying the medical men for their time and skill only.

When the time shall have arrived when both the upper and lowest class shall be prescribed for *only* by medical men, the medicine ordered being obtained from independent sources, the great middle class may discern that medical men ought not to have any interest whatever in the medicines they prescribe, and be willing to pay for advice, unaccompanied by medicine, very frequently worthless. I venture to prophesy, that, under such conditions, armed with an intellectual qualification, and fortified with the generous support of the medical profession,—no longer rivals,—the profession of pharmacy will be one offering fair inducements to its votaries, instead of being, as at present, to the majority, like the apples of the Dead Sea, fair to look upon, but dust and ashes to the touch.

Haverstock Hill, September 22nd, 1866.

USE OF METHYLATED SPIRIT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Cambridge, September 24, 1866.

Sir,—As I believe there is a confused idea in the minds of many chemists respecting methylated spirits and methylated finish, may I be allowed to make, through your Journal, the following remarks?—

Till your last month's Journal came out, I should have supposed every chemist had been aware that methylated spirits of wine could not be sold without a licence.

Now, as there may be some chemists who suppose the finish cannot be sold either without a licence, allow me, through your Journal, to say, no licence is required to sell methylated finish. Neither does the Act which comes into operation on the 1st January, 1867, affect the sale of methylated finish, as finish, in any way.

Here I would give my advice to chemists having methylated finish by them: test it, and see that it is finish, and not spirits. Every gallon of spirits ought to contain at least 1 ounce of shellac or sandarac. To some, the following inquiry may be interesting:—

"*To the Honourable Commissioners of Inland Revenue.*

"Gentlemen,—May I ask your favour in answering the following question?—

"After the 1st of January, 1867, will it be lawful for any chemist to use methylated finish in making soap liniment or opodeldoc?

"Though the compound is a pharmaceutical preparation, it cannot be used internally as a medicine.

"I am, your obedient servant,
"JOSEPH STURTON.

"*18th September*, 1866."

"*Inland Revenue, Somerset House, London,*
"*22nd September*, 1866.

"Sir,—In reply to your application, dated 18th inst.,—

"I am directed by the Board of Inland Revenue to inform you, that soap liniment and opodeldoc may, on the assumption of their being incapable of being used either wholly or partially as a beverage or internally as a medicine, be made with methylated spirit.

"I am, Sir, your obedient servant,
"WM. CORBETT.

"*To Mr. Sturton.*"

EARLY CLOSING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—At the request of the meeting held at my house on Monday evening last, 17th instant, I beg to inform you that all the chemists of this neighbourhood have unanimously decided upon closing their establishments every evening (excepting Saturdays) at nine o'clock, and entirely on Sundays; cases of emergency, of course, being attended to on ringing the bell, as usual.

Our special object in sending this information to you is with the hope that the "infection may spread," and that other localities may be induced to make a similar determination to reduce our at present unreasonable and perfectly unnecessary hours of business.

As matters stand at present, we voluntarily surrender ourselves slaves to the public, by allowing the unreasonable demand for late supply to be kept up and encouraged, by keeping our shops open, our assistants and ourselves prisoners, in numerous instances, until midnight hours. It is my most confirmed opinion that such a system is entirely unnecessary, and that the public would fully appreciate and fall in with a united early closing movement among the unfortunate "white slaves."

As to indiscriminate Sunday trading, it is a cause of surprise to my mind, that in a professing Christian land, common decency, if not far higher motives, should not prevent respectable, educated men, from so lowering themselves in the eyes of the public. I can fully testify, from ten years' experience, that "where there is a will there is a way," and that the coffers will not suffer through the observance of the command "Remember the Sabbath-day to keep it holy."

I might mention, as a further practical hint, that there will be, in addition to the notice in our windows, as many as 25,000 handbills divided among us for circulation among our customers and over the counter. I subjoin our names.

Trusting that the example may be followed by united action in other parts, until the exceptions become limited to "old women" and "crusty individuals,"

I am, dear Sir, faithfully yours,
EDWIN B. VIZER.

Messrs. BRADLEY AND BOWDEN, 48, Belgrave Road.
" CARRICK AND BEDDARD, Churton Street.
Mr. FRED. J. CHARD, 39, Warwick Street.

Mr. J. DAVIES, Moreton Street.
" JOHN S. FENN, 83, Regent Street.
" WILL. GILLETT, "Surgeon," 77, Vauxhall Bridge Road.
" ALFRED HART, 117, Warwick Street.
" H. KING, 1, Churton Street.
" J. H. KINSEY, 11, Hugh Street West.
" D. J. LEWIS, 13, Upper Tachbrook Street.
" W. W. URWICK, 60, St. George's Road.
" EDWIN B. VIZER, 63, Lupus Street.
" R. WATKINS, Moreton Street.
" T. WELLS, 91, Charlwood Street.
" J. WILSON, Sussex Street.

63, *Lupus Street, Belgravia South, Sept. 19th*, 1866.

BRITISH ASSOCIATION.—NOTTINGHAM.

The thirty-sixth meeting of the British Association commenced on Wednesday, August 22nd. The General Committee Meeting was held at one o'clock, Professor Phillips presided, when the Report of the Council and the Reports of the various Committees were read, and the general business of the Association disposed of. At eight o'clock the theatre was filled with a brilliant assembly, to hear the President's address. Professor Phillips, after a few farewell remarks, introduced his successor, Mr. Grove, Q.C., who proceeded to deliver his address. The following are the officers representing the Chemical Section:—

President—Dr. H. Bence Jones.

Vice-Presidents—Professor Daubeny, H. Debus, Dr. W. A. Miller, Lyon Playfair, J. Stenhouse, A. W. Williamson.

Secretaries—J. H. Atherton, Professor Liveing, W. J. Russell, Joseph White.

Committee—F. A. Abel, J. Attfield, H. Bassett, J. S. Brazier, Dr. Bauer, Crace Calvert, W. Crookes, Dr. John Davy, G. C. Foster, J. H. Gilbert, J. P. Gassiot, J. H. Gladstone, W. E. Heathfield, S. Macadam, T. H. Rowney, H. E. Roscoe, J. Robinson, Peter Spence, Dr. E. Smith, J. Spiller, A. Voelcker.

This Section was held at the School of Art, H. BENCE JONES, Esq., M.D., presiding. In the course of his opening address, the PRESIDENT remarked that, from the foundation of the British Association, in 1831, no practising physician had been President of the Chemical Section. For centuries the union of chemistry and medicine has been at one time admitted and at another disallowed; but in the last half-century the discovery of Dr. Bright has proved that chemistry is absolutely requisite for the detection of a large class of diseases, and that without chemistry the nature of these diseases cannot be understood. When the union of chemistry and medicine is perfect, then science will show us how to keep or to regain the greatest of blessings, health. Among the harvest of new truths of the last year, Dr. Bence Jones noticed Professor Frankland's synthetical researches on ethers, and his researches with Mr. Duppa on the synthesis of acids of the lactic series. The President next alluded to Professor Roscoe's paper 'On the Chemical Intensities of Sunlight,' as the direction in which the chemist looks for the climax of all his synthetical investigations—the discovery of the chemical architecture of substances in the vegetable world.—Dr. Bence Jones then proceeded: "A most remarkable discovery has been made by the Master of the Mint on the absorption and dialytic separation of gases by colloid septa: for example, he finds that mixed gases pass through india-rubber at different rates, proportioned to their powers of liquefaction. The oxygen of atmospheric air passes through rapidly, whilst the nitrogen is comparatively stopped. The importance of this discovery in metallurgy, and its application to the physiology of respiration and of the passage of oxygen from the blood into the textures, must be apparent to all. It seems but a few years ago when we were taught that the animal and vegetable kingdoms were composed of entirely different kinds of substances. Nitrogenous compounds were said to belong to the animal kingdom; and the vegetable kingdom was said to be formed of carbonaceous matters only. First starch, then woody fibre, then colouring matters like indigo, then alkaloids like quinine, were, one after the other, thought to distinguish the vegetable from the animal creation; and each of these substances, or their representatives, have at last been found in animals. At the present time no chemical distinction whatever between vegetables and animals can be made; and, except in the mode in which these different substances are produced in the two kingdoms of nature, no chemical difference exists. Although we are beginning to ask how our present formula for education has arisen, and why it remains almost unchanged whilst all natural knowledge is advancing, and although an entire change in everything except the highest education has taken place, yet public opinion is affected so slowly, and the prejudices of our earliest years fix themselves so firmly in our minds, and the belief we inherit is so strong, that an education far inferior to that which a Greek or a Roman youth, say twenty centuries ago, would have received, is the only education fit to make an English gentleman, that I consider it is of no use, notwithstanding the power which this Association can bring to bear on the public, to occupy your time with the whole of this vast question. But there is an outlying portion of this subject which personally touches each one of us here present. I allude to the present state of education in natural knowledge of that portion of the community who may at any moment be asked to tell any of us here present what mechanical means should be used to lessen or increase the mechanical actions of the body, and what chemical substances should be taken to lessen or increase the different chemical actions within us when they rise or fall to such a degree as to constitute disease. I will, as shortly as possible, put before you the present education of those who practise medicine. The present higher education for the medical profession consists, shortly, in learning reading, writing, and arithmetic in the first ten years of life. In the second ten years, Latin, Greek, some mathematics or divinity, and perhaps some modern language. In the third ten years, physics, chemistry, botany, anatomy, physiology, and medicine, and perhaps surgery. Looking at the final result that is wanted, namely, the attainment of the power of employing the mechanical, chemical, electrical, and other forces of all things around us for increasing or diminishing the mechanical, chemical, and other actions taking place in the different textures of which our bodies are composed, it is quite clear that the second decennial period is passed without our advancing one step towards the object required; and that in the third decennial period the amount to be learnt is very far beyond what is possible to be attained in the time allowed. If we turn to the lower education, in the first eighteen years of life, reading, writing, and arithmetic, and enough Latin to read and write a prescription, constitute the minimum to be acquired. During the next three years, physics, chemistry, botany, anatomy, physiology, and the practice of medicine, surgery, and midwifery, have all to be learnt; and from this crowding it follows that the study of physiology is begun at the same time as the study of physics and chemistry. In other words, the structure and the foundation are commenced at the same time. The top of the house may be almost finished when part of the foundation has not been begun. What chance is there of any one understanding the action of the chemical, mechanical, and electrical forces in the body, until a fundamental knowledge of chemistry, mechanics, and electricity, has been first obtained? What chance has a medical man of regulating the forces in the body by giving or withholding motion, food, or medicine with any reasonable prospect of success, when a preliminary education in these sciences is thought to be of no importance? It seems to me that the only possible way to make the present preliminary education for medical men less suited to the present state of our knowledge, would be to require them to know Hebrew or Arabic instead of Latin, in order that the origin of some of our words might be better understood, or that prescriptions might be written in one or other of these languages. Let me now, for contrast's sake, draw you a picture of a medical education, based upon the smallest amount of classical knowledge, and the greatest amount of natural knowledge which can be obtained. In the first ten or twelve years of life, a first-rate education in the most widely used modern language in the world, English, with writing and arithmetic, might be acquired; and in the next five or ten years a sound basis of knowledge of physics, chemistry, and botany, with German or French, might be obtained; and in the following five years anatomy, physiology and medicine, surgery and midwifery. If every medical man were thoroughly well educated in the English language, and could explain the nature of the disease and the course to be followed in the most idiomatic and unmistakable English, and if he could use all the forces in nature for the cure or relief of his patient, and if he could, from his knowledge of chemistry and physics, and their application to disease and medicine, become the best authority within reach on every question connected with the health and welfare of his neighbours; and if he possessed the power of supervising and directing the druggist in all the analyses and investigations which could be required as to nature and actions of food and medicines and as to the products of disease, surely the position, and power, and agreement of medical men would be very different from that which they now obtain by learning some Latin and less Greek. At present, so far from physicians possessing more knowledge of food and of medicine than any other class of persons in the community, the analytical and pharmaceutical chemists are rapidly increasing in knowledge, which will enable them not only to understand fully the nature and uses of food and medicines, but even to detect the first appearances of a multitude of chemical diseases. Their habits of investigation and their knowledge of the nature of the forces acting in the body will gradually lead them to become advisers in all questions regarding the health of the community, and from this they will, like M. Bouchardat, in Paris, become almost, if not altogether, practitioners of medicine. In confirmation of my opinion of the direction in which the treatment of disease is progressing, I may just refer to the cattle-plague, which in 1745 was treated by Dr. Mortimer, at that time Secretary of the Royal Society, and therefore one of the most scientific physicians in the country, with antimony and bleeding. In 1866, two chemists, Dr. Angus Smith and Mr. Crookes, gave the only useful suggestion for combating the disease, namely, by the arrest or destruction of the poison by chemical agents. There is yet another point of view in which chemists will see the harm that results from our present medical education. The use of Latin in our prescriptions requires that the pharmaceutists should learn at least sufficient Latin to read what we have written. Many errors have arisen, and will arise, from the dispenser being unable to give the directions rightly. To avoid such mistakes, a portion of the time that ought to be given to the attainment of the highest possible amount of chemical acquirement, and a perfect knowledge of the English language, or some foreign language wherein he might learn the discoveries in chemistry and the improvements in pharmacy of other countries, must be devoted to the learning of Latin, in which the physician writes his directions. All our druggists in England ought to be what they are in Germany and in France, chemists capable of any analysis that might be required of them, and able to satisfy themselves and the medical men that the substances they sell are what they profess to be—pure, unadulterated chemical compounds. No one of my hearers in this Section will consider five years a long time for the acquirement of such knowledge; and until the pharmaceutists all obtain this education, medicine will be subject to a great cause of uncertainty in the variations in the quality and quantity of the different substances which, under the same name, are obtained from different druggists. Before I conclude, I must apologize to some in this Section who may think that this subject is of no interest to them, by reminding them that none but chemists can judge what the worth of chemical education really is; and I am sure that no body of scientific men exists who are so fitted to judge of the necessity of an education in natural knowledge for those who employ the forces around us to regulate the forces within us, as the Chemical Section of the British Association. Last year Professor Miller said, 'It behoves all who are themselves engaged in the pursuit of science to consider in what way they can themselves aid in forwarding the cultivation of natural knowledge.' I ask you, for the good of science, and for your own good, to exert your influence in the first place, and more especially to effect a change in the preliminary education of all those who intend to practise medicine; so that leaving Greek and Latin to be the ornaments and exceptions in their education, they may have time to obtain the best possible knowledge of the chemical and physical forces with which they have to deal. I urge this because of my conviction that whenever the most perfect knowledge of chemistry and physics becomes the basis of rational medicine, then, and not till then, medicine will obtain the highest place among all the arts that minister to the welfare and happiness of man."

AN ACT FOR THE AMENDMENT OF THE LAW WITH RESPECT TO THE CARRIAGE AND DEPOSIT OF DANGEROUS GOODS. (Aug. 6, 1866.)

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 the authority of the same, as follows:—

1. The goods or article commonly known as nitro-glycerine or glonoine oil shall be deemed to be specially dangerous within the meaning of this Act.

2. Her Majesty may from time to time, by order in Council, declare that any goods named in any such order (other than nitro-glycerine or glonoine oil) are to be deemed specially dangerous within the meaning of this Act; and may from time to time amend or repeal any such order; and any goods which are by any such order declared to be specially dangerous shall, so long as such order is in force, he deemed to be specially dangerous within the meaning of this Act.

3. No person shall deliver any goods which are specially dangerous to any warehouse owner or carrier, or send or carry or cause to be sent or carried any such goods upon any railway or in any ship to or from any part of the United Kingdom, or in any other public conveyance, or deposit any such goods in or on any warehouse or quay, unless the true name or description of such goods, with the addition of the words specially dangerous, is distinctly written, printed, or marked on the outside of the package, nor in the case of delivery to or deposit with any warehouse owner or carrier, without also giving notice in writing to him of the name or description of such goods, and of their being specially dangerous. And any person who commits a breach of this enactment shall be liable to a penalty not exceeding five hundred pounds, or at the discretion of the court to imprisonment, with or without hard labour, for any term not exceeding two years.

4. Provided always, as follows:—

(1) Any person convicted of a breach of the last foregoing enactment shall not be liable to imprisonment, or to a penalty of more than two hundred pounds, if he shows to the satisfaction of the court and jury before whom he is convicted that he did not know the nature of the goods to which the indictment relates:

(2) Any person accused of having committed a breach of the said enactment shall not be liable to be convicted thereof if he shows to the satisfaction of the court and jury before whom he is tried that he did not know the nature of the goods to which the indictment relates, and that he could not, with reasonable diligence, have obtained such knowledge.

5. Where goods are delivered, sent, carried, or deposited in contravention of the said enactment the same shall be forfeited, and shall be disposed of in such manner as the Commissioners of her Majesty's Treasury or (in case of importation) the Commissioners of Customs direct, whether any person is liable to be convicted of a breach of the said enactment or not.

6. No warehouse owner or carrier shall be bound to receive or carry any goods which are specially dangerous.

7. In construing this Act the term warehouse owner shall include all persons or bodies of persons owning or managing any warehouse, store, quay, or other premises in which goods are deposited; and the word carrier shall include all persons or bodies of persons carrying goods or passengers for hire by land or water.

8. The Act of the session of the twenty-fifth and twenty-sixth years of her Majesty's reign, chapter sixty-six, "for the safe keeping of petroleum," is hereby extended and applied to nitro-glycerine, and that Act shall be read and have effect as if throughout its provisions nitro-glycerine had been mentioned in addition to petroleum; save that so much of the said Act as specifies the maximum quantity of petroleum to be kept as therein mentioned without a licence shall not apply in the case of nitro-glycerine, and any quantity whatever of nitro-glycerine shall be deemed to be subject to the provisions of the said Act.

9. The said Act of the session of the twenty-fifth and twenty-sixth years of her Majesty's reign is also hereby extended and applied to any substance for the time being declared by any Order in Council under this Act to be specially dangerous, and that Act shall be read and have effect as if throughout its provisions the substance to which such Order in Council relates had been mentioned in addition to petroleum; save that the quantity of such substance which it shall not be lawful to keep as in the said Act men-

tioned without a licence shall, instead of the quantity specified in relation to petroleum in the said Act, be such quantity as is specified in that behalf in relation to any such substance in any such Order in Council.

10. This Act may be cited as The Carriage and Deposit of Dangerous Goods Act, 1866.

CARRIERS AND CHEMICALS.

CHARLES RUMSEY AND CO. *v.* FARDELL.

This was an action tried at the City Sheriffs' Court, before Mr. Commissioner Kerr, in which the plaintiffs sought to recover the value of a carboy of acetic acid, which had been broken in transit; plaintiffs being manufacturing chemists, of 120, Aldersgate Street, and defendant a carrier, of 40, Gresham Street. Mr. Rumsey said he should be able to prove to the court that acetic acid had been sent to him by another firm in perfect good order. It did not reach its destination in safety, and witness contended that defendant was liable for the damage that had occurred. Mr. Fardell entirely denied his liability, and contended that the carboy must have been cracked or starred before it was delivered to him. He had to unload the carboy, and while he was about the work he heard a noise like the explosion of a bottle of champagne, or some effervescing liquor. He lifted the carboy down, and immediately the acetic acid ran out. It was a wonder it had not spoilt a large quantity of valuable goods. His Honour: "Acetic acid does not explode; it is perfectly harmless." Mr. Rumsey: "Of course it is." Defendant: "I admit that acetic acid is not explosive, but I wish to point out that the carboy must have been starred before it reached me." Mr. Rumsey: "That is certainly not the case, and I have a witness here who will state that the carboy was carefully packed and sent out in good order." His Honour, while listening to the evidence, carefully looked over his law books, and at last came to one entitled 'Smith's Mercantile Law, Dowdeswell, sixth edition.' He appeared to be much struck with one portion of this volume, and said: "Mr. Fardell, listen to me for one moment. The law, as I find it and as I must enforce it, is thus laid down: At common law he (the carrier) stands in the situation of an insurer of the property entrusted to him, and he is answerable for any loss or damage happening to it while in his custody, no matter by what cause occasioned, unless it were by the act of God, such as a tempest, or the Queen's enemies. In other cases, even his (the carrier's) entire faultlessness does not excuse him; thus he is liable for damages done by accidental fire or by robbery." Mr. Rumsey seemed rather surprised at this piece of law in his favour, and Mr. Fardell asked the judge if he would not hear a witness whom he could call. His Honour: "What is the use of my hearing your witness when the law is so clear? No doubt the case is a hard one so far as you are concerned, but the law is clear and defined. Plaintiff must have a verdict for the full amount claimed." It may here be remarked that the *dicta* as laid down in Smith's 'Mercantile Law' were fully borne out by the reference notes. Each point was alluded to in quoted cases, and in one portion even strengthened by the opinions of the judges sitting *in banco* in reference to carriers' law. The chemists and druggists must admit that this ruling is of the very highest importance to them, and touches their trade most nearly.—*Chemist and Druggist.*

MISCELLANEA.

Accidental Poisoning by Laudanum.—An inquest has been held by Mr. Bedford, in St. James's Workhouse, on Henry C. T. Webb, of Little Windmill Street, who died from the effects of a large dose of laudanum, given by mistake for cough mixture. The laudanum had been used by the father of the deceased for poultices to relieve rheumatism, and the servant had placed that bottle beside the cough mixture, where the mother had put it in case of need during the night. The child coughed excessively, and the mother, taking the bottle supposed to contain the mixture, administered a teaspoonful of laudanum. Medical aid was called in immediately the mistake was discovered, but without success. Verdict, "Accidental death."

Poisoning by Nitro-glycerine.—The following case is recorded in the 'Times' of July 31. At Woolwich, a man named Daniel O'Leary, employed by Messrs. Kirk, the contractors, was engaged at the proof butt in the Royal Arsenal; perceiving, among the stores there, a white bottle containing some light-coloured liquid, he applied it to his nose to ascertain the nature of its contents, and, exclaiming "Whisky," drank off a portion of it. He was instantly seized with great pain, and his body became suffused with a dark blue tinge. His companions lost no time in conveying him to the surgery of Mr. Allinson, medical officer to the local Board of Health, whose impression, amid the imperfect evidence given by the men, was, that it was a case of cholera, and he administered the usual remedies for that disease. The men, fearful of injury to themselves, had foolishly cast away the remainder of the contents. The bottle on being handed over to the chemical department of the Arsenal was recognised as having contained about half an ounce of nitro-glycerine used in experimental shell firing. It had been negligently left at the butt after an experiment a few days previously. The unfortunate man only survived a few hours.

Fatal Explosion of Naphtha.—An explosion of naphtha occurred at Bolton, on Wednesday, July 25th, which occasioned the death of four persons. Mr. Alfred Langshaw, chemist and druggist, Deansgate, to prevent accidents had constructed a wooden shed in the yard behind his shop, in which he placed naphtha. On Wednesday he received two casks containing naphtha, and was engaged in removing it to the store in the yard, when an explosion took place. Mr. Langshaw had emptied the first barrel by running it into a can, and then, by means of a pipe, sending it into a stone cask. For some purpose, which cannot now be ascertained, Mr. Langshaw left the naphtha running into the can, and went into his shop. A woman who saw the naphtha running over the can into the gutter went for Mr. Langshaw, who, when he got into the entry, found the naphtha burning. He rushed forward and tried to stop the hole, when the explosion took place, which caused his death and set fire to an adjoining cottage, in which an infirm old man and his wife perished. The naphtha covered the cottages in the yard, and the first one, in which John Spencer and his wife resided, and the door of which was open, was instantly in a blaze. A messenger was dispatched for the fire brigade. It is supposed that the vapour of the naphtha became ignited by coming in contact with the fire in the cottage. When the fire was subdued, the remains of Mr. Langshaw were found, but there was nothing to identify him but his watch and a pocket-knife, his clothes being completely consumed. John Spencer and his wife were also found in the house dead. The woman who went for Mr. Langshaw had her clothes set on fire; and a painter, named William Cross, who attempted to extinguish the flames, was so seriously burnt that he died in the night. Several other persons who went to render assistance were also much burnt.

Asbestos.—A correspondent of an Australian paper, the *Orange Guardian*, writes as follows:—"Some 22 years ago I recognized the asbestos, or amicanthus rock, in this district, and since then I have from time to time exposed portions of the stone to atmospheric influence, and the result has always been a perfect change of the stone into asbestos, or into a substance closely resembling the finest staple of wool, only something stronger, and, if possible, whiter in appearance. I have sometimes obtained it 6 inches in length, have combed it out, and found it as soft and pliant as any silk. This substance, as no doubt you are aware, is inconsumable by fire. The stone may be brought into the state of asbestos in a very short time. I have been employed sinking a well of late, and some days I got as much of this mineral as would make a suit of clothes. I can show the stone here in all its stages, from stone itself to the asbestos state. Should asbestos ever come into general use, it will, in some measure no doubt, from its incombustible nature, supersede the evils of crinoline. Besides this great advantage, it will also set aside the vexatious expense and use of soap and water, for all a lady will have to do when she unrobes herself will be to pitch her articles of apparel into a glowing fire, and when they have become as white as a snowflake she may resume them at her pleasure. Perhaps you may deem some parts of the foregoing rather extravagant; but, nevertheless, I really believe that by proper appliances the amicanthus may yet become a source of revenue, and I therefore recommend the thing to your attention.

BOOKS RECEIVED.

The Wholesale and Retail Druggists' Price Book. Compiled by D. Elliott. H. Silverlock, Wardrobe Terrace, Doctors' Commons. 1866. (From the Author.)

Annual Report of the Surgeon-General, United States Army, 1865.

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.

"*Ignatius.*"—In making Incense according to the formula referred to, the only difficulty would be with the "onycha," which is supposed to be the odoriferous shell of the onyx-fish. The other ingredients are "stacte" (myrrh), galbanum, and frankincense. We doubt whether it would, at the present day, be considered very fragrant.

"*Juvenis*" (Norwich).—Holbyn's 'Dictionary of Terms used in Medicine,' and Henry's 'Glossary of Scientific Terms.'

W. E.—We do not know the composition of "Casbey's Disinfecting Fluid." "Condy's Green Fluid" is a solution of Permanganate of Soda.

A. P. S. (Bury St. Edmunds).—(1) A species of Lycium, belonging to the Natural Order *Solanaceæ*. (2) This could only be ascertained by a chemical examination of the liquid. (3) The writing is so indistinct that we are unable to read it. (4) We cannot give the information.

T. M. (Horncastle).—(1) See lecture by Dr. Hofmann on this subject, Pharm. Journ. vol. iv. (2nd series), pp. 321 and 415. (2) 'Report on the Industry of Manures,' Pharm. Journ. vol. vi. (2nd series), pp. 83 and 123, will give the necessary information.

Apprentice (St. Albans).—Fownes' 'Manual of Chemistry,' and Bentley's 'Manual of Botany.'

J. H. (Macclesfield).—The bark is derived from *Quillaia saponaria*, a plant of the Natural Order *Rosaceæ*. It has been used in some parts of America as a substitute for soap, and in this country as a detergent in scurviness and baldness of the head. Bentley's 'Manual of Botany,' p. 536.

C. N.—The wood of *Cæsalpinia Sappan*. It is used in India as an astringent and tonic, being closely allied in its action to Logwood. We know nothing of its value as a remedy in neuralgia.

J. B. S. (Bromley).—*The use of Methylated Spirit in medicine.*—See page 49, also page 256 of our present number.

W. X. M. (Plymouth).—*Quinine Wine.*—See vol. vii. (2nd series), page 384.

T. Z. (Westbury).—(1) Several forms for the preparation will be found in Beasley's 'Pocket Formulary.' (2) Pepsine pills are best made by means of glycerine. (3) By reduction of the oxide of mercury.

Wanted, January, February, and April numbers of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. V.—NOVEMBER, 1866.

EARLY CLOSING.

Of all the subjects introduced in Mr. Ince's excellent paper on Pharmaceutical Ethics, not one, perhaps, attracted more immediate attention than his remarks on the relations subsisting between teachers and apprentices, masters and assistants. It was clearly his duty to impress on both parties the mutuality of their contracts, a mutuality extending far beyond what may be called the "letter of the bond," embracing their moral duties to each other, over and above their legal obligations. That the same spirit should animate the whole tenor of his remarks was, of course, to be expected from the very title of his paper, and that it did will readily be granted by all who have perused, as well as all who heard it. But there is generally some question uppermost in the public mind, which brings one part of a discourse into greater prominence than the rest. At this time the qualification or education of future pharmaceutists, the opportunities to be given to apprentices for study, and assistants either for study or relaxation, as they may wisely apportion them, happen to be engrossing much attention; therefore, various speakers were led to offer opinions on these points on the instant, although, we trust, the many valuable remarks offered by Mr. Ince on other principles of pharmaceutical morality, were impressed on them no less deeply, and will bear fruit no less certainly.

We are free to confess, that the mutualities between masters and apprentices have often been very imperfectly performed, perhaps on both sides, but the latter may be expected to take their tone from the former. Many masters, in taking apprentices, have looked too much to the premium paid by, and the manual labour to be performed by them; too little to the preliminary education necessary for entering on a scientific business, and scarcely at all to the special instruction which it is their duty as teachers to inculcate. But, we trust, matters are improving on these points, as surely they must, unless chemists, who should be the most professional of tradesmen, are content to lag behind in the general progress of society. We believe, most apprentices are now better instructed in "the arts and mysteries" than they were twenty years ago, although they may be employed (not unprofitably to themselves) in *dusting bottles* and keeping the every-day apparatus of the shop in decent order. The growing conviction that a time is approaching when a man will be compelled to prove his qualification before entering on the important practice of pharmacy, drives apprentices, in greater proportion year by year, to register under the Pharmacy Act, and necessarily to submit themselves to the preliminary examination. Masters give them the opportunity to obtain, even if they themselves do not impart it, such knowledge of drugs and chemicals, and the operations of the laboratory, as can be had from books, or from lectures where good fortune has placed such advantages within reach.

It may seem but the reiteration of a truism to dwell on the duties of masters and apprentices. A. and B. have signed articles, giving pledges each to other of instruction and diligence,—pledges so distinct, that however much they may be disregarded in practice, they are never denied in theory. Doubtless Mr. Ince had another, and perhaps a higher, object in introducing the subject. It is the tendency of such gatherings as the meeting at Nottingham, to rouse men to a sense of their position as members of the body politic, to show in what way their private conduct may influence the public weal; the paper on Pharmaceutical Ethics might fitly have been read a week or two later at the Social Science Congress, for it treats on a question of interest to the whole community. If A. and B. defraud each other in the execution of their agreement, the law is open for the redress of private wrong, but no tribunal, save that of public opinion, has authority over a master who agrees, and then neglects to educate a youth for the important business of dispensing, sending him forth, as it were, at the end of his term, like a bottle of poison wrongly labelled. In that a grievous wrong is done to the public, who take a service of apprenticeship as a *primâ facie* evidence of qualification, and a vast injury accrues to the whole body of pharmaceutists, who suffer, as a class, for the shortcomings of individual members.

We claim for this Journal the right to promote the proper education of apprentices in every possible way; nay, we hold it to be our duty, alike to the preceptor, the pupil, and the public, to do so,—the right and the duty belong to the Pharmaceutical Society. The second branch of the subject which attracted so much attention in Mr. Ince's paper, is of a somewhat different character, and is, indeed, one on which the Society can take no action. Private arrangements for carrying on trade have ever been carefully excluded from our consideration as a corporate body; they were marked "dangerous" by the wise founders of our institution, and the same notice-board remains to warn us at the present day. Not that the same spirit of repulsion exists, or could be easily evoked among pharmaceutists now, as was in full force a quarter of a century ago; they have been brought together, led to act in concert, and imbued with some of those high moral excellences on which Mr. Ince discourses so instructively. They can distinguish now between those general principles which should animate all, and private arrangements which must ever be made by each man, according to the nature and necessities of his business.

Now the hours of application to the wants of customers will be at once recognized as a question to be governed by both general principles and private requirements. As a general question, we cannot fail to observe that from the highest to the lowest occupations in this country, there has of late years been a growing disposition to curtail the hours of labour. Public officials, merchants, bankers, wholesale and retail traders, mechanics, and indeed all occupied in business are alike bent on that object. Circumstances beyond the mere desire of the employed to be free, have arisen to favour the movement. First, perhaps the desire for mental improvement, stimulated and assisted by the institution of various means and opportunities for adult education. Secondly, the means of locomotion, at the disposal alike of those who seek health and the mere lovers of rural scenery or pursuits. Lastly, we believe the great volunteer movement, which, arising as it seemed in a national necessity, fixed itself firmly in the favour of all classes,—the press using its powerful voice to induce young men to enrol themselves, and employers to give the necessary time, until at last we find meetings held in the most aristocratic of London mansions to aid the trading classes in the "early closing" movement. The causes we have mentioned may no longer be recognized; mechanics' institutes may be neglected; volunteers, saving the "crack shots" who aspire to Wimbledon honours, may have cooled in their military ardour, or calmed in their dread of invasion, but the effect remains, and the cry for early closing has settled into a national voice. Can it be wondered at, then, that chemists whose hours of toil have, in obedience to the wants of suffering humanity, been extended far beyond the average of other trades, should ask, like their neighbours, for some improvement? We think not; and we think that if *employers* and *employés* will but work together in the spirit suggested by Mr. Ince, a great amelioration may be accomplished,—a benefit to both parties. It would be absurd to suppose that all houses of business, north, south, east, and west, can be closed at the same time. The very liberation of men from one district sends them home to another, to think on their own ailments and supply their own wants.

There are other phases of the early closing question which have troubled, and always will be a source of anxiety to some of the best and kindest masters in the drug trade. As a rule, chemists' assistants hold a better position in the families of their employers than do the assistants, or "shopmen" as they are called, in other trades. They must be an educated class, and, in nine cases out of ten, their sojourn in an establishment is but a period of practical education. It follows then, that if their leisure time be increased, the question will naturally arise (and for their benefit be it remembered) in the minds of their employers, "*What use will be made of that time?*"

They, of all others, require opportunities for scientific research. Will they avail themselves of the opportunities provided? Will the Library take its turn with the popular amusements of the day; or will music and dancing engross all their time, and a good deal of their money?

These are important questions, and we have some reason for asking them. We admit at once that assistants are "men grown," supposed to be capable of controlling their own actions; but we have heard it said by persons, in the best possible position to judge, that in certain houses which were formerly kept open until eleven, there was then more scientific reading, more research, more thirst after knowledge, than are to be found now when a couple of hours have been cut away from the period of business. We cannot forget, too, that when the first effort was made by principals to give leisure to their assistants, the Library of the Pharmaceutical Society was lighted, warmed, and kept open until ten o'clock, but, alas, no visitors ever entered it.

On the other hand, the success of the evening classes instituted by the London colleges is a fact pregnant with encouragement to masters and example to assistants. They were established expressly to give opportunities to young men, liberated early from the office, the bank, or the warehouse, to obtain such an education as would improve them for their own, or fit them for any higher walk in life; and marvellously have they succeeded,—not only in the number of the pupils drawn to them, but in the sound character of the education imparted. The roll of Graduates in the University of London bears the names of many worthies who have to thank these classes for their position.

We commend these matters alike to all parties concerned,—the masters, who may fear they are making a sacrifice of their customers, and the assistants, for whom that sacrifice would be made. Let them both feel that their interests are mutual; but, above all, let the latter remember that in taking every occasion to prosecute their studies, although the immediate benefit may accrue to their employers, a much greater and more lasting advantage would be secured for themselves.

TWENTY-FIVE YEARS AGO.

Sometimes we gain time by standing still; in the career of a society, as in that of an individual, there is occasionally a positive advantage in taking a retrospect of past trials and successes, in order to be better prepared for the emergencies of the future. Five-and-twenty years ago the Pharmaceutical Society was established; the results are now before the world, of which the practical details are chronicled in a recent publication called the Calendar. This little pamphlet, issued under the authority of the Council, contains a short but sufficient statement of official arrangements, and various lists, including those of Council, Committees, Local Secretaries, Honorary and Corresponding Members, Officers, and Professors; together with all such information as may be likely to prove of use or interest to the pharmaceutist. It is needless to draw attention to its separate paragraphs, though we may be allowed to advert with unfeigned pleasure to the sessional prizes and certificates. Full particulars are given with regard to the award of these honourable distinctions, whose real value consists in their being the symbol of recognition of patient and successful study.

The Society has done itself no slight honour in paying a tribute of respect to one whose name, according to the grand old university phrase, *cui nomen in hâc Universitate semper est in honorem*, is ever entitled to be remembered with respect. No one certainly is more entitled to be held in perpetual reverence amongst us than the late Jonathan Pereira; and rightly therefore a medal is granted in his honour. The day, we hope, will come when they will form but one of the series of special rewards the Society may have to offer.

We feel some difficulty in so frequently alluding to the late Jacob Bell. Here, at least, his services must be gratefully recorded. Such a record exists in the two Memorial Scholarships that were founded in connection with the Laboratory, for which we are indebted to his wise munificence. We say *wise* advisedly, for that is the truest wisdom which seeks to establish pharmacy on the basis of sound learning; all other plans must fail, having no vital element of success. One day, not possibly so very distant, we hope to see on the title-page of a future Pharmacopœia, the same inscription as that which now adorns the Paris Codex (1866):—"Edited under Official Sanction; the Editorial Commission being composed of the Professors of the Faculty of Medicine and of the High School of Pharmacy at Paris; of Members of the Imperial Academy of Medicine, and of the Pharmaceutical Society of Paris." This is as it should be. There can be no antagonism between pharmacy and medicine, if the teaching of our Society obtains, and the requisite qualification exists on our part. The trade (in its highest sense) must supplement the profession; and just in proportion as we elevate our standard, the two will walk hand in hand together.

To what extent this higher tone exists we may refer the reader to the remarks of Mr. Edwards, made at the opening of the session. The few but pregnant words of that gentleman were characterized by the grace and exquisite finish with which we are happily so familiar. We commend his admirable observations to every Pharmaceutical student.

"You wish, no doubt," (he remarks,) "that your character, as chemists, should give you a higher position in society, and raise you in public estimation above mere traders. Show yourselves men of education and sound knowledge, and you will be likely to attain it; there will be that silent growth of respect in the public mind which will bring it to you more surely than any legislative enactment."

True, it has been objected as an argument against our present organization that our numbers are comparatively small. Mere numbers go for nothing, nor can we expect aught else but to be numerically in the minority, so long as the angel of examination stands with a drawn sword to guard the entrance.

The grains of sand on the sea-shore are proverbially numerous, but their multitude would scarcely be quoted as an illustration of united strength. We sympathize most cordially with the instructions of this address, as much as we envy its facile charm of expression.

One word more, and we have done. A sense of extreme gratification compels us not to pass over unnoticed the present healthy and vigorous condition of the Benevolent Fund. For some years this charitable Institution appeared to be either languishing or unformed; of late it has acquired ampler and more satisfactory proportions. All hearts must wish its prosperity to be annually on the increase. Most fortunate is it that its management is in the hands of those whose benevolence is only equalled by their financial skill. The entire working of the scheme reflects unquestionable honour as well on the Society at large as on those who are answerable for its direction.

Looking back on these last five-and-twenty years, we may conclude that, while there remains full scope for future exertion, there is solid ground for congratulation for the past, and, at least for the encouragement of our members, we may borrow a sentence from Carlyle, and say, "We bid you be of hope."

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 3*rd October*, 1866,

Present—Messrs. Bottle, Brady, Carteighe, Edwards, Hills, Ince, Morson, Orridge, Savage, and Standring,

The following were elected—

MEMBERS.

Browne, Henry Robert ....Eastbourne.
Jones, Robert William ....London.
Stevens, Henry William ....London.

William Quinton Dutton, late at Twickenham, was restored to Membership.

BENEVOLENT FUND.

Two grants of £15 each were made to a Member, and to the widow of a late Member residing in London.

EXAMINATION, 10*th October*, 1866.

Registered as Pharmaceutical Chemists.

Heald, Benjamin...Sleaford.
Price, William ....Birmingham.
Skinner, Thomas...Cirencester.
Wallwork, Joseph ....Tyldesley.

EXAMINATION, *17th October*, 1866.

MAJOR (Registered as Pharmaceutical Chemists).

Jones, Rowland Pritchard	Llanrwst.
*Martindale, William	Carlisle.
Pratt, Joseph	Stratford-on-Avon.
*Wilson, John Henry	Driffield.

MINOR (Registered as Assistants).

Armitage, Edmund Hewson	Louth.
Brown, Joseph Frederick	Frome.
Buckett, Alfred Henry	Neath.
Butterworth, John	London.
Dawson, William Powell	Horncastle.
Moore, George James	Bristol.
Prockter, Alfred Edgcumbe	Oakham.
Ross, Lewis Buttle	Driffield.
Smith, Henry	Burnley.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Cole, Frederick	Mr. Howell	London.
Constance, Herbert Edward	Mr. Constance	London.
Durham, Frederick William	Mr. Rubbra	Greenwich.
Ekins, Charles	Messrs. Battle and Maltby	Lincoln.
Fox, Charles James	Mr. Fox	Witney.
Gittings, Joseph Henry	Mr. Bache	Pensnett.
Goulden, Henry James	Mr. Smith	Walworth.
Hall, Frank Algernon	Mr. Prosser	Colchester.
Harwood, Henry Thomas	Messrs. Manning and Son	Yeovil.
Herring, George Albert	Messrs. Herrings and Co.	London.
Jackson, John Pim	Messrs. Harvey and Reynolds	Leeds.
Josling, Alfred	Mr. Humphreys	Chelmsford.
Part, Edward James	Mr. Thornton	Dover.
Redpath, William	Mr. Ord	Brixton.
Roberts, Moody John	Mr. Robinson	Leeds.
Robeson, Charles Brunting	Mr. Smith	Walworth.
Spencer, Job	Mr. Parkes	Atherstone.
Thomas, John Darby Dermott	Mr. Keevill	Clifton.
Treharne, John Llewellyn	Mr. Mitchell	Bristol.
Wonfor, Herbert	Mr. Dowman	Southampton.

BENEVOLENT FUND.

A meeting of the Society, in accordance with notice given, was held on Friday, 19th October, for the purpose of electing two Annuitants on this Fund, each to receive Thirty pounds; Mr. Sandford, President, in the chair.

The following were appointed scrutineers:—Messrs. T. N. R. Morson, Robert Palmer, James Burgoyne, B. B. Orridge, and Dr. Attfield.

After receiving their report, the Chairman declared that William Jacobs Froom and Thomas Novis were duly elected.

* Passed in Honours; eligible to compete, at the end of the Session, for the Bronze Pereira Medal.

SUBSCRIPTIONS RECEIVED DURING OCTOBER:—

LONDON.

	£	s.	d.
Cracknell, Chas., 107, Edgware Road, W.	2	2	0
Jackson, John, 83, Southampton Row, W.C.	1	1	0
Stevenson, Wm. L., 81, Connaught Terrace, W.	1	1	0
Waugh, Alexander, 177, Regent Street, W.	0	10	6

COUNTRY.

	£	s.	d.
Axbridge, Hallam, Edward	0	10	6
Bristol, Ackerman, Theophilus	1	1	0
Chatham, Tribe, John	0	10	6
Sidmouth, Chessall, Rowland	0	10	6
Swansea, Pearson, Chas. James	0	10	0
Tenterden, Willsher, Stephen H.	0	10	6

DONATIONS.

	£	s.	d.
Allen, George, Ampthill	£5	5	0
Hughes, John, and Friends, York Glass Co., 3, West Street, Finsbury Circus, E.C.	15	15	0
Hunt, Richard, Winchester	5	5	0

PHARMACEUTICAL MEETING.

Wednesday, October 3rd, 1866.

MR. THOMAS HYDE HILLS, 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:—

British Journal of Dental Science,—Chemical News,—Chemist and Druggist,—Dental Review,—Photographic Journal,—Technologist,—L'Union Pharmaceutique,—Watts's Dictionary of Chemistry,—Revista Farmacéutica: from the Editors. Journal of the Linnean Society,—Journal of the Chemical Society,—Journal of the Society of Actuaries,—Journal of the Society of Arts,—Proceedings of the Royal Medical and Chirurgical Society of London,—Proceedings of the Literary and Philosophical Society of Manchester,—Memoirs of the Literary and Philosophical Society of Manchester,—Bulletin de la Société Botanique de France: from the respective Societies. Proceedings of the Royal Institution,—Annual Report of the Board of Regents of the Smithsonian Institution for 1864: from the respective Institutions. Proceedings of the American Pharmaceutical Association for 1865: from the Association. Bulletin of the United States Sanitary Commission, 1863-65,—Documents of United States Sanitary Commission: from the Commission.

The CHAIRMAN said the next business would be a pleasing one to all parties, namely that of presenting to the successful competitors the prizes and certificates of merit awarded at the conclusion of the last session of their school. He begged to call upon the Professors to report the results of the examinations in their several classes.

CHEMISTRY AND PHARMACY.

Professor REDWOOD reported the results of the examination in Chemistry and Pharmacy, and in doing so he said he could speak in very favourable terms of the conduct of the class. Their attendance at the lectures had been regular and punctual, their behaviour in the lecture-room had been exemplary, and the progress they had made in their studies, as indicated by the results of the examination, was quite satisfactory. It had sometimes happened that the examinations indicated a great disparity in the proficiency of the students, the highest honours being awarded to those who were enabled greatly to outstrip their competitors; but it is perhaps more to be desired that there should be evidence of general good progress than that a star of great magnitude should lessen the apparent merits of less favoured luminaries. On the present occasion, of the seven competitors for distinction in the class, he could not say that any one was discredited by the position he had taken, and the one who stood first had taken a very good position, having obtained 87 marks out of 100. He had great satisfaction in announcing the following as the awards made by the Council to the successful competitors:—

COUNCIL MEDAL..............John James Thorn.
CERTIFICATE OF HONOUR...Walter Henry Smith.
CERTIFICATES OF MERIT { James Deane. / Robert Yates.

The following were the Questions for Examination in Chemistry and Pharmacy:—

1. What is the specific gravity of a liquid a fluid ounce of which weighs 510 grains?
2. Describe the theories of heat that have been generally received, and especially that which is known as the dynamical theory.
3. What is the latent heat of water, and of steam at 212° Fahr.?
4. Describe sulphur, its sources, methods of purification, properties, allotropic conditions, and some of its principal combinations.
5. From what source is Bromine generally derived, and how is it obtained?
6. Describe marsh gas and olefiant gas, processes by which they may be produced, their properties, and some of their combinations.

BOTANY AND MATERIA MEDICA.

Professor BENTLEY said that his report on the general good conduct and attention of the students in the Class of Materia Medica and Botany was, as usual, a most satisfactory one; indeed, he might say his was a model class, and, if any one doubted this, he would ask him to come some morning to the lecture and judge for himself, for he felt sure that so quiet and attentive would the students be found, that no sound would be heard, except the voice of the lecturer. Professor Bentley stated that he could not only speak favourably of the conduct, but also of the progress of the students. Every one also who took an interest in the education of Pharmaceutical students, would be glad to know that the number of students in attendance showed a steady progressive increase during the last three years; thus, in the Class of Botany and Materia Medica, in the Session of 1863–64, there were 65 students; in 1864–65, 73; and in the last year, 85. This was a striking fact, and showed in a remarkable manner the desire that now existed throughout the country amongst apprentices and assistants for a scientific training. At the Terminal Prize Examination three of the candidates had much distinguished themselves, not only in the written examination, but also by their practical acquaintance with medical and other plants in the *vivâ voce* examination. Such men he (Professor Bentley) felt sure would in future years reflect honour on the school in which they had been educated.

The questions for the written examinations were as follows.—

1. Describe the general properties and structure of the cell-membrane or cell-wall.
2. Describe the internal structure and external appearance of an acotyledonous or acrogenous stem.

3. Define the following:—stoma, hair, gland, prickle, spine, vitta, bulb, corm, tuber, rhizome, tubercule, and stipule.
4. Explain the meaning of the terms indeterminate and determinate, as applied to the inflorescence of plants. Define a spike, amentum, corymb, capitulum, cyme, and fascicle.
5. Mention the botanical and geographical source of Guaiac resin. Describe how it is obtained, its physical and chemical characteristics, and the means of detecting it when employed to adulterate Scammony.
6. What are the characters of the Alexandrian and Tinnivelly kinds of Senna? Mention their botanical and geographical sources, the substances usually employed to adulterate them, and the means of detecting such adulterations.
7. What is Saffron, and what is its botanical and geographical source? Describe the mode in which it is obtained and prepared for use, its physical characters, the substances used to adulterate it, and the means of detecting such adulterations.
8. Enumerate the officinal plants of the Leguminosæ, and mention the parts or products of each which are directed to be employed in the Materia Medica of the British Pharmacopœia.
9. Give the essential characters of the following Natural Orders:—Caryophyllaceæ, Papaveraceæ, Scrophulariaceæ, Compositæ, Amentaceæ, 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 medical and economical properties, and to describe any peculiarity they might present worthy of notice:—

Aconitum Napellus—Sinapis alba—Sinapis nigra—Raphanus sativus—Althæa officinalis—Chærophyllum temulentum—Coriandrum sativum—Fœniculum dulce—Conium maculatum—Ecbalium officinarum—Inula Helenium—Pyrethrum Parthenium—Tanacetum vulgare — Anthemis nobilis—Hyoscyamus niger—Atropa Belladonna—Datura Stramonium—Nicotiana Tabacum—Solanum nigrum—Solanum Dulcamara—Solanum Dulcamara, var. alba—Villarsia Nymphæoides—Borago officinalis—Symphytum officinale—Anchusa tinctoria—Origanum vulgare—Ricinus communis—Cannabis sativa—Funkia ovata—Crinum capense.

The medal and certificates were awarded as follows:

Medal..............................Alfred Richard Hall.

Certificates of Honour... { John James Thorn. / Robert Yates.

PRACTICAL CHEMISTRY.

Dr. Attfield said that the highest praise he could give to his students of the session just ended was, that, in general attainments and conduct, they had fully equalled the students of any previous session during his directorship. It was always a pleasure to him to teach chemistry to pharmaceutical students, irrespective of his own predilection for pharmaceutical chemistry; for even if they had never looked into a chemical book, and not otherwise been thrown much in the way of chemistry, their associations at the counter had, at least, taught them the names, uses, and relative values of all ordinary chemicals, and, what was perhaps of still greater importance, had given them habits of industry, neatness, and application. These were qualifications not always possessed by other classes of students, but formed such an excellent foundation on which to build a knowledge of chemistry, that it was a real pleasure to impart chemical instruction to any one who possessed them. The students of the past session had fully risen to his expectations in this respect. Then the number of students had been larger, the yearly increase having culminated in a class fifty per cent. greater than that of the first year in which he was Director. The attendance and general assiduity had also been good. One gentleman had exhibited such praiseworthy zeal in coming up to the school, that the case was deserving of record. An apprentice in Lincolnshire, he had denied himself the pleasure of a fortnight's annual holiday in 1864, in order that in 1865 he might put the two fortnights together, and spend a month in the Laboratory.

The questions proposed for the prize examination at the end of the term 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 result.
2. Is the accompanying "tincture" made with methylated or with pure spirit of wine?
3. Is there any calomel in the "pills" supplied to you?
4. Laudanum is suspected to have been added to the specimen of "beer" placed before you; are morphia and meconic acid present?
5. What proportion of arsenic is in the "Liquor Arsenicalis" given to you?

He was as pleased with the results of the examination as he had been with the labours of the students during the session. Mr. Yates, who occupied the highest place, was to be especially commended, as he had worked under the disadvantage of not having the qualifications already alluded to as possessed by those who had been engaged in retail pharmacies. Mr. Battle, the second man, was a most zealous student. Mr. James Deane stood high, considering he had only been able to work during two days per week. These gentlemen, with Mr. Thorn, richly deserved the honours which the Council of the Society had awarded to them.

The successful competitors stood as follows:—

Council Medal	Robert Yates.
Certificates of Honour	John Scoley Battle. James Deane. John James Thorn.

PEREIRA MEDAL.

This medal was awarded to

Alfred Mumford.

MINOR EXAMINATION PRIZE OF BOOKS.

Five candidates competed, and the prize was awarded to

John Robert Wretts.

The questions were as follows:—

1. Describe the processes of the British Pharmacopœia for the preparation of Extracts, and point out the advantages or disadvantages of these processes as compared with others.
2. State what you know with reference to Concentrated Infusions, and give your opinion of their properties and usefulness in medicine.

JACOB BELL SCHOLARSHIPS.

Five candidates presented themselves for the Junior Scholarship. The Scholarship was awarded to

John Scoley Battle.

No candidate presenting for the Senior Scholarship, a second Junior was awarded to

Alexander Pedler.

The questions were as follows:—

ARITHMETIC.

1. Reduce $\frac{5}{6}$ of a penny to the fraction of a pound.
2. Multiply 561·2 by ·0654.
3. Reduce $\frac{5}{9}$ of a pound (avoirdupois) to the fraction of a hundredweight (cwt.).
4. Multiply $3\frac{3}{4}$ by $4\frac{2}{3}$.
5. Express the following vulgar fractions in decimal:—$\frac{1}{2}$, $\frac{6}{7}$, $\frac{11}{12}$, $\frac{18}{19}$.

LATIN.

1. Decline the following:—*mistura, folium, cochleāre, quercus, niger, bonus, qui.*
2. What are the superlatives of *malus, parvus, dives?*
3. Give the perfect tense of *fio, possum, volo, edo.*
4. Translate the following passage from Cæsar, liber i., paragraph 50:

"Proximo die, instituto suo, Cæsar e castris utrisque copias suas eduxit; paullumque à majoribus progressus aciem instruxit, hostibusque pugnandi potestatem fecit. Ubi ne tum quidem eos prodire intellexit, circiter meridiem exercitum in castra reduxit. Tum demum Ariovistus partem suarum copiarum, quæ castra minora oppugnaret, misit. Acriter utrinque, usque ad vesperum, pugnatum est. Solis occasu suas copias Ariovistus, multis et illatis et acceptis vulneribus, in castra reduxit."

ENGLISH COMPOSITION.

Write some remarks upon one of the following subjects:—

A. "The Advantages of the Study of the Natural Sciences."
B. "Industry."

CHEMISTRY AND PHARMACY.

1. What is the composition of Cream of Tartar, and how is it obtained?
2. In what respects do *Ferri Sulphas*, *Ferri Sulphas Exsiccata*, and *Ferri Sulphas Granulata*, of the British Pharmacopœia, differ from each other?
3. What is the extent of the solubility of sugar in water?
4. Describe the reaction which occurs when zinc is dissolved in diluted sulphuric acid.
5. What is the proportion of opium in Dover's Powder?

BOTANY AND MATERIA MEDICA.

1. Describe the structure and growth of the bark of a dicotyledonous stem.
2. Define the following:—*hair, gland, spine, prickle, epiphyte,* and *parasite.*
3. What are the essential characters of the three great classes of plants, namely, acotyledons, monocotyledons, and dicotyledons?
4. How would you distinguish aconite from horse-radish root? What are the properties of the two respectively, and to what are they due?
5. What are the officinal kinds of senna? From what plant or plants are they derived? Describe generally the officinal sennas, and mention their ordinary adulterations and the means of detecting them.
6. Enumerate the officinal plants of the natural orders Cruciferæ, Umbelliferæ, and Melanthaceæ.

The distribution of rewards to the students being concluded, the Chairman called upon Mr. GEORGE EDWARDS, who said he was desirous of making a few remarks.

Mr. EDWARDS said: Gentlemen, you are about to commence the duties and engagements of another Session—one that bids fair to be more numerously attended than any former one, for many years. I rejoice at this, for your sakes, for healthy emulation and companionship in study contribute very much to success. But I must, at the same time, remind you that the very fact that greater numbers are entering this Session, is a proof of a growing conviction in the public mind that higher attainments will be expected of a chemist than heretofore. You will have more rivalry to contend with, and, if you would hold your place before the world, you must not waste these times of study. Shall we regret all this? If the public demanded higher attainments. and there were no means of gaining the necessary knowledge, I *should* regret it, but not whilst the abundant advantages which this Society offers are before you. I rather rejoice that the required standard is higher, and that the public join with us in requiring competent attainment in those to whose care the health and life of their fellow-creatures are frequently committed. I join with Dr. Attfield in thinking highly of the advantages you possess in having passed through an apprenticeship, and having thus laid the foundation well, in what some would call the drudgery of the business. Depend upon it, this part of your education is as valuable as any other. However others may speak slightingly of dusting the shop and attending to the routine of daily duties, I believe the teaching to be indispensable. It forms the character, it gives habits of order, of attention to business, and of perseverance, which lay the foundation of future success. You gain that insight into the tastes of your customers, and that tact and sound judgment which you will hardly get without. If you wish to get on in the world, the knowledge gained, not in the study, but behind the counter, will be of priceless value. Believe no one who tells you to despise it. Science is full of glittering visions, which are apt to lead astray unless corrected by practical knowledge of the world, and you will be in danger of trusting some showy project, which will be broken to pieces when it comes in contact with the time of actual trial. It will be like a house built upon the sand, fair and wise in everything but the foundation, where the very massiveness and grandeur of the ornaments only serve to render more complete the ruin. But if you take care to lay the foundation well, you may build scientific knowledge upon it with the greatest possible advantage. And one of the advantages will be this, you will be able to enter upon any opening for superior profit which may present itself. You may not all your lives be attached to the counter or follow the retail trade,—opportunities of advancement, in many ways, may come before you, and, then the turning-point in your lives may be, whether you are or are not capable of entering into the open door. Some of us never had the advantages which are offered to you, or our course might have been more prosperous and our success more abundant. And, let me say, whilst you are seeking to profit by the instruction provided, you are helping materially to solve the questions which often trouble us. For instance, you wish, no doubt, that your character as chemists should give you a higher position in society and raise you in public estimation above mere traders. Show yourselves men of education and sound knowledge, and you will be likely to attain it; there will be that silent growth of respect in the public mind which will bring it to you more surely than any legislative enactment can do. You feel that you ought to be better remunerated, that the heavy responsibility which rests upon your position ought not to have its present scanty reward. Determine to shew yourselves competent and able men, and this will be more likely to bring you this remuneration than anything else.

Some of you have received prizes to-night, and I am glad to hear that you have so well deserved them. Keep and look upon them with pleasure. But do not cease to learn. Be students still. Knowledge will rust and pass away, unless it is fed by more acquirements, and the power of learning will gather strength by constant use. In the name of the Council I wish you success; our hopes rest upon you. Some who have laboured for this Society have passed away and others are passing, but our hope is in you. The founders of this Society did not seek to benefit themselves, but those who should come after them, to raise in the next generation, a class of able men throughout the country, and, if this is not accomplished, all we have done will be in vain,—the Society will pass uselessly away; like a meteor, it will have glittered with temporary radiance, only to give place to deeper darkness. You are to be our future Council —our Examiners; those who will have to stand between the Legislature and the Chemists of the nation, and your success in the Laboratory and the Lecture Room is a thing in which the Council feel a lively interest. And then there are, besides all this, the sources of enjoyment which knowledge opens to its possessor. The hillside has a voice for you, the wild flower, the blue skies above, and the teeming earth beneath, all are full of interest to the man who has stored his mind with knowledge; they bring pleasures which the votary of dissipation knows nothing about and sighs after in vain,—pleasures heightened by the consciousness that you are rightly using the varied faculties which your great Maker gave you.

The following paper was then read:—

ON A NEW PROCESS FOR THE PREPARATION OF COD-LIVER OIL WITH IODIDE OF IRON, BY WHICH DECOMPOSITION OF THE IODIDE AND INJURY TO THE OIL ARE PREVENTED.

BY MR. SINIMBERGHI, OF ROME,

MEMBER, BY EXAMINATION, OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

In a memoir addressed, in 1864, to the Pharmaceutical Society of Paris by the corresponding member M. Robourdin, chemist in Orleans, and containing the result of experiments showing the necessary precaution to be adopted in the employment of certain reagents, the author notices the non-existence of iron in iodide of iron with cod-liver oil; and the general secretary of the Society, M. Bougnet, reported the fact in the following terms, in his 'Compte Rendu' of the 11th of November:—

"Prussiate of potash, containing in itself the body the presence of which it is intended to indicate, may, under certain circumstances, lead to error, indicating iron in medicines that do not contain it. And this has happened with regard to the iodide of iron with cod-liver oil, which was regarded till now as containing this metal in a considerable proportion, but it is now found not to contain any trace, according to the analytical test to which our Orleans correspondent has submitted it."

The assertion of Robourdin surprised me greatly, for doctors of great reputation daily sent their patients to my pharmacy to obtain the iodide of iron with cod-liver oil. In three samples of oil, and precisely those most commonly in request, I desired to ascertain the fact noticed by Robourdin. Two had a garnet-red colour, and one a tint approaching to a deep green; but all three were much altered, and had more or less a nauseous pungent taste, and a disagreeable and almost disgusting smell of varnish. This alteration, commonly known under the name of rancidity, which is produced by the absorption of the atmospheric oxygen, gives to the cod-liver oil also a thicker appearance, and, with long exposure to the air, reduces it into an almost resinous mass, so that the cod-liver oil might take its place amongst the drying oils.

I took 30 grammes of each of three different samples of oil, and submitted them to the reaction of ferrocyanide of potassium. I obtained from all a very slight bluish precipitate; but I had no faith in the reaction obtained, on account of the observation before stated by Robourdin, and therefore preferred the use of sulphocyanide of potassium, the action of which had been made most sensible by Natanson, with the addition of ether. The result of the researches was always negative, as the ether did not acquire even a pale rose-colour. Knowing how often the presence of some salts may be concealed, when intimately mixed and in a state of emulsion with an oil, I took the before-mentioned iodide of iron with cod-liver oil, acidulated with diluted hydrochloric acid, and, warming the mixture to facilitate the separation of the iron compound, I could not discover the existence of any of it in the resulting liquid by evaporation. An equally negative result was obtained by using, for the separation of the iron compound from the oil, Graham's dialysing apparatus,—a process which I followed by mixing repeatedly with the oil in the state of emulsion the diluted hydrochloric acid, and then putting the whole into the tube with wetted membrane—although some experiments made by me showed that hydrochloric acid is able to decompose the iodide, in an iodide of iron with cod-liver oil, combining with the iron. Nevertheless, for the better assuring myself whether in the three commercial oils there did not exist the iodide of iron, I added to each a certain quantity of sulphuric acid, and, with the help of heat, I caused the reduction of the oil into a carbonated mass. I divided this in two parts; one I washed with water, to test the solution with the usual reagent, which proved negative; the other I treated with concentrated hydrochloric acid, and then exhausted the mass with water, which I evaporated to dryness, to test the residue with sulphocyanide of potassium. And this second method I adopted, thinking that the iron of the iodide of iron might be transformed into oxide by the action of the carbonization, and that this would be dissolved by the hydrochloric acid. With so many experiments differently conducted, I satisfied myself that no iron compound was contained in the said samples of oil, two of which were purchased in France and one in Italy; and that the doctors were greatly mistaken in prescribing them, administering only a very altered oil, excessively rancid, having a very disagreeable odour of varnish and rotten fish, and containing only a small quantity of iodine. From printed memoirs on the iodide of iron with cod-liver oil, published from 1857 to 1865, I ascertained for certain the solubility of iodide of iron in cod-liver oil, although in a very small proportion; and I supposed that, by the decomposition of the iodide at the time of preparation, or in keeping, the precipitation of the iron took place. I proposed to myself, therefore, to find a process by which the cod-liver oil should not only undergo no alteration, but its combination with the iodide remain constant, and in certain established proportion.

The process I have adopted is as follows:—From 1000 grammes of pure and light-coloured cod-liver oil, I separate 30 grammes, to which I add 12 grammes of pure sulphuric ether. These are mixed together by agitation, aiding the mixture by a slight increase of temperature. I then take 6·5 grammes of pure protosulphate of iron and 5·15 grammes of perfectly neutral iodide of potassium; these are rubbed together in a porcelain mortar and 1 gramme of reduced iron added, to ensure the recombination of any iodine that may be set free during the process. A sufficient quantity of pure glycerine is added to moisten the salts and expedite double decomposition. When this has taken place, which usually occurs in about two minutes, one-third of the mixture of oil and ether is gradually well mixed with the salts, and then one-third of the separate 970 grammes of cod-liver oil being added, the whole is put into a well-stopped bottle, which it fills, and having been well shaken, the precipitate is allowed to subside and the oil then poured off. The same process is repeated by adding a second and a third portion, both of the oil and ether and of the pure oil, to the precipitate as in the first instance. The whole is then put into a bottle capable of holding it, and which it exactly fills, and it is left thus for about ten days. It is then filtered through paper and kept in well-closed bottles.

For the success of the process it is essential that pure ether, quite free from acid, should be used. The glycerine must also be pure. It acts as a solvent of the iodide of iron, which it preserves from decomposition, while the ether transfers the iodide of iron from the glycerine to the oil, and promotes its solution in the latter without the aid of heat. Perhaps a small quantity of the glycerine remains united to the oil, for that which remains on the filter does not correspond to the quantity used. Most of the ether evaporates during the process of filtration.

The oil thus prepared has the following characters:—It is limpid, of a yellowish-orange colour, differing but little from that of the oil in its original state. The smell is also that of pure cod-liver oil, and the taste does not materially differ from it. It does not change colour and undergo decomposition on exposure to the air. It is therefore constant in its composition, containing about 4 grains of iodide of iron in a fluid ounce.

PROVINCIAL TRANSACTIONS.

THE ANNUAL MEETING OF THE LIVERPOOL CHEMISTS' ASSOCIATION, OCTOBER 11, 1866.

The President, Alfred Redford, Esq., in the chair. Number present, twenty.

The Chairman opened the meeting, and offered his greetings to the members. After a short exposition of the business of the evening, the following gentlemen were elected Members:—

- Mr. Joseph Edwardson, 111, Myrtle Street.
- Mr. F. J. Mackinlay, 31, St. James Street.
- Dr. Waite, Oxford Street.
- Mr. Charles Symes, 93, Oxton Road, Birkenhead.
- Mr. M. Hughes, 70, Mill Street.
- Mr. T. Murray Steele, Seaforth.
- Mr. Reginald Crooke, Fairfield Crescent.
- Alexander Fraser, 50, Lord Street.

As Associate—

- Mr. Thomas F. Abraham, 87, Bold Street.

The Secretary announced several donations of the 'Pharmaceutical Journal,' 'Transactions of the Historic Society,' etc. etc., which were received during the recess, and mentioned that the serial scientific works ordered had been duly received as published.

The President proposed a vote of thanks to the donors, which was carried unanimously.

The President then called upon the Secretary to read the Annual Report.

Annual Report of the Council of the Chemists' Association for the Seventeenth Session of 1865–6:—

Gentlemen,—Your Council have much pleasure in laying before you their Annual Report of the Seventeenth Session of the Association. The results of the past session, as regards the transactions of the general meetings, the numerical strength of the Association, and its financial position, are of a highly satisfactory character.

Sixteen members and two associates were elected during the past year; twelve have tendered their resignation, consequently the enrolled members are 176, exclusive of some honorary members.

Your Council have given their attention to the maintenance of the Library in an advanced state of efficiency; and to this end they have made additions of valuable scientific works to it, namely, Publications of the Cavendish Society, Watts's 'Dictionary of Chemistry,' etc. Besides these, several donations have been received during the year, among which may be mentioned one of six important volumes from Mr. Natha Mercer.

The Librarian reports that 320 volumes have circulated among fifty readers during the session, and that there were two borrowers of the microscope in the same period.

Your Council availed themselves of the willingness of Professor Robert Hunt, F.R.S., to deliver a lecture before the members of the Association, and resolved to make that the basis of their annual conversazione.

The entertainment, which was held on the 15th of March, proved to be, in respect to the Professor's lecture, and the merit of the several other scientific discourses and illustrations that supplemented it, one of the most interesting and instructive hitherto organized. Your Council regret, however, that, in its financial aspect, a considerable balance on the debit side of the conversazione account had to be met out of the funds of the Association.

Your Council have to inform you that the Association has lately lost the valuable aid of two of its most prominent and efficient members; namely, Mr. Nathan Mercer, the late Vice-President, and Dr. Edwards, the teacher of pharmacy, than whom none were more energetic and painstaking to contribute to the advancement of your body.

Fully believing that the zeal and labour exhibited by these gentlemen in the cause of the Association, for a long series of years, merited not only the esteem but the gratitude of the members generally, your Council felt that an expression of those feelings was due to them from the Association before their departure to Canada. Urged by this motive, and by the personal regard of the Council for each, your Council entertained Mr. Mercer at dinner, in July last, at the Alexandra Hotel, Dale Street. The attendance on the occasion was large; and the greetings tendered to Mr. Mercer were most friendly and cheering. To Dr. Edwards, your Council, on behalf of the Association, presented an illuminated Address on vellum, embodying appropriate expressions of obligation for his services, and of regret for his departure, etc. In addition to these public testimonies, your Council have elected Mr. Mercer and Dr. Edwards honorary members of our Society.

Your Council may be permitted to remark, that the withdrawal of two members of such acknowledged talent is calculated, if not to produce a void in our ranks, at least to throw upon the members generally an additional necessity to use their best endeavours in carrying out the work the Association has mapped out for accomplishment. No doubt a cordial and generous desire, by the members, to lay before the Association some portion of the scientific and other facts which they may have noticed within the range of their acquired knowledge, would render the general meetings more attractive and instructive, if possible, than they have been. At all events the endeavour to prepare something of interest for the Association would frequently be productive of as much benefit to the authors as to listeners.

Your Council desire to direct attention to another subject which they have always considered of special importance, namely, the maintenance of a well-conducted and efficient Pharmacy Class. In view of the tendency, both of the governing body and of the public mind in this country, that persons following the calling of chemist and druggist should be well-qualified in chemistry and pharmacy, and being cognizant of the fact, that the object of the Association is the cultivation of such knowledge among its members, it behoves your Council to urge upon the members not to undervalue the advantages which proficiency in these sciences confers, but, on the contrary, to cherish every means that will conduce to their attainment.

Of late years the Pharmacy Class, in connection with the Association, has not been, from a variety of causes, so successful as your Council wish it to be; and it is their anxious desire that the members would earnestly co-operate with them to render the Pharmacy Class one of the successes of the Association. Your Council, therefore, invite special attention to the circular announcing the classes for the ensuing session.

Respecting the Museum, your Council have to report, that very few donations have been received during the past session. It is greatly to be desired that members should exert themselves in obtaining objects of chemical and pharmaceutical interest for the Museum. Sixteen valuable specimens of rare chemical preparations by Messrs. Johnson and Mathey, of London, were purchased during the session for the Museum.

In compliance with the request of the Committee of the British Pharmaceutical Conference, your Council lent several series of objects from the Museum, for exhibition at the meeting of the Conference at Nottingham. Your Council learned with pleasure that these contributions attracted marked attention, and were much admired.

In further compliance with the invitation of the same body, your Council deputed your President, and Messrs. Abraham and Edwards, to represent the Association at the Conference.

Your Treasurer, Mr. R. Sumner, will read the audited statement of the finances of the Association for the past year, which shows a balance of £11. 15*s.* 1*d.* on th credit side.

Four vacancies at the Council Board require to be filled, in consequence of the retirement, by rotation, of Messrs. Higgins, Jones, and Barber, and of Dr. Edwards, resigned. Of these, Messrs. Higgins, Jones, and Barber are eligible for re-election.

TREASURER'S REPORT FOR THE SEVENTEENTH SESSION, 1865-6.

The Liverpool Chemists' Association in Account with R. Sumner, Treasurer.

	£	s.	d.		£	s.	d.
To Fire Insurance	1	6	0	By Cash in hand	31	19	3
,, Librarian (two years)	8	4	0	,, Arrears of Subscriptions	5	0	0
,, Books for Library	8	19	0	,, Subscriptions of Members and Associates	67	0	0
,, Printing, etc.	22	14	0	,, By Proceeds of Conversazione	11	3	0
,, Joinery Work	2	15	0	,, Surplus from Dinner to Mr. Mercer	0	12	0
,, Chemicals for Museum	3	11	7				
,, Expenses of Conversazione	26	10	0				
,, Collector's Commission	3	0	3				
,, Tea, Coffee, and Attendance	16	9	4				
,, Rent	10	10	0				
,, Balance in hand	11	15	1				
	£115	14	3		£115	14	3

Audited and found correct,
JOHN SHAW.
EDWARD DAVIES.

The TREASURER offered some remarks respecting the statement, and the causes that led to the diminution of the credit balance.

The PRESIDENT remarked, that the Treasurer's statement was a very satisfactory one, and showed the solvent state of the Association. He characterized the Annual Report as being likewise a very good report, and very creditable to the Association, more especially, as all the papers read at the general meetings, and the lectures delivered during the session, excepting Professor Hunt's lecture, were by members of the Association. He had great pleasure in proposing that the reports, as read, be adopted, printed, and published.

Mr. R. SUMNER seconded, and Mr. ABRAHAM supported the motion, which was carried unanimously.

The next business was the election of Officers to serve on the Council. Several members were proposed. On the votes being cast up, the following were declared elected by the majority of votes, namely, Messrs. Higgins, Barber, Jones, and Betts,—the votes being :—Higgins, 11 ; Barber, 18 ; Jones, 18 ; and Betts, 8.

Mr. J. K. BETTS proposed, and Mr. STEWART seconded, "That the best thanks of this meeting be offered to the Officers and Council for their valuable services during the past session." Carried unanimously.

Mr. J. ABRAHAM proposed, and Mr. JOHN SHAW seconded, "That the best thanks of this meeting are hereby given to the donors to the Library and Museum, and to the authors of papers during the past session." The motion was unanimously agreed to.

The PRESIDENT returned thanks on behalf of the Officers and Council for the vote so cordially passed in recognition of their services during the past year.

The SECRETARY referred to the paragraph in the circulars of meetings, calling upon members to subscribe a small sum in support of the Gallery of Inventions and Science. He regretted that he had received but very few subscriptions for this end, and wished o impress upon members the obligation of contributing to the support of the Gallery.

Mr. JOHN ABRAHAM, in a complimentary speech, proposed a vote of thanks to the President, for his able and dignified conduct in the presidential chair during the past session. The vote was carried by applause.

The PRESIDENT returned thanks, and the meeting adjourned.

LEEDS CHEMISTS' ASSOCIATION.

The fourth Annual Meeting was held on the evening of Wednesday, October 10, 1866, in the Library of the Philosophical and Literary Society; the President, Mr. J. Haigh, in the chair.

The Honorary Secretary, Mr. Yewdall, read the following Annual Report:—

The Committee congratulate the Society on the occasion of its fourth anniversary, being confident that as the institution has overcome the many difficulties attendant upon the formation of such societies, if each individual member exerts himself but a little, and continued unanimity reigns amongst us, future progress is certain.

During the past session interesting and practical papers or lectures have been given as follows:—

On the Phenomena of Combustion, by Mr. Fairley, F.C.S.
Dispensing Chemists and their remuneration, by Mr. E. Brown.
On a Series of Models of Fungi, by Mr. Reynolds, F.C.S.
Specific Gravity, by Mr. G. Ward, F.C.S.
Photo-Microscopic Objects by the Oxy-hydrogen Light, by J. Holroyd, Esq.
The Chalybeate Spring at the Cheltenham Gardens, Harrogate, by Mr. R. H. Davis.
Hints to Dispensers, by Mr. S. Taylor.

The Committee arranged with Mr. Abbott to give a series of readings from Oliver's 'Elementary Botany' during the summer months, for which sixteen tickets were taken. The attendance was highly creditable to the pupils, and evinced a thorough appreciation of the arrangements of the Committee. Two prizes were offered for competition, viz. first, Bentley's 'Manual of Botany,' by the President; and second, Lindley's 'School Botany,' by Mr. Reynolds. These have been awarded by Mr. Abbott as follows:—

First Prize . . . . . . Mr. E. Payne.
Second Prize . . . . . Mr. Ellison.

The Committee acknowledge, with many thanks, the great kindness of the Council of the School of Medicine, in allowing the use of their excellent Lecture Theatre for the delivery of this course. They would testify to the zeal and perseverance of Mr. Reynolds, through whose exertions this arrangement was made. The Committee considered it advisable, for the better illustration of the Readings in Botany, to purchase a series of coloured diagrams designed by Professor Henslow, especially for this mode of instruction. These diagrams are now in process of being varnished and mounted, and will shortly occupy a prominent position in the Library, thus affording an excellent opportunity for reference.

Several of the Associates attended the Chemical Class of the Mechanics' Institution during the past session, and by their commendable regularity, and the satisfactory manner in which some of them passed the examinations of the Society of Arts, and of the Department of Science and Art, have given hopeful promise of the future.

The Library has received several additions of new works, and the various weekly and monthly periodicals have been continued as heretofore, by which the usefulness of this department of our Society has been increased.

The Committee suggested that Mr. Smeeton and Mr. Yewdall should represent the Association at the Nottingham Meeting of the British Pharmaceutical Conference. Accordingly, those gentlemen attended as a deputation, and can testify to the very interesting character of the Conference, and the practical utility of the Exhibition of objects relating to pharmacy. They will make a brief report of the proceedings of the Conference.

From this report it will be seen that the objects of the Society have been kept steadily in view, and the continued support of its members cannot fail to ensure continued ccess.

The Treasurer's account was presented, and was as follows:—

Dr. BALANCE SHEET. *Cr.*

1865–6.	£	s.	d.	1865–6.	£	s.	d.
To Balance due from Treasurer	7	3	0	By Balance due to Secretary	2	2	1
,, Thirty-two Members' Subscriptions	16	0	0	,, Books and Periodicals for Library	4	17	8
,, Thirty-four Associates' ,,	4	5	0	,, Printing Circulars, etc.	2	6	4
				,, Lecture Room—Philosophical Hall	1	10	0
				,, Rent of Library	8	0	0
				,, Gratuities to Porters	0	10	0
				,, Collector's Commission	1	0	6
				,, Postages	0	17	7
				,, Reprints from Pharmaceutical Journal	1	12	6
				,, Envelopes	0	1	9
				,, Cash in Treasurer's hands	4	9	7
	£27	8	0		£27	8	0
To Balance in hand	4	9	7				

Examined and found correct.

J. B. BILLBROUGH, }
EDWARD BROWN, } *Auditors.*

The Report was adopted, on the motion of Mr. ABBOTT, seconded by Mr. STEAD.

The PRESIDENT then presented the prizes to the students in botany, addressing to them a few words of congratulation upon their present success, and expressing good wishes for their future welfare.

A resolution offering the very cordial thanks of the Association to Mr. James Abbott for his kindness in giving the course of Readings in Botany was carried.

The ballot for officers for the ensuing year was then taken, the following being the result:—President, Mr. Edward Thompson; Treasurer, Mr. J. Land; Secretary, Mr. E. Yewdall; Librarian, Mr. W. Smeeton; Committee, Messrs. Abbott, Brown, Reynolds, Stead, B. Taylor, S. Taylor.

Mr. SMEETON and Mr. YEWDALL then gave an interesting report of their visit to Nottingham, during the late meeting of the British Pharmaceutical Conference. Through the courtesy of Messrs. Southall, Son, and Dymond, of Birmingham, they were able to exhibit the collection of medicines, etc., sent by Professor Parrish, of Philadelphia, to the recent Exhibition.

ORIGINAL AND EXTRACTED ARTICLES.

KERR'S SOLUTION OF PERNITRATE OF IRON.

BY T. AND H. SMITH.

Many pharmaceutists, as well as ourselves, must have found the process for preparing Kerr's solution of pernitrate of iron very unsatisfactory, from the unstableness of the product yielded; in a longer or shorter time it begins to lose its transparency and becomes unsightly, or through the production of nitrous gases of a more or less condensible nature the stopper may be thrown out or the bottle burst.

Kerr's solution being made by the action of nitric acid on metallic iron in the cold, contains a varying proportion of protoxide of iron, depending upon variations of temperature and other circumstances; hence arise after changes. Lower oxides of nitrogen and possibly even free nitrogen may be produced from the continued action between the protoxide of iron and nitric acid; part of the nitric acid being thus destroyed, the quantity necessary for the solution of the metallic oxide becomes deficient. In this way gases are liberated, and—from the production of a basic compound—the liquid becomes cloudy. It cannot have been intended that the compound should be a protopernitrate, such a preparation being a medicine, whose components are in a state of gradual change;

further, the British Pharmacopœia views it as a nitrate of the peroxide. With a view to remedy these inherent defects, we were led to adopt a method which has for a considerable time been satisfactorily prosecuted. We have little doubt that the process may have already occurred to some, and may have been advantageously applied by them. With the hope however that an approved method would not be unacceptable to such as have experienced the uncertain results of the recognised formula, we publish the following process:—

In making Kerr's solution, instead of acting directly on metallic iron with nitric acid, we dissolve the pulpy precipitate of peroxide in the proper quantity of nitric acid, diluted with water, so as to produce the necessary measure of 30 fluid ounces for each ounce of metallic iron.

Supposing 60 fluid ounces the quantity to be prepared: make a solution of perchloride of iron, according to the directions of the British Pharmacopœia, dilute with 2 or 3 gallons of cold water, and add ammonia or a weak solution of carbonate of soda till the precipitation is complete. The precipitate having subsided, wash by decantation or siphoning till completely free from saline taste. As the oxide of iron, after entire subsidence, contains too much water, the excess must be removed by pressure in a cloth, so that the remaining pulp may not occupy more space than about 30 ounces.

The solution of the oxide of iron may now be easily made: dilute the acid to within a little of 30 ounces, introduce the pulpy mass gradually, with constant stirring, and bring the whole to the proper bulk.

A simple method of accurately arriving at the proper quantity, is, to measure into the vessel, before use, 60 ounces of water, and mark with a slip of gummed paper the level of the liquid. In order to avoid the risk of the formation of a basic compound (which the after addition of acid might fail entirely to dissolve), it is preferable to add the oxide to the acid than the reverse.

56 parts or 2 eq. of iron require 3 eq., or 162 parts of absolute nitric acid.

For 2 oz. of iron we find by proportion—

$$56 : 162 :: 437{\cdot}5 \times 2 : 2531 \text{ parts of nitric acid necessary.}$$

Let 80 per cent. of anhydrous acid be present in the acid used, and the requisite quantity will be—

$$80 : 100 :: 2531 : 3164 \text{ grains, or, as the measure is inversely as the density—}$$
$$1500 : 1000 :: 3164 : 2109 \text{ water grs., or } 4{\cdot}82 \text{ fl. oz., or 4 oz. 6 drs. 33 ms.}$$

As it is advisable to have a slight excess of acid in the pernitrate solution, one or two drachms more than the calculated quantity should be used.

Following rigidly the process given in the British Pharmacopœia, we have been unable to obtain a preparation giving no precipitate with ferridcyanide of potassium.

CONSIDERATIONS AS TO THE DIETETIC PROPERTIES OF WHEAT IN ITS DIFFERENT STATES.

The communication of Dr. M'Cormac in the July number of the 'Pharmaceutical Journal,' and the very interesting papers by Professor Church, of Cirencester, which gave rise to Dr. M'Cormac's letter, lead one to consider, in a new light, questions hitherto apparently settled.

Professor Church has called attention to the fact that a well-dressed sample of wheat will consist of three qualities of grain, viz. plump floury grains, which are opaque, together with hard horny translucent grains, and a medium of the two; and he has shown from practical experiments that, while a larger proportion of the opaque grain germinates and fruits, a greater amount of dressed corn is obtained from the translucent; and what, in a dietetic point of view, is apparently of equal importance, that the proportion of albuminoid or flesh-forming principle is, calculating from the percentage of nitrogen, very far greater in them than in the opaque grains.

What I would particularly wish to draw attention to is this,—whether, all circumstances considered, translucent wheat is more nutritious, or, in reality, so nutritious, as the more fully developed opaque kind?

That the opaque is the more fully matured grain we may assume from the fact ascertained by Professor Church, that "a far larger proportion germinates and arrives at maturity;" for though diseased corn will often germinate freely, yet the plants, unlike the sound, seldom mature. Messrs. Lawes and Gilbert also have shown that "the percentage of nitrogen is lower in wheat grain the more this is perfected." And it was moreover confirmed by some practical and observant farmers of my acquaintance, who all agreed that "the white opaque wheat was that which had become ripened, or very nearly so, before the straw was cut; and that—although if reaped too early the grain was thin and shrivelled—the translucent corn is obtained by cutting whilst the straw is still green. That this translucent grain is the most valuable, yielding a greater weight per bushel, and being more highly esteemed by the miller as producing a stronger flour."

Most persons are well acquainted with the difference in quality and flavour between the fruit which remains attached to the plant until thoroughly ripened and that which is gathered just as it commences to ripen. Taking pomaceous fruits, for instance; in that which hangs until thoroughly ripe the saccharine matter is more fully developed; the fruit is less firm in texture and more readily digestible; whilst it exhibits the delicate flavour peculiar to each especial kind, which is wanting, in a greater or less degree, in fruit which has ripened after storing. At the same time, we know that this "dead ripe" fruit, as it is called in some places, retains its agreeable flavour and freshness but a short time; it soon becomes vapid, and decays very rapidly.

Now, it seemed to me not unreasonable to suppose, on similar grounds, that a wheat, naturally ripened and matured, should prove to be more ready of digestion and assimilation—and hence of nutrition—than that which is allowed to mature after storing, despite the larger proportion of nitrogenized matter contained in the latter.

For the purpose of roughly testing this, I obtained a sample of white wheat grown on a favourable soil, and well harvested, but, the grower informed me, "rather too ripe when cut." After separating the very few broken grains and foreign seeds it was sorted, and found to consist of a proportion of—

29·3	per cent of	opaque grain.
39·5	,,	translucent.
31·1	,,	medium.

One hundred of the finest grains, both of the opaque and translucent, were selected; the opaque corns weighed 80·2 grains, the translucent 77·75 grains; and, allowing for the difference of weight, the opaque were of one-twentieth greater bulk than the translucent.

Portions of the two kinds were then crushed, and the flour separated through fine lawn. With similar proportions of water to each, both flours were then made into a firm paste by boiling; other two portions of paste, similarly prepared, had, when cooled to 140° Fahr., each a small quantity of its own kind of flour well stirred into it. The firm pastes were then put into covered vessels and exposed to a temperature of 90° Fahr. In the boiled pastes no change occurred for many hours, and in both it was identical; but with those to which uncooked flour had been added the case was different; in less than one hour that from the opaque ripe flour had lost its tenacity and acquired a sweet taste; whilst the translucent paste required more than four hours to arrive at the same state.

By mixing the two kinds of flour with water to a gruelly consistence, and then whipping the mixture with strips of wood or twigs, the strings of gluten adhering to these are far more tough and tenacious from the translucent than the opaque. This quality, as Dr. M'Cormac mentions, the miller tests by simply chewing.

If we take two kinds of flour,—some, the best, called by the miller "strong flour," and some "poor and weak,"—and make each into a paste under exactly similar circumstances, we shall find that the paste of the former is by far the most firm and tenacious, and also, when placed in a favourable atmosphere for undergoing change, it retains its tenacity for a much longer period. Add now to the paste of the *strong* flour a little infusion of bran, and this will cause it to become thin very far more rapidly than does the *weaker paste with water only.* Again, add to the infusion of bran a little *alum*, then mix it with the paste even of the *weaker flour*, and this will retain its consistence yet longer than the paste made with *strong flour* and water alone: the alum, combining with the soluble gluten and forming with it an insoluble compound, renders it inert.

Wheat grain consists—putting aside inorganic matter, fat, and cellulose—of a mass of starchy granules interspersed by, if not enveloped in, an elastic network of nitrogenized matters which in the aggregate goes by the name of gluten. This gluten varies in character, dependent both on the state of the grain and also on the portion of the seed from which it is obtained. The interior portion yields a gluten less soluble and more tenacious; whilst the external portion, especially that immediately beneath the outer skin, contains nitrogen-yielding matter of diminished tenacity but increased solubility, acquiring the property, as shown by the infusion of bran, rapidly to change the starch into glucose.

The valuable properties that bread possesses depend greatly on its mechanical structure; the dough, from being distended and blown out into a number of hollow cells or vesicles, is enabled to become cooked during the baking, or "soaked," as the baker calls it. That it retains the vesiculation through this process without collapsing, is due to the toughness of the gluten which, ramifying through the mass, holds it by its tenacity, suspended from the outer wall of crust mechanically, and much in the same way as plaster is held together by hair. The lightness of the bread, therefore, depends on the strength or tenacity of the glutinous web; whilst the common method of obtaining and disseminating the carbonic acid gas through the dough by vinous fermentation necessitates the exposure of the sponge to conditions very destructive of this.

Wheats having the combined qualities of great strength of gluten with good flavour are exceptional and costly; the most freely producing English wheats, whilst possessing the latter, are deficient in the former. To remedy this, the miller adds to them a proportion of hard strong foreign grain; but as this also commands a high price, the baker, who makes the commonest bread from very poor and home-grown flour, resorts to the use of alum, the question with him being whether to manufacture a white, light, well-baked bread which is saleable (without taking into consideration that it contains a compound of alumina and gluten not especially digestible), or a dark, heavy, uncookable mass, questionably digestible and certainly not saleable.

It is this constituent of the more external portion of the wheat which renders the manufacture of bread from the whole meal so difficult by the old process. Some medical authorities are of opinion that the hard branny portion causes an irritation of the bowels, and that by the long-continued use of it this becomes chronic; but such an objection has been obviated by more than one process patented for unbranning wheat, by removing merely the hard horny outer integument, and thus rendering the whole nutritive portion available for human food. No doubt a meal from this, containing so much larger a proportion of important inorganic, and also the soluble nitrogenized constituents, would be preferable to fine flour as an article of diet; but from the uncertainty of manufacturing it by the ordinary baker, it is still found to be more advantageous, in a commercial point of view, to retain, as hitherto, only the fine flour, and give that containing the most digestible form of gluten, with the phosphates, as food to the lower animals. By non-fermented processes this meal can be utilized and made into light wholesome bread.

During the transformation of wheat-grain from the translucent to the opaque condition, nitrogenized matter is diminished in amount, and that which remains has evidently undergone a change, and in its central portion assumed in some degree the property possessed by that immediately beneath the bran; and were the old and lengthy process for lightening dough the only one known or likely to be practicable, it would be useless to raise the question; but, with the new thoughts and appliances that have of late been brought to bear upon bread-making, and by which many of the difficulties have been overcome, it seems well worth consideration and practical inquiry, whether the wheat chosen, with good reason, by the miller for its mechanical properties, is of so much value as an article of nourishment, or flesh-former, as that naturally ripened, which, if containing a smaller proportion of nitrogenized constituents, yet possesses them in a more soluble, and, one would imagine, more readily assimilable form.

It would be highly interesting to learn whether, during the change in the wheat, the loss of nitrogenized matter is equally distributed through the grain, or whether it occurs principally in either the external or internal portion; also the relative proportion of soluble and insoluble gluten in the two; but the subject is one of so much importance, and opens up so wide a field, that it is to be hoped that wheat-grain is yet a matter of further investigation with Professor Church.

LIEBIG'S EXTRACT OF MEAT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the last number of your Journal (October, p. 196), I find an excellent contribution from Messrs. Deane and Brady on "The Results of the Micro-Chemical Examination of Extract of Flesh."

I beg you will allow me to make a few remarks which may form a proper basis of judgment of extract of meat, and particularly of South American, respecting its colour, taste, and consistency.

You are probably aware of my having accepted the office of Director of the Scientific Department of Liebig's Extract of Meat Company, Limited, and on conditions calculated to offer to the public a complete guarantee of the genuineness and purity of the extract manufactured by that Company.

One of my former assistants, Mr. Seekamp, is the manager of the chemical branch of the manufactory at Fray Bentos; another of my assistants, Dr. Ch. Finck, is acting at the general depôt of the Company. One manufactures the extract according to my special directions, the other receives it at Antwerp, and is bound to take a sample of each package, and to forward it to my Laboratory at Munich for analysis. The packages are tin canisters of 36 to 45 lbs. each; the extract is sold only after being approved by myself. You will perceive thereby, that I not only control the manufacture, according to my process, of the extract at Fray Bentos, but also its quality when sold by "Liebig's Extract of Meat Company, Limited," and I may safely assert, therefore, that the Fray Bentos extract does not contain any gelatine, or anything that can be considered as such.

Gelatine does not belong to the composition of extract of meat, and must, therefore, be excluded as much as possible; it gives more consistency to the extract, and allows, to the detriment of buyers, of a larger percentage of water, and makes it liable to turn mouldy. But the action of tannic acid, as a reagent, might lead to erroneous conclusions, against which it is necessary to guard.

In my little work 'On the Chemistry of Food' (Taylor and Walton, London, 1847), I say, p. 141: "The portion of juice of the flesh which is soluble in cold water, but not in alcohol, is precipitated by tannic acid; the precipitate softens like plaster in hot water, and cannot be distinguished from the tannate of gelatine, but it differs from gelatine by that characteristic property of both, that it does not gelatinize when concentrated." Extract of meat, then, may and does precipitate with tannic acid, even when entirely free from gelatine.

By the exclusion of gelatine, the yield in extract is naturally diminished. According to a recent communication received from Mr. Seekamp, 34 lbs. of fresh lean meat yield only 1 lb. of extract, as manufactured at Fray Bentos (corresponding with 45 to 48 lbs. of butchers'-meat, inclusive of fat and bones).

It has been observed, that the colour and taste of the Fray Bentos Extract vary; this is owing to the difference of sex and age of the animals.

The meat of oxen always yields an extract of darker colour and stronger flavour, reminding somewhat of the flavour of fresh venison, pleasant when diluted; the extract of cows' meat is of lighter colour, and a mild flavour, and is preferred by many persons. The meat of animals under four years cannot be used for the manufacture of extract; it yields a pappy extract of weak taste, like veal, and without flavour.

According to the predominance of ox or cows' meat, the colour and taste of extract varies, which is by no means a fault of the manufacturing process, and is fully explained by the preceding remarks. The extract of ox meat is, however, richer in creatinine and sarkin than the cows' meat extract.

The extract received from Munich, and examined by Messrs. Deane and Brady, was cows' meat extract,—the Bavarian Pharmacopœia prescribing the use of cows' meat, and not of ox meat.

These gentlemen observe that they never experimented on a sample which they had any reason to believe to be adulterated with chloride of sodium (common salt). My experience has taught me that such falsification, more especially by retail dealers, is by no means a rare occurrence, and it is even practised by manufacturers.

I hold a sample of extract manufactured by Dr. Tenner, of Darmstadt, containing 9 per cent. of common salt, and, besides, 26 per cent. of water more than the Fray Bentos extract. He sells it in jars, with labels stating that the extract is prepared "according to Liebig's process."

It is extremely difficult, as regards extracts of meat, the genuineness and purity of which are not discoverable by the eye, to protect the public against fraud; all manufacturers prepare their extract according to what they call "Liebig's process;" but since I have given only general, and not special, directions for manufacture, it so happens that every one fills in the details after his own fashion, and the consequence is that not one of these extracts is, in its composition, like another.

There exist only *two special directions* for the manufacture of extract of meat, the one in the Bavarian Pharmacopœia, the other in the Pharmacopœia Germanica, but these directions are not mine.

I am, Sir, your obedient servant,

J. v. Liebig.

Munich, 22nd October, 1866.

EARLY CLOSING.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—Will you be so good as to publish the enclosed copy of a notice now printing for circulation? I am taking this course independent of any pledge or even communication with the chemists at Kilburn. Trusting, from my great experience in the real necessities of our business, and my exertions* in the cause of early closing extending over many years, I shall have their approval and support,

I am, Gentlemen, your obedient servant,
JOHN BEATON.

"Mr. Beaton begs to apprise the inhabitants of this neighbourhood, that he purposes closing his business punctually at nine o'clock (Saturdays one hour later) on and after the 1st of December, 1866.

"Mr. Beaton does not take this step for any personal convenience or comfort, but solely with reference to the public good. He has long regretfully observed the diminishing supply of well-qualified chemists' assistants. Young men of capacity shrink from a business which offers so few social privileges. The daily responsibility, lengthened out to unreasonable, because unnecessary hours, is antagonistic to the advancing intelligence of the times, and the result is a great scarcity of assistants of such ability and character as the importance of the business requires.

"6, *St. George's Terrace, November*, 1866."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The letter of Mr. Vizer, in the Journal of this month, is calculated to greatly benefit those engaged in our business if they will but follow with spirit the example therein set forth.

Ten years ago, last April, the movement now made in South Belgravia was successfully adopted by all then in business in this district; it has worked well and much to our comfort; the public generally have fallen in with the arrangement, so that "late duties" are almost entirely at an end.

I hope, with Mr. Vizer, that the infection will spread far and wide throughout the Metropolis, and if the testimony of over ten years' experience can influence the contagion, I am certain my neighbours will cordially bear out my assertion, that the curtailment of our business hours has conduced much to the comfort, and with no pecuniary loss, to the "white slaves" who broke through the trammels of custom. Our esteemed friend Mr. John Garle first suggested the movement, and, with Mr. Sharpe and self, successfully persuaded our neighbours to follow the improved system.

Mr. Long, the successor of Mr. Garle, has, with much spirit, embraced the earlier hour of eight o'clock to close his establishment,—an hour I hope soon to be realized by us all.

I am, Sir, yours respectfully,
J. E. LIDWELL.

130, *High Street, Notting Hill.*

N.B. The closing on Sunday was commenced at the same time, and with the happiest results.

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* *Vide* Pharm. Journ. vol. viii. 1st series, pp. 152, 197.

PHARMACEUTICAL ETHICS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—*Apropos* to the question of education in Mr. J. Ince's excellent essay on Pharmaceutical Ethics, permit me to mention a circumstance recently under my own observation.

On the same day I had two assistants offer me their services, and both acknowledged that they had "*never been taught* LATIN *in any way*." Was it consistent for any one to take these young men as apprentices?

With such a state of things, Sir, I fear that, until the examination of apprentices is made compulsory by law, the social elevation of chemists as a body will be very minute.

I am, Sir, your obedient servant,
G. H. WRIGHT.

7, *Poultry, October* 3, 1866.

THE TRUE POSITION OF PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you allow me to make a few remarks upon the subject which is now filling your pages, and which is so deeply interesting to all chemists,—the position and prospects of pharmacy? My only apology for intruding on your space is the interest I feel in the subject.

I have read, with much pleasure, your report of the proceedings of the Nottingham Conference; the papers read and the discussion which followed, are replete with interest and instruction; but, in reading them, the thought arose in my mind whether some of our friends were not aiming a little too high, and trying to make that a profession which after all has too much in common with trade to become one.

We are called tradesmen, and we take our position in society as such; now, whatever may be the future of pharmacy, this is its position at present, and while we make continuous efforts to rise, we shall, I think, do well not to blink this fact. Still, while we are without doubt a trade, there is no reason as Mr. Giles says, that we should be a mere trade. The practice of pharmacy affords ample scope for the acquisition of scientific knowledge, and not only so, but its efficient and proper exercise require it.

That pharmacy is not a mere trade, is evident from the fact that while a grocer's or draper's customer is as capable of judging of the quality of the article he buys as is the seller himself, and therefore pays him beyond the cost of the article itself, for outlay of capital and labour only,—the same person purchasing drugs or medicine, is more or less dependent for their genuineness upon the knowledge, skill, and conscientiousness of the chemist, and, of course, in addition to mere cost, pays for these "ethics" also. Now this difference it is that (although it does not make us a profession) distinguishes us from other mere trades and puts us upon a higher level; and that we are so inferior, and, as a body, so uninfluential, is I think greatly our own fault in not educating ourselves to occupy fitly that higher position properly our own.

To be practical, it is a well-known fact that many persons residing in the country send habitually to the medical man for any drug the quality of which is an object, paying, in most cases, a higher price for it. Why is this? It is because they have confidence in one man and not in the other, and they go to the one who understands and is in a position to guarantee the purity of the article which he supplies.

It has a very plausible appearance to say that one man, knowing the composition of oxalic acid, its reactions, etc., on supplying an ounce to a customer, possesses no advantage over another who, on supplying the same article, knows nothing at all about it; but let them be ten years in business, and if they are in other respects equal, it will not be difficult to say which of them, at the end of that time, will possess the greater share of the public confidence. Education and scientific attainments are not valueless, and added to good business abilities, will in an equal race give the possessor a very decided advantage.

If I could speak with the influence possessed by some, I would say let us not appropriate to ourselves unsuitable names, nor strive after a position which, in the present state of things, is unattainable, nor call ourselves professional men when we are not such, but at once go in and win that true position marked out for us, and which we have hitherto, as a body, most culpably neglected. It is a wide and it is a profitable field, and it is at present occupied in great part either by those who are incompetent, or by those who have in a manner been forced upon it by our inefficiency. It lies between the mere trade and the pure profession, and it affords ample opportunity for the employment of very high intellectual and scientific attainments. Much is being done to enable us to occupy this, our true position, but the task is difficult to combine a *just consideration* for existing interests with the requirements of advancing knowledge; but beyond all these considerations, which I leave to abler men, lies the fact of our youth; there is a field which will repay effort, there is a material to hand which may be moulded at will. Let us see that our apprentices have a fair education to start with, and then take them in hand and teach them *to dust bottles*, ay, and to do it well, too, as part of their duty,—

> "Who sweeps a room as for thy law,
> Makes that and the action fine,"

—to prepare medicines, to compound prescriptions, and then lead them on to that wide field of scientific knowledge which lies open before them, and invites them. Let apprentices see the duty and necessity of qualifying themselves, and let masters encourage them to do so, and the great obstacle to elevation will be removed; time will accomplish the rest, and at length bring round that better state of things for which many sigh, and for which all should work.

A. H. C.

APPRENTICE *v.* DUSTER.

Allow me to call your attention to an abuse which adds considerably to the ranks of incompetent assistants, and fills its victims with a disgust of our vocation, not calculated to better their own interests or those of pharmacy.

There are shopkeepers, I hope few in number, who not only deal in drugs, but also show a decided tendency to do a trade in apprentices,—unblushingly pocketing premiums, and in return initiating youths into the art and mystery of performing the work of porters.

Although no advocate for the abolition of the duster, I am decidedly against the period of apprenticeship being almost wholly spent in taking down shutters, sweeping out shop, or grinding down oil-colours, which duties, with others equally as intellectual, it was my fortune to be particularly well instructed in.

As an attempt at a remedy, to parents and guardians, who are too often ignorant of the exigencies of the case, and invariably overrate the advantages to be derived from the business,—I would advise the necessity of discriminating between a desirable and an undesirable opportunity of offering up a sacrifice to pharmacy.

To such masters, let me suggest more consideration for the requirements, and a more lively interest in the future prosperity of the young people consigned to their guidance.

As the study of chemistry is not wholly made up of brilliant experiments, but has its own dirty work, so I am aware that the pursuit of pharmacy cannot be regarded as a livelihood adapted to those who fear a little drudgery.

Let us, then, endeavour to follow a happy medium, which would not be derogatory to our calling as scientific men, but would at the same time allow us to claim some merit as men of business.

FRANK OLDFIELD.

Florence, October, 1866.

GENERAL BUSINESS.

Sir,—Many gentlemen, especially those in a London West-end locality, have the most obscure ideas as to the kind of business transacted by their brethren in the country. It has occurred to me that that obscurity may be to some extent dispelled by forwarding, as a specimen, a catalogue of a day's transactions, which I accordingly enclose. I imagine that, on the whole, my business is not vastly different from an average country connection. I have been in business sixteen years, during which period I have copied 323 prescriptions. I was apprenticed in the leading business in one of the smaller county towns, the returns being about £2000 yearly, and comprised nearly all the best business of the neighbourhood; yet there, I believe, we did not average more than three or four prescriptions weekly, and had the business been confined to drugs I do not suppose it would have been worth carrying on. You may not be able to comprehend that much of the knowledge insisted on by "The Society" is to the country druggist commercially all but worthless,—in fact, I am inclined to think that, in some towns, more business might be obtained by becoming a good fiddler than a good practical chemist; and, in many connections, a young man who had passed all the examinations with honours would not know how to serve a considerable portion of the customers who might present themselves, whilst, on the other hand, the country youth, who might never have heard of aldehyde, and in botany did not know the distinction between calyx and corolla, would be *au fait* in all that came before him.

In writing thus, I am not arguing against education. The country druggist, as well as the town pharmacien, must keep pace with the times, and maintain his efficiency to perform that which his position requires,—and I maintain does so, although his curriculum of knowledge may be different, both in degree and kind, to that of his more aristocratic fellow-worker. If a London chemist can get his name up in "the Journal," and bring out a "Liquor" or "Syrupus" containing all the known minerals, it may bring him the patronage of two or three physicians, and be half a living; but in the country not one person in fifty even knows of the existence of "the Society," nor what the term "pharmaceutical" may mean; consequently, in such cases it would pay much better to make furniture paste. Unfortunately, we do not readily comprehend that that which accords with our own circumstances and position may be quite out of place with respect to another who is apparently under much the same conditions as ourselves. Reformers of every grade are whipping the very life out of their pet hobbies, each striving to compress within the narrow limits of his own time events which, in the natural course of things, should occupy at least a century; hence spring three-fourths of the controversies and jealousies with which we plague each other and ourselves. You may rest assured that country druggists will avail themselves of scientific knowledge quite as fast as they can utilize it; that they have not more generally co-operated with the Pharmaceutical Society is owing to the circumstance that the plant is not suited to the soil, and therefore requires an immense deal of nursing in order to make it grow; and I believe a large portion of those who are connected with it are so more from policy than sympathy. Under this view, I should not be surprised at a considerable secession when it be seen that no further parliamentary interference need be feared or expected.

Yours very respectfully,
A Country Chemist.

[*Note.*—The list of a day's business forwarded includes a large number of articles, mostly in one and two pennyworths, amounting in all to £2. 12*s.*]

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

The Source of Muscular Power.

Some very important researches upon this subject have been recently published by Drs. Fick and Wislicenus, Professors at the University of Zurich, and also by Dr. Frankland in this country. An account of these experiments was given in a lecture delivered at the Royal Institution by the latter chemist during last session.

It is probable that these investigations will very materially affect the present condition of physiological science, tending, as they do, to entirely change the ideas hitherto entertained respecting the relation of food to the requirements of the animal body.

Twenty years ago, physiologists would have attributed the source of muscular power to something peculiar, developed by living animals, and termed *vital force.* The progress of scientific discovery, however, rapidly dissipated the very crude notions which then existed regarding this mysterious agency. We now know than an animal, however high its organization may be, can no more *generate* an amount of force capable of moving a grain of sand than a stone can fall upwards, or a locomotive drive a train without fuel. All that such an animal can do is to liberate that store of force, or *potential energy*, which is locked up in its food. It is the *chemical change* which food suffers in the body of an animal that liberates the previously pent-up forces of that food, which now make their appearance in the form of *actual energy*,—as heat and mechanical motion. From food, and food alone, comes the *matter* of which the animal body is built up; and from food alone come all the different kinds of physical *force* which an animal is capable of manifesting.

The two chief forms of force thus manifested are *heat* and muscular motion, or mechanical work. These have been almost universally traced to two distinct sources,—the *heat* to the oxidation of the *food*, and the mechanical work to the oxidation of the *muscles*. This doctrine, first promulgated by Liebig, has been within late years adopted by most physiologists, and has been taught in all text-books treating of the subject. The proximate constituents of food have been frequently divided into two groups—the carbonaceous or non-nitrogenous, such as fat, starch, sugar, and the nitrogenous, such as fibrin, albumen, and casein,—the former class being regarded as comprising simple *heat givers*, that is to say, substances that furnish material for oxidation in the process of respiration, and thus maintain the temperature of the body; the nitrogenous constituents being the *flesh-formers*, or substances building up the muscles of the body, through which motive force is exerted. The exercise of a muscle being accompanied by a proportionate destruction or oxidation of its tissue, it follows that the plastic or flesh-forming constituents of food should bear a relation to the amount of muscular work performed. This theory, namely, that mechanical work, *i. e.* muscular exertion, is dependent on the destruction of muscular tissue, has been supported by Ranke, Playfair, Draper, and others; and, as we have already stated, it has been generally taught up to the present time. Nevertheless it has not escaped challenge. Immediately after its promulgation Dr. J. R. Mayer wrote, "A muscle is only an apparatus by means of which the transformation of force is effected, *but it is not the material by the chemical change of which* mechanical work is produced." This assertion he supported by several cogent arguments. Other physiologists also expressed similar opinions. Messrs. Lawes and Gilbert advocated a like view, basing their opinions on their own elaborate and carefully-executed experiments on the feeding of cattle. The experiments of Messrs. Fick and Wislicenus and of Dr. Frankland, to which we have already referred however, furnish results which are entirely subversive to the doctrine which has hitherto prevailed, and are almost conclusive in favour of the view expressed by Mayer. Messrs. Fick and Wislicenus, during the autumn of last year, undertook the ascent of the Faulhorn, one of the peaks of the Swiss Alps, near the lake of Brienz, in the Bernese Oberland. This ascent represented a measurable amount of mechanical work, *i. e.* the raising their own weights from the base to the summit. For some hours before commencing, and during the experiment, they consumed no nitrogenous food whatever. As it has been well ascertained that all the nitrogen passes out of the body in the state of urea, they were enabled, by collecting the urine they passed, to ascertain accurately the quantity of nitrogen excreted, and consequently the amount of muscle oxidized during the journey. It only remained to determine whether the amount of force they exerted in the ascent was greater than could possibly be generated by the quantity of muscle oxidized during the same time. If it was, then it would necessarily follow that the power of the muscle was not derived exclusively from the oxidation of their own substance.

The calorimetrical determination of the actual energy evolved by the combustion of muscle and of urea in oxygen have been made by Dr. Frankland, and the results show that the amount of muscle destroyed by the former gentlemen during their ascent would not account for one-half of the force required to lift them to the summit of the mountain. Taking the average of the two experiments, and making several necessary allowances, Dr. Frankland calculates that scarcely one-fifth of the actual energy required for the work performed could be obtained from the amount of muscle consumed.

Examining a number of previous experiments of a like kind, Dr. Frankland finds them all confirmatory of the same thing. Thus, he gives a summary of three sets of experiments made by Dr. E. Smith, by the Rev. Dr. Haughton, and by Playfair, in which in each case the force expended is in excess of that derivable from the muscle oxidized.

The following are the conclusions deduced by Dr. Frankland from his experiments:—

"1. The muscle is a machine for the conversion of potential energy into mechanical force.

"2. The mechanical force of the muscles is derived chiefly, if not entirely from the oxidation of matters contained in the blood, and not from the oxidation of the muscles themselves.

"3. In man, the chief materials used for the production of muscular power are non-nitrogenous; but nitrogenous matters can also be employed for the same purpose, and hence the greatly-increased evolution of nitrogen under the influence of a flesh diet, even with no greater muscular exertion.

"4. Like every other part of the body, the muscles are constantly being renewed; but this renewal is not perceptibly more rapid during great muscular activity than during comparative quiescence.

"5. After the supply of sufficient albuminized matters in the food of man to provide for the necessary renewal of the tissues, the best materials for the production, both of internal and external work, are non-nitrogenous matters, such as oil, fat, sugar, starch, gum, etc.

"6. The non-nitrogenous matters of food, which find their way into the blood, yield up all their potential energy as actual energy; the nitrogenous matters, on the other hand, leave the body with a portion (one-seventh) of their potential energy unexpended.

"7. The transformation of potential energy into muscular power is necessarily accompanied by the production of heat within the body, even when the muscular power is exerted externally. This is, doubtless, the chief and probably the only source of animal heat."

ACCIDENTAL POISONING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Once more are we thrown into a state of alarm by one of those accidents which a little judicious arrangement of bottles would have prevented.

After the accident at Liverpool, the feeling of the trade was that some arrangement ought to be universally adopted, and many suggestions were made to accomplish the desired object, out of the abundance of which it was thought that the Committee appointed by the Pharmaceutical Society to consider the matter would mature some plan which they would recommend to be adopted. However, those who hoped that this would be the case were doomed to disappointment, for, after great consideration, the Committee gave up the subject in despair, and left each chemist to do the best he could for himself.

The majority of chemists do adopt some method for the keeping of active from inactive medicines, and, no doubt, some of their arrangements are very good, but there are some whose arrangement is solely to please the eye. In one shop that I noticed, some time ago, the articles of the same colour were grouped together, regardless of their relative strengths. This kind of arrangement has a very pleasing appearance, but it is attended by very great danger; with it accidents are very likely to occur in the hurry and flurry of business.

It is very desirable that some mode of arrangement, bearing the authority of the Pharmaceutical Society, should be given to the trade, so that it might be generally followed. There are a few who would not adopt it at once, but if an accident were to happen, which would have been prevented by its adoption, the censure following would be so great that it would lead to its universal adoption, not only by chemists but by surgeons also. The subject of arrangement is one of great difficulty, and no perfect plan can be worked out, but surely a committee of men of experience could mature a plan as good as, if not better than, the plan used in any single shop.

A well-arranged poison cupboard would be better than no separation of potent from harmless medicines; but if all the articles in the shop could be grouped according to their doses, it would be the best. Some will say that such an arrangement is impossible, on account of the doses of medicines anastomosing into each other, but I think that lines of division could be made so as to ensure great safety. If a wrong bottle were taken where such an arrangement was adopted, the dose of the article contained in it would be about the same as of the article which ought to be used, and no danger would follow its administration; and if one method were followed by all, assistants changing from one situation to another would soon understand the geography of the new shop.

Hoping that this matter of life and death will be again discussed in the Journal, taken up by the Council, and pursued to a favourable termination,

I am, yours truly, G. R.

Huddersfield, October 17, 1866.

EXHIBITION OF OBJECTS RELATING TO PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—We observe in the 'Pharmaceutical Journal' of the present month, in the list of articles reported as shown at the Exhibition in connection with the British Pharmaceutical Conference, that we are stated to have shown "Preserved Meats." This being entirely an error, we beg to lay before your readers a correct account of the articles exhibited by us.

We are, Sir, your most obedient servants,

JOHN GILLON AND CO.

A case containing Essence of Beef, Essence of Mutton, Essence of Chicken, in various sizes of tins.
" " Essence of Beef Lozenges,—a concentration of the Essence of Beef.
" " Extractum Carnis, prepared by Liebig's process from Scotch ox beef.
" " Neat's-foot Oil.
" " Marrow.

ARSENIC-EATING.

A recent number of the 'Boston Journal' contains an interesting case of arsenic-eating, communicated by Dr. La Rue, Professor of Toxicology in Laval University, Quebec. The subject of it is an Englishman long resident in Canada, aged forty-seven, of lymphatic temperament and good constitution, intelligent, and well educated. About 1854, believing himself to be the subject of consumption, and having heard that white arsenic was an excellent remedy, he purchased two ounces, and began taking it without much regard to quantity, consuming the whole parcel in six or eight weeks, taking it sometimes five or six times a day, at the rate of five or six grains per dose as far as can be ascertained by his subsequent description. He also mingled arsenic with the tobacco he smoked, inducing the garlic fumes. He has six children, who are all healthy, the eldest being twenty-one and the youngest eleven. He has read all that has been written concerning the action of arsenic, and declares that the doctors know nothing of the matter; and as to the constitutional symptoms said to result from its use, he has never experienced them in the slightest degree, even after six weeks' constant use of the arsenic. He refrains from drinking water for some time after eating arsenic, but willingly takes a glass of wine or beer. He has always taken the white arsenic, and never the solution. He never suffers from pain in the stomach or bowels, which are regular in their action.

This individual first came under Dr. La Rue's notice in 1864, and then again in the present year, and took in his presence on the first occasion a grain and a half, and on the second four grains of pure arsenious acid, smoking also another grain with his tobacco. He remained under observation for several hours, and not the slightest inconvenience resulted.—*Medical Times and Gazette.*

NOTES ON THE MEDICINAL PROPERTIES OF THE THISTLE-OIL, OR OIL EXTRACTED FROM THE SEED OF THE *ARGEMONE MEXICANA*.

BY E. BONAVIA, M.D., CIVIL ASSISTANT-SURGEON, LUCKNOW.

Baboo Kanny Loll Dey, in his paper about indigenous drugs, published in the 'Indian Medical Gazette' (No. 7, of 1st July last, page 197), has given a faint idea of the medicinal properties of the oil of *Argemone Mexicana*, Linn. (called in Bengal *She-al Kanta*, and in Upper India *Karwàh*). He was not aware that a number of experiments have been made in Oudh, which prove it to be a much more useful oil than for the mere purposes of burning.

Some time ago I read in Simmonds's 'Commercial Products of the Vegetable Kingdom,' page 626, that "in Nevis (one of the Caribbean Islands), the oil of *Argemone Mexicana*, called '*thistle-oil*,' is sold in one-ounce phials at a quarter of a dollar each (that is, about 8 annas an ounce). The usual dose for dry belly-ache is 30 drops upon a lump of sugar, and its effect is perfectly magical, relieving pain instantaneously, throwing the patient into a profound and refreshing sleep, and in a few hours relieving the bowels gently of their contents. This oil seems fitted to compete in utility with the far more costly and less agreeable oil of croton." Mr. Simmonds further states that "Dr. Hamilton, of Plymouth, recently brought under the notice of the profession the medical properties of the prickly poppy, or Mexican thistle (*Argemone Mexicana*)."

Knowing that this plant grows plentifully all about Lucknow, and in fact in most parts of India, I determined to make some experiments with the oil of its seed, in order to ascertain whether the oil from the East Indian plant had the same effects as that of the West Indies. I got a quantity of seed collected, and had the oil extracted. I tried it in various cases of colic accompanied with constipation. It often gave relief and moved the bowels, but these effects are not always produced. Sometimes, too, a second dose is required. I understood that in Upper India natives were in the habit of using it for an affection of the skin which they call *dâd*. I tried the oil externally in all the *dâds* which came under my notice, and I cannot remember *one* in which the itchiness was not removed, and the affection cured. The *dâd* is a skin affection which appears about the waist where the "dhotee"* is tightly bound, and occurs mostly among Hindoos. The oil is rubbed twice or thrice a day on the affected part. A short time ago a patient came into my hospital with a pustular eruption all around his waist, and patches of it on his right thigh. It was very painful and troublesome. I got the seed of this plant pounded and mixed with a little flour and water, and made into a soft paste. This was plastered all over the pustular eruption; it had a very good effect. In about a week the man was quite well, and all the pustules had healed and left a clean skin.

In May, 1865, I addressed the Chief Commissioner of Oudh, suggesting that this oil should be tried in the various dispensaries of Oudh. I furnished them with the oil, and the following is the result of some of the experiments:—

Dr. Whishaw, of Fyzabad, and Dr. Jamieson, of Hurdui, reported that it acted as a mild purgative. The former stated that it would be a useful addition to the Pharmacopœia; the latter stated that he used it instead of castor oil, and it had the advantage of not being half so nasty to swallow.

From Pertabgurh it was reported that the thistle-oil had been tried in the dispensary of that district on 90 patients, said to have been suffering from colic. In 73 of the number it was successful, in 17 cases it was not.

From Roy Bareilly Dr. Baines Reid reported that "it had been given in cases of colic, in doses varying from 30 drops to 2 drachms, repeated if necessary. The smaller dose was generally successful, quickly relieving the pain and acting mildly on the bowels; but it sometimes causes purging and vomiting." "In my own practice," he says, "among Europeans, I have not been successful in its use. On three occasions, when given as a purgative in doses of 20 drops, it caused violent vomiting with long-continued nausea. The native doctor has used it successfully in cases of itch, but unfortunately not by itself. The oil made in the jail at Roy Bareilly appears similar in its properties, and has been given with the like results.

* Cotton cloth with which natives cover the middle part of their bodies.

"From my experience of the oil, it seems sometimes to have great power in relieving colic; but it is very uncertain in its effects."

Dr. Selons reported from Sultanpore—"I have had several opportunities of trying the thistle-oil, and in my opinion it is an excellent remedy in colic.

"In one case, which occurred in my own compound, one dose of half a drachm allayed the pain and caused action of the bowels; in others, two doses have been required; but in all, the medicine appeared to exercise some influence beyond that of a mere purgative, as the pain was in all cases alleviated by its administration before the bowels acted.

"I am inclined to consider it a valuable addition to the indigenous Pharmacopœia."

Dr. Condon reported from Baraitch that "it was tried in only three or four cases, and in some it did no good at all; in others it did afford some relief. It was more extensively used as an application to some skin diseases, as 'scabies' or 'itch,' and in some forms of 'psoriasis;' and its beneficial effect was very marked in all.

"I am of opinion," he says, "that its utility in colic is doubtful; but as an application in skin diseases, there can be no doubt whatever of its being a valuable remedial agent."

The same medical officer reported from Gondah that "it was used internally in four cases of colic, in each of which it gave relief;" "but," he states, "the number is too small for me to form an opinion of its merits." He tried it in skin diseases very extensively, and found that it was an excellent remedy, rarely failing to afford relief; he further states that there can be no question as to its utility in some skin diseases, more especially that kind of "psoriasis" which is so common among natives, and also in "scabies." I sent a large tin of the oil to Dr. Wilkie, then Deputy-Inspector-General of Hospitals, Meerut Circle, for trial in his dispensaries. He soon after left Meerut for the lower provinces, and I have not heard what the result has been.

Dr. O'Shaughnessy, in his 'Bengal Dispensatory,' under article *Argemone Mexicana*, states that "he subjected the seeds to numerous experiments, and has never found them to show any emetic or narcotic influence; they contain a bland oil, resembling that of poppy oil, and which can be used in ounce doses without producing any purgative effect."

The accounts given by the different individuals who tried it are conflicting, but, upon the whole, they are favourable. Its great usefulness in skin diseases I don't think can be doubted. There is discrepancy in results of trials made with the oil used internally for colic. I think this can be easily accounted for. All oils are changed more or less by keeping, and it is quite possible that the differences in the result originated in one case in being kept more exposed to the air than in another. The newly-pressed oil may give results different from those when a long time has elapsed after the seeds have been pressed. Differences of climate and soil may undoubtedly produce a change in the properties of a plant. No one doubts that all the varieties of *Nicotiana Tabacum* descended from the same stock, but no two kinds agree exactly in their properties; some have more, some have less of the narcotic principle. So it may be with the plant under consideration. We all call it *Argemone Mexicana*, but the one that grows in Mexico may have different properties from the one that grows in the West Indies, in Bengal, or the North of India.

I think it is well deserving of more extensive trials. If we find it of use, its value will be enhanced by the extent of country over which it spontaneously grows. I think if separate trials be made with fresh seed and old seed, with fresh oil and old oil, we may arrive at some conclusive results regarding the properties of each. I am now making trials with the fresh pounded seed mixed up with a little flour and water. I use it as a poultice for indolent ulcers and skin diseases. At some future period I shall give the result of my experiments.

Baboo Kanny Loll Dey states that the oil is of a pale yellow colour. Certainly, the oil which I had extracted in Lucknow was of a very different colour, it had a marked reddish-brown tinge, resembling somewhat that of the dark coloured cod-liver oil. It became much paler by keeping. The cost of producing the oil in Lucknow is as follows:—

Collecting seed, from 2 to 4 pice per seer.

Pressing a maund of seed (40 seers) by the native process, 1 rupee and 4 annas.

A maund of seed gives 8 seers of oil.

So that the oil costs about 3 rupees and 2 annas for 8 seers, or less than 8 annas a seer. The Nevis thistle-oil must be valuable indeed, to fetch about 8 annas an *ounce*.

21*st July*, 1866.

P. S.—With reference to the change of properties of oils by keeping, I have often heard natives say that when castor-oil is *newly* extracted, they sometimes make use of it for cooking purposes. It is bland and very different from the same oil kept for some days.—*Indian Medical Gazette, August*, 1866.

[In previous volumes of this Journal, attention has already been drawn to this oil, but Dr. Bonavia has evidently not had the opportunity of consulting its pages, or he would have found very full details given by our correspondent the late Dr. Hamilton, of Plymouth. In a paper in vol. iv. p. 167, he goes largely into its medicinal uses, and quotes the experience of West Indian practitioners with it. He then spoke of its anodyne effects in cancer and irritating skin diseases. In vol. xii. p. 292, he suggested it as a remedy for Asiatic cholera, and some further observations on the same subject are given by him at vol. xiii. p. 642.—Ed. Pharm. Journ.]

ERYTHROXYLON COCA.

Dr. Reis, in the 'Bulletin Gén. de Thérapeutique,' of Feb. 28, 1866, writes with regard to the *Erythroxylon Coca*:—

"In January, 1863, as some of my colleagues may remember, I published an account of some experiments made with the leaves of the *Erythroxylum peruvianum*, *Erythroxylon Coca*, a plant which is used by the Indians of Peru as a masticatory, in doses of fifteen to twenty-five grammes daily, for the purpose of enabling them to undergo fatigue, hunger, and thirst, or the severe labours of the mines.

"I have subsequently verified the powerful yet inoffensive efficacy of this substance as a nervous stimulant. On the one hand, results are augmented, and continued activity of the mental faculties, rendering elocution easy and animated, and inspiring resolution, courage, and perseverance; on the other, an increased disposition to muscular action as shown by facility in locomotion, which can be continued without fatigue for a long period during the mastication of the coca. Hence, my observations have led me to regard this stimulant as an agent well adapted to distract the mind from its habitual cares, and sustain temporarily the vital forces, with or without a moderate use of food. Doses of two, three, or four grammes of coca, renewed at seasonable intervals, are sufficient to produce these physiological effects.

"The experiments of MM. Gorse and Mantegazza have, however, shown that in large doses the Peruvian leaf causes an acceleration in the cardiac contraction four times greater than that produced by tea, more than twice as much as that resulting from coffee, and at least a third greater than that which follows the employment of the *Ilex maté*. When used in doses of thirty to forty grammes, an intense fever, accompanied with hallucinations and delirium, follows. Being among the first to call attention to the prompt, energetic, and almost poisonous action of the coca, I cannot but recommend its employment in diseases characterized by marked depression of the nervous and muscular system, and particularly in cholera."

Dr. Reis then goes on to state that he has used it during the recent epidemic, but adds that no severe cases came under his observation. In a few in which algid symptoms began to make their appearance, and the pulse was small and almost imperceptible, the use of the remedy was followed by apparently good results. It may be administered in the form of elixir, syrup, extract, infusion, masticatory, or may be smoked like tobacco. The experiments made in this country with the coca do not confirm the very sanguine opinions of Dr. Reis. The results have been contradictory. It is, however, a remedy worthy of further examination, since if half which has been told of it were true it would be very valuable in some nervous diseases.—*London Medical Press.*

BEET SUGAR AND CANE SUGAR.

The astonishing progress made in late years by beetroot sugar is beginning to excite the greatest apprehension in the sugar-growing colonies. It is of the greatest interest to consider the different points that are likely to cause the preponderance of the cane or of the beet. In the first place, the sugar-cane is a denizen of the tropics, where the condition of the weather at any given time can be counted upon with certainty. The beet, on the other hand, grows in the temperate zone, where, although the inhabitants neither suffer from excessive heat nor excessive cold, the weather is almost always unsettled and more or less uncertain. The beet, which is affected by too much rain or by too little, by unseasonable heat, by unexpected cold, or by too little or too much sunlight, is particularly uncertain in its growth, and the remarkable fluctuations in the crops during the last few years sufficiently establish this point. In 1859-60 the beet crop amounted to 438,000 tons; in 1860-61 it amounted to only 366,826 tons; in 1861-62 it again rose to 404,411 tons; and in 1862-63 to 450,000 tons. The season 1863-64 was a bad one, and the return sank to 385,741 tons, from which it again rose in 1864-65 to 475,000 tons. This season it will probably amount to close on 600,000 tons. It must be remembered, in considering these very great fluctuations in returns, that, notwithstanding the extraordinary variation in yield, the breadth of land sown has steadily increased year by year, and that even the present season (the largest known) has been a favourable one only in France, while in Germany the weather was decidedly unfavourable, and in Russia so much so as to cause a failure of the crop. Although the beet crops will probably continue to increase, and although in a generally favourable season much heavier returns may be looked for, there is certainly some comfort for cane planters in the fact of the great uncertainty of the European plant. The beet owes its rapid spread over the Continent, in great measure, to its indirect use in agriculture. It gives a basis for the rotation of crops; its leaves and refuse are useful for cattle-feeding and for manure. But, on the other hand, the indirect uses of the cane have never been tried, and its refuse, although full of saccharine matter, far from being made useful, is burnt. There is another advantage possessed by the beet in its being produced in the very countries where the sugar is wanted —thus saving the costly freight from the tropics. This certainly applies to countries in the interior of Europe; but countries having a seaboard, and which have to draw their supplies from the interior or from other European kingdoms, can frequently import sugar at nearly as cheap a rate as they can transport it. For instance, the latest quotations of freight from Mauritius to England is 30*s.* per ton, while to get sugar even from the north of France to London costs 25*s.* per ton; or, in other words, the carriage of sugar from Mauritius to England is only 3*d.* per cwt. dearer than from France to England. Thus, as far as freight is concerned, there is little fear, while the English market remains open, of cane sugar being shut out from consumption. It must, however, be expected, if the present state of things continues, that in a very few years the Continent will draw its supplies entirely from the beet, and also, that although England has as yet made no sugar from it, that the beetroot grows and thrives from John o' Groat's to the Land's End, and that a little more success on the Continent will cause the manufacture of native sugar to be introduced here. It remains to be seen whether cane sugar can recover the ground lost; but there can be little doubt, had proper use been made of their advantages, that the colonial planters would not have been so far behind in the race as they are at present. The scale of duties meant to protect certain colonies against the effect of their ignorance and wastefulness, had the effect of lowering the standard of sugar-making all through the tropics. Instead of trying to make the finest possible sugar, the planter tried to make the worst, and the wasteful process that had existed in only a portion of the colonies became general. In the meantime the ablest chemists, engineers, and agriculturists were silently studying the constitution of the beetroot. Every invention that could increase the saccharine yield of the root, facilitate its working, and improve the quality of the sugar, was eagerly applied; the yield of sugar from a given quantity of beetroot has been doubled in ten years, and white sugar can now be made in France at the first operation as cheaply as brown. Should such progress induce cane planters to despair? On the contrary, it should stimulate them to exertion. Surely if the cane contain twice as much saccharine matter as the beet; if it be far more easily worked; if its growth can be more confidently relied on; if its molasses be a saleable article, which is not the case with the beet, surely we say that, far from despair, the feeling that should animate the planters should be that of hope that the proper appliances may yet rescue their industry from ruin. Every year that passes shows more indisputably the necessity for improving cultivation, for improving machinery, and for making the best instead of the worst sugar; and if cane planters will take advantage of their opportunity, they may yet retrieve their position.—*Travers's Circular.*

THE VALUE OF PETROLEUM AND OTHER OILS AS A FUEL.

In a former number we referred to the experiments in burning petroleum, as carried on at Woolwich, and the following is taken from an article which appeared in the 'Standard' newspaper, on the official report of the experiments at Woolwich made to the Admiralty:—

The engineers of the Woolwich Dockyard have returned to the Admiralty, we hear, a statement, without comment, of what Mr. Richardson has done, and have accompanied their statement with a drawing of the apparatus by which the results have been obtained. Good wine needs no bush, and such results as the patentee, aided by the dockyard authorities, has obtained need no comment. When it is known to every practical engineer that $7\frac{1}{2}$ lb. of water per 1 lb. of the best steam-coal is the maximum quantity in ordinary practice; that not more than $3\frac{1}{2}$ lb. to 4 lb. of water are done by common coals, and $6\frac{1}{2}$ lb. is the usual rate for railway locomotives, what need could there be to add one word of remark to a table of practical experiments showing 13 lb. for American rock oils, 15 lb. to 17 lb. for Burslem, and above 18 lb. for the Torbane Hill oil?

Taking the average evaporation effected by coal as 6 lb., we may fairly urge that the best mineral oil, being three times as strong as coal in the quantity of heat it generates, and evaporating three times the quantity of water in the same space of time, is just as cheap as coal if it cost three times as much to distil it from the shale as it does to get the coal out of the earth, and convey to our furnaces. It is quite a mistake to say that, however valuable shale may be for the production of paraffine, it can never be a satisfactory substitute for coal. No one ever dreams of carting shale about with its great percentage of earthy base, any more than bones and coprolites are expected by farmers to be carted over their lands while chemists can supply them with superphosphate of lime. What men have been trying to do is to burn shale-oil; to get the oil away from the mineral base, and to have as little useless matter to carry about as possible. What has been done at Woolwich has been to burn such oil in a boiler-furnace practically, and to beat coal with it. It is no use any longer to question results. The mineral oil has been burnt for days together, just as it might be burnt for months together, and it has raised steam effectively, efficiently, quickly, steadily, and continuously. It is now only a question of time how soon the world will accept the fact, and engineers begin to employ it. Already oil-works are dotting with numerous manufactories considerable regions in England, Wales, and Scotland, and our shales and bituminous rocks are being fast brought into commercial use. Evident it is that great will be the future supply when oil is admitted as the best steam fuel—a fuel that our factories will burn day and night with only a flickering glimmer of hot air from their chimney tops. Ships will carry the oil in tanks, and stow it in the bilge-ways under the lower decks, and in otherwise useless spaces, pumping it as wanted; all the labour of moving coal, all the dust and dirt from coal will be avoided, and every drop of oil will be consumed, and there will be smokeless fires ashore and afloat. As with coals, so with oils, there is a difference of quality, and it is not a little remarkable that England, possessing the superior qualities of the first, should possess also the best of the latter. While the American oils will touch 13 lb., nearly all the English ones exceed them, and the Torbane Hill oil will go nearly, if not quite up to 20 lb.; and here we would hint to oil distillers that their present crude oils and the veriest tarry refuse will have as fuel a value in the market, for most of them will do as much as ordinary coal. For the best work engineers will have the best oil, as they have now the best coals; but if the thickest refuse of the distilleries will evaporate probably its 6 lb. of water, the mineral-oil-makers will have a profitable market for that which they incur an expense now to be rid of, disposing of it for manure or any casual purpose. For our fast passenger steamers the oil will be a boon of the greatest value, and our sharp-witted companies will doubtless try its mettle. For our men-of-war it will, in unpeaceful times, be an imperative necessity, and we may be sure that our new Government will neglect no important means of providing for the supremacy of the British navy.

Whatever further experiments may be probably undertaken before oil is adopted by the Admiralty, sufficient at least has been done, and under such superintendence that the results can neither be doubted nor disputed, to prove that there is a fuel capable of superseding coal for steam and mechanical purposes, that it has been practically tried and applied, and which only awaits the demand to come into the market at economic prices.

BOUSSINGAULT'S RESEARCHES ON THE ACTION OF FOLIAGE.

A full abstract of the first part of these investigations, communicated to the French Academy of Sciences, is given in the 'Comptes Rendus,' vol. lx. No. 18 (May, 1865). Theodore Saussure had long ago ascertained that, while plants prosper and decompose carbonic acid gas in an atmosphere containing as much as one-twelfth or even one-eighth part of that gas, they promptly perish in unmixed carbonic acid, apparently without decomposing any of it. Boussingault made his experiments in a better form, upon leaves only, avoiding all complication of the action of the roots or other parts of the plant. His results are:—

1. That leaves exposed to sunshine in pure carbonic acid do not decompose this gas at all, or only with extreme slowness.

2. But in a mixture with atmospheric air, they decompose carbonic acid rapidly. The oxygen of the atmospheric air, however, appears to play no part.

3. Leaves decompose carbonic acid in sunshine as readily when this gas is mixed with nitrogen or with hydrogen.

Although this decomposition of carbonic acid by green foliage must be a case of dissociation,—a separation of carbon from oxygen,—yet Boussingault recognizes an analogy here with an opposite phenomenon, viz. with the slow combustion of phosphorus at the ordinary temperature. Phosphorus in pure oxygen emits no light, does not sensibly undergo combustion, but does so in a mixture of oxygen with atmospheric air, or with nitrogen, hydrogen, or carbonic acid. The analogy may even be carried further. For while a stick of phosphorus is not phosphorescent in pure oxygen at ordinary or increased pressure, it becomes so in rarified oxygen. And Boussingault equally ascertained that leaves which exerted no sensible action upon pure carbonic acid at ordinary pressure, decomposed it, with the liberation of oxygen gas, under diminished pressure. That is, rarefaction and mixture with an inert gas act alike in mechanically separating the atoms, whether of carbonic acid as in the one case, or of oxygen as in the other, so as to determine the action either of combination or of dissociation.

In a continuation of these investigations ('Comptes Rendus,' vol. lxi. Sept. 25, 1865), Boussingault shows that carbonic oxide, whether pure or diluted, is not decomposable by foliage, and that this inertness of green foliage upon carbonic oxide goes to confirm the opinion maintained in his 'Économie Rurale,' that leaves simultaneously decompose carbonic acid and water, $CO_2, HO = CO, H, O_2$; the O_2 being liberated, CO,H expresses the relation under which carbon is united with the elements of water in cellulose, starch, sugar, etc., *i.e.* in the important principles elaborated by the leaves, the composition of which is represented by carbon and water. He goes on to prove that a leaf which has been decomposing carbonic acid and water all day long is capable of doing the same work the next day, if not allowed to dry, but the losing of a certain amount of water annihilates this faculty, and irremediably destroys the life of the cells of a leaf, vegetable life in this state being far less tenacious than that of some of the lower animals (*Tardigrades*, *Notipes*, etc.), which bear wonderful desiccation.

The third instalment of the investigation is given in Nos. 16 and 17 of the same volume (Oct. 16 and 23, 1865). It appears that detached leaves, kept in shade for many days, with the cut end of the petiole in water to prevent desiccation, preserve the power of decomposing carbonic acid whenever brought into sunshine. But for this they must be kept in an atmosphere containing a supply of oxygen; without this they soon die, as Boussingault thinks, from asphyxia. The oxygen in darkness is slowly transformed into carbonic acid, through an operation which is presumed to go on continually, whether in light or darkness, and to answer to respiration. Of course a healthy and active leaf decomposes far more carbonic acid in the light than it forms in darkness. In eighteen experiments, with Oleander-leaves exposed to the sun from eight A.M. to five P.M., in an atmosphere rich in carbonic acid, a square metre of foliage decomposed on the average over a litre of carbonic acid per hour, while in darkness only $\frac{7}{100}$ of a litre of carbonic acid was produced per hour. In air which contains oxygen and carbonic acid, leaves will go on indefinitely producing oxygen in the presence of carbonic acid, and carbonic acid in the presence of oxygen. But the latter, though relatively small in amount, seems to be necessary to the preservation of their vitality. In hydrogen, carburetted hydrogen or nitrogen, as well as in pure carbonic acid, they soon lose their decomposing power, and die from the impossibility of respiration, *i.e.* are asphyxiated.

Leaves confined in a limited portion of atmospheric or other air over mercury, lose the power of decomposing carbonic acid; and the experiments pretty clearly show that they lose it through the deleterious action of the vapour of mercury. It is thought remarkable that the leaf does not under these circumstances at all lose the power of transforming oxygen into carbonic acid; but that is what we should expect, for the carbonic acid so evolved (whether its evolution be called respiration or not) must be a product of decomposition of the leaf's contents or substance.

We owe to Boussingault and his assistant Lewy the idea of determining the composition of the air contained in a fertile soil, and the fact that this air in a strongly-manured soil contains a very large percentage of carbonic acid. Boussingault has now devised an experiment by which the air contained in a branch of an Oleander in full vegetation was extracted. It proved to be nitrogen 88·01 per cent., oxygen 6·64, carbonic acid 5·35 per cent.,—being about the composition of the air from a well-manured soil. This carbonic acid carried into the leaves with the sap, and also that which they may absorb directly from the atmosphere, decomposed along with water under sunlight, must be the source of the glucose ($C_{12}H_{12}O_{12}$) which it is the principal function of foliage to produce. This glucose, in fixing or abandoning the elements of water, becomes sugar, starch, cellulose, or other hydrates of carbon, which, in whatever part of the plant accumulated or deposited, and however transformed or re-transformed, must always have originated from carbonic acid and water in the green parts of plants. In closing his present paper with some illustrations of this now familiar view, Boussingault announces that his more recent experiments will enable him to demonstrate the direct formation of saccharine matter by the green parts of vegetables exposed to the light.—*Amer. Journ. Sci. and Arts.*

ON THE COMBUSTION OF GAS FOR ECONOMIC PURPOSES.

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(*Continued from p.* 170.)

Lastly, there are cases where the amount of carbon in the vaporous matter is so abundant that contrivances are needed for its oxidation. All these contrivances are plans for diminishing the supply of the combustible and increasing the flow of air. In the paraffin candle the wick is adapted for a small supply of the material; and in the benzole and paraffin lamps there are caps and deflectors, with slights for blowing the air upon the sides of the flame. In the camphine lamp there are additional deflectors in the form of a central button, and a throttled chimney, for directing the air upon the inside and outside of the flame; and in the Carcel lamp the oxidation is increased by the length of the chimney. In all cases, however, the points for consideration are—the best means for effecting perfect and prolonged combustion; and having attained this, we have to take care that the light is not destroyed by the medium of transmission. Glass is very transparent, but yet it destroys a notable proportion of light; and when the surface is ground the loss of light is often considerable:—

Loss of Light by Glass Globes.

Clear glass destroys	12 per cent.
Slightly ground in pattern .	24 ,,
Half ground	35 ,,
All ground	40 ,,
Opal glass	60 ,,

And lastly I have to refer to the methods which are adopted for estimating the value of the light of gas. These are as follows:—

1. By observing the durability of a jet of gas of a given height from an aperture of a given size.
2. By ascertaining the pressure necessary to obtain a flame of a given height from the same jet.
3. By noting the height of the jet when the gas is burning from an aperture of a given size and at a uniform pressure.
4. By ascertaining the quantity of air which is required to destroy the light or a flame burning at a given rate.
5. By comparing the light with a standard flame.

The first method of testing the illuminating power of gas was often used by the late Dr. Fyfe, of Glasgow, and when it was conjoined with another test, namely the amount of condensation by chlorine, it was much relied on. The jet which he used had a diameter of the 1-33rd of an inch, and the flame was kept at uniform height of four inches. In this way he found that a given volume of gas of different qualities burnt out in different times, thus:—

Durability of a Cubic Foot.

Common Newcastle coal gas .	50·5 minims.
Wigan cannel	57·0 ,,
Lesmahago	65·0 ,,
Wemys	75·0 ,,
Boghead	81·0 ,,

Secondly, he further ascertained that the pressure necessary to make a gas burn from an aperture of a given size, and with a flame of a given height, was also the exponent of the quality of the gas; for the better the gas the less the pressure at which it burns, and the less also is the consumption to produce a flame of a given height. For example, with a jet 1-40th of an inch diameter, and a flame 5 inches high, the following were the rates and pressures of different gases:—

Pressure, Inch.	Consump. per Hour, Cub. Ft.	Specify Gravity of Gas.
0·6	0·67	0·841
0·8	0·77	0·729
1·0	0·86	0·552
1·2	0·94	0·595
1·4	1·03	0·551
1·6	1·09	0·515
1·8	1·15	0·486
2·0	1·21	0·461

His deductions from these results were, that the specific gravity of the gas—or, in in other words, its quality—was inversely as the square roots of the pressures, and that the volume consumed in a given time was as the square roots of the pressures. He relied so much on this test, that he thought it capable of taking the place of both the meter and photometer.

The third method of ascertaining the value of gas is by observing the height of a flame at a given pressure from a jet with an aperture of a given size. This method has has been adopted by Mr. Lowe, and it goes by the name of Lowe's jet. It is, as you perceive, a modification of the preceding, for a poor gas will burn with a shorter flame than a rich gas; and by using a jet with an aperture 0·04 of an inch in diameter, and a pressure of 0·5, the flame of fourteen-candle gas will be just 6 inches in height.

The fourth method for determining the quality of gas is by ascertaining the quantity of air necessary to destroy its light. The best instrument for determining it is the apparatus designed by M. Erdmann, and which is called a gas-prover. It is a sort of Bunsen burner, with a contrivance for graduating the supply of air. Erdmann recommends the gas to be turned on until there is a flame of a given height, and then the supply of air is admitted until the light is destroyed. This, however, is not the proper way to use the instrument. The gas should first be turned on at a given rate—viz. at the rate 0·84 of a cubic foot per hour—and then the quantity of air necessary to destroy the light should be read off. In this way reliable results may be obtained, for the richer the gas the more air is required.

I referred in my last lecture to this diagram, which has been prepared from the experiments of Mr. King, of Liverpool:—

Illuminating Power of Gas, as estimated by Erdmann's Gas-Prover, the Gas burning at the rate of 0·84 Cubic Feet per Hour.

	Description of Gas.			
	Newcastle Coal.	Equal Parts Newcastle and Wigan.	Wigan Coal.	Boghead Coal.
Height of flame (inches)	1·87	2·00	2·75	5·50
Number of index prover	14·72	23·39	32·78	61·14
Relative value of do.	1·00	1·59	2·22	4·15
Coefficient of power	0·70	0·70	0·72	0·70
Illum. power (coefficient =0·7)	10·30	16·37	22·93	42·80
Do. do. by photometer	10·30	16·35	23·55	42·96
Relative values	1·00	1·58	2·29	4·17

Lastly, the common method for ascertaining the illuminating power of gas is by comparing it with a standard flame.

In this country, the standard was formerly a wax candle burning at the rate of 120 grains per hour, but the variations in the value of the light were so great, that it was abandoned; for, as a wax candle requires snuffing, it was difficult to decide when it was burning in a proper manner. After numerous experiments, extending over a year, I ascertained that, for equal consumptions, the light of wax and sperm was as 14 to 16—in other words, the power of sperm was just one-seventh greater than that of wax.

At present, the standard flame in this country is a sperm candle of six to the pound, burning at the rate of 120 grains per hour. But for some time past this standard has also become uncertain—first, because there has been great irregularity in the construction of the wicks; and, secondly, because the sperm is being adulterated with wax and paraffin or both. The irregularity of the wick causes a variation in the rate of burning from 116 grains per hour to 140; and the real value of the light in the two cases, when reduced to the standard consumption of 120 grains per hour, is as 96 to 116. The adulteration of the sperm with wax and paraffin also affects the value of the light, for the former gives 13 per cent. less light than sperm, and the latter gives 23 per cent. more light. These irregularities are becoming so serious, that we must ere long change the standard.

In France, the standard is a Carcel lamp of specified dimensions in every particular, burning refined colza oil at the average rate of 648 grains per hour. With proper precautions this standard appears to be very uniform, care being taken that the consumption of the oil is never less than 617 grains per hour or more than 679.

And now, in concluding this part of the subject, I will direct your attention to the comparative power and value of the most important illuminating agents.

Relative Value of different Illuminating Agents.

Name.	Rate of Consump. per hour.	Illum. Power. (Sperm 120.)	Quantity = 14 Candles.
Cannel gas	4 feet	18·67	3 feet.
Coal gas	5 ,,	14·00	5 ,,
Benzole	301 grs.	4·91	857 grs.

Paraffin oil	265 grs.	7·11	522 grs.
Sperm oil	686 „	10·00	960 „
Colza oil	648 „	9·01	1008 „
Paraffin candles	122 „	1·46	1171 „
Sperm „	132 „	1·35	1440 „
Wax „	168 „	1·43	1652 „
Stearic „	140 „	1·13	1732 „
Composite „	144 „	1·08	1858 „
Tallow „	145 „	0·83	2542 „

With regard to the value of other illuminating agents, as the magnesium light, the oxhydrogen or Drummond light, and the electric light, little can be said, as they vary so much with the consumption of the material.

In the case of the magnesium light, I find that when a wire the 100th of an inch in diameter is doubled and twisted, it burns at the rate of 2·4 grains per minute, and gives the light of about 69 standard sperm candles; an ounce of the wire, therefore, is equal in light-giving power to rather more than 3½ lbs. of sperm candles. The power of the Drummond, or oxyhydrogen light, varies with the combustible used. With

Coal gas	and air	it is equal to	19	candles.
„	„ oxygen	„	29	„
Alcohol	„ „	„	69	„
Ether	„ „	„	76	„
Hydrogen	„	„	153	„

And the power of the electric light varies from 650 candles to 1444, the average being about 1000.

All these agents are expensive, and they give a light which is characterized by intensity rather by quantity but as the light is pure as well as powerful, it is frequently used for signals and for photographic purposes, and also for theatrical illustrations.

I now pass to a very interesting part of our subject, namely the cause of the marked differences in the colour of the flames of different substances; and in order that you may perceive the reason of this, let me remind you that a pure white light, with all the colours of the spectrum, is never obtained but by the intense ignition of solid or molten matter. This is so with the phosphorus flame, and with the magnesium, the oxyhydrogen, and the electric light. In all these cases there are particles of concrete solid matter in a state of intense ignition, but in the case of coal gas, and in that of other burning hydrocarbons, the light is never pure unless it is intensified by very energetic combustion. The reason of this is that the particles are only heated to the point of yellow whiteness; for Dr. Draper has shown that, acording to the temperature, an ignited solid (as a spiral of platinum heated by the galvanic current) passes through all the tints of the spectrum from red to white, according to the intensity of the heat; and these tints and temperatures are somewhat as follows:—

Very dull red	about	970	Fahrenheit.
Cherry red	„	1500	„
Full red	„	2000	„
Dull red, white, or orange	„	3000	„
Yellow white	„	4000	„
Greenish-white	„	5000	„
Bluish-white	„	6000	„
Perfect white	„	7000	„

If, therefore the temperature of combustion is not sufficiently high, the light is never pure. This is especially so with the creamy lagging flame of underburnt gas, and with the smoky flame of hydrocarbons rich in carbon, as benzole, turpentine, and paraffin; but if the combustion of these flames is intensified by a proper supply of air, the temperature of the ignited carbon is increased, and the light becomes purer and purer, so that when it is thrown upon coloured objects it displays the tints in a more or less perfect manner. Such a flame, when examined with the prism, gives a spectrum like that of solar light, with all the tints of the rainbow. This is the specialty of pure light from an ignited solid. If, however, the vaporous matter does not contain solid particles in a free or concrete form, the ignition of it produces only certain tints of the spectrum, and hence its variable colours. Examined, therefore, with a prism, we see only those bands of colour which are characteristic of the flame.

I will show you this by moistening little balls of coke with the chlorides of the following metals, and then introducing them into the colourless flame of a Bunsen burner, or, better still, into that of Griffin's blast jet; and you note how different are the tints, and how they fail to illuminate certain colours of these dyed ribbons.

Chloride of sodium	gives a rich yellow flame.
Chloride of copper	„ a deep blue-green flame.
Chloride of strontium	„ a rich scarlet flame.
Chloride of barium	„ a pale pea-green flame.
Chloride of lithium	„ a bright crimson flame.
And a salt of thallium	„ a beautiful grass-green flame.

The chlorides are used because they are the most volatile, and they exist in the flame in a vaporous condition. These tints are so characteristic of the several metals, that they afford the most delicate means of discovering their presence; but the great fact which modern investigations have brought out is the circumstance that the spectrum of these flames consists of certain well-defined and constantly-placed bands of colour. This diagram will show you the spectra of the metals which I have been using; and so true and constant are the positions and tints of these bands, and so delicate are the manifestations of them, that they become the means of discovering the merest traces of the several metals. But I must not pursue this further, except by showing you the differences in the tints of this spectrum and ribbons when examined with the pure white light of burning magnesium.

And now I will briefly describe the contrivances which are used for increasing, or rather, I should say, for fully developing, the temperature of burning gas. I have shown you that the light of a flame depends on the presence of ignited carbon; if, therefore, by any contrivance we can at once burn this carbon, and not permit it to stand as it were idle in an ignited condition, the temperature must be considerably increased. This is the principle concerned in all the contrivances for developing the heat of gas.

One of the simplest means of accomplishing this is to mix a sufficient quantity of air with the gas before it reaches the place of combustion; and this is easily done by putting a cap of wire gauze upon the chimney of an Argand burner, and setting fire to the gas above it. The effect of this arrangement is that, as the gas passes from the burner to the top of the chimney, it draws in a quantity of atmospheric air, which freely mixes with it and burns the solid particles. The same is the case with the burner of Bunsen, which I have already described; and you will note how strongly it ignites this platinum crucible. The same arrangement is adopted by Mr. Griffin in his reverberatory furnace, which is a Bunsen's burner enclosed in a clay chamber. I have here another contrivance of the same nature, called an *atmopyre*, which is used by Professor Hofmann in his furnace for effecting organic analysis. It is a hollow cylinder of baked pipeclay pierced with a large number of small holes. When it is placed on a small fish-tail burner, the gas, in issuing from the holes, draws in a sufficient quantity of atmospheric air to make it burn at all the apertures with a clear blue light; and thus the temperature is so much increased that the entire body of the numerous cylinders composing the furnace becomes almost white hot.

(*To be continued.*)

THE TRANSPORT AND STORING OF NITRO-GLYCERINE.

The annexed report has been issued to the underwriters by Lloyd's Salvage Association, in reference to the explosiveness of nitro-glycerine, or glonoin oil:—"When intelligence reached this country of the calamitous destruction of life and property caused by the explosion on board the 'European,' applications from many quarters were made to the Association to investigate the circumstances. A general belief existed that the accident was occasioned by a new combustible substance, hitherto unknown to commerce, and of enormous explosive power. When the committee yielded to these applications and came to consider what they had to investigate, there appeared to be no doubt of the presence of such a combustible substance on board the vessel. It appeared, also, that the question whether that substance occasioned the accident or not would probably have to be determined in the courts of law. The inquiries of the committee, therefore, were limited to the following points:—The chemical composition of the substance and its explosive force; its applications and the places of its manufacture; the means employed for its transport and the exact nature of the risks attending its manufacture, carriage, and use. The committee requested Captain Grant, R.N., one of the officers of the Association, to carry out an investigation directed to these questions, and to do this in communication with Professor Abel, chemist, Royal Arsenal Laboratory, Woolwich. The result of Captain Grant's inquiry is set out in the report annexed, which has been read and approved by Mr. Abel. The following is a summary of its contents:—The substance is a manufactured substance, composed of glycerine, nitric and sulphuric acids. It is called nitro-glycerine, glonoin oil, and Nobel's patent blasting oil. It is exploded by concussion, and apparently, under ordinary circumstances, by nothing else —neither by friction nor fire. Generally, a trifling percussion is sufficient to explode it. Its explosive force is about ten times that of gunpowder. It is usually carried in tin cans, holding each about 25 lb. weight of the oil. It has all the appearance of ordinary oil; so that there is nothing in itself, or in the tins used for its carriage, to give notice of its dangerous nature. The cans are packed each in a wooden case, for carriage by land or water. The oil is manufactured by the patentee, Mr. Nobel, of Hamburg, and by other persons abroad, under his licence. It is at present employed for blasting only. It is extensively used both abroad and in this country.—Salvage Association, Lloyd's. W. W. Saunders, *Chairman*." The committee append to their report a notice which has been issued by the Prussian Government as to the transport of glonoin oil, and which they suggest might be advantageously followed out in this country:—"There has lately appeared in commerce a blasting material under the name of 'blasting oil,' or 'nitro-glycerine,' the qualifications of which to explode under certain conditions with great force has already occasioned sad accidents. As this blasting oil supersedes in many ways the use of gunpowder, and has been used with great success as a blasting expedient in mines and other ways, it will no doubt become an article of great importance. According to the present experiences, the sudden explosion is occasioned by strong heat as well as by the effect of a shock, and by compression. The transport and the warehousing of this article can only, therefore, be allowed under such conditions as to exclude the possibility of contact with great heat, as also of any shock or pressure. The transport of nitro-glycerine by land or by water, especially also by rail, can therefore only be allowed under the same conditions as those referring to the transport of ignitable jars, in addition to which we issue the following orders as further means of precaution:—The nitro-glycerine must be packed in bottles, made either of tin or strong glass. The bottles must be closed by a stopper of cork, not of glass. The glass bottles used for the transport of blasting oil must be cased with cork, having an inside lining of straw. These packages, the tin bottles as well as the incased glass bottles, must be packed in tight wooden cases, straw, hay, or such like, to be used for packing. The cases must be marked 'sprengoel' (or blasting oil) on the outside. Sending 'blasting oil' by post is strictly forbidden. As the nitro-glycerine, in a temperature of a few degrees above zero, crystallizes, and is in this condition, according to experience, more likely to explode, a greater amount of care is recommended during the colder season of the year. As regards the warehousing of blasting oil, the same orders have to be complied with as those applying to gunpowder and other explosive articles. Whosoever acts contrary to these orders will be fined not exceeding ten dollars, or, if unable to pay, the offender will be punished by proportionate imprisonment. By order of the King.—Home Department,—Lack. Breslau, Feb. 20, 1866."

ACCIDENTAL POISONING BY STRYCHNINE.

A very singular and exceedingly painful case of accidental poisoning occurred at the village of Wardley, near Uppingham, Rutlandshire, on the 9th of September, the victim being the wife of Mr. C. H. Simkin. On the following day an inquest was held on the body before Mr. William Sheild, coroner, when the following facts were adduced in evidence:—Mrs. Simkin (the deceased) had for some time suffered from ill-health, and had been attended by Mr. Spencer, who is an old practitioner residing at Hallaton. On the 31st of August she complained of being unwell, and said she had pain in her back and shoulders, which she attributed to rheumatism. On a subsequent day she was taken seriously unwell at an archery meeting, and had to be taken home. On that occasion she had a fit, and complained of a pain in her head, which she attributed to neuralgia. From that attack she recovered, and on the Sunday she died she was apparently in excellent health and spirits, but was still taking medicine. On that day Mr. Simkin called at the house of Mr. Spencer for a repetition of the medicine. After taking a dose of it she was attacked with violent convulsions, her teeth being firmly set and the limbs rigid. An attempt was made to administer brandy, but it was found impracticable, and she died in about twenty minutes from the time of being first seized. Mr. Spencer was sent for, and on being told that Mrs. Simkin had expressed a wish that she had not taken the medicine, he felt so convinced no mistake had been made, that he took up the bottle and drank some of the medicine; a few minutes afterwards he was seized with convulsions, and twitchings of the limbs. He sent for Mr. Bell, another medical practitioner, under whose care he gradually recovered. A *post-mortem* examination was made by Mr. Bell, and at the resumed inquiry, Dr. Alfred Taylor, having deposed to receiving the bottles containing the contents of the stomach and the medicine from Chief Constable Mitchell, proceeded to relate the result of his examination and analysis of the same. He said the large bottle contained $1\frac{1}{2}$ ounces of liquid, including sediment, and the small one $2\frac{1}{2}$ ounces, also including sediment, making altogether 4 ounces, or one-third of the total capacity of the large bottle, 12 ounces. The liquid was separated from the sediment. It tasted very bitter. A chemical analysis showed that the liquid contained, in a dissolved form, brucia and strychnine in the proportion of 1·7 grains to an ounce, the brucia, from its greater solubility, being in larger proportion. The dry sediment obtained from the large bottle weighed 5·2 grains, and that from the small bottle weighed 3 grains, making 8·2 grains of undissolved matter from the two bottles. This sediment was tested, and found to be nearly pure strychnia. A quarter of a grain of the sediment produced tetanic convulsions in a rabbit in thirty minutes, and caused the death of the animal, with the usual symptoms of strychnia poisoning, in ten minutes more. The sediment or undissolved residue from the two bottles was examined for bismuth, but none was found in it. He mentioned that fact because he had seen from the prescription that it was stated to have contained bismuth. The liquid in the bottles contained much brucia, with some strychnia. On evaporation 1·7 grains were obtained from an ounce of it. Hence in the 4 ounces there would be 6·8 grains dissolved. Hence, in the two bottles the weight of dry sediment, principally strychnia, was 8·2 grains; the weight of brucia, strychnia, and other soluble matter, 6·8 grains; total grains in 4 ounces of mixture, 15 grains. Three tablespoonfuls, the dose marked on the large bottle, are equivalent to nearly two ounces, hence such a mixture would contain in a single dose, if it were shaken, a fatal dose of strychnia. Half a grain of strychnia has proved sufficient to destroy the life of a human adult in twenty minutes, and in the sediment alone there was enough to kill sixteen persons. The stomach contained three ounces of partly-digested food, in which was starchy matter; the stomach was quite healthy, and its contents presented the appearance usually seen in the bodies of persons who have died suddenly in a state of health, and while digestion was going on. The application of the usual tests and processes to the stomach, duodenum, and œsophagus, as well as to their contents, showed that strychnine was present in a small quantity in each case. The largest proportion was found in the duodenum. Some powdery matter scraped from the surface of the œsophagus was by the usual tests found to be strychnine. Taking these facts and the statements in the depositions—namely, that deceased took a dose of the mixture and died in about half an hour afterwards,—I am of opinion that her death was entirely due to strychnine. From the appearances, the symptoms described, and the result of the analysis, I have no doubt whatever that the deceased died from strychnine, and not from natural causes. It is possible that old samples of bismuth might be mistaken for strychnine, as they are very much alike in appearance, but they are very different in their effect. The one is very simple, and the other is a very potent poison. Any human being taking a dose like the one alleged to have been taken by the deceased would certainly die from the effect.

Generally, strychnine is only kept in very small quantities, while bismuth is kept in large bottles. All bottles containing drugs ought to be distinctly labelled. An inexperienced person ought to know the difference between bismuth and strychnine by the weight, the one being much heavier than the other.

Evidence was adduced to show that there had been no tampering with the medicine after it left Mr. Spencer's surgery. The coroner then explained to the jury the question they had to decide; and the jury, after consulting a short time, returned a verdict that the "Deceased died from Strychnine, administered by Mr. Spencer with gross neglect."

Upon the delivery of the verdict, Chief Constable Mitchell, who had been present during the proceedings, took Mr. Spencer into custody on the charge of manslaughter. He was shortly afterwards admitted to bail, himself in £500 and two sureties in £250 each. The case will be tried at the next assizes.

MISCELLANEA.

Safety from Accidental Poisoning.—Mr. William Dyer, of Halifax, in a communication published in the 'Halifax Guardian,' recommends the following plan for the safe keeping of dangerious remedies:—"The plan I have adopted for a considerable length of time, in my establishment, and found to operate as a perfect safeguard, is as follows:—In my shop I have a cupboard, or closet, in which all delicate chemicals, or preparations, and the most dangerous articles, are stored; and inside this cupboard I have another smaller special poison closet, with a locked door (the key being kept in a convenient place close by), in which are kept the most deadly articles, such as before mentioned, some of which, for further protection, are in bottles with glass caps fitted over the stoppers. The effect of this arrangement is, that before any one of these articles is reached, the dispenser must go some distance from his counter, open the first closet door, then get the key of the inner one from its accustomed place, unlock the second door, and when he has selected the bottle he requires, in the case of several of the articles, he must remove the glass cap before getting at the drug. It will easily be seen that this arrangement makes it next to impossible to get the strychnine bottle for the bismuth one, or to make any similar mistake; indeed, had it been in force at Uppingham, no such fatal blunder could have occurred, and it would have equally prevented the melancholy accident which occurred a few years ago in a large dispensing-establishment in Liverpool."

Varieties in Ink.—Gold ink is made by grinding upon a porphyry slab, with a muller, gold leaves with white honey, till they become reduced to the finest possible division. The paste is then collected upon the edge of a knife or spatula, put into a large glass, and diffused through water. The gold by gravity soon falls to the bottom, while the honey dissolves in the water, which must be decanted off. The sediment is to be repeatedly washed till entirely freed from the honey. The powder, when dry, is very brilliant, and when to be used as an ink, may be mixed up with a little gum-water. After the writing becomes dry, it should be burnished with a wolf's tooth.—Silver ink is prepared in the same manner.—*Indelible Ink.* A very good ink, capable of resisting chlorine, oxalic acid, and oblution with a hair pencil or sponge, may be made by mixing some of the ink made by the preceding prescription, with a little genuine China ink. It writes well. Many other formulæ have been given for indelible inks, but they are all inferior in simplicity and usefulness to the one now prescribed. Solution of nitrate of silver thickened with gum, and written with upon linen or cotton cloth, previously imbued with a solution of soda, and dried, is the ordinary permanent ink of the shops. Before the clothes are washed, the writing should be exposed to the sunbeam, or to bright daylight, which blackens and fixes the oxide of silver. It is easily discharged by chlorine and ammonia. A good permanent ink may be made by mixing a strong solution of chloride of platinum with a little potash, sugar, and gum to thicken. The writing made therewith should be passed over with a hot smoothing iron, to fix it. Nitrate of silver, 1 to 2 dr.; water, $\frac{3}{4}$ oz.; dissolve, add as much of the strongest ammonia water as will dissolve the precipitate formed on its first addition, then further add mucilage, 1 or 2 drachms, and a little sap green to colour. Writing executed with this ink turns black on being passed over a hot Italian iron. Asphaltum, 1 part; oil of turpentine, 4 parts; dissolve, and colour with printer's ink. Very permanent. (*From Paper Trade Review.*)—*The Technologist.*

Poisoning by Absorption.—An inquest has been held at Albury on Mary Ann Parish, who, according to the evidence, appears to have been poisoned by the external application of an ointment containing arsenic. Mr. Chamberlain, of Hertford, the accused, who is said to have been successful in the treatment of cutaneous diseases, treated the deceased for what he termed "cancer-tumour," and supplied an ointment, with verbal instructions to use "a very little at a time;" but it appeared to have been used freely twice or three times a day for a fortnight, when she became very ill, with all the symptoms of poisoning. Mr. Pope, a surgeon, of Tring, was called in, who prescribed for the deceased, after which some improvement took place, but she subsequently relapsed and died. Professor Taylor deposed that he received from the coroner of Hemel Hempstead three boxes, two of which contained ointment and one pills, for analysis. One of the boxes contained a common red ointment mixed with red peroxide of mercury. It was similar to an ointment known as the "red iodide of mercury." It contained only the usual proportion of mercury. It acted as an irritant when applied to the skin, and if used for any length of time would produce salivation and other symptoms of chronic poisoning by mercury. It was a very useful ointment when properly employed; one of its specific qualities being to remove tumours by absorption. The second box contained a dark ointment. Arsenic was the only mineral ingredient it contained. From the examination of a small quantity, about the size of a filbert, weighing 19 grains, he obtained two grains and a quarter of arsenic. It was white crystallized arsenic. The ointment contained as well some vegetable substance, which gave to it the colour and smell. There was no ointment like it recognized in medical practice. It was a very potent compound of arsenic, and if applied frequently to the skin in a broken or diseased condition the arsenic would most likely be absorbed into the blood, and cause symptoms of chronic poisoning and death. The pill contained antimony, a sulphate of antimony, calomel, a resin called "guaiacum," and, in addition to these chemicals, a small quantity of Venice turpentine. The pills were a very proper medicine for the treatment of skin diseases, or where alterative medicines were required, and they corresponded with what was called "Plummer's pill," or the compound calomel pill of the British Pharmacopœia. The pills and pink ointment were very proper things to use. Taking the symptoms and appearances of the deceased, as described by Mr. Pope and Mr. Whateley, and the fact that he had discovered arsenic in the brown ointment, and that it had been applied by the deceased to the tumour on the shoulder, he was of opinion that her death had been caused by the absorption of arsenic. Witness went on to say that he had made an examination of the tumour, and found it was an encysted tumour. He found traces of arsenic in it. The stomach was reddened in streaks. The liver also contained arsenic, and in his opinion it had been absorbed and diffused through the body of the deceased. Arsenic was now used as an internal medicine. It was formerly used for cancer and other skin diseases, but it so frequently destroyed life that the external use had been abandoned by regular medical practitioners. The amount absorbed would entirely depend upon the quantity applied, the frequency of the application, and the state of the skin. Frequent rubbing in would cause a sore or abrasion of the skin. Witness then said that, taking into consideration the delicate state of the deceased's health, the arsenic would necessarily act more readily. The jury retired, and returned a verdict of "Manslaughter" against Isaac Chamberlain. The coroner accepted bail for the accused's appearance at the next sessions.

Obituary.

Died, October 4th, at Carhampton, Somerset, Mr. J. P. Watts, Pharmaceutical Chemist.

BOOKS RECEIVED.

The New and Old Notation of Chemistry; or, a Complete Set of Tables, giving the Formulæ of all the More Important Compounds, according to each System, etc. etc. By Sidney W. Rich. London: sold by Jackson and Townson, Bishopsgate Street Within. 1866.

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.

Mr. W. Wickham (New Cross Road) wishes to make known the following occurrence, in order to put others on their guard. Some time since, he was favoured with an order for methylated spirit, and, although he had given his assistant directions to sell it only as "finish," he supplied methylated spirit. Shortly after he was served with a notice that information had been laid, and that in due time he would be served with a summons. In order to avoid "such an enviable position," he petitioned the Honourable Board of Commissioners, who, in reply to his application, stated that the information laid against him would be stayed, provided he took out a licence to retail methylated spirit.

M. P. S.—(1) *Licence for the use of stills.* It is necessary to take out a licence in all cases where a still is kept *for the purposes of trade.* (2) The light-coloured preparation is almost invariably intended.

"*A Dispenser*" (Wakefield).—The mixture referred to, if properly prepared, is opaque, and of a dark brown colour; in no case would it form a clear solution.

"*A Young Aspirant*" (Coventry).—We cannot advise in such a case; much would depend on the terms of the indenture.

R. E. (Thornbury).—*Blacking:* See Vol. IX. p. 393, and Vol. XII. p. 256.

"*Adventurer.*"—(1) Yes. (2) Yes. (3) Apply by letter to the Director-General, Army Medical Department, Whitehall Yard, and to the Navy Medical Department, Somerset House. For particulars respecting the examinations, apply to the Secretary, 17, Bloomsbury Square.

"*A Member*" (Manchester).—The label with the words "prepared only by" omitted would not be liable to stamp-duty.

T. W. C. L.—Full particulars will be forwarded, on application by letter, giving name and address, to the Secretary, 17, Bloomsbury Square.

H. E. (Kensington).—*Silvering Glass.* See Vol. IV. pp. 82, 194, and 379.

Mr. Mee, "*A Member,*" "*Multum in parvo,*" and *Mr. Melhuish*, are severally thanked for their communications.

J. C.—Fluoric acid is produced by the action of sulphuric acid on fluor-spar.

Wanted, January numbers of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

Erratum.—Page 257, *for* Bradley and Bowden *read* Bradley and Bourdas.

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. VIII.—No. VI.—DECEMBER, 1866.

THE BENEVOLENT FUND DINNER.

Our readers will see in the Transactions published in the present number of our Journal a resolution of the Council proposing that a public dinner shall take place early in 1867 in aid of the Benevolent Fund.

It is nearly nineteen years since the Members of the Pharmaceutical Society dined together, under the able chairmanship of Mr. Morson, with the view of enriching the exchequer of this Fund; therefore it cannot be said the Council are precipitate in the matter,—indeed the very opposite accusation has from time to time been heard among the Members, but from various causes it has not been thought expedient to hold such a festival until now.

Our readers are familiar with the good that has been effected,—that a few of the aged have been provided with annuities of £30 each; that two orphans have been placed in homes, where they are boarded, clothed, and educated; that, in numerous instances, persons whose age is under fifty years have had substantial donations from the Council; and that in no one case, proper and eligible for relief, has it been asked in vain.

As time rolls on, however, some of the earlier Members and Associates of the Society, who have been unsuccessful in life, or by sickness and affliction incapacitated for business, may be expected to stand in greater need of assistance from this Fund, and the pressure consequently will be sensibly felt unless an effort be now made to augment the invested capital to TEN THOUSAND POUNDS, the sum originally contemplated as a Foundation for annuities.

It is absolutely essential, then, that we should be prepared to meet the demands upon our resources which each successive year will assuredly bring forth; and we fervently hope that the opportunity of joining in the good work will have the hearty co-operation of every Member and Associate of the Society, and, judging from evidence before us, of non-members also.

From those in slender circumstances we have no right to expect more than a small contribution; but this we may fairly hope for on the twofold grounds of duty and prudence. From the more opulent we devoutly hope we shall have energetic assistance. If, through the kindness of Providence, they have looked on better days than their fellows,—

> "If ever been where bells have knoll'd to church,
> If ever sat at any good man's feast,
> If ever from their eyelids wiped a tear,
> Or know what 'tis to pity and be pitied,"—

then, indeed, we are assured that the reflections induced will "our strong enforcement be" in enlisting their best sympathies and most strenuous exertions in the cause before us.

A communication to the Secretary during the present month will procure the insertion of the names of those willing to serve in the first List of Stewards. The liability for the Stewardship will be confined to the cost of the Dinner Ticket.

THE NEW FRENCH CODEX.

It has been generally known in pharmaceutical circles that for several years past preparations have been in progress for the publication of a new edition of the French Pharmacopœia. At the end of 1861 and beginning of 1862 Ministerial decrees were issued, by which the necessary authority was given, and an Imperial Commission appointed, for the revision of the then existing Codex and the production of a new work which should supersede it throughout the French Empire. The Commission consisted of five professors of the School of Medicine, five professors of the School of Pharmacy, four practical pharmaceutists, two members of the Academy of Sciences, and two Ministers of Public Instruction. The result of the labours of the Commission has just appeared, in the form of a royal octavo volume of 830 pages. Such a work, emanating from such a Commission, comprising some of the most eminent medical, chemical, and pharmaceutical authorities of France, could not fail to attract a great deal of attention in other countries as well as that for which it is especially intended. It is certainly the most comprehensive work of the sort extant. Not only is the list of natural products derived from the animal, vegetable, and mineral kingdoms unusually long, but the compounds prepared from these are also, we believe, more numerous than they are in any other Pharmacopæia. That the descriptions given, both of natural products and of substances prepared by the art of the chemist and pharmaceutist, should be consistent with the present advanced state of knowledge is what would be confidently anticipated from the circumstances under which the work has been written. Neither time, nor labour, nor expense have been spared in producing a book worthy of its position, and calculated to reflect credit upon its authors. Yet there are some features in this French Codex which foreigners will view with surprise and regret. The work is very different in some respects from those which now occupy the corresponding positions in Germany, America, and this country. For many years we have been engaged in trying to weed out from officinal medicines all worthless substances, and we no longer retain in our Materia Medica many drugs which in past ages occupied an important position there. We still retain the representatives of medicines which once figured in our pharmacopœias as the antidotes for all known poisons or the remedies for almost every conceivable complaint, but we have simplified their composition, retaining what was supposed to be useful, and omitting what was obviously worthless. Thus we retained, under the names of Confectio Catechu and Confectio Opii, the representatives in simplified and rationalized forms of the once celebrated Mithridate and Theriaca, which formerly occupied positions in the Pharmocopœias with their fifty or more ingredients. One of the old Paris Pharmacopœias contained a formula for a plaster (Emplastrum Diabotonon) consisting of sixty ingredients, and for a distilled water (Aqua Generalis) consisting of more than one hundred and twenty ingredients. We abolished this sort of polypharmacy more than a hundred years ago; but the French Codex still retains a formula for Theriaca with sixty ingredients, including agaric, asphaltum, and dried vipers. It is much to be regretted that the Commission did not feel themselves justified, by the existing state of medical practice in France, in abolishing or remodelling this and other remnants of the medicines of a by-gone age. But with some such blemishes, there is in the Codex Medicamentarius much that may be studied with profit and followed with advantage by pharmaceutists of all countries. We shall hope to give a more detailed analysis and review of the work when we can do so in connection with the forthcoming edition of the British Pharmacopœia, and this may be expected very shortly.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *7th November*, 1866,

Present—Messrs. Bird, Bottle, Carteighe, Deane, Edwards, Evans, Hanbury, Haselden, Hills, Ince, Mackay, Morson, Orridge, Palmer, Randall, Sandford, and Savage.

The following were elected—

MEMBERS.

Heald, Benjamin ....Sleaford.
Hudson, John William ....Middlesborough.
Price, William ....Birmingham.
Skinner, Thomas ....Cirencester.
Wallwork, Joseph ....Tyldesley.

Henry Robert Peatson, of Salford, having paid arrears and subscription for the current year, was restored to Membership.

BENEVOLENT FUND DINNER.

Resolved, That such Members of the Council, Auditors, Professors, and Examiners of this Society as may be willing to act, be constituted a Committee, with power to add to their number, for the purpose of arranging a Public Dinner in aid of this Fund, to take place at an early period of the ensuing year.

BENEVOLENT FUND.

Subscriptions received during November:—

London.

	£	s.	d.
Berdoe, Edward, 511, Hackney Road, N.E.	0	10	6
Gaunt and Fuller, 221, Union Street, Borough, S.E.	1	1	0
Gorton, John George, 144, High Street, Whitechapel, E.	0	10	6
Sanger, John, and Sons, 150, Oxford Street, W.	2	2	0
Sanger, William A., do.	1	1	0

Country.

	£	s.	d.
Birmingham, Price, William	0	10	6
Brighton, Savage, William W.	0	10	6
Maidenhead, Thompson, C. H.	1	1	0
Weston-super-Mare, Gibbons, G.	0	10	0

Donation.

Sumner, Robert, and Co., 50a, Lord Street, Liverpool... 5 5 0

EXAMINATION, *21st November*, 1866.

MAJOR (Registered as Pharmaceutical Chemists).

Churchyard, Robert Leman........................Bungay.
Moussempés, Jules ....Biarritz.

MINOR (Registered as Assistants).

Bailey, Henry Frederick..........................Newport Pagnell.
*Naldrett, George Thomas ....Brighton.
Shaw, Henry Woolhouse ....Oakham.
Telfer, Henry Vaughan ....Leytonstone.
Walsham, William Johnson ....London.

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

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Bell, Charles Christopher	Mr. Harrison	Nottingham.
Collishaw, John	Mr. Smith	Nottingham.
Goldsworthy, William Leggs	Mr. Dunn	St. Austell
Jaques, William	Mr. Procter	Beverley.
Johnson, Fletcher	Mr. Bordass	Driffield.
Moses, William Russell	Mr. Roberts	Liverpool.
Roberts, Harvey	Mr. Granger	Clapton.
Rogers, Jerome George	Mr. Turner	Holloway.
Snook, John	Messrs. Jameson and Barnett	Bath.
Squire, Alfred Herbert	Mr. Squire	London.
Watson, Robert	Messrs. Pattinsons and Boyd	Carlisle.

PHARMACEUTICAL MEETING.

Wednesday, November 7th, 1866.

MR. 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:—

Chemical News,—Chemist and Druggist,—Educational Times,—Photographic Journal,—L'Union Pharmaceutique: from the respective Editors. Journal of the Linnean Society,—Journal of the Chemical Society,—Journal of the Society of Arts: from the Societies. Proceedings of the Royal Institution: from the Institution. Calendar of the Royal College of Surgeons: from the College. Journal of the Institute of Actuaries: from the Institute. Camille Montagne, Botaniste; par M. P. A. Cap,—Elogio Historico e Noticia Completa de Thomé Pires, Pharmaceutico; por Pedro José Da Silva,—The New and Old Notation of Chemistry in a Complete Set of Tables; by Sidney W. Rich,—Creosote and Acetic Acid with other Substances produced by the Destructive Distillation of Wood; by M. A. Payne: from the respective Authors. Traité Complet de la Culture de l'Opium Indigène; par Alphonse Odeph. Plantes Médicinales de Maurice, 2me édition; par Louis Bouton: from Mr. P. L. Simmonds. Specimens of the root, fruit, and leaf of the Eland's bean: from David Bain, Esq. Drawing of the Eland's Bean-plant: from Thomas Baines, Esq. Fruit of the *Cycas revoluta*, grown at Highgate by James Yates, Esq., F.R.S. Specimen of Boghead coal bearing the impression of a *Sigillaria*: from Robert Warington, Esq., F.R.S.

The following paper was then read:—

ANALYSIS OF ELAND'S BOONTJES; A SPECIES OF *ACACIA* YIELDING FOOD, MEDICINE, AND TAN TO THE NATIVES OF SOUTH AFRICA.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

Boontjes is a Dutch word, signifying *little beans*, and "Eland's boontjes" are simply "Eland's beans," that is, the little beans that Elands eat. *Eland zyn Boontjie*, the Eland his little bean. It is the local name of a plant in the Orange Free State, South Africa.*

* This Eland, or Cape Elk, must not be confounded with the elk or eland of the northern parts of Europe and America; the latter is the *Alces Malchis*, distinctively known as the moose-deer, the former the *Oreas Canna*, one of the antelope tribe. The term Eland is

Specimens of the root and seed and a leaf of this plant were presented to me by David Bain, Esq., who brought them from South Africa, and who gave me the following additional information concerning them. From the bean the Kafirs extract, by boiling, an oil which they use in food; an infusion of the root is employed by them as a gargle, and is taken in cases of dysentery and other affections of the bowels; while both the natives and the Dutch Boers find the root of considerable value in converting skin into leather, the Boers using it as a substitute for oak bark in tanning, and the natives employing it in the preparation of their "karosses," or blankets, by rubbing it on the flesh side of the skins of animals.

Apparently, therefore, Eland's boontjes is a plant of some importance in the Cape, yet no mention of it is made in the 'Flora Capensis' of Harvey and Sonder, nor in the work of the late colonial botanist Pappè, nor in any similar book that I have been able to consult. Mr. Bain says,—and in this he is confirmed by an associate of Livingstone, Mr. Thomas Baines, with whom I recently had some conversation,—that the plant is evidently a species of dwarf Acacia, hence the name *boontjes*, *little bean*, growing about a foot and a half high. Compared with the size of the plant the pods are enormous. It has roots seven to eight feet long. The stem dies annually. As evidence that it is very plentiful, a brother of Mr. Bain, resident at the Cape, undertook to supply a neighbour who had a tannery with three loads, or from five to six tons weight, weekly for some time. He collected it by ploughing.

The roots of Eland's boontjes being then of considerable value as a tanning agent, it became a matter of some interest to determine the amount of tannic acid they might contain, especially as their medicinal effect would probably be due to the same substance. On making experiments with this view 20 per cent. of tannic acid was first obtained, precipitation by tartar-emetic, and estimation of the weight of tannate of antimony separated, being the method adopted. It was afterwards found, however, that this process was not reliable; to the decoction therefore was added some chloride of ammonium; in this solution tannate of antimony is insoluble, and, moreover, deposits so readily that the tannic acid present may be estimated volumetrically. Proceeding in this way, 13 per cent. of tannic acid was obtained for me by Mr. Watts, lately my assistant, as the mean of six experiments. Doubtless the percentage of tannic acid in this Acacia varies just as it does in oak-bark,—age, temperature, etc., probably influencing its formation in the cells of the plant. It will also, of course, vary according as the amount be calculated on the recent or the dried material. The roots that I examined were hard, quite dry, very fibrous, and of a light brown-red colour. This colour, Mr. Bain says, enables the Boers to dye white wood of a mahogany tint, and gives to their moleskins a similar hue. In quality the tannic acid resembles that of oak bark, an infusion giving with iron salts precipitates similar to those produced by gallotannic acid, and unlike those of the mimotannic acid existing in the *Acacia Catechu* or *Uncaria Gambir*. The above amount of tannic acid, then, sufficiently accounts for the value of Eland's boontjes as a tanning agent, and as an astringent medicine. Mr. Bain, when in the colony, some years ago, conceived the idea of making an extract of the plant, hoping to obtain a marketable article similar to catechu. He boiled the roots in water and evaporated the liquor to dryness by the heat of the sun. The resulting mass was sent to a broker in this country, who pronounced it to be "superior to gambier, but inferior to East Indian cutch, and worth about £20 per ton."

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perhaps usually restricted to the African animal, and Elk to that occurring in colder latitudes. Both are fine creatures, often the size of a large horse, but the eland has conical, unbranched horns, not so long as half a metre (about 18 inches), while those of the elk spread much, have many points, and often weigh 25 kilogrammes (50 to 60 pounds).

The boontjes themselves, the little beans, are, in the dry state, externally of a dark chestnut colour, and about twice the size of a horse-bean. On opening them, a yellowish-white kernel is seen, weighing about two-thirds of the weight of the whole seed. A given quantity of the kernel was digested in ether in the usual way, to dissolve out the oil, 34·6 per cent. of which was obtained, or 22·5 per cent. reckoned on the whole seed. The oil is of light colour, not very fluid, inodorous, and has no marked flavour. The ease with which it can be expressed from the seed, its abundance, and its bland taste, amply explain its alimentary use in the meals of the Kafir.

The percentage of nitrogen in the kernel is 3·6, in the integument 1·03. This nitrogen probably all exists in the state of vegetable albumen, for I could not detect any other nitrogenous constituent. If so, then the percentage of albumen in the kernel is 22·6, and in the integument 6·48. Or as an average of the weights of kernel and integument of several seeds gives the weight of the kernel as 1·099 grammes, and its accompanying integument ·594 of a gramme, it follows that the average amount of albumen in the whole seed is nearly 17 per cent.; about three-fourths of the proportion commonly existing in peas, beans, and other leguminous seeds. In this percentage of flesh-forming material, and in the proportion of oil, we have ample explanation of the observed liking which elands have for these beans. No wonder that the plant has been locally named Eland's boontjes.

The percentage of ash in the kernel of the seed is 1·82, in the integument 1·54, or, in the whole seed 1·72.

In 100 parts of the seeds or beans we have—

Albuminous matter (Legumin)	17·0
Oil	22·5
Woody fibre, moisture, etc.	58·8
Ash	1·7

And in 100 parts of the root—

Tannic acid	13

The analysis of a plant which affords an important article of food to man, is useful in the preparation of his clothing, and, at the same time, is a storehouse of muscular force eagerly resorted to by animals, could not but prove instructive and interesting. It was chiefly for that reason that the examination was made, and that the results are now recorded.

17, *Bloomsbury Square, London.*

Mr. Morson, referring to a diagram of the plant exhibited by Mr. Baines, remarked on the extraordinary length of the fruit as compared with the plant itself, and asked whether the drawing was correct.

Mr. Baines said it was now sixteen or seventeen years since he had seen the plant growing, but he had prepared the diagram to the best of his recollection. The plant grew about a foot and a half high, and the legumes were nearly as long, and dragged generally, to a slight degree, on the ground.

ON THE IGNITING-POINT OF PETROLEUM.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

It is now well known that petroleum, as it issues from the earth, and as met with in commerce in the crude state, emits a vapour of powerful odour, which is inflammable, and which, consequently, when mingled with air in certain proportions, forms an explosive mixture. The combustible properties of this vapour closely resemble those of common coal-gas. As with coal-gas so with petroleum vapour,—a small quantity in a large quantity of air gives odour to the air but does not form an explosive mixture. Again, coal-gas, as supplied to the consumer, always contains a small percentage of air, and yet the mixture is not explosive, so petroleum vapour, even though containing a small quantity of air, burns very well at a jet (so long as the petroleum which supplies the vapour is kept boiling), but the vapour itself is not explosive. In short, petroleum itself, or petroleum-vapour itself, is no more inflammable than common air; it is the *mixture* of petroleum-vapour and air that is dangerous. It is almost as easy to show that a jet of air will burn in an atmosphere of petroleum-vapour as it is to show that a jet of petroleum vapour will burn in an atmosphere of air.

Now, crude petroleum generally gives off, at common temperatures, quite enough vapour to form an explosive mixture with air if the air be in a confined space, as in a partially empty lamp, bottle, or cask. For this, among other reasons, crude petroleum is always refined before it is sold to the general public; it is distilled, and the portion which first rises into vapour is collected apart, and, under the name of petroleum-spirit, used as a substitute for turpentine. The next and larger portion which distils is the refined petroleum, so extensively sold under various names as a cheap illuminating oil. The residue is heavy oil used for lubricating purposes.

Refined petroleum still has the characteristic odour of petroleum. Even at the coldest temperatures it emits sufficient vapour to be most obviously perceptible to the nose, but not sufficient to form with the air in the vicinity of the oil an explosive mixture. But as we rise to the warmth of summer, or of a hot room, or the still higher temperature in the neighbourhood of a lighted lamp, a point may be reached at which the oil emits vapour at such a rate that before it can diffuse away into the air of the apartment, explosive proportions are arrived at, and on a flame being brought into contact with the mixture, explosion results. Now this point, the point to which the petroleum must be raised in temperature before its vapour is emitted sufficiently rapidly to form an explosive mixture with the air in the vicinity, will of course vary according to the quality of the petroleum, will vary with the proportion of "spirit" removed by the refiner. If enough has been boiled off, the oil is perfectly safe; but, unfortunately, it is not to the interest of all parties to remove the spirit, hence much of the petroleum sold in retail shops is dangerous to use. Should a lamp fed with it become a little warmer than usual, an explosive mixture forms in the chamber of the lamp, and any flame brought accidentally or thoughtlessly into contact with the mixture gives rise to explosion. Hence the Legislature of this country has wisely ordered (25 & 26 Vict. cap. 66) that large quantities of crude petroleum shall not be stored within fifty yards of a dwelling-house or warehouse except under license; and the Act states that "Petroleum shall include any product thereof that gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer." That is to say, refined petroleum, such as is commonly vended in retail shops as "Crystal Oil," "Photogen," "American Paraffin Oil," etc. etc., for illuminating purposes, must not be kept in or near a house in larger quantities than forty gallons, unless proof is forthcoming that it does not give off inflammable vapour below 100° F. If it will stand this test, then the liquid is not petroleum within the meaning of the Act, and the owner of it runs no risk. I have purposely characterized this Act as wisely framed, because some have questioned the wisdom of placing restrictions on the sale of petroleum and its products (refined petroleum and petroleum-spirit), while naphtha, spirituous liquors, knives, razors, and still more dangerous things, are freely bought and sold without any such restriction. It must be remembered, however, that the danger attending the use of these things is well known, and therefore always guarded against, whereas not only was petroleum a new article to the public, the dangers attending the use of which had to be learned, but, worse still, it was introduced as a lamp-*oil*,—an article of unknown and dangerous properties was called by the name of an article of known and safe properties. Petroleum, infinitely less dangerous in itself, became, by the false colours under which it sailed, far more dangerous than gunpowder; that is to say, there was far greater chance of accidents occurring by it than by gunpowder. I say that, under these circumstances, restrictions on its sale were wisely made, and will be wisely retained until the character of petroleum is thoroughly well recognized.

The Act having been passed, and having come into operation (Oct. 1, 1862), merchants, brokers, and other dealers in large quantities of petroleum, became commendably anxious to buy and sell only that quality of the refined article which should give off no inflammable vapour at temperatures below 100 degrees of Fahrenheit's thermometer. But, unfortunately, an egregiously wrong method of determining this point crept into the trade. To ascertain the quality, it was, and still is, usual to pour a little of the liquid into a saucer, small bowl, or other similar vessel, to apply heat by a lamp, by partially immersing the saucer in hot water, or otherwise, stirring the liquid with a thermometer, and applying a lighted match from time to time during the gradual rising of temperature until the oil caught light. The degree at which this occurred was said to be the igniting-point of the petroleum. But disputes as to the igniting-point soon occurred. Careful observers frequently noticed that several degrees before the petroleum finally ignited, a thin blue flame would seem to shoot from the lighted match to the surface of the liquid, or, as one experimentalist described it, "the petroleum would appear to ignite and go out again," and some would give this as the igniting-point. Other observers, not noticing this flame, or not operating under the circumstances causing it, found the igniting-point to be much higher. But igniting-points were observed and stated which could not be accounted for by this cause of difference. Hence disputes, and hence arbitrations, which sometimes made the matter worse instead of better. Hence, too, which is the most serious part of the matter, much, if not most of the petroleum sent up to the present time into retail commerce in the refined state for use by the public gives off inflammable vapour many degrees below 100° F., and is unquestionably very dangerous. Slowly, and apparently carefully warmed in the manner already stated, the petroleum does not fully ignite perhaps till 100° F. is reached, and the merchant or broker is satisfied, yet, as I shall presently show, inflammable vapour is evolved at perhaps 80° or 85°, and should the inflammation of this vapour cause the fracture of a lamp, or otherwise scatter the petroleum, danger to life and property ensues.

The above is only a fair picture of the state of the petroleum trade at the present time. My object in writing this paper is to show why the igniting-point of petroleum is liable to variation, and also to suggest a modification of the usual method by which that igniting-point shall be determined with accuracy and constancy of results. And in speaking of igniting-point, I shall henceforward always mean the temperature to which the petroleum must be raised before its *vapour* becomes inflammable. This is the point referred to in the Petroleum Act, and this is the point at which petroleum becomes dangerous. As already indicated the igniting-point of petroleum itself may be several and often many (sometimes thirty or forty) degrees higher than the igniting-point of the inflammable mixture of vapour and air on its surface, and the petroleum does not catch fire for the same reason, doubtless, that gun-cotton may be ignited on a heap of gunpowder without setting fire to the latter; the heat evolved is intense enough, but the explosion occurs too quickly for the subjacent material to be ignited. Neither the petroleum nor the gunpowder, however, is any the less dangerous on that account; for, should the ignition of the mixture of petroleum-vapour and air cause an explosion so slight as only to force up a little of the petroleum into fine splash or spray, ignition of the petroleum will inevitably ensue, as in *that* condition petroleum is inflammable even at very cold temperatures.

But to proceed to show why a given specimen of petroleum may be observed to ignite at various temperatures.

The *time* employed in the operation of taking the igniting-point of petroleum as usually performed, is the first cause of variation to which I shall allude. About two ounces of a specimen of petroleum marked "Ladoga" was placed in a small dish or capsule about five inches wide and one inch deep, and very slowly warmed by a gas-lamp, a small flame being passed near the surface of the liquid every quarter or half minute. The liquid was stirred with the bulbed end of a thermometer, the temperature rising at the rate of about a degree per minute. In this way the experiment was carried on until at 124°, as marked on the stem of the thermometer, the petroleum-vapour ignited, and the liquid also ignited at the same instant. A similar experiment was performed on a fresh specimen of the same oil, except that the temperature was quickly raised; ignition of the vapour took place at 95° and the oil itself took fire at 111°. It would seem that the highly volatile portion of the petroleum, the portion which forms inflammable vapour, soon escapes when the oil is heated in an open vessel, leaving a liquid less inflammable than before. We know, from the researches of Ronalds, Schorlemmer, Pelouze, Cahours, and others, that petroleum, utterly unlike sperm, colza, olive, and the other old burning oils, is a mixture of a large number of liquids of different degrees of volatility, and, indeed, containing bodies which when isolated are permanent gases, hence the above result might have been expected.

The *rate of escape of vapour* from the oil and from the operating vessel is another cause of variation in the igniting-point. Some of the same "Ladoga" oil was treated as already described, except that it was heated somewhat quickly, and was only stirred just before taking a reading of temperature. This time ignition occurred at 98°. Stirring, as is well known, promotes the escape of vapour from a liquid, and in this case also by causing eddies and currents of air promotes its escape from the surface of the liquid.

The *form of the vessel* in which the petroleum is heated, by accelerating or retarding the escape of vapour, also causes variation in the igniting-point. Some "Ladoga" oil was heated gradually but quickly in a wide-mouthed bottle; the mixture of petroleum-vapour and air thus formed in the upper part of the bottle gave indications of ignition at 92°, and fairly burnt at 94°, several degrees below the igniting-point in an open vessel.

The *arrangement of the vessel* over the source of heat of course influences the result. If a dish, etc., be so placed that its upper walls, not covered by the liquid, become much hotter than the lower portions, then the petroleum stirred up on to the hot part is quickly converted into vapour and ignites, while perhaps the liquid itself is comparatively cool. This is simply bad manipulation, and any one making an error of this kind should not be trusted with the performance of such experiments. Making the experiment in a deep glass beaker, or wide-mouthed glass bottle, and so frequently introducing a large test-flame, that the upper part of the vessel becomes full of the products of combustion to the exclusion of much of the air would, of course, be equally bad manipulation. It is, perhaps, unnecessary to allude to these causes of variation, but that many of those to whom these remarks are addressed deal much in petroleum, but have no knowledge of practical chemistry. The usefulness, therefore, of the observations must be the excuse if they are trite and commonplace.

Shaking with air causes great variation in the igniting-point of a specimen of petroleum. A fresh specimen of the same refined "Ladoga" oil was gradually warmed in a bottle, the specimen being violently shaken before the test-flame was introduced. In this way explosion actually took place at 78° F. This was an extreme experiment, but it serves to show the influence which more or less shaking or, so to speak, washing out of the vapour from the oil by air, exerts on the point of ignition. It is true that when once in a lamp petroleum is not likely to be much shaken about, yet there are other circumstances under which violent agitation may take place; it is only fair therefore that in taking the point at which a specimen of petroleum evolves inflammable vapour, some amount of stirring or agitation should be practised.

The *distance of the test-flame* from the petroleum may cause variation in observing the igniting-point. The amount of vapour evolved in a given time may be sufficient to form a small quantity of explosive mixture near the surface of the petroleum, but not at an inch or two from the surface, hence an operator dipping the test-flame down to the surface of the liquid, or even below the surface, to see if the oil will extinguish instead of being ignited by his flame, will give a lower igniting-point of the vapour than an operator who only brings his test-flame within an inch of the surface of the oil in a basin, or only just within the mouth of a bottle or gallipot. In an experiment with the "Ladoga" oil this cause of error made a difference of 4° in the observed igniting-point.

The *amount of petroleum* operated on in comparison with the size of the vessel in which the operation is performed will, of course, influence the observations, for the reason just stated. An operator making his experiments in a bottle or deep beaker or gallipot, and always introducing the test-flame only just within the mouth, will sooner meet with the explosive mixture if the vessel is three-fourths full, than if that mixture has first to fill the upper part of a vessel only one-fourth occupied by the liquid.

These, then, are causes, amply sufficient in number and nature, of the variation in the igniting-point of petroleum, as observed by different experimenters, or by the same experimenter at different times. They fully explain the fact that I have found a specimen of petroleum to ignite at almost any degree between 78° F. and 124° F. Before proceeding to suggest a modified method of observation which shall give constant results, it may be instructive to give a table of the igniting-points of several specimens of refined petroleum recently circulating in wholesale and retail commerce,* the experiment on each specimen being taken under three conditions:—first, heating in an open earthenware bowl, of the form, etc., already described; second, heating in a two-ounce, wide-mouthed, white glass phial, without shaking the petroleum; and third, as the second, except that before introducing the test-flame the stopper was inserted in the bottle and the whole well shaken for three or four seconds. It will be noticed that differences of igniting-point in any one specimen are obtained varying from ten to thirty degrees. The other causes of variation already alluded to were excluded by the experiments being all performed by one operator of experience, each set of experiments being made under equal conditions, and each experiment occupying the same amount of time,—about three minutes. The table will also serve to show what the 'Lancet' showed (March 29, 1862) in regard to mineral oils sold in London, and what the observations of O'Neill showed at Manchester in June 1862 ('Chemical News,' vol. v. p. 312), and of Tate at Liverpool, in September 1862 ('Pharmaceutical Journal,' vol. iv., new series, p. 150), namely, that much of the petroleum supplied to the public is dangerous. In addition it shows that, as much of it (in the words of the Act)

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* For the former I have to thank Messrs. Rose, Graham, and Wilson, of Threadneedle Street.

"gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer," the law has not yet had the effect anticipated, namely, the exclusion from retail trade of that quality of petroleum which is so badly refined as to have dangerous, because unsuspected, properties.

TABLE OF GRAVITIES AND IGNITING-POINTS OF COMMERCIAL PETROLEUM.

Name, Brand, or Distinctive Mark.	Specific Gravity (Water=1000).	Igniting-point of vapour in degrees Fahrenheit.		
		In open bowl.	In bottle.	
			Without agitation.	With violent agitation.
"Woodville" . . .	796	80	76	70
A.	797	98	83	78
"Standard"	798	96	95	85
"Cayuga"	798	81	80	70
B.	799	101	87	71
"Denmark"	799	94	86	85
"Hutchinson" . . .	800	90	86	84
"Lucifer"	801	91	81	78
"American Paraffin Oil"	801	92	80	68
"Commercial" . . .	803	104	81	79
"American Petroleum," No. 1.	804	134	134	111*
" " No. 2.	805	93	90	74
" " No. 3.	806	83	76	66
"Common Paraffin Oil"	806	105	90	83
"Brilliant"	808	83	74	72
"Young's Paraffin Oil" (not a Petroleum) .	819	116	97	91

And now, with regard to a method of taking the igniting-point of petroleum-vapour, which shall be reliable and constant in the results of its application.

As petroleum is not a definite chemical compound, but a varying mixture of several hydrocarbons; as, in short, it has no constant chemical or physical property of which advantage might be taken in devising a ready method of taking igniting-points, it follows that the method selected must be more or less arbitrary, empirical, conventional. It is true, that their volatility is a constant physical property, and MM. Salleron and Urbain in France, have, it is said, contrived an apparatus for taking the tension of the vapour of mineral oils, which is obviously proportional to their volatility, adopting 64 millimetres of water at, apparently, 35° C. as the limit of safety; but only an abstract of their paper was published, in the 'Comptes Rendus' of January 2, 1866; their full paper does not seem to have been printed, so that I am unable to judge of the merits of the method. It has not the recommendation of being a direct process. The only feasible plan would seem to be, select a direct method, simple in prin-

* This is an interesting specimen. Its light colour, both when purchased and after being exposed to the light for some time, and its specific gravity, indicate that it really is a petroleum, and not a paraffin oil. It was purchased a retail shop in Drury Lane, London, as "our best, 4½*d.* per pint." Another quality, sold at the same shop at 4*d.* per pint, had a *higher* specific gravity, 806, but much lower igniting-point. Tried in the manner recommended at the end of the paper, the "best" gave off inflammable vapour at 114°, the other at 86°. The properties of this sample prove, or at least indicate (for I could not get at the history of the bulk) that it is easy to supply the public with a perfectly safe petroleum at a reasonable price, a petroleum so low in specific gravity as to readily ascend a wick, and so high in igniting-point as not to be dangerous under ordinary circumstances.

ciple, easy of execution, occupying little time in performance, and inexpensive; and when this is found, to take steps for accomplishing a far more difficult task, namely, securing its universal adoption. Now the ignition method is sufficiently simple in principle; but from the foregoing, and many other experiments, I would advise the rejection of its application in an open dish, saucer, basin, or bowl. Even if this experiment could be always similarly performed under constant conditions, which is impossible, the rapidity with which vapour escapes from the surface of the liquid renders a thermometric reading, taken under the experiment, an unfair indication of the temperature at which inflammable vapour would be given off from the petroleum in a lamp or other closed or partially closed vessel. Of course experiments, made without a thermometer, are not sufficiently delicate for the purposes of the analyst. Again, the petroleum must not be heated in a common bottle, on account of the great liability of the latter to fracture; nor is it necessary to use a vessel contrived for violently agitating the oil and air together. But if the bottle be substituted by a short, wide tube of glass, thin, so that it can be heated with safety,—by, in short, a rather wide variety of the common test-tube of our analytical laboratories; then, if equal quantities of petroleum be operated on, the liquid be fairly well stirred and shaken, and the test-flame be always introduced to the same distance from the surface of the liquid, constant results may be expected. The same tube may be used in which to insert a hydrometer to take the specific gravity of the oil, and thus, with a naked thermometer somewhat longer than the test-tube to act also as a stirring-rod, we have a compact and inexpensive apparatus. These articles have been made for me by Mr. Casella, the well-known physical instrument maker of Hatton Garden; he has included them all in a neat pocket case, introducing a small spirit-lamp also; but I need not say that the petroleum test-tube may be heated over a gas-flame, by partial immersion in a vessel of hot water, or by any other convenient plan. Half-way up the test-tube is a mark indicating the amount of petroleum to be operated on. The test-flame should be introduced to within half an inch of the surface of the oil.

I will conclude by giving detailed directions by which to take both the igniting point and specific gravity of a specimen of petroleum or paraffin oil. Into a test-tube of thin glass 6 or $6\frac{1}{2}$ inches long, and $1\frac{1}{8}$ inch in diameter, pour the liquid until the tube is half-full. Stir the liquid well with a naked thermometer, having the usual degrees marked on the stem, shaking also so as to keep the upper part of the tube well wetted with the liquid, and note the temperature. Now introduce a flame (of a thin splint of wood, or, far better, a small gas flame a quarter or an eighth of an inch long) into the mouth of the tube to within half an inch of the surface of the liquid, quickly withdrawing it, and noticing whether a thin blue flame runs between the test-flame and the surface of the oil. If not, warm the tube by passing the bottom of it gently through a spirit-lamp, or other flame, or by dipping the lower portion of the tube into hot water, constantly stirring the liquid with the thermometer, frequently noting the temperature, and introducing the test-flame every minute or so. The temperature at which the thin blue flame appears will be the igniting-point of the petroleum, the point at which it gives off inflammable vapour. To correct this result, let the tube gradually cool, introducing the test-flame as before. The lowest temperature at which the vapour takes fire is the true igniting-point. To ascertain the specific gravity, pour the petroleum or paraffin oil into the test-tube until the latter is about three-fourths full; insert a thermometer, and warm or cool until the temperature is about 60 degrees;* now immerse the hydrometer, and take care that it fairly floats in the

* Five degrees of temperature make about one degree difference of specific gravity. At 70° Fahr. an oil will be about two degrees lighter in specific gravity than at 60° Fahr., and at 50° Fahr. two degrees heavier.

liquid; the point on the stem of the hydrometer, cut by the under surface of the liquid, will be the specific gravity. A copy of these directions will be found in the case, as sold by Mr. Casella.

This particular hydrometer might be termed a *Petroleometer;* that name would, however, perhaps best designate the whole box or set of articles. The most accurate method of taking specific gravities is of course the specific-gravity bottle; but a hydrometer, if well made, gives, I find, numbers varying not more than one degree from those of the bottle, while its use involves far less trouble and expense.

As an indication of the extent to which confidence can be placed in an igniting-point of petroleum, taken in the manner recommended, I may state that two different observers, experimenting at different times on three different specimens of petroleum placed before them without distinguishing marks, gave igniting-points in which the greatest limit of variation was one degree. It would doubtless be easy for an analyst, by processes of fractional distillation, to obtain even from safe petroleum, vapour that would be inflammable at 60° Fahr., or even at freezing temperatures; but it would be absurd to regard such petroleum as dangerous, or to use such a fact as evidence of the weakness of any method of determining the igniting-point of refined petroleum. What I claim for the method above described is, that it accurately shows the temperature at which petroleum, as used by the public, is dangerous. It surely is not too much to expect that the method will be adopted by the trade, and that no mineral oil will be supplied to the public unless guaranteed to give off no inflammable vapour below 100 degrees of Fahrenheit's thermometer. Only by some such means will explosions in lamps, etc., be avoided, explosions which are always alarming, frequently the cause of loss of property by fire, and occasionally resulting even in loss of life.

17, *Bloomsbury Square, London.*

NOTE ON PURIFIED ESSENTIAL OIL OF ALMONDS.

BY WILLIAM A. TILDEN, F.C.S.,

DEMONSTRATOR IN THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

A few days ago, I came upon two specimens of essential oil of almonds which I had prepared in 1864 in illustration of a short communication I had the honour of reading at one of the evening meetings of this Society. I suggested, at that time, that it was probable this essential oil might be rendered more permanent than in the purified state it is generally found to be by introducing into it some fused chloride of calcium, so as to remove from it the last traces of moisture. These specimens I produce in support of that suggestion; they have been prepared upwards of two years, and have been preserved side by side under precisely the same conditions. The one, as you see, is filled with crystals of benzoic acid; the other, in which is placed a fragment of chloride of calcium, is perfectly free from crystalline deposit, and remains quite fluid. These bottles seem to me to exhibit clearly the very decided influence of perfect drying.* Shortly after the publication of my paper, a wholesale drug firm in this city wrote to the 'Pharmaceutical Journal,' announcing that the purified essence

* I am informed by Mr. C. Umney, who is in the habit of purifying essential oil of almonds on a large scale, that he has found the above plan of desiccation by means of chloride of calcium to succeed perfectly in preventing change in the purified oil.

prepared by their process was perfectly free from the objection attaching to purified oil of almonds in general, being permanent and inalterable for an indefinite period. As this was quite in opposition to the remarks made by myself and others at the meeting referred to, I was anxious to test their statement, it being an interesting point to determine whether it were indeed possible to render the almond essence less susceptible of oxidation. I accordingly procured a quantity of this essential oil.

It was examined, first of all, for the evidence of change, for benzoic acid. It was found to be strongly acid to test-paper, although no crystallization was apparent except at the stopper. This circumstance, coupled with the limpidity of the liquid, and its sp. gr., which was as low as 1·003 or thereabouts, led me to suspect the admixture of spirit of wine. On application of Dr. Redwood's test, fuming nitric acid, it gave, as anticipated, abundant evidence of alcohol by the violent evolution of nitrous fumes. Here also proof was obtained that the change effected in the liquid by the air was in an advanced stage, for on cooling, the mixture became nearly solid from the deposition of nitrobenzoic acid. Two other (pure) specimens, tried at the same time, remained fluid many days.

Not content with the nitric acid test alone, I separated a quantity of the alcohol bodily by the following plan, which may equally well be applied to any other essential oil:—Six measures of the oil were agitated with six measures of water in a graduated tube; on standing, $4\frac{3}{4}$ measures only of oil subsided; the aqueous liquid was separated by a pipette and saturated with carbonate of potash; on remaining at rest a few minutes, about one measure of alcohol separated as an oily stratum floating on the surface. It was recognised by the ordinary tests. I have examined other samples of commercial purified oil of almonds. They are certainly all equally liable to change, the permanence of those which are alleged to be inalterable being only in appearance, the benzoic acid, as formed, remaining in solution. The addition of alcohol would, moreover, tend, in my opinion, to facilitate rather than obstruct the absorption of oxygen.

SOME OBSERVATIONS UPON THE FORMULÆ FOR THE DECOCTIONS OF THE BRITISH PHARMACOPŒIA.

BY MR. A. F. HASELDEN.

Looking carefully through the forms given in the British Pharmacopœia for the decoctions, it is almost next to impossible not to be struck with the apparent absence of uniformity and design in the arrangement and carrying out of this section, if it may be so styled, of the book.

Taking as a starting-point that the imperial measure for liquids is to be employed, it is only natural to expect that where possible, the gallon of eight pints, and the pint of twenty ounces, would be made use of, and that where a subdivision of the pint was required, it would be the half-pint of ten ounces or the quarter of five, and thus, as far as convenient, render the arrangement and calculation simple and facile. Take the waters, for instance; the form for the production of a gallon is given in every case but one, aqua laurocerasi, but here, though the quantity is advisedly small, the imperial pint is adhered to. Again, in the infusions, the quantity of liquid employed is ten ounces, the imperial half-pint in every case with but one exception, viz. the infusion of kousso, the quantity of water being four ounces; but why this deviation, seeing that the direction given with some of the early packages of kousso which reached this country was half an ounce of kousso to a pint of water, and the whole to be swallowed, having previously fasted for some hours? Once more, as a further example, look at the tinctures; with but one solitary case, compound tincture of lavender, in which two pints are ordered, the form for one *pint* is given. Thus, in these three sections, with but one real deviation, it is quite clear that uniformity of measure and quantity has been especially attended to and cared for.

But how is it with the decoctions? Truly imperial measure is started with, but in the product the quantity is ever varying, and the time allowed for preparation equally so. For cetraria, pareira, sarsa, sarsa comp., and taraxacum, the quantity of a pint and a half is to be reduced to a pint, the time allowed for cetraria and the two sarsæ is *ten* minutes in a *covered* vessel, for pareira and taraxacum *fifteen* minutes in a vessel either *covered or open*, at the will of the pharmaceutist, as no direction is given either way. For hæmatoxylum and cinchona a pint of twenty ounces is to be boiled for ten minutes, the product measuring sixteen ounces; in the case of cinchona the vessel to be covered, in that of hæmatoxylum optional, the cinnamon being added towards the end of a ten minutes' boiling. It might well be added as soon as the boiling commences, and it should certainly, with more reason than the cinchona, be evaporated in a covered vessel. Again, with papaver, three imperial pints are to be reduced to *thirty-two ounces*, an *old measure* quart, in ten minutes, whilst the same time is allowed in scoparium for reducing ten ounces to eight in a covered vessel. For quercus, thirty ounces or a pint and a half are to be boiled for ten minutes; for hordeum, the same quantity for twenty minutes in covered vessels, but no amount of product stated in either; for granatum two pints are to be reduced to one, time and vessel being unheeded, in dec. aloes co. the ingredients for making sixteen ounces. Without being hypercritical, and though variety may in some matters be charming, it is impossible altogether to refrain from observing that in the directions given for preparing the decoctions, and in the measure, there is a want of unity and consistency. If the imperial measure can be carried out thoroughly in the waters, infusions, and tinctures, there should be no difficulty. With the decoctions, I myself see none in arranging the quantities so that every decoction should measure either a pint of twenty ounces or a half-pint, when finished. It would be quite as easy to direct one ounce and a quarter of cinchona to be boiled with a pint and a quarter of water down to a pint, as in the existing form, one ounce in twenty ounces down to sixteen. With respect to the time allowed for the boiling, there must unavoidably be some little difference, and it need not be fixed; it would to a great extent depend upon the quantity prepared, the size of the vessel, and the absorbing properties of the ingredients used, and singularly enough none of them are ordered to be pressed. As to closed or open vessels, I cannot see why cetraria should be cooked in a covered vessel more than papaver, or hordeum than taraxacum.

I feel that the arrangement might be considerably simplified, and I believe improved by directing in every case the proportion for the production of an imperial pint when finished, by employing sufficient water, in most cases a pint and a half would suffice, to be reduced by gentle boiling, in a partially covered vessel, to one pint; for cetraria, papaver, and sarsa comp., rather more water, say two pints, following the other general direction, but adding gentle pressure with the hand or a spoon whilst straining.

By adopting this plan, there would be simplicity and uniformity in the arrangement and directions, and I am satisfied quite as good a preparation. The operator would of course make more or less than a pint, according to his requirements. I fancy I have made out a clear case, worthy the attention of the Pharmacopœia editors; and if need were, I think I can add yet another reason for a rearrangement of the decoction formulæ.

As a member of the Board of Examiners, it is frequently my duty to question the candidates as to their proficiency in pharmacy. Now, where there is a decidedly marked process to be carried out, and preparing the green vegetable extracts, there is something to arrest the attention, and the pupil who has once or twice prepared any of them is not likely to forget the *modus operandi;* but with the decoctions there is nothing, as a rule, to fix them in the memory, and when the proportion of ingredient employed in any decoction is asked for of a candidate, it is clearly and absolutely an affair of memory, and he has to ask himself whether the proportions for that decoction are given for a twenty- or sixteen-ounce pint. This would certainly be rendered easier by making the proportions in every case for the imperial measure.

This is not too much to ask on behalf of these candidates, when the number of subjects upon which they have to be examined, in a short time in one day, is taken into consideration; and it is not to be wondered at if memory sometimes fail, and that which tripped so glibly off the tongue when questioned by a fellow-student, should be lost at the moment of trial. In attempting an improvement in one direction, assistance may be given in another, and where it is not too much to say it is frequently needed.

Having pointed out what to me appears a defect in the arrangement of the quantities prepared, and the time employed, I would now add some further remarks suggestive of improvement in a few of the decoctions. Without enumerating them separately, it may not be out of place to record the fact that no less than thirteen decoctions of the London, three of the Edinburgh, and six of the Dublin have been left out of the British Pharmacopœia; three of them, namely, dulcamara, senega, and uva ursi, being transformed into infusions. I am not able myself to discover the advantages of this alteration, on the contrary, they take a longer time to prepare, which is often a serious inconvenience, and are no better for it; indeed, the uva ursi is, I think, less valuable, and for this reason,—in making the infusion, the leaves are *not* ordered to be *bruised*, and in the decoction they were; with the unbruised leaves a brighter preparation is produced, but, I feel convinced, a less active one. Let any one prepare the two, then compare and taste them, and there will be no hesitation in deciding between them. Uva ursi has been found useful in catarrh of the bladder, etc., its efficacy depending more upon its astringent property than its bitter, and by bruising the leaves, whether an infusion or decoction be made, more of that principle is obtained; in the infusion of bucco, a remedy sometimes given in conjunction with the uva ursi, the leaves are ordered to be bruised. I cannot resist this opportunity of drawing attention to the alteration of decoctum scoparii comp. to decoctum scoparii, the juniper berries and taraxacum root of the London Pharmacopœia and the juniper tops and bitartrate of potash of the Edinburgh being left out; perhaps there was difficulty in choosing between taraxacum root and cream of tartar, and juniper berries and tops, but I think it was a difficulty that might have been overcome if the ingredients were worth anything as remedies; for my part, I believe in the diuretic properties, at least, of all of them, and the combination I consider more grateful and palatable than the simple decoction; besides, if the compound decoction be a superfluity, the simple, assuredly, seems so to be, as there is introduced, as a novelty, the succus scoparii, the purest form of preparation, ready to supply the place of a simple decoction. Perhaps I am making too free with the Pharmacopœia, but, at any rate, it is a harmless species of freedom, and one to which all pharmaceutists have to a degree been invited.

In the two decoctions of sarsa, both simple and compound, more water and time for digestion might be resorted to with advantage; but both these preparations could be, and, I am inclined to think, very generally are, superseded by the liquid extracts. The Pharmacopœia provides a form for the simple fluid extract, and, if well and carefully prepared, it is a more reliable preparation than the decoction; nevertheless, the decoction has this advantage, that it is within the means of every one to prepare his own, and thus ensure its genuineness, whereas the liquid extract, to be made to advantage, requires appurtenances, not perhaps equally within the reach of all. I should like to see the compound fluid extract countenanced, and a form given for it in the Pharmacopœia, whether the ingredients constituting the compound portion are really of service, or whether, as some assert, with the exception of the mezereon, that they are useless, I am not in a position to say, but guaiacum is considered useful, and the liquorice and sassafras improve the flavour of the preparation; for good, well-made liquid extract of sarsaparilla alone has not an agreeable flavour. In making the compound liquid extract, I make, as stated in the Pharmaceutical Journal, vol. ii. p. 20, a soft extract of the compound ingredients, and having made the calculation, add the proper quantity to each pint of the simple liquid extract. This plan was adopted by my predecessors forty years ago, so that compound liquid extract of sarsaparilla would, in reality, be no novelty. In the directions given in the Pharmacopœia for preparing the liquid extract, there seems to be a fear of raising the temperature too high. I see no disadvantage, but rather an advantage, in raising it to the boiling-point; by this the albumen, if there is any, becomes coagulated, and if a little starch is taken up—and there is very little in the so-called Jamaica variety—it does not prevent a good and elegant preparation being made; and I have not been able by distillation, operating in a moderate way upon twenty pounds of Jamaica sarsaparilla, to obtain the odour or flavour which pervades during the cooking of sarsaparilla, nor have I obtained any of the essential oil mentioned by analysts, therefore the volatile principle must, I think, be so small that the sarsaparilla cannot suffer by being brought to the boiling-point. The extract is richer, and if, after the second quantity of water has been strained off, the root is washed with a little more water, no pressing is necessary; all that is useful will drain away, the cortical layers being perfectly exhausted of extractive. It is, I am convinced, as I have, I think, before stated, an oversight, in a general way, to order the liquors to be mixed, and then evaporated away; the first rich liquor should be evaporated by itself and added to the second, when that has been reduced almost as low as required.

17th October, 1866.

At the conclusion of the meeting, Mr. Botham, of Sheffield, exhibited and explained the construction of his "Improved Feeding-Bottle."

PHARMACEUTICAL MEETING, EDINBURGH.

The first meeting of the Session 1866–67 took place in St. George's Hall, on Tuesday evening, November 20; Mr. Kemp, President, in the chair.

On taking the chair, the President delivered the following address:—

Gentlemen,—Before entering on the business which is more immediately to engage our attention, it is my duty to acknowledge your kindness in placing me, for the third time, in the honourable position of President of this branch of the Pharmaceutical Society.

I therefore thank you very cordially for this additional proof of your confidence, which I fear has not been deserved on my part, but which, I assure you, it will be my endeavour to justify, so far as that can be done by strict attention to my duties and unabated zeal for the interests of the Society.

My next duty is to remind you that, in the relation in which we stand to each other, we have reciprocal duties to discharge, and that the success of our scientific gatherings depends very much on your presence and hearty co-operation.

I hope, therefore, that we will all feel our responsibility with regard to it, and that there will be an earnest and united effort to make the Session which has just opened surpass those which have preceded it, at least, in the degree of interest taken in the proceedings, and the number attending the meetings.

With the exception of the late highly successful meeting of the Pharmaceutical Conference, held at Nottingham, the proceedings of which have been extensively published, I do not remember any recent events connected with pharmacy which seem to call for special notice on the present occasion. Indeed, ever since the two Pharmacy Bills were so keenly discussed by the rival interests, and so quietly shelved by the Select Committee, there has been quite a lull of the pharmaceutical atmosphere, which neither party seems inclined to disturb at present, probably because the forces on both sides were somewhat exhausted in the struggle. If so, let us, without grudging them a little repose, entertain the hope that when they gather strength and courage for a new effort to obtain improved legislation respecting pharmacy, it may produce more satisfactory results.

In the absence, then, of any important pharmaceutical events to record, and therefore of interesting topics for an opening address, it occurred to me that it might not be amiss to deviate slightly from the usual course, and, instead of speaking generally of matters connected with the progress of pharmacy, to say a few words relative to the efficient practice of it, and the principles which ought to guide the pharmaceutist in the discharge of his important duties. Unfortunately for me, however, this point was just settled when Mr. Ince's able paper on Pharmaceutical Ethics, read at the Conference, appeared in the Journal,—a circumstance which, on account of the kindred nature of the subject, and the well-known ability of the author, at once suggested to me the propriety of seeking some other theme. Knowing well, however, from previous experience, that it is much easier to seek one than to find it, especially when there is little time and less leisure, I scarcely ventured to hope that the search would be successful, in time to be available on this occasion.

I was, therefore, as you may imagine, considerably relieved when, after some consideration, it occurred to me that it was perhaps unnecessary after all to make the attempt, and that the best course, in the circumstances, might possibly be just to adhere to the original subject, and modify it, so far as it might be necessary, to avoid going over the ground which has been already so extensively and carefully surveyed. As this view seemed, upon the whole, a satisfactory solution of the difficulty, it was adopted, and therefore I now, with your permission, proceed to offer a few observations on the qualifications, duties, and responsibilities of pharmaceutists.

Assuming, at the outset, that the pharmaceutist has received a fair education, and is well acquainted with the science and practice of pharmacy, and therefore, in these respects, qualified to perform his various duties with intelligence and accuracy, I think it will be generally admitted that he would be still better fitted for his position by having, in addition to his other qualifications, what is usually called moral principle. Of course this may be said of every man, whatever be his profession or employment, but it seems to have peculiar force when applied to the pharmaceutist, whose position is one of the highest trust, and the interests committed to his charge so important as to require that, even in minute and apparently trifling details, his duties should be conscientiously performed, but for which, on account of their peculiar nature, and the difficulty of determining whether they have been so or not,—the best, and in many cases the only, guarantee to the public, is his professional and moral character.

There are, doubtless, many cases in which these duties are well discharged, from a sense of honour and from motives of expediency; but the great advantage of moral principle is, that it tends to secure that this shall be done in all circumstances, even when a strict regard to its claims seems opposed to present advantage, and to involve the sacrifice both of profit and patronage. It is, therefore, the best security for his integrity in all departments of duty, whether scientific, commercial, manufacturing, dispensing, or advertising, and the safest rule of conduct in the relation in which he stands to the medical profession, the public, and his pharmaceutical brethren.

Moral principle ought, therefore, to be regarded, not merely as a desirable but necessary qualification for all engaged in the practice of pharmacy; one for which even extensive experience, a high degree of scientific knowledge, or the best code of conventional rules, will not serve as a substitute. Such rules may and often do exist, apart from moral principle, and are, no doubt, in their own place both useful and valuable; but that place is to accompany, not to supersede moral principle, which, so far from diminishing their usefulness and value, furnishes the highest motives for their observance, and thus tends very much to enhance both.

Notwithstanding, however, the great importance of moral principle, as a qualification of the pharmaceutist, it must be allowed that it is one which it is not the province of the Pharmaceutical Society directly to impart, or even to test by examination, because it cannot be measured by an educational standard, or ascertained by any board of examiners, however competent in other respects; but these circumstances, so far from being objections, seem just additional reasons why it should be urged on the attention of pharmaceutists, why each should be his own examiner in regard to it, and make sure that he is under its influence, that he is really—what, no doubt, he wishes to appear—a man of sterling integrity, discharging all his duties conscientiously, not because it is expedient or honourable, but because it is right.

As you are aware, much attention has been given within the last few years to the condition of pharmacy and pharmaceutists, and various means have been used for the improvement of both. Among these we have the Pharmaceutical Society, the Journal, and scientific associations throughout the country, at the meetings of which excellent papers have been read on pharmaceutical and other subjects, and addresses given on the necessity of raising the standard of pharmaceutical education; the importance of scientific knowledge and a well-cultivated mind, as means to success in the practice of pharmacy; the beneficial results of which are to be seen, not only in an increased desire to enjoy them, but in some degree of progress towards their attainment. There is, therefore, reason to hope that the discussion of such subjects as Pharmaceutical Ethics will be followed by similar benefits, and that the pharmaceutist, while seeking to increase his mental acquirements, will not fail to cultivate the moral sense, to take his stand, not on the low ground of expediency, but on the higher ground of moral principle; and thus show that, besides business intelligence, fair and honest dealing, honourable conduct, and moral integrity, are real and distinguishing characteristics of the pharmaceutist, and that they are so,—not because they are in themselves becoming or praiseworthy, not because he is a Member or Associate of the Pharmaceutical Society, and, as such, bound in some degree to prove himself worthy of such an honourable connection, and to promote its objects, which he knows to be the advancement of pharmacy and the elevation of the professional and social position of the pharmaceutist,—but from a sense of moral obligation to do right, even independently of such considerations, and certainly not less so on account of them.

If it be granted that the pharmaceutist ought to be honourable and upright in all that pertains to his business, it surely follows that he ought to seek these qualities in the highest degree and in the best way; and, therefore, not apart from, or independently of moral principle, but rather as the natural and certain results of its operation.

No doubt the love of science—the desire to aid as far as possible investigations into the nature and therapeutic value and actions of the various substances employed in medicine, to produce them in the highest style of the pharmaceutic art, and thereby establish a reputation for skill in the science and practice of pharmacy—will tend to promote carefulness and accuracy; but when we have superadded to these qualities, moral principle, we have a pharmaceutist, much better equipped for his onerous duties, and, therefore, more likely to discharge them faithfully, even when other admittedly powerful influences and considerations fail. When it is remembered that the business of the pharmaceutist is not to vend merely, but to select and prepare, and, when necessary, test medicinal substances; to weigh and combine them with accuracy and skill when prescribed, and thus—it may be in a humble but still important manner—aid the physician in his endeavours to mitigate suffering, to control and cure disease,—the value of moral principle becomes evident, because it tends to secure carefulness and conscientiousness in the discharge of these duties, the want of which might do much to defeat such efforts, to lessen the confidence of medical men in the honour and integrity of pharmaceutists, and render their experience of the actions of medicines variable, conflicting, and unsatisfactory.

The remedy for this, so far as pharmaceutists are concerned, is to do their part skilfully and honestly; to furnish and use invariably materials of standard purity; to give the precise articles and quantities prescribed, carefully and tastefully prepared. All which, it is true, may be done without any regard to moral principle, but more certainly, uniformly, and satisfactorily with it; and, therefore, the pharmaceutist who is under its influence, gives an additional guarantee for professional uprightness, which those who really require his services will not fail, in some degree, to discover and appreciate.

On the whole, then, it appears pretty clear that the pharmaceutist who is generally intelligent, well acquainted with his business, and guided in the performance of his duties by moral principle, who both knows what is right and is careful to practise it, is the one most likely to understand his responsibility, and on all occasions to act with integrity, and therefore the one most deserving of the confidence of the public, and most likely, in some good measure, to enjoy it.

As there is perhaps no class of tradesmen, merchants, or professional men, whose characters are more thoroughly canvassed by their employers than those of pharmaceutists, it is of great importance that, as regards their business and moral qualities, they should be able to bear the closest scrutiny, in order to which they must be men of intelligence, of principle, and moral worth.

One thing, however, is plain, which is, that the public expect to find them so, or at least above reproach in those respects, before they entrust them with duties which involve health and even life; and hence, as a general rule, they extend their patronage and support to those only who they believe are professionally and morally qualified for their duties as practitioners of pharmacy.

It is also evident that the medical profession require it, and therefore if pharmaceutists are to be specially employed in dispensing physicians' prescriptions, which they very properly regard as their legitimate duty, for which they have been trained and educated, they must have the confidence of medical men, for the obvious reason that the right discharge of that duty is one in which they have not only a scientific and professional interest, but regarding which they have some degree of moral responsibility, which does not cease when the prescription is written, but extends to the administration of the medicine and its effects; and hence it is necessary that they should know, or have good reason to believe, that their instructions will be scrupulously carried out by men of intelligence and moral principle.

It is, therefore, both the duty and the interest of pharmaceutists to adopt a moral, as well as a scientific standard of attainment and practice, and thus increase the intrinsic value of their services, which, as it becomes understood and appreciated, will do much to secure for them an honourable position among their professional brethren, and a just and proportionate reward.

I have purposely abstained from referring minutely to the various details of the business to which these principles are to be applied, and from making special allusion to the different classes of pharmaceutists, by whom they are to be exemplified and carried out, because I was anxious to avoid being tedious, and because I thought every pharmaceutist, whether principal, assistant, or apprentice, would know them very well already, and at once remember many instances in which the operation of these principles would have prevented errors, annoyance, and loss, and thus secured the safety of the public, with comfort and benefit to all concerned. If, then, a moral standard is to be uniformly applied to the business of pharmacy, it must be so by pharmaceutists of every grade: principals must be careful to set the example; there must, on their part, be no equivocal proceedings, no attempts to evade or ignore their moral responsibility, because these would, in all probability, be imitated by others in their employment, and thus the fabric of business integrity would be shaken, if not altogether destroyed. Assistants and apprentices also should remember that without moral principle, or conscientiousness, on their part, in the performance of their duties, the most stringent shop-rules will be of little value in securing their faithful service, without which the best motives and the most strenuous efforts of their employers will often fail to make their pharmaceutical preparations reach the scientific, commercial, and moral standard which they desire to attain.

It is, therefore, clearly necessary, that all engaged in the practice of pharmacy, in any department, should not only feel, but practically acknowledge their moral responsibility, that they should take a large and enlightened view of duty, and resolve to be faithful to the trust committed to them in their respective positions; for they will then find, from experience, that an intimate knowledge of the business, combined with moral principle, is not only beneficial to themselves and the public, and the best guide in all departments of duty, but, all things considered, the best foundation for success and eminence in the practice of pharmacy.

At the close of the President's remarks, Dr. S. Macadam made a communication on "The Testing of Waters for Impurities." The following is an abstract of the leading features of the paper:—

It was stated that the present condition of many of the well-waters of our towns and villages was extremely unsatisfactory, and from the daily examination of samples of waters forwarded from those populous places where choleraic attacks had been prevalent, Dr. Macadam had shown that there was a very close connection between such and bad or unwholesome water. Many of the towns and villages of Scotland which had suffered, and were still suffering severely from choleraic attacks, were supplied with water from wells which were contaminated with decomposing organic matter of animal origin, and the most severe attacks of cholera were observed wherever the impurity in the water was greatest. In testing the water which might be clear and transparent, and faultless to the eye, nose, and palate, attention must be directed to the presence, nature, and amount of the organic matter, the presence and quantity of nitrates, the presence of chlorides, besides the total amount and general nature of the saline matter. Dr. Macadam then specially referred to the various modes of indicating the presence and quantity of the injurious ingredients, showed experimentally the tests he employed in the examination of the waters, and proved that whilst the permanganate of potassium, or chameleon, was a reliable test when it was decolorized, yet no dependence was to be placed upon it when it failed, as it often did, to indicate impurity, owing to the test only being influenced by organic matter in one of the three states or conditions in which it is present in some domestic waters.

His remarks were listened to with much interest, and a vote of thanks, proposed by Mr. D. R. Brown, was carried unanimously.

The Secretary intimated the following presentations to the Library:—Dr. Pereira 'On Food and Diet,' by Mr. D. R. Brown, Vice-President; 'Note-Book of Materia Medica, Pharmacology, and Therapeutics,' by Dr. Scoresby Jackson, presented by the Author; Dr. Scoresby Jackson 'On Medical Meteorology,' also presented by the Author; 'Proceedings of the British Pharmaceutical Conference at Nottingham,' presented by the Association; 'On the Sanitary Condition of Edinburgh,' by Dr. Littlejohn,' presented by the Author.

Intimation was made regarding the arrangements for the Library, and the meeting thereafter adjourned.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The First General Meeting of the Liverpool Chemists' Association was held at the Royal Institution, October 25th, 1866; the newly elected President, R. Sumner, Esq., in the chair.

The following gentlemen were duly elected members:—Mr. Septimus F. Leete, 16, Hope Place; Mr. W. Bowman, 50, Miles Street; Mr. J. Hockin, 31, Oldhall Street.

The Secretary announced the following donations to the Library:—The Report of the Birkenhead Literary and Scientific Society for 1865–6; the Report of the Liverpool Geological Society for 1865–6; the 'Chemist and Druggist' for October, 1866. The thanks of the meeting were passed to the donors.

The Secretary reminded the members of the Annual Meeting of the Gallery of Inventions and Science, and desired their presence and support to that institution.

Mr. Redford greeted the President, and mentioned that a prescription had come into his hands having a label affixed by a chemist who had compounded it, which he considered highly offensive, as it stated that at the shop in question no youths or apprentices were employed, and that all poisonous drugs sold by him were labelled poison, to prevent the "numerous mistakes which so frequently occur."

Messrs. Shaw and Sharp agreed with the views expressed, and advocated the employment of apprentices.

Mr. Shaw gave the substance of a letter from Dr. Edwards, announcing his safe arrival at Montreal.

Mr. Redford exhibited a small apparatus of his own invention for making pessaries. He described the difficulty of using cacao butter, owing to its ready fusibility, and showed that, with the method which he employed, this was surmounted in a cheap, simple, and easy manner.

The President spoke highly of the simplicity and efficiency of the process.

The PRESIDENT then proceeded to deliver the Annual Address:—

Gentlemen,—Your Council have done me the honour to elect me your President for the coming year, and in my acceptance of so great a compliment I assure you I am prompted more by my zeal for the prosperity of our Association than by any great ability I possess to further that object. By your kind courtesy, some years ago, I occupied this chair, and in that interval the Association has worked hard and made great progress. If we look back to the days of which I speak, our numbers were few and our self-help feeble; and although it may have been alluded to many times before, we may still be allowed to acknowledge our grateful recollection of the generous and efficient help that was given us by professors and the medical profession in those early years of our career, —an aid which is still afforded when needed. But our own members grew with its growth, as if determined to take and maintain a leading position among kindred institutions in provincial towns; and we may now look back upon its success in the members it has reared, and the work they have done and are doing, some here and others spread over the globe. There is this also to be said, that from the day of the formation of the Society to this day, we have had nothing to disturb one unbroken course of harmony, peace, and good-fellowship.

The little help I have rendered to the Liverpool Chemists' Association has been more than amply rewarded by the kind good feeling manifested towards each other by all its members. Encouraged by this, I ask for your cordial co-operation for the Session now commenced, as we shall need extra efforts if we are to maintain our position, being in the position of a school where at the close of a session the more advanced scholars drop off and leave their places for fresh comers.

As respects the attendance at our meetings, we are, I think, as fairly represented here as the other learned societies of our town; but there are many worthy members who could render us essential service, and who, I am sure, would derive more than satisfaction from more frequent attendance with us. Some, I know, are not able; but for them we have, by the accumulation of years, collected in this building a library of 500 or 600 volumes, in the selection of which the invariable rule has been to purchase such books as were not likely to be possessed by individual members, a revised list of which is yearly published with the annual report. This year I hope the library will prove both a source of interest to the members, and also a great benefit to the Society, by inducing the young members especially to study, so that at our miscellaneous meetings they may be encouraged to give practical proof of the benefit which they have derived. I hope that these miscellaneous meetings will form a prominent feature in the business of the session, on account of the practical suggestions brought forward at them, and the opportunity which they afford to those members who may not have confidence enough to read a paper.

New efforts are being made to bring the laboratory classes to a greater state of efficiency, under the personal superintendence of our newly-appointed teacher of pharmacy, Mr. Edward Davies, F.C.S. This is one of the special advantages which Liverpool offers to those who are to become the pharmaceutical chemists of the future; and in so far as young men avail themselves of present advantages, by so much will they forestall both time and expense in meeting the demands which will be made upon them by the Pharmaceutical Society, and more especially by the public in general. That public is not now satisfied with what it once was, nor will it rest its requirements on the present basis; it knows no rest, nor will it give you any, therefore the intelligent and the qualified only will have its confidence. It is, however, not enough to become proficients in the science of your business; and I use the word business advisedly, somewhat in contradistinction to those who constantly call it a profession; you are tradesmen too. You may meet with the man of science profoundly learned in the department which he has cultivated, and you may more readily find the complete man of business, but a good compound of the two is rare. They do sometimes present themselves; the Pharmaceutical Society has produced them, the Liverpool Chemists' Association has produced them, and so have the societies in other towns. Make them your standard; not content with science alone, nor business alone, but seeking a happy union of both.

Before I close, let me say a few words to you who are principals, upon the subject of apprentices. This is a matter which has been brought before you previously, and you who most need assistance know most also of the condition into which you are drifting. It has grown too much the fashion to ignore the taking of apprentices, and, like other ficklenesses where fashion rules, I hope this will soon have seen its day. I can carry in my memory establishments of long standing which have constantly kept up a succession of youths; and there are others of more recent date, who have also turned out apprentices the stamp and character of whom have been creditable alike to school and scholar. We all know, and the public also knows, that a lad raw from school is at first only put to the merest alphabet of his business, yet, if educated up to the standard of our time, there will be found ample materials for every need. Nor is the advantage confined to large establishments, for where few are kept the two extremes come into closer proximity, and an early copy of the master grows into a strong habit. I can only hint at these things; but if it should provoke a further discussion of the subject, my present purpose will have been accomplished.

Mr. SHAW proposed a vote of thanks to the President for his address, characterizing as especially valuable his advice to unite science and business, alluding to Dr. Edwards and Mr. Mercer as examples of this union.

Mr. REDFORD seconded the motion, and informed the meeting that Mr. Brown, late member of the Association and assistant at his shop, had passed the Minor Examination of the Pharmaceutical Society, and the Matriculation Examination of London University, and offered him as an example to young members.

The motion was carried by acclamation, and the meeting closed.

LEEDS CHEMISTS' ASSOCIATION.

The second meeting of the Association for the present session was held in the Library of the Philosophical Society, on the evening of November 14, 1866; Mr. Edward Thompson, the President elect, in the chair.

The PRESIDENT proceeded to deliver the following inaugural address:—

To review the progress of pharmacy during the past year would have been my task to-night, but for two simple reasons,—because to do so would have required more knowledge than I possessed, and more research than I had time for.

A very superficial observer may notice, however, that pharmacy is now making considerable progress in this country. Several influences have been at work in producing this result. It was well known that in England our art was in a backward state, and that other countries were cultivating it far more successfully than we were, when the late Jacob Bell and others instituted the Pharmaceutical Society, and brought out the Pharmaceutical Journal. They appointed men of acknowledged ability, such as Dr. Pereira, Dr. Anthony Todd Thomson, and Mr. Redwood, to give instruction in the various branches of science required by the pharmaceutist; and they set up a well-furnished laboratory for the practical study of chemistry and pharmacy. Thus they provided, with wise foresight, and in the most effectual manner, that a future generation of pharmaceutists should arise well grounded in the various studies necessary to be cultivated for successful competition with foreign chemists. The establishment of the journal, too, ably conducted as it was by Mr. Bell till his lamented death, was the means of spreading among those of us who had not the advantage of personal intercourse with original investigators, some knowledge of what they were doing. Even the United Society, though not assuming any high scientific position, may have done good in watching over and stimulating the Pharmaceutical Society in its work, ever sounding in the ears of the paid officials the sentiment, if not the words of Burns:—

> "A chiel's amang you, takin' notes,
> An' faith, he'll prent it."

In more recent times, we cannot doubt that the Pharmaceutical Conference, by suggesting and directing researches, and by providing for the social intercourse of its members, has done good service in advancing the cause of pharmacy. And we may congratulate ourselves that one of our own members had no small share in originating the Conference, and now labours diligently and honourably, as one of its secretaries, in carrying it on.

Such associations as our own, too, have had some humble part to play in promoting the progress of pharmacy; and we hope that much more will still be done by societies yet to be established in all the principal towns in the kingdom. One thing is certain, that we must not depend any longer upon the medical profession for advancing pharmacy, but on ourselves alone. It is true that, as things are at present arranged, the Medical Council have the responsibility of compiling a national Pharmacopœia, and it is to be hoped that their future efforts in this direction will be more successful than the last. But there seems to be something arising from the constitution of the Council which prevents them from boldly adopting improvements. They have to do so much in the way of compromise, that they naturally fail to please either side. "*Medio tutissimus ibis*" may do for a motto on the sign of a public-house, as may be seen at Apperley Bridge, but it seems to me not well adapted for the compilers of a Pharmacopœia. Without referring to some of the absurd errors the Council committed in the last edition, such as ordering the mineral acids to be made of such strength that they would neither keep nor be safely carried, there are three vexed questions that will be brought before them, viz. those relating to nomenclature, weights and measures, and symbols, concerning which I would respectfully make a few suggestions, if my opinion were required.

1st. Let such *names* be adopted as are best known, and not likely to confound things that differ. For instance, it is most dangerous to give names to calomel and corrosive sublimate so as to leave it for a moment doubtful which is meant. Let scientific precision and theory go to the winds, rather than human life be put in jeopardy. These were my sentiments as given in the 'Pharmaceutical Journal,' so long ago as 1848, and I think it would have been well if subsequent editors of the Pharmacopœia had more fully recognized them.

2nd. I would go in boldly for the *metric system* of weights and measures. It is making advances abroad, it is universally used by scientific chemists, and it is now legalized with a view of being authoritatively adopted throughout England. Surely the spirit of mediocrity will no longer inspire the Council to refuse to adopt a method so full of advantages.

3rd. *Symbols* are not of so much consequence. If the unitary system is decidedly preferable, as I suppose it is, then why not venture to make use of the most modern system of notation, though Dr. Apjohn and Dr. Taylor should talk of breaking their hearts about it? But if such an event be really imminent, I am humane enough to suggest that no symbols at all should be employed, for they are of little practical use in a Pharmacopœia, though of course essential to a chemical treatise.

Our respected Secretary suggested at our last meeting that it would be very desirable to commence a Materia Medica Museum in connection with our Association. I dare say he will develope his own ideas on the subject; but I mention it now because I think it is well worthy of being seriously entertained. The Museum might be begun on a small and inexpensive scale, not attempting to collect a complete set of specimens, but limiting ourselves at present to those which are unusual or novel—such, in short, as we are not all likely to see in our own shops. Specimens, I think, would come in abundantly, and could not fail to interest and instruct. They would be much more useful to us than a larger collection in a distant place, because we could carefully examine them at leisure.

Our object is to render our Association as useful as possible to the body of members. We ought therefore, I think, to pay special attention to the Library, because every member can make use of it if he choose to do so, whereas the long hours of business which unfortunately prevail, may prevent him from attending lectures or meetings. By means of the Library more especially we ought to enable our members to keep pace with the progress of pharmacy, chemistry, and materia medica, and the addition of a select museum will greatly aid them to do so.

It will be remembered that Mr. Smeeton told us at our last meeting of his admiration of Mr. Ince's "Essay on Pharmaceutical Ethics," stating that he thought it well worth going to Nottingham to hear. I had not the advantage of hearing the paper read by the author, but I have read it myself with great interest. Of the various topics so ably handled by Mr. Ince, many are necessarily such as afford room for differences of opinion, and many may be looked upon by him perhaps too exclusively from a Metropolitan point of view.

With your leave, I will proceed now to offer a few remarks on some of the subjects treated by Mr. Ince, hoping at least to suggest matter for friendly converse, either at this meeting or at a subsequent one.

According to Mr. Ince, our business is more of a trade than a profession. One of Dr.

Johnson's definitions of a trader is one who exchanges goods for other goods, or for money. A professional man will then be one who exchanges, not goods, but technical skill or knowledge, for money. It is evident therefore, that our business partakes of the character of both, but is more a trade than a profession. In this respect we differ much from each other, but all are essentially traders.

This being so (and nothing to be ashamed of in it), I confess I prefer the homely designation of a *shop* to express the place where this trade is carried on to the more pretentious title of a "*a pharmacy*." As a general rule, I think it is well to "call a spade a spade." Even a schoolmaster, I cannot think, consults his *real* respectability when he styles his school an Academy, a Seminary, or an Establishment for the Education of Young Gentlemen, or perhaps even a College. Why should we use a word which is much more Greek than English, and which may not be understood by a twentieth part of the persons who read it, rather than employ one which is plain, downright English, and known to every child where English is spoken; a word about the meaning of which no mistake can be made? "A Pharmacy," Mr. Ince says, is "English, not fanciful." If it be English at all, the word shop is much better English. I suppose, however, that he will grant that in this sense a pharmacy is a word only lately introduced into the English language. Beceause of its ambiguity, I would humbly suggest that it should speedily be put out of it. Let us retain the old word pharmacy, as the art of compounding medicines; but not make use of the very same word to express another idea, namely the place where medicines are sold. Such would be my verdict on what is rather a matter of taste than of principle.

There is much truth in what Mr. Ince and Mr. Brady say about the impropriety of taking apprentices who have received an imperfect school education; and much to be admired in their high aim of providing that every candidate for apprenticeship should be well acquainted with Virgil and Euclid. But in practice we are unfortunately obliged to come down from this high position. From my limited sources of observation I should conclude that while general intelligence has been making progress, and boys are generally receiving a much better education than they used to do, druggists' apprentices are less educated than young men holding similar positions were thirty years ago. But what can masters do? To insist upon much higher attainments than those now possessed would be to hinder themselves from having apprentices at all. We all know, too well, that we are but poorly remunerated for our responsible and laborious efforts to serve the public; and can we wonder that those parents who can afford to give their sons a good classical and mathematical education should hesitate about placing them in a business yielding so little profit? The advice once given to persons about to marry was—don't. And if asked whether a well-educated youth should enter the business of a chemist I should almost be inclined to answer—don't, for you can make your attainments go further in another direction, and if asked the same question respecting a boy whose education had been neglected and who did not evince any extraordinary aptitude for learning, I should decidedly answer—don't, for you will never understand your business and will always labour under disadvantages. Practically speaking, the druggist has to obtain the best apprentices he can get, for as Mr. Ince observes, necessity has no law. Besides a youth who is ignorant, and whose mind is undisciplined, is dangerous in a druggist's shop,—dangerous to the customers and to his master, the latter having to bear all the responsibility of his errors. No master then, having regard to his own interests and safety, would *prefer* an ignorant boy.

Mr. Ince's section on Personal Ethics, in which he lovingly looks back upon his early classical studies, and recommends the cultivation of ancient literature to us all, is written in so enthusiastic a style, as to prove that our hard and matter-of-fact business does not necessarily deprive us of all aspirations after what is more ethereal and intellectual. It is a consolation to know, that the spirit of his recommendations may be carried out without so much classical culture as Mr. Ince has enjoyed. Most of us perhaps have to confess that we know "little Latin and less Greek." But we have stores of literature in our own language which we may study with abundant benefit to ourselves, and we have at least one poet equal to Mr. Ince's favourite Horace. After all, money-getting is not everything. As Mr. Ince suggests, man was not made to stand for thirty years behind a few square yards of mahogany. Like the rest of mankind, it is our duty, and may be our pleasure, to cultivate the intellect, to contemplate the beautiful, and to bring ourselves under all the influences that tend to raise us as moral, accountable, and religious beings. We need to be reminded of these things the more, as our avocations are necessarily so absorbing as to require almost our undivided attention.

With regard to trade extension and the mixed character of the business carried on by many druggists, our fellow-associate Mr. Gissing gives rather a melancholy picture, which I am afraid is but too true. Men must live, and capital must be made to produce some interest; and if, in certain places, our own legitimate trade will not do these things, something else must be tried. So long as this is done honestly, who has any right to find fault? Some look with longing eyes to the Legislature for a remedy for this state of things; and seeing the general practitioners largely engaged in pharmacy they would fain have a law passed prohibiting surgeons from meddling with this branch. I must confess that I think that such a prohibition would not be just to the surgeons or to the public; that Parliament would not pass such a law, and that if passed, it would be evaded so as to be inoperative. I dare say that we shall all agree that if surgeons in English towns would follow the example of some of their Scotch brethren, and leave pharmacy to pharmaceutists, they would consult their own convenience and dignity, and the benefit of their patients. And we may go further, and assert that in proportion as medical practitioners partake less of the spirit of traders, and more of that of professional men, in proportion as they become highly educated, and practise medicine not as an empirical art, but as a branch of philosophy, in the same proportion will they be ready, whenever circumstances allow, to abandon the custom of making up their own prescriptions. But I would not go further still, and say that we must try to get a law passed forcing them to do that which they will do spontaneously if we will only wait for the operation of influences which are already silently, but surely and gradually tending to the same result.

Mr. Ince, recollecting that Pandora's box had Hope at the bottom, closes his paper with a bright prospect for the future. How pleasant, after depicting the ills that the present practice of pharmacy is heir to, to reveal at last the one panacea that is to cure them all. "I have spoken," says he, "of a great deliverance. I believe our sole hope is in a stringent Act of Parliament, on the one basis of compulsory examination."

I am sure it affords me no pleasure to feel any doubts about the soundness of the foundation on which Mr. Ince's "sole hope" rests; especially as this hope is shared in by many—perhaps by nearly all—of our body throughout the kingdom. But it cannot be unprofitable to look a little more closely at the grounds on which so many expect such glorious results to follow from compulsory examinations. We have hitherto heard chiefly one side of this question, and many have taken it for granted as an axiom that every future druggist should be compelled to pass through an examination, the only question with them being by whom the examination should be conducted. Now I think we want the previous question further discussing before we need to ask who are to be the examiners, and we should carefully look at the negative argument before we come to the affirmative conclusion. If I enter a little further into this question, therefore, it will not be that I would presume to be the champion of a minority, or an opponent of Mr. Ince; but I would rather perform the more humble office of bringing before you some views of this question which, as far as I can see, have been hitherto very much overlooked.

Let us, then, examine what Mr. Ince and his correspondent Mr. Orridge have to say in favour of compulsory examinations.

Mr. Orridge, in a "calm and lucid statement," addressed to Mr. Ince, reasons thus:—The Apothecaries Act of 1815, which prohibited any one from practising as an apothecary who had not passed the examination of the Company, raised the apothecaries from a low position to a high and prosperous one, and enabled them to charge "in one line" of their bill for professional services, rather than in many lines for medicines supplied. In like manner, an Act of Parliament making the examination of chemists compulsory before they were allowed to compound prescriptions, would raise their position, and enable them to get a better price for their skilled labour than they do at present.

Allow me to remind you that the reasoning here adopted by Mr. Orridge is that of *analogy*—a sort of reasoning upon which we are often obliged to act, but which is not always the most conclusive, and never demonstrative. "It is founded," says Leechman, "on some similitude existing between things that are compared together. We are thus induced to believe," he continues, "that similar causes will produce similar effects, and, from our knowledge of certain properties in objects which we know, are led to infer that similar properties exist in other objects which are unknown, or but imperfectly discovered." There are at least two sources of fallacy to which this mode of reasoning is liable—1st, the properties of the thing supposed to be best known, and with which others are compared, may be misunderstood; and, 2nd, the points of resemblance between the objects compared may be few and unimportant.

Now, to apply these logical principles to the case in hand. The object whose properties are here supposed to be well known is the operation of the Apothecaries Act of 1815. I believe that Mr. Orridge has greatly overrated the effect of that Act. Its immediate consequences could not be very striking, as all existing apothecaries were allowed to continue to practise without molestation. Then, as now, skill and knowledge were valued and paid for above ignorance; though the latter, then as now, when joined with impudence, sometimes got the upper hand. Mr. Ince admits that the immediate effect of any compulsory Pharmaceutical Bill would also be small. But Mr. Orridge attributes to the Apothecaries Act great results after it had been in operation many years. Let us see what they were.

According to my recollection, not a dozen persons, perhaps not half-a-dozen, were ever prosecuted for violating the Apothecaries Act. The Company found, after a few trials, that the duty of bringing offenders to justice was a thankless and an expensive one; and so it came to pass, that long before the Act was virtually repealed, it had become a dead letter, practically allowing every one to do that which was right in his own eyes. That is to say, the Act produced very little legal effect in the earlier period of its history, and none at all in the latter.

How could such a piece of legislation—cumbrous in its working, so that it was hardly ever put in force—so greatly raise the medical profession in dignity and emolument, as Mr. Orridge alleges? And if it could not, then has Mr. Orridge fallen upon one of the fallacies to which analogical reasoning is exposed; he has mistaken the properties of the object supposed to be best known,—he has greatly overrated the effects on the medical profession of the Act of 1815.

I readily concede that the medical profession has made great advances since 1815, but I contend not mainly in consequence of the Act of Parliament then passed. Other causes have been at work, and other professions have also made progress without compulsory laws. If, as Professor Fawcett informs us, the exports of this country have trebled during the last twenty years, and the wealth of the class providing capital has vastly increased, it would be strange if a higher quality of medical skill should not have been in demand; and, if found, that it should not have been paid for at a higher rate than an inferior article. The demand has created a supply, and so the efficiency and emolument of medical men have been increased, not so much in consequence of any single act of legislation, as by the operation of ordinary economical laws,—laws which govern all classes and professions, and all the more surely when parliamentary legislation does not attempt to interfere with them.

And how shall we estimate the bearing upon the present question of the progress that has been made since 1815, in education and general intelligence? Are we not all certain that the more intelligent a man is, the more he will seek after real skill on the part of his medical attendant, and the less likely will he be to be deceived by mere pretenders?

If, then we can show, as I think we can, that the Act of 1815 has done very little to advance the prosperity of the medical profession, but that that advancement is chiefly due to other causes not difficult to discover, we shall see that Mr. Orridge has so far failed to prove that a similar compulsory Act would do much for our own interests.

Mr. Orridge's over-estimate of the operation of the Act of 1815 may be shown in another way. If a compulsory Act raised the medical profession, we might suppose that the substitution of a non-compulsory one would bring it down again to its former level. The experiment has been tried, and has not been favourable to Mr. Orridge's argument. The Medical Act now in force is, so far as the analogy before us is concerned, non-compulsory, as it allows all to practise, and only hinders any one from assuming titles which do not belong to him. And though the Medical Act now in force has not done all that could have been wished, yet no one, I imagine, will affirm that the medical profession has not progressed since it came into operation even more than it ever did before in the same time.

We may even turn Mr. Orridge's weapon of analogy against himself. If the compulsory Act of 1815 has done so little for the surgeons, a similar Act would do little for the druggists. And if in the course of time the surgeons were willing virtually to have their compulsory

Act repealed, or, which is nearly the same thing in this argument, if Parliament compelled them to do so, then let the druggists take warning by the example, and avoid seeking a compulsory Act which, when obtained, will be powerless for good, and which public opinion or the Legislature may soon repeal.

Supposing that Mr. Orridge had escaped the first of the fallacies before mentioned, he might still have fallen into the second. I think he has done so. In other words, as far as regards compulsory examinations and a monopoly of certain functions, there is no proper analogy between the profession of medicine and the trade of a chemist and druggist. I shall not attempt to enter into any adequate proof of this proposition, which I could not do without treating too largely of some not universally acknowledged principles of Political Economy. I will venture, however, so far as to say that, as a general rule, and in the interest of the public, all trades and professions ought to be free to be exercised by all, unless some special reasons can be given to the contrary. Some think that there is a special reason to the contrary in the case of the medical profession, as an ignorant surgeon may kill more than he cures, and a paternal government should prevent the unnecessary loss of human life. But in this country we do not go so far as this. Our Government, whether paternal or not, leaves the matter to the judgment of the people, considering that the natural instinct of self-preservation will generally lead men right. It does step in, however, and forces some men to be honest against their will, so that the public may be able clearly to distinguish the learned from the unlearned, those who have passed an examination from those that have not. Here, then, in this country, we now draw the line. We *almost*, but *not quite*, make the practice of medicine a monopoly. It would be strange if we were to make the practice of pharmacy, which is confessedly less responsible, *quite* a monopoly. Such a consummation seems to be devoutly wished for by many; but, unless the whole course of modern English legislation be reversed, I think it is a consummation not likely to be attained.

But enough of this. Let me for a moment turn back to our own Association, and the coming session of meetings. Hitherto, we have been very glad to receive help from our friends of the medical profession, with whom we hope always to reciprocate acts of kindness and goodwill, and from others; but still we have been very much dependent upon ourselves for providing profitable matter for consideration and discussion. Let me then hint to some members who have not yet favoured us with the reading of papers, to do so.

We have had one or two essays by Associates which have done them very great credit; may I venture to hope that some others will follow their example? From experience I can tell you that are Associates that it will be most improving to yourselves to take up one single subject, and study what has already been done in it, and, with or without any original investigations, write a condensed account of it, and read what you have written at one of our meetings. I could easily suggest subjects, such as spectrum analysis, as it has been applied to different classes of substances on the earth or to the heavenly bodies,—the application of dialysis to pharmacy,—volumetric analysis, as directed in the Pharmacopœia, or as it might be further used in the examination of pharmaceutical products,—the metric system,—the microscopic detection of adulterations,—polarized light, as it may be used in examining various drugs and chemicals,—the chemistry of the different waters used, or to be used, for the supply of Leeds,—the effect of air, agitation, subsidence, filtration, etc., in depriving water of organic impurities,—some of the more recent advances in organic chemistry,—foreign pharmacy,—the habitats of plants growing round Leeds,—and many other topics furnished by chemistry, botany, and pharmacy.

And now, in conclusion, allow me to express my trust, that during the coming year we shall all do our best to make our Association as useful and agreeable as possible. Societies such as ours have sprung into existence amid great enthusiasm,—have flourished for awhile,—and then, not fulfilling the too sanguine expectations of their first admirers, or yielding to the temptation of meddling with topics of business which they had better have let alone, and thus causing divisions and bad feeling, have ceased to exist. We have now passed through the dangerous period of our novitiate, and may consider our Association as fully established. We have not so many members as we once had, or might wish now to have; but I believe many others would join us, if the long hours of business would allow them to do so. We cannot expect to prosper, or to gain an accession of members, unless we make it appear that our brethren in the trade may obtain some advantage by joining us. I do not suppose that we are more selfish than other people, nor do I mean that the advantage to be gained by becoming members of our Association will always be a pecuniary one; but I maintain that if we supply our members with the means of becoming acquainted with the progress of the branches of science bearing upon our daily pursuits, and conduct our proceedings in such a manner as to promote honourable and generous conduct amongst ourselves, we are giving them *quid pro quo*, and are making it to be their interest and duty to unite with us.

Mr. R. M. Atkinson said that restrictions were the great want of the trade. He had drawn up a petition praying that a license of the cost of two guineas per annum should be granted to every chemist, and no person be allowed to sell drugs without possessing such license; by this means, the trade in drugs by hucksters would be effectually stopped. He was glad that sixty chemists out of eighty in Leeds had signed this petition. Until some such course was adopted, the position of the chemist would be like what Juvenal described, when he wrote, "Honesty is praised, but starves."

Mr. Reynolds expressed the pleasure with which he had listened to the address of the President, and moved a vote of thanks. At the same time, he felt compelled to hold very different views to those just enunciated on the subject of legislation for pharmacy. Analogies had been brought forward comparing our position with that of the learned professions, and the President had endeavoured to show that such analogies could not make out a case for legislative interference. But it must be recollected that a large number of other instances could be adduced in which the State interfered with the liberty of the subject: thus, a railway company could not open a new line without official inspection and sanction,—ship's anchors were officially tested before they could be used,—steamboats must carry a certificate of being sea-worthy,—and the sailing masters of ships had to undergo personal examination as to their fitness to perform their duties. The public security and good being the reason for this interference, it seemed impossible not to admit that the State should require a competent knowledge on the part of those entrusted with the responsible duties of dealing in medicines. At present a man was liable under Lord Campbell's Act for the results of misadventure, whether that arose through ignorance or otherwise; but would it not be better to prevent a large portion of error, by securing proper qualifications in those whose actions were so important?

Mr. Smeeton agreed with the sentiment that there was no disgrace in trade, and said he could not desire to divest himself of the character of a trader. He was anxious that distinctions should be made public as to qualified and unqualified dispensers of medicine. Supposing that in travelling he went into a strange town, he wished to be able to tell to what chemist he could apply for medicines with similar security to that which he had in calling upon a physician. He would not object to see a further extension of the principle to skilled labour of other sorts; for instance, to have qualified watchmakers distinguished in some way.

Mr. Yewdale said, that it was because the public could not be judges of the quality of drugs as they could be in the case of provisions, articles of clothing, etc., that the right of State interference was established. He alluded to the importance to the Association of forming a collection of the newer or rarer objects of materia medica, and promised to bring forward a definite proposal at some future day.

Mr. Brown was hopeful as to future improvement in the preliminary education of those entering the drug trade, since the admitted advance of pharmacy during the past twenty years could not fail to attract to it a superior class of pupils. This advance in the education and standing of many members of our body, undoubtedly enables those members to command a better remuneration for their services to the public, and their neighbouring brethren were consequently better paid by the influence of the standard thus created.

Mr. Haigh, in seconding the vote of thanks, expressed his opinion that the improved education and status of the medical profession were much more due to the compulsory education of its members than to the general "march of intellect" to which the President attributed it.

The President acknowledged the thanks of the meeting, and replied to some of the objections to his views that had been raised.

BATH CHEMISTS' ASSOCIATION.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—At a meeting of the Bath Chemists' Association, held on the 2nd inst., the following address was delivered by the President, Mr. Merrikin. The sentiments therein contained were approved by the meeting, and Mr. Merrikin's views, expressed in the latter part of it, were considered of sufficient importance to be, with some modifications, embodied in an address to the Council of the Pharmaceutical Society. This has been done; and I am requested to forward to you a copy of Mr. Merrikin's address for insertion in the Pharmaceutical Journal.

I am, Sir, your obedient servant,

JOHN C. POOLEY.

Bath, November 17th, 1866.

THE PRESIDENT'S ADDRESS.

After a few preliminary remarks, the President went on to say:—

On commencing this our third Session, I cannot but congratulate you on the success which has attended the formation of our Society. Taking into consideration the smallness of our numbers, our progress has been as great as could reasonably be expected, and thanks to the aid so kindly and generously afforded by Messrs. Schacht and Stoddart, the papers of the last Session were not only productions of marked interest, but full of suggestions capable of being utilized in the practice of our profession.

Those gentlemen who were present at the reading of Mr. Stoddart's paper must still bear in their minds, with pleasurable recollection, the large amount of practical information contained in it, delivered, as it was, in such an easy and instructive manner, accompanied by such numerous and striking experiments, and enhanced by the author's genial and affable tone, when explaining the theories which those experiments illustrated; and, I doubt not, those gentlemen will join with me in expressing my regret that such a valuable paper should have been read to so small an audience.

Mr. Schacht's paper was one also of great practical interest to us all, and more especially, as a modification of Mr. Schacht's more elaborately constructed apparatus may soon be used on every chemist's counter.

The continued success and increasing influence of the Pharmaceutical Conference, as proved by the late meeting at Nottingham, justifies us in the hope that it will become a permanent institution.

The addition of an Exhibition of Objects relating to the Practice of Pharmacy was a most excellent idea, and appears to have been well carried out. I do not know whether the gentlemen who attended the Conference as our delegates noticed any novelties amongst those objects which were likely to be of general use; if so, perhaps they will kindly bring them under our notice.

The Conference has unquestionably been the means of doing much good; it evidently has a mission to perform, and a part of that mission is to arouse chemists generally from the state of lethargy and inaction into which we had, as a body, fallen. Until of late, we had given ourselves up too much to mere trade interest, forgetting the higher and more scientific branches of our calling, and, if I may use the expression, we have been accustomed to look upon borax merely as a commercial article, and not as a biborate of soda, and to accept our drugs and chemicals from the wholesale houses without a thought as to their origin or mode of production.

The great feature of the Nottingham meeting was undoubtedly Mr. Ince's paper on "Pharmaceutical Ethics;" and an admirable paper it is,—remarkable, at once, for the terse eloquence of its language, the purity of its tone, and the force of its conclusions. It is a matter of regret that as much cannot be said of some portions of the discussion which followed. I allude, in the first place, to the question of dusting by apprentices. The idea that they are degraded by taking a duster in their hands, may suit very well the ethics of a southern luxuriousness, but it scarcely accords with my own notions of shop-rule,—notions engendered and fostered, I admit, by the more stern and rugged training of a northern school. The suggestion, again, that only large establishments should be tolerated, is, I think, worthy of reprobation, more especially as it was coupled with the unjust and ungenerous remark, that (quoting the speaker's own words) "as a rule, the class of small shops were conducted by men who took no pride in the quality of the drugs they dispensed, and, therefore, were nothing more or less than mere hucksters or chapmen." The speaker, I think, must have forgotten that public convenience required small establishments as well as large ones; and if, before giving utterance to such sentiments, he had made inquiries, he would have found that undue competition was as much the vice of the large as the small. As an instance of this, I recollect a large and wealthy concern in the north, conducted, too, by a founder of the Pharmaceutical Society, where three qualities of sweet nitre were kept, in order to meet the requirements of its connection. And on pushing his inquiries still further, he would have found that the existence of so many small shops could be accounted for by the illiberality and want of consideration on the part of large proprietors in days gone by. If gentlemen employing assistants in those days had been more considerate of the feelings and requirements of those assistants, had paid them more liberally out of their own handsome profits, and had conceded them more time for the furtherance of their studies, and the cultivation of those social amenities which are as necessary for the assistant as the principal, many of the men now conducting small concerns would still have remained as assistants. But I will dismiss this unpleasant part of the subject, by giving the speaker the cordial sympathy of a *small* proprietor in support of the resolution moved by him, to the effect, "That this meeting considers that the practice of pharmacy requires to be limited to fully-qualified persons, and that it is necessary, to attain this result, that an appropriate examination should be enforced by legislative authority." This resolution, which every lover of his profession cannot do otherwise than endorse, brings us into the region of pharmaceutical politics, and at once the question is started, How shall this be accomplished?

It is an easy thing to propose an abstract resolution, but it is a difficult and an arduous task to attempt to so conciliate all the classes of persons interested in this matter, as to give effect to that resolution; still I think it possible to accomplish even that, and if, Gentlemen, in addressing you somewhat at length on this subject, I should appear too prolix and tedious, I will plead, as an apology, its great importance.

The interests involved are of a very diverse nature, and unless we approach the subject with a free and full determination to make mutual concessions in order to secure a successful result, all our deliberations will prove of no avail. I have given much attention to this question, and it appears to me that there are six different classes of persons whose interests have to be considered and, if possible, conciliated. Firstly, there are the original founders of the Pharmaceutical Society, the men who have stood by it through evil as well as good report; the men to whom is due the credit of all the efforts which have been made to advance the interests of pharmacy as a profession, to whom we owe the origin of the Pharmaceutical Conference, and, as a sequence to the others, our very meeting to-night. Secondly, there are those men who, to their honour, have passed the examinations of the Society, and who, in order to attain that status, must have sacrificed a considerable amount both of time and money, and whose material interests we cannot blame the Council for jealously guarding. Thirdly, there are the men who were eligible to be registered as Pharmaceutical Chemists in 1852, but who, from some cause or other, —some, perhaps, from not appreciating the advantages offered, others from inadvertency, —neglected to avail themselves of that opportunity. Fourthly, there are those who have entered business on their own account since that period. Fifthly, the present race of assistants. And, sixthly, apprentices.

The great difficulty to overcome is, how to reconcile the various conflicting interests without sacrificing the principle for which the Pharmaceutical Society, and for which, indeed, we all contend, viz. an examination as to fitness. The Pharmaceutical Society has already made certain concessions, by offering the privilege of a limited examination to men who have been in business five years, or who are upwards of thirty years of age. I for one, as belonging to class three, accept that concession; and I think that many others similarly situated will, for the sake of furthering the interests which we all have at heart, sink all feelings of jealousy, and give in their adhesion to a re-considered programme of the Society; but the greatest amount of the opposition at present is from men of this class, who, I think, in some instances, take a mistaken view of the matter, and imagine that directly the examination is made compulsory, and that the diploma of the Society becomes of *bonâ fide* value, that their material interests will be sacrificed, and the public will run away from their shops to those of the men who will write M.P.S. after their names. I have no fear, and cannot bring myself to believe, that a single customer would be lost from such a cause. Depend upon it, Gentlemen, a chemist's connection is invariably a personal one, and the man who has made a connection by his assiduous attention to business, by his general competency, considerate attention to the wants and wishes of his customers, and by a careful selection of the remedies he employs, will never have to lament over that connection as a lost one. In fact, I am of opinion, that in the course of a few years, the number of chemists would be more limited, and, therefore, there would be a larger scope for the energies of others. But before dismissing this class, I would observe, that no principle would be sacrificed by its admission as members of the Society, as they were eligible in 1852, and I cannot conceive that any of them are less eligible after an additional fourteen years' experience; and it would, perhaps, be as well for the Council to ask themselves, whether the most conservative policy would not be a liberal course of action; for as the accomplishment of their desires is deferred from year to year, so the number of vested interests, hostile to those wishes, is increased by young men going into business, and to whom the passing an examination would prove a great inconvenience. And in this view of the question I am supported by a "Country Chemist," who writes thus in yesterday's Journal:—"I should not be surprised at a considerable secession, when it is seen that no further Parliamentary interference need be feared or expected." And I think we must all admit, that if the Council should not succeed in passing their Bill during the coming Session, the question of a compulsory examination will be deferred to an indefinite period. Such being the case, the Society would lose many of their supporters who, as suggested by a "Country Chemist," are supporters from policy and not from sympathy.

Then follow classes four and five, composed of men not yet five years in business or not thirty years of age, and assistants.

With respect to these classes, I am strongly of opinion, and trust that opinion will be supported by gentlemen present, that they ought to have accorded to them the privilege of the limited examination; many of them, no doubt, entered the business without having had placed before them the advantages which would accrue to them by becoming Members of the Pharmaceutical Society, and therefore a great injustice would be inflicted by its refusal. Some, perhaps, of these classes have arrived at the period of middle life, perhaps with families, perchance with businesses the profits from which are barely sufficient to maintain life, much more to enable them to pass through such a course of study as should fit them for the full examinations. Shall these men, from no fault of their own, be deprived of the privilege which has been bestowed on men of the same social standing, of the same or perhaps better attainments and ability? And further, as an argument against such an injustice, we must bear in mind that these men will still continue in business, and the assistants will have to be allowed to enter business as ordinary chemists, and therefore will be the rivals of their more fortunate pharmaceutical brethren, and in all probability will seek to increase their profits by reduced prices, and other objectionable means.

With respect to the sixth class, viz. apprentices, I am of opinion that no special provision is required on their behalf; they are still young—still have life before them, and the opportunity, by careful attention to their duties and a persistent course of study, to qualify themselves for the full examination.

In giving expression to my views, I fear I have trespassed too much upon your time, but will conclude this portion of my address by observing that, as other towns are moving in the matter, Bath should not lag behind, but should give expression to her sentiments.

If the views laid before you to-night should meet with your approval, I would suggest that a series of resolutions, embodying these views, might be passed, together with any additions considered advisable, and presented in the form of a memorial to the Council of the Pharmaceutical Society.

I recommend that course, feeling strongly that provincial chemists generally have been culpably negligent of their interest, and have left them too much in the hands of the metropolitan chemists.

The President then recommended that the Board of Inland Revenue should be memorialized, with a view to the obtaining a *reduction* of the licence necessary for retail dealers in methylated spirit, and that the co-operation of the chemists in Bristol and

Clifton should be solicited, in order to give greater weight to such memorial. He then alluded to the question of early closing and other local matters, and concluded by appealing to those present to contribute papers during the present Session, in order that the business of the Association might not be brought to a standstill; assuring those gentlemen who had not yet contributed papers, that the information they would gain during their researches on the subject they may select, would amply repay them for their trouble, besides giving them a taste for the acquisition of scientific knowledge,—remarking that if our pinions of thought were not sufficiently strong to carry us to the top of the tree of science, at all events, by nestling in its lower branches we shall be able to gather for ourselves some of the smaller, and be better fitted to appreciate and relish the finer fruit which may be thrown down by others.

ORIGINAL AND EXTRACTED ARTICLES.

SALE OF METHYLATED SPIRIT AND FINISH.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

October 26, 1866.

Dear Sir,—I received the enclosed answer to my inquiries, which, if of service, you may print in the Journal.

In Mr. Sturton's letter to the Inland Revenue Office, which is in our last Journal, he asks if Methylated FINISH might be used in making lin. saponis.

As Mr. Corbett's reply is that Methylated SPIRIT may be used for such purposes, I wrote for further explanation, as it appeared to me that Methylated Finish and Methylated Spirit were being confounded together.

I presume, as we are allowed to use Methylated Spirit in making medicines for external purposes, we are allowed to keep it without paying for a licence.

Yours truly,

J. MELHUISH.

"*Inland Revenue, Somerset House, London, W.C.,*
"*24th October*, 1866.

"Sir,—I am desired to acquaint you, in reply to your inquiry of the 19th instant, that methylated spirit may be used in the preparation of any article for external application, provided such article be not capable of being taken internally by man or animal.

"Methylated Finish, however, is now absolutely prohibited in any preparation.

"I am, Sir, your obedient servant,

"WM. CORBETT.

"*Mr. J. Melhuish.*"

METHYLATED SPIRIT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Perhaps the following letter may serve to throw a little more light on the above subject.

Most chemists and druggists are aware that they will be allowed, after the 31st December to *keep in stock* preparations such as lin. saponis co., lin. camph. co., etc., made with methylated spirit, but the Board of Inland Revenue never gave any intimation that those who MADE these preparations on their own premises would be allowed to keep the spirit in stock for the purpose.

I myself have seen the difficulty for some time, and thereupon addressed a letter to the Board on the matter. The reply, I think, will be found satisfactory, which is as follows.

I am, Sir, yours truly,

JOHN HURST.

Louth, Nov. 15, 1866.

"*Inland Revenue, Somerset House, London,*
"31*st October*, 1866.

"Sir,—I am desired to acquaint you, in reply to your inquiry of the 26th instant, that a chemist, if authorized by the Commissioners, may continue to make use of methylated spirit in the preparation of articles for external use, provided such articles are not capable of being used either wholly or partially as a beverage, or internally as a medicine by man or animal, but the use of methylated finish in any preparation is now absolutely prohibited.

"I am, Sir, your obedient servant,
"W. CORBETT.

"Mr. John Hurst"

ADDITIONAL OBSERVATIONS ON EXTRACTUM CARNIS.

BY H. DEANE, F.L.S., AND H. B. BRADY, F.L.S.

Our paper on the "Results of the Micro-chemical Examination of Extract of Flesh," read at the recent meeting of the British Pharmaceutical Conference, was necessarily of a fragmentary character, if indeed it can be said to be more than an outline of the subject; and further experiment naturally yields from time to time fresh facts, bearing to a greater or less extent on those already adduced.

In connection with one of the samples of extract examined, it was stated that it contained a large proportion of colloid constituents, and, at the same time, gave only a relatively small precipitate with tannic acid; and it was suggested that this apparent anomaly might be explained on the supposition that a portion of the chondrine or some other gelatinous principle was decomposed by the continued heat employed in evaporation. We therefore took about sixteen pounds of the exhausted meat, left after the preparation of extract, boiled it in water for an hour and a half, and strained. The strained liquor (about a gallon) was evaporated at a temperature below 212° to about twenty fluid ounces, and strained again through calico. When cold, the product took the form of a beautiful, clear, colourless, and almost tasteless jelly, about the consistence of good calf's-foot jelly, melting at a low temperature, and easily soluble in water. The aqueous solution was readily and completely precipitated by tannic, citric, and acetic acids. That the gelatinous matter obtained by this process is chondrine we had been made aware of on a previous occasion by a domestic experiment, when the attempt was made to render a quantity of the jelly thus prepared suitable for table use:—the unfortunate addition of a lemon spoilt the whole. A portion of this jelly was evaporated at 212° to extract consistence, and the heat continued for some time afterwards. The result was a small quantity of brown non-gelatinous matter, having considerable taste and odour, and giving but little precipitate with tannic acid. We may therefore assume, that by the application of long-continued heat, as in the process of evaporation where large quantities are operated upon, a considerable portion of the gelatinous matter is decomposed, and in its place we have the high-coloured, strong-smelling, non-gelatinous extractive, whose presence may be traced in inferior samples of extract. The experiment above detailed also shows that the tannic acid test must be used in conjunction with dialysis, in estimating the value of a preparation.

The chondrine jelly keeps for a long time unchanged. After three or four weeks it becomes fluid, and some which we have had about six weeks is now beginning to show signs of mould.

The residue of the meat, after exhaustion both of extractive and gelatinous matter, acquires a very offensive odour; but the addition of *very* small proportion of phosphate of soda and chloride of potassium, too small a quantity, as we should have thought, to have had any influence as an antiseptic, strikingly counteracts this tendency.

The behaviour of *Extractum carnis* with various reagents has been but slightly touched upon hitherto. The appearances following the addition of hydrochloric acid are worthy of note. Some of the extract, containing a full proportion of crystalloids, was placed in a watch-glass, and a little hydrochloric acid added. The whole became almost immediately quite transparent, owing to the rapid solution of kreatine and phosphates. After a few minutes, minute cubes of chloride of potassium made their appearance, increasing in number and size until they studded the whole field of the microscope. This was set aside, and in twelve hours a second set of crystals, of large size, and in the form of prisms and plates, were found. The second series appeared to consist of hydrochlorates of organic bases. Our original idea in acidulating the extract was to reduce the phosphates to a more soluble state, thereby to observe more easily the organic constituents; but the rapid precipitation of chloride of potassium, from its smaller solubility in hydrochloric acid, was a result we did not look for. The gradual combination of the acid with kreatine (or sarkosine?) or the formation of kreatinine, would explain the second growth of crystals.*

It may not be out of place here to notice two letters which have been published referring to our last paper,—one in the 'Chemical News' of October 5th, the other in the 'Pharmaceutical Journal' for November. To the former we did not reply, firstly and chiefly because it was anonymous, and secondly, because there is nothing incompatible in our statement and the paragraph quoted from Baron Liebig. Gelatine and allied principles have doubtless their use in the animal economy, and if the writer desires a preparation of meat containing these principles to their full extent, he may buy a very fair sample in London for about four shillings per pound. But the term *Extractum carnis* is now a well-understood one, and cannot be applied to any and every preparation that happens to be made by the evaporation of a decoction of flesh. The relative physiological value of the gelatinous and other constituents belongs to a subject beyond our province.

Baron von Liebig's letter in the last number of the Journal requires more remark, although it only affects our paper directly in one or two particulars. Our use of the word "gelatine" we explained fully in the paper itself. It was intended to comprise the non-crystallizable extractive precipitated by tannic acid or tincture of galls, consisting chiefly of chondrine, just in the same general sense as the term "albuminoid" is used by physiologists, to comprise a number of bodies allied to albumen. The *character* of the precipitates in the various samples we experimented on did not differ. The same weight of extract, and the same quantity of water, was used in each, and the tannic acid solution was added in the same way from a burette. The only difference observable was in the *amount* of precipitate.

The age and sex of the animals used for the preparation of the extract has without doubt something to do with the variations met with in the produce of certain manufacturers, but we cannot allow that it explains everything. The sample kindly given to one of us at the Royal Pharmacy at Munich and which had been manufactured there was labelled "Liebig'sches Fleisch-extrakt," and we suppose we are to consider that it was made from cow-beef, in accordance with the instructions of the Bavarian pharmacopœia. Why the flesh of the female animal should be ordered in that work, in preference to that of the male, we do not understand, except it be on the grounds of cost. We suspect there is still some misunderstanding of terms, and that the South American article is not prepared solely from *oxen*, in our sense of the term, at all, but from the

* This reaction is one to which we hope to devote further attention.

flesh of bulls, cows, and oxen in varying proportions. After careful inquiry, it is satisfactory to be able to state that we have the assurance of both of the British firms whose names were mentioned in our paper that they have never used other than fine ox-beef in the preparation of their extract, and they give ample reasons in addition to those adduced by Baron Liebig for this preference. Our own experiments have in the same way been conducted exclusively on the flesh of oxen, and that always of the finest quality. Any one who has made the subject a study, and has once examined with the microscope extract of veal,* will have little difficulty in ascertaining whether a suspected article has been made from animals of mature age.

In respect to adulterated samples of *Extractum carnis,* we can only repeat that we have never met with a specimen we had any reason to suspect. We do not doubt that the extract, like every other expensive article, is adulterated; but, in England at least, we are certain that the variation in quality depends far more upon the want of knowledge requisite for its proper preparation than from extraneous admixture. As to the formulæ in the German pharmacopœias, we should not have supposed that any maker would adhere strictly to their processes when working in a large scale, for in our hands they have yielded but a poor gelatinous product. If chloride of sodium had been added to a sample of extract in any large proportion, suspicion would commonly be excited by other circumstances, and the microscope would still be of service in its detection.

It is to be regretted that Baron Liebig has introduced the commercial element, hitherto avoided as far as possible in the scientific treatment of the subject. We have no word to say against the Fray Bentos extract; the public will judge for themselves of external characters, such as flavour, odour, and strength, without the assistance of scientific men; but our belief is that those are not the qualities for which the South American product will be preferred. The Fray Bentos company will find ample sale for all the extract they can make, but it will be on the ground of price rather than any advantageous comparison in other respects with that prepared by some of our home manufacturers. If it be true, as we believe it is, that the chief difference in the article prepared from wild or semi-wild cattle from that of domesticated oxen is not so much difference of quality as of quantity—that the former yield an appreciably smaller amount of extract,—the figures sent home by Mr. Seekamp are in excess of the proportion of extract we should have expected, judging from the experience of makers in this country. The climate, too, of Uruguay cannot be favourable to its manufacture; indeed, we have seldom seen a sample of their extract in which we have not thought we detected a trace of flavour attributable to it. *Extractum carnis*, originally the product of the chemist in his laboratory, has now become a public boon, the importance of which it is impossible to over-estimate, and the name of Baron Liebig will ever be associated with it, as with so many other of our domestic comforts, but that it would be little short of a public calamity if by any means the supply were made dependent on a single firm or company, the experience of the last eighteen months must have satisfied every thinking person.

Since this paper was written we have received from Antwerp, through the kindness of Baron Liebig, three samples of *Extractum carnis* for examination, with his notes on the chemical analysis of each. Should their investigation yield facts of sufficient interest, we may make them the subject of a future communication.

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* Although it is necessary that the flesh of mature animals alone should be used in the preparation of *Extractum carnis,* it is well to know that by proper treatment a very nice, and not too gelatinous extract may be made from veal. Variety is a desideratum in the dietary of invalids.

LIEBIG'S EXTRACT OF MEAT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The drift of Baron Liebig's letter in your last number will scarcely, we think, be intelligible to those of your readers who are not aware of what has been taking place in connexion with Extract of Meat; and we therefore deem it well to draw attention to some remarkable statements which that letter contains.

Baron Liebig tells us at the outset, that he has accepted the office of Director of the Scientific Department of Liebig's Extract of Meat Company Limited, and "on conditions calculated to offer to the public a complete guarantee of the genuineness and purity of the Extract manufactured by that Company." He further adds that he not only controls the manufacture in South America, but also its quality when sold in Europe.

This is highly plausible: it is something like saying—"If you wish to have Extract that is genuine, buy it of the Company of which I am a Director." But Baron Liebig goes a step further:

> "It is extremely difficult," says he, "as regards extracts of meat, the "genuineness and purity of which are not discoverable by the eye, to pro-"tect the public against fraud; all manufacturers prepare their extract "according to what they call 'Liebig's process'; but since I have given "only general and not special directions for manufacture, it so happens "that every one fills in the details after his own fashion, and the conse-"quence is that not one of these extracts is, in its composition, like another. "There exist only *two special directions* for the manufacture of extract of "meat, the one in the Bavarian Pharmacopœia, the other in the Pharma-"copœia Germanica, but these directions are not mine."

Thus Baron Liebig not only claims to control the manufacture and quality of the Extract to which he refers, but implies that there is some secret essential to the process, suppressed in his published directions, but now imparted to the agents of the Company with which he has connected himself, and the formation of which was registered 4 Dec. 1865. How far the spirit of this statement accords with what Baron Liebig published before the Company existed, we will leave others to judge from the following extracts:

> Since my experiments on meat in the year 1847 (*Annalen d. Chemie u. Pharmacie*, Bd. 62), I have constantly endeavoured to promote the manufacture of Extract of Meat after the method I have described, in countries where beef has a lower price than with us.
>
> *Since the introduction into the Bavarian Pharmacopœia of this Extract of Meat* (which must not be confounded with the so-called *Consommé* or *Bouillon tablets*), it has proved of great efficacy in cases of impaired power of assimilating food, etc.
>
> * * * * * * * *
>
> The introduction into Europe of Extract of Meat at half or one-third the present price, from countries where meat has almost no value, would be regarded as a real blessing to the population of Europe. I had directed attention very earnestly to the manufacture of Extract of Meat in Podolia, Buenos Ayres and Australia, and was always ready to make known the method of preparation to persons who showed themselves disposed to become acquainted with it, and to assist them with my advice.*

These sentiments are worthy of a scientific man occupying the eminent posi-

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* Translated from the *Annalen der Chemie und Pharmacie*, Bd. 133 (1865), p. 127.

tion of Baron Liebig, and such as were to be expected of one so placed: and we have reason to believe that prior to the formation of the Company with which he has become associated, Baron Liebig acted in entire accordance with them, for we find that under date 6 Oct. 1865, he thus wrote to Mr. Tooth of Sydney who had shortly before had personal communication with him in Germany, and who was at that time engaged on some experiments on extract of meat in London:

> "* * * * Allow me to tell you that you need not trouble yourself "with finding out a new method, or a simpler one, for the preparation of "the Extract of Meat; all this has been done a hundred times. There is "only one method for manufacturing,—and this is to mix the chopped flesh "with its volume of soft water (without gypsum), and to raise the tempe-"rature of that mixture to 180° F. To extract the essence with cold "water is not applicable for manufacturing.
>
> "The South American Extract does not contain gelatine (or glue); it "is precipitated by tannic acid, but this precipitate is not due to gelatine."

With regard to the special directions for *Extractum Carnis* contained in the Bavarian Pharmacopœia (1856), which Baron Liebig says *are not his*, it is difficult to imagine that the words we have put in Italics in the second paragraph of the foregoing translation, were written with a consciousness that the directions in question were so far defective or different as not to yield "this extract," of which he is there writing. But be that as it may, it must at least be presumed that they had the sanction of his coadjutor Dr. Pettenkofer, who was a member of the committee responsible for the processes prescribed in that work.

Whatever Baron Liebig may mean by "*special directions*," it is plain that *all needful directions* have long ago been fully made public. *Special directions* will be modified by special circumstances, such (among others) as the quantity of material to be operated upon, the nature of the apparatus employed, the climate of the country where the process is carried on, and other matters not involving any general principle;—and all extract of meat, fairly and intelligently manufactured according to Liebig's published process is *cæteris paribus* identical, and may therefore, in our opinion, be properly designated *Liebig's Extract of Meat.*

Baron Liebig's present attempt to sell an exclusive right to the use of a discovery which he had long before given to the public, appears to be exactly parallel to a certain transaction *twenty years ago*, which called forth from the Editor of the Pharmaceutical Journal the following remark:

> "Baron Liebig had an undoubted right to give the benefit of his dis-"covery to whom he pleased: but having given it to the public, he could "not make it private property afterwards."—*Pharm. Journ.*, *Oct.* 1846, page 163.

We are, Sir,
Your obedient servants,
ALLEN AND HANBURYS.

Plough Court, Lombard Street, 9 *Nov.* 1866.

EARLY CLOSING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—I am glad to be able to tell you that the movement commenced in Belgravia South, has been in Belgravia proper a decided success. In conjunction with Mr. Gulliver I canvassed the lower half, with Mr. Bourdas the upper half, and with Mr. Radermacher the Chelsea and Brompton borders of Belgravia, with the following satisfactory result:—A resolution to close their shops at nine o'clock every evening except Saturday (Saturday at ten o'clock), and make no display whatsoever of business on Sunday, has been unconditionally agreed to by the following firms:—

Mr. Anderson, Lower Belgrave Street.
Mr. Bicknell, 38, Ebury Street.
Messrs. Bradley and Bourdas, 7, Pont Street, Belgrave Square.
Mr. Chard, 13, Eccleston Street South.
Messrs. Decastro and Watson, St. George's Place.
Mr. Doughty, 4, William Street.
Mr. Goddard, 37, Chapel Street.
Messrs. Godfrey and Cooke, 26, St. George's Place.
Mr. Gulliver, 33, Lower Belgrave Street.
Mr. Hucklebridge, 103, Upper Ebury Street.
Mr. Leake, 12, Motcomb Street, Belgrave Square.
Messrs. Savory and Moore, Chapel Street.
Mr. Ward, 1, Lower Grosvenor Place.
Messrs. Williams and Elvey, 8, Halkin Street West.]

And in Chelsea and Knightsbridge by:—

Mr. Quiller, 145, Sloane Street.
Mr. Radermacher, 173, Sloane Street.
Mr. Barnes, Knightsbridge.

Mr. Quiller has since gained all the chemists in the King's Road, etc., and Mr. Radermacher several in the Brompton Road, conditional on others joining. At the request of several, I send you these particulars,

And am, dear Sir, faithfully yours,
S. M. Hucklebridge.

P.S.—I should state that some of the firms above mentioned close at nine o'clock throughout the week.

EARLY CLOSING.

The following circulars on this subject have been issued by the chemists of Worcester:—

"Sir,—We beg to enclose a copy of the resolution entered into by us for the earlier closing of our respective places of business.

"May we solicit your kind assistance in the matter on all occasions where your opinion may be useful to us with your private patients or others?

"Although we shall close at 8 P.M., some one will always be in attendance, should medicine or any other requisite be needed after that hour.

"We beg to remain, Sir, your obedient servants,
"The Chemists of Worcester."

A copy sent to each medical man.

"*Worcester, October* 28, 1866.

"We, the undersigned chemists of the city of Worcester, beg to inform the public that on and after the 1st Novmeber, we purpose closing our establishments at eight o'clock every night throughout the year, Saturday excepted.

"In taking this step we shall feel obliged if our friends will at all times forward their prescriptions or orders at as early an hour in the day as possible, so as to assist us in this endeavour to shorten the hours of our close application. In cases of *emergency*, some one will always be in attendance to supply whatever may be required.

"Whitfield & Son,
Thomas Witherington,
J. C. Courtis for F. Tyler,
Anderson & Virgo,
Fredk. J. Gough,
George & Welch,
(late Lea & Perrins,)
J. Twinberrow & Co.,
E. C. Kitson,
Ed. Watton,
E. C. Darby,
S. Moore,
William Woods,
W. T. Horniblow,
E. Amphlett,
Ed. Skyrme,
J. Morris,
C. Masters,
G. Acton."

The following circular has been issued by Mr. Hobson of Beverley :—

EARLY CLOSING.—C. Hobson, Pharmaceutical Chemist, begs to advise his numerous friends and the public generally, that in order to give his assistants increased opportunities for study and recreation, and thereby, he hopes, enable them more efficiently to perform their duties during business hours, he intends, on and after the 19th inst., until the 1st April next ensuing, to close his shop at eight o'clock P.M., instead of nine as heretofore, and trusts to have the assistance of his patrons to aid him in carrying out this arrangement.

Urgent requirements will after that hour be supplied on application at the house door.

Market Place, Beverley, Nov. 15th, 1866.

THE POSITION AND PROSPECTS OF ASSISTANTS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Permit me to thank you for the calm and dispassionate tone of the remarks which, under the heading of "Early Closing," appear in the Journal for November, and which form a worthy supplement to, and practical application of Mr. Ince's "*Pharmaceutical Ethics.*"

I am persuaded that it is only by a full and free discussion of the somewhat vexed questions of the relations between employers and assistants that a satisfactory result can be anticipated; but it is necessary that while the assistants approach the discussion of the subject with becoming deference, the employers should show a willingness to listen to the opinions, and further the interests, of their *employés*.

As you pertinently remark, "Chemists' assistants hold a better position in the families of their employers than do the assistants, *or shopmen*, as they are called, in other trades." It is nevertheless an undeniable fact, that "shopmen" in every other trade, who require perchance no *special* education, can command a better salary by far than their more select compeers in the drug trade. A case occurred the other day (for which I can vouch), in which a young man applied for a situation as junior assistant at an establishment in one of the fashionable *faubourgs* at the West End: the liberal-minded employer prefaced his remarks by supposing the applicant to be about twenty-four years of age, and proceeded to offer the tempting salary of £20 per annum!—which, I am happy to be able to say, was *declined with thanks.*

Now I hold, that if apprentices be well instructed in the "arts and mysteries," they ought to be able, at the expiration of their term of apprenticeship, to go up and pass the Minor Examination of the Society; but if such an instance as the foregoing can be cited of West End salaries, well may youths who know the real state of affairs pause before entering "the profession" of a chemist and druggist; and well may young men, who are now filling situations as assistants, exclaim, with much truth, when urged to qualify,—*Le jeu ne vaut pas la chandelle.*

For be it remembered that there are in the drug trade very many assistants who have not the remotest chance of getting into business, and who should be receiving a sufficient salary to enable them to lay by for old age. In every other trade (notably drapery), if a young man endowed with but average abilities get into a large establishment, he can always by diligence in a few years secure an income far beyond that with which many a druggist in business would be but too contented; it cannot be because the responsibility in dispensing medicine is less than in measuring tape.

What is the remedy?

It lies with assistants themselves; as I have supposed apprentices to be capable of passing the Minor Examination when they have completed their term of apprenticeship, I would advise all such to follow up steadily by diligent study the advantage they enjoy, and pass the Major Examination as early as may be, which might generally be accomplished in from twelve to eighteen months at most, especially if the candidate could afford to take a month or so at the Square, or elsewhere, for continuous study. I am not suggesting this course to those who can afford the time and money for a nine months' course at the Society's Laboratory, but to those who, like myself, have their spurs to win without any help from Dame Fortune.

Let all who are duly qualified see to it, that they do not "*sell their labour for a salary*," unless it be a respectable salary. The habits of application and continuous study, and, let us hope, the knowledge of chemistry and botany they may have gained, will fit them for something better than druggists' assistants, if they have but pluck and determination.

Those who have not passed the Examinations I would urge to do so by all means, feeling sure that it rests with each one to add his quota of influence to help onward and upward the great body of men whose interests you have at heart; but let employers not forget the extra outlay consequent on an assistant having qualified, and let them pay accordingly.

Thus, having no assistants (but juniors) who had not passed the Examinations, by a natural process we should soon have none but *Pharmaceutical* chemists.

The question you have touched on, "What use will be made of their time?" (when they get it), I think hardly worth discussion. If there be the slightest probability of chemists' assistants spending *all* their spare time in "*music and dancing*," I can but attribute it to the little hope they have of ameliorating their, at present, hard lot; not that it should be wondered at if an assistant, released at nine o'clock at night, should seek some innocent recreation and relaxation.

In conclusion, I would ask, Why cannot evening lectures be given at Bloomsbury Square on Chemistry and Pharmacy, and Botany and Materia Medica, for the benefit of those for whom 8.30 A.M. is simply an impossible hour to attend.

I am, Sir, yours,
A MAJOR ASSOCIATE.

ACCIDENTAL POISONING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—No one can feel more deeply than myself that intelligent care is the best safeguard against accident, in the sale or dispensing of medicines; but none can deny that in all probability many accidents would have been prevented by a more judicious arrangement of the shop. I have by degrees picked up many practical hints on this subject from the 'Pharmaceutical Journal,' and beg to tender my thanks to the authors. I am by no means satisfied yet with what I have done, but with a sincere desire to assist others by my experience, I offer an outline of the leading features of my plan as it stands at present. What is approved and practicable may be adopted; let the rest be forgotten.

I have a front and back shop, and am therefore able to keep nearly all tinctures, etc., in the latter, where I have two counters, each against an opposite wall, with an open space between; above each counter are shelves for bottles, pots, etc. Those above the dispensing counter contain all the more common preparations required in the work of dispensing. Over the whole length of the dispensing counter is a skylight, and gas for nightwork. At one end of it, *in the best light*, is a POISON CUPBOARD, with lock and key. In it I keep *a small supply* of each of the potent alkaloids, acids, etc. etc. etc. The *more dangerous of these* are each, not only in a purple bottle, but the bottle in *a cylindrical cardboard case*, made to hold a ℥ij phial, *both bottle and case fully labelled.* This gives a distinctive character to the more deadly poisons, without in any way hindering the work. In addition to this, every bottle in the back shop that can be considered dangerous has a bold plain paper label "Poison" on it. As there is a partial screen between the front and back shop, this cannot be seen by customers. All *stores* of poison are kept in a distinct cupboard, under my own sole care.

A sense of gratitude for preservation from accident constrains me to send my quota of experience for the benefit of all whom it may concern.

Yours faithfully,
JOHN C. POOLEY.

Bath, Nov. 15th, 1866.

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

Than-mo, a Vermifuge Remedy of the Burmese.

Under the name of *Polyporus anthelminticus*, M. J. B. has recently described, in the 'Gardeners' Chronicle,' a species of Fungus which is reputed to possess valuable anthelmintic properties. It is indigenous in the neighbourhood of Tavey, in the Tenasserim Provinces of the Burman Empire, where it is known under the names of Wa-mo (Bamboo Mushroom), or Than-mo (Worm Mushroom). Its supply is very limited, and can only be obtained in small quantities at a high price. It was first brought into notice in 1840, by Dr. Packman,* and in that journal are the details of four cases, three by Dr. Richmond and one by Dr. Shaw, which prove that its character as an anthelmintic, in cases of lumbrici, is worthy of further attention. It produces no sensible effect on the system, but if followed on the third morning by a purgative, the entozoa are expelled in a lifeless state, proving that the remedy has exercised a specific influence on them. Being without taste or smell, children take it readily. In case of the first dose not producing the desired effect, it may be repeated at intervals of two or three days, and the quantity may be increased to three or even four drachms; no injurious effect appears to be produced, however large the dose (Packman). It seems well worthy of further trial, though it is to be feared that it never could be obtained in sufficient quantity ever to come into general use.

This hitherto undetermined species of Polyporus is very closely allied to *Polyporus rufescens*, a British species, which, upon trial, will probably be found to possess similar properties; indeed, the *Polyporus officinalis*, another British species, has long had a reputation as a vermifuge, and may be occasionally found at the present day in some of our herb-shops.

Economic Value of the Common Brake.

In the 'Gardeners' Chronicle' Mr. John R. Jackson has directed attention to the economic value of the common Brake or Bracken (*Pteris aquilina*), the commonest and best-known of the British ferns. According to him, the Brake,

* "Remarks on the Use of a Vermifuge Remedy of the Burmese, called Than-mo or Wah-mo," 'Madras Quarterly Medical Journal,' vol. v. p. 146.

though not used at the present day to the extent to which it was formerly, is nevertheless much valued in many parts of the country for manuring land. At one time it was much in request as fodder for cattle, but it is rarely, if ever, now employed for that purpose; as a litter for horses, however, the fronds are still much used in neighbourhoods where they abound, and in some districts, in Monmouthshire for instance, the cottagers collect them during the summer months and burn them, preserving the ash, which is moistened sufficiently to enable it to be made into balls about the size of a cricket ball. These are afterwards dried, and are then ready for use for washing all kinds of clothing. The use of this ash as a substitute for soap is attributable to the large amount of potash which it contains; indeed, it was used at one time for glass-making. In some parts of Scotland, the fronds of the Brake may still be seen as a thatch upon the roofs of cottages. Besides these uses, the creeping underground rhizome is said to contain much starch and mucilage, and to be highly nutritious. The author of the 'Useful Plants of Great Britain,' after bearing testimony to the nutritive properties of these rhizomes, gives the following formula for preparing them for use:—They should be first roasted over a fire until the outer skin is charred, and then the fibres should be separated by beating; the starchy substance that remains tastes much like oat-cake, but with a slight astringency that is not unpleasant. Few substances will keep off hunger during violent exertion better than the underground stem or rhizome of the Brake thus prepared,—a fact worth remembering by the rambler in uninhabited districts.

Application of Turnips in Dyeing.

We extract the following from the 'Intellectual Observer:'—The process of dyeing with indigo, though extremely simple in theory, is attended with difficulties in practice that demand the skill of an adroit and experienced workman. M. Leuchs, of Nuremberg, has so simplified the operation that it may now be performed with ease and certainty. He avails himself of the property possessed by *pectine* of changing insoluble blue into soluble white indigo. Fortunately, pectine is very plentiful, being found in large quantities in Pumpkins, Melons, etc., but most abundantly of all in Turnips. Nor is it required, for the purpose of dyeing, to separate it from the Turnips; it is only necessary to cut them up in small pieces, after which they are ready for use. Their efficiency, in this state, may be shown by a very simple and striking experiment. A small quantity of indigo, and a few drops of a solution of a caustic alkali, and then a little bit of Turnip, are to be placed in a tube closed at one end; after which heat is to be applied. The indigo becomes, in a very short time, colourless and soluble. On the large scale, 100 parts by weight of caustic ley, at a temperature of 75° Cent. (167° Fahr.), one part indigo, and five parts of Turnips chopped very small, are used; the Turnips being put within an iron cage, which is suspended in the liquor. When all the ingredients have been added, the temperature is raised to the boiling-point; and as soon as the indigo has become colourless, the solution is decanted off, and requires no further preparation for use in dyeing. About five per cent. of the Turnips are left as a residue, which answers well in paper-making. At places where, or during seasons when Turnips cannot be had, an essence extracted from them with water, under a pressure of two or three atmospheres, answers equally well; about four parts by weight of it being used for one part indigo. The employment either of the Turnips or their extract prevents that waste of indigo which is almost inseparable from the ordinary process.

Physiological Effects of Narceine.

The 'American Journal of Pharmacy' gives the following *résumé* from the 'Gazette des Hôpitaux,' of the observations of M. Liné, after a series of experiments with narceine in the wards of M. Delpech:—

1st. Of all the alkaloids contained in opium, narceine possesses hypnotic power to the greatest extent. In the great majority of cases neither morphia nor codeia produced so long or so profound a sleep.

2nd. Narceine causes, only in a very feeble degree, the physiological phenomena consequent upon the sleep produced by morphia and the salts of that base. Besides, the perspiration is much less abundant than after the use of opiates. Vomiting is rare; nausea and loss of appetite more common. Narceine, in its action upon the intestines, differs sensibly from morphia; instead of causing obstinate constipation, its effect, in small doses, is that of a gentle aperient; in larger doses it causes diarrhœa.

3rd. Narceine relieves pain, like all opiates.

Among the different effects produced upon the secreting organs, that upon the kidneys is nearly constant. Anurea, to a greater or less extent, is noticed, particularly after rather large doses. Perhaps this peculiar action of narceine might be turned to account in the treatment of incontinence of urine in children.

On the Febrifuge Properties of the Leaves of Cinchona.

The following Report, recently presented to the Madras Government by Dr. Chipperfield, Acting Physician of the General Hospital, "On the febrifuge properties of the leaves of Cinchona," is abstracted from the 'Madras Quarterly Journal of Medical Science:'—

"1. On the 29th of November, 1865," says Dr. Chipperfield, "I received two wax-cloth parcels, containing, the one 8 lbs. of the leaves of *Cinchona succirubra*, and the other 8 lbs. of the leaves of *Cinchona Condaminea*, with instructions to make trial of various preparations of these leaves in cases of fever. The leaves were not in such a fresh state as I expected to find them, but were so nearly dry as to be capable of being rubbed into a coarse powder.

"2. I wrote out the following formulæ, and gave them to the Superintendents of the Dispensing Department, for their guidance:—

I. Cold Infusion of Cinchona leaves.
Take of Leaves of Cinchona, 1½ oz.
Diluted Sulphuric acid, ¼ oz.
Cold water, 20 oz.
Infuse for twelve hours and strain.

II. Acid Decoction of Cinchona leaves.
Take of Cinchona Leaves 1½ oz.
Diluted Sulphuric acid, ¼ oz.
Cold water, 20 oz.
Boil for ten minutes and strain.

III. Stronger Decoction of Cinchona leaves.
Take of Cinchona leaves, 1 oz.
Cold water, 6 oz.
Boil for ten minutes and strain.

"3. There was some waste in consequence of decomposition occurring in the infusion, which was necessarily kept ready prepared in case of its being required; but by management this waste was reduced to the lowest possible amount.

"4. The appended table shows the result of the trial. Preparation No. I. was prepared entirely from the *Cinchona succirubra*, and was administered in doses of 3 or 4 ounces, three times daily, in cases Nos. 1 to 12 in the table.

"5. Preparation No. II. was prepared partly from the *Cinchona succirubra*, and partly from the *Cinchona Condaminea*, and was administered in doses of 4 ounces, thrice daily, in cases 13 to 20.

"6. Preparation No. III. was prepared entirely from the *Cinchona Condaminea*, and was administered in doses of 6 ounces, twice daily, in cases 21 to 26.

"7. I observed no difference, as regards febrifuge property, in the leaves of the two species of cinchona submitted to trial; but, although the table does not show this, it appeared to me that preparation No. III. was the most effectual.

"8. Preparations Nos. I. and II. were used as a tonic, with the best results, in doses varying from 2 to 4 ounces, thrice daily, by nineteen patients, some of whom had previously suffered from fever and remained in a debilitated condition.

TABLE OF FEVER CASES TREATED BY PREPARATIONS OF CINCHONA LEAVES.

No. of case.	Type of Fever.	No. of days taking the remedy.	No. of doses taken.	No. of days fever was Present.	No. of days fever was Absent.	Remarks.
1	Tertian ...	6	18	1	5	Cured, but had taken large doses of quinine for five days previous to commencing the remedy.
2	Remittent	8	24	8	0	Fever uninfluenced by the remedy.
3	"	9	27	0	9	This was a relapse. Took quinine for three days before commencing the remedy.
4	Quotidian	5	15	1	4	A mild case. Cured.
5	"	5	15	1	4	Do. Do.
6	"	6	18	3	3	Cured.
7	"	2	6	0	2	Do. A mild case.
8	"	4	12	4	0	Remedy without effect.
9	Tertian ...	6	18	3	3	Do., cured by quinine.
10	Quotidian	1	2	1	0	Remedy nauseated patient. Do.
11	"	6	18	2	4	Cured.
12	"	5	15	2	3	Quinine resorted to.
13	Febricula.	5	15	1	4	A simple case. Cured.
14	"	3	9	0	3	Do. Do.
15	"	3	9	0	3	Do. Do.
16	Quotidian	6	18	2	4	Cured.
17	"	5	15	0	5	Do. A mild case.
18	"	5	15	5	0	No effect. An obstinate case in a Bombay Marine. Transferred to Bombay.
19	"	3	8	3	0	Cured by arsenic.
20	"	13	33	2	11	On each day, when fever occurred, took 15 grains of quinine.
21	Common continued	7	21	0	7	Cured.
22	Remittent	10	20	8	2	A very obstinate case, still under treatment.
23	Febricula.	1	2	0	1	A very mild case. Cured.
24	Quotidian	3	6	1	2	Do. Do.
25	"	5	8	4	1	Quinine resorted to.
26	"	4	8	2	2	A mild case. Cured.

"9. I think that cases Nos. 4, 5, 7, 13, 14, 15, 17, 21, and 23, may fairly be removed from the table, as they were cases either of simple febricula, or of such mild intermittents as might readily have been cured without resorting to any preparation of cinchona.

"10. *So far as my experience enables me to judge, I am led to the conclusion, that in simple cases of mild intermittents the remedy may be trusted to, but that in severe cases of malarious fever it is not one on which any great reliance can be placed, and that it is in no way comparable to the extracted alkaloid salt, disulphate of quinine, as a genuine trustworthy antiperiodic.*

"11. I observe that in Mr. Howard's report on the cinchona leaves from Ootacamund ('Madras Quarterly Medical Journal,' vol. vii. p. 425), it is stated that the quantity of quinine contained in the leaves is very small, viz. 0·11 per cent. of alkaloid, soluble partly in alcohol and partly in ether, and 0·19 per cent. contaminated with an astringent extractive matter. Granting that 0·30 per cent. of this impure quinine is obtainable from the leaves, and that all of this is taken up by the water of the infusions and decoctions I had made, one pint of preparation Nos. I. and II., would contain not quite $2\frac{1}{4}$ grains of quinine, and each dose of 4 ounces would contain less than $\frac{1}{2}$ a grain, and the dose, 6 ounces, of preparation No. III. would contain about $1\frac{1}{3}$ grain. But it cannot be supposed that anything like the whole quantity of the quinine is taken up by the water. However, as Mr. Howard points out, the kinovic acid, which is abundant, may assist the action.

"12. *It appears to me that a much more extended trial of the leaves is required before any correct conclusion can be arrived at as to their value as an antiperiodic, but that the bitter infusion acts well in giving tone in cases of atonic dyspepsia and of debility, especially after fever; and I consider that the Infusum Cinchonæ Foliorum would be a useful addition to our list of bitter vegetable infusions.*

"13. Should the principal Inspector-General be of opinion that further experiment is desirable, I shall be happy to carry out his views on being furnished with another supply of the fresh leaves."

Further experiments have been ordered to be tried with freshly gathered as well as with dried leaves.

CHEMICAL INVESTIGATION OF THE CINCHONAS CULTIVATED IN INDIA.

The Secretary of State for India has appointed Mr. J. Broughton, late Senior Chemical Assistant, Royal Institution, to the post of chemist to the Government Cinchona Plantations of the Madras Presidency. Mr. Broughton proceeds to the Neilgherries to determine, by chemical investigations made on the spot, the conditions of growth which produce the largest yield of alkaloids in the bark, and also to decide upon the best means of extending the general use of this important febrifuge among the native inhabitants. The great success of the Neilgherry plantations, under the superintendence of Mr. M'Ivor, has already been reported in this Journal.

MISCELLANEA.

Poisoning by Impure Water.—On Wednesday, September 19, Mr. J. Humphreys, Coroner, resumed an inquiry at Poplar, relative to the death, through alleged impurity of water, of John Davis, aged twenty. The deceased, a sailor, went on shore and got a bucket of water from a pump. Some of the water was boiled for the breakfast of himself and the captain of the barge. He also drank some of the unboiled water from the bucket, and shortly afterwards was taken with violent cramps. He was taken to a doctor, and was treated, but died the next day after great suffering. Some of the water was analysed by Dr. Letheby, who in his report states:—"The water contained 61·5 grains of saline matter per imperial gallon, besides 2·8 grains of organic matter, and much ammonia. The saline matter, as well as the organic, are chiefly derived from surface drainage, and the presence of ammonia indicates percolation from a sewer or cesspool. The water is quite unfit for drinking purposes, and, from the nature of the pollution, is very likely to have occasioned choleraic disease, especially if drunk without previous boiling." Mr. M. Brownfield said that deceased died of cholera, without doubt, arising from impurity of the water. The coroner having summed up, the jury returned a verdict, "That the deceased died from Choleraic Disease, occasioned by drinking polluted water drawn from a certain pump," and they recommended that the attention of the proper authorities should be drawn to the nature of leaving such a source of disease accessible to the public.

Supposed Poisoning by Shell-fish.—The 'Glasgow Evening Citizen' says that three persons had died suddenly, death having been caused, as is supposed, from eating shell-fish. It appears that Mr. Forbes, on his return from Manchester, had brought with him some Norwegian crab shell-fish, and invited some friends to supper, when they all partook of the fish, and on the following morning were seized with choleraic symptoms. Mr. Bain, one of the party, was taken to the hospital, when everything that skill could suggest was done; he died in the evening. Mrs. Darling and Mrs. Merry had the prompt assistance of several medical men, but the former died the same evening, and the latter on the following morning. The other members of the party, having been slightly affected, recovered. The symptoms were those of cholera, but were supposed to be due to something poisonous in the shell-fish. Dr. Moon, who attended Mrs. Darling and Mrs. Merry, is of opinion that those ladies died of cholera, and Mr. Bain's case is reported as one of choleraic diarrhœa, but Dr. Gairdiner, who was called in, would not take upon himself to say whether the deaths were traceable to cholera, or to the eating of the crabs.

Accidental Poisoning.—The 'Manchester Courier' records the following case:—An inquest has been held at Manchester on William Hart, a chemical labourer, aged seventy. Peter Hart said his father was manager at Tennant and Co.'s chemical works. Witness was a chemist there, and was carrying on experiments in the laboratory, when the deceased came in and sat down. The deceased's practice was to make some tea, which he put into a "beaker" vessel or anything else that was at hand. All at once the deceased started up, made a confused noise, and ran towards witness, calling out 'Water, water." Witness gave him some water, with which the deceased rinsed his mouth, and witness then saw that his father had drunk out of a beaker which contained a strong solution of caustic soda. Witness took deceased home in a cab, where, although medical aid was promptly brought into requisition, he died of brain fever that morning. The beaker out of which the deceased had drunk stood on a table near where witness was evaporating a solution in another vessel. Deceased had worked at the place for twenty years, and perfectly understood his business, and the table at which witness was standing was separated from that on which the beaker was placed out of which the deceased had drunk. The jury returned a verdict of "Accidental poisoning."

New Form of Medicated Pessaries.—At a meeting of the Dublin Obstetrical Society, Dr. Kidd exhibited a new form of medicated pessary, made by Mr. Pakenham, whose object appears to have been to meet the following conditions:—1st. That it can be introduced by the patient herself. 2nd. That it will bring the medicinal agent into contact with the mucous membrane of the vagina and uterus, and retain it there sufficiently long to allow of absorption, or of such local action as may be required. 3rd. That it will not be offensive to the patient, soil her clothes, or prevent the medicine having due effect, by allowing it to escape from the vagina. In manufacturing this pessary, Mr. Pakenham rolls a small portion of cotton, to which a thread has been attached, on the end of a glass rod, giving it the form and size of the ordinary conical medicated pessary. He now dips it rapidly into melted cocoa-nut butter, so as to give it a uniform thin coat, to preserve its shape, and give it firmness. As soon as the cocoa-nut butter is cool, the glass rod is withdrawn, and the pessary now resembles an empty cartridge case, which may be charged for use by introducing into it the medicinal agent to be employed, and which may be used either in the state of dry powder, or mixed with glycerine or water. The end of the charged cartridge is now plugged with cotton and cocoa-nut butter, and it is ready for use.—*Dublin Quarterly Journal of Medical Science.*

BOOKS RECEIVED.

Malaria, the Common Cause of Cholera, Intermittent Fever, and its Allies. By A. T. Maccowan, L.R.C.P. Lond. London: John Churchill and Sons.

Little Experiments for Little Chemists. By William Henry Walenn, F.C.S., etc. London: T. J. Allman, 463, Oxford Street. 1866.

Archives of Dentistry. Vol. I. Edited by Edward Truman, Dentist in Ordinary to Her Majesty's Household. London: John Churchill and Sons, New Burlington Street. 1866.

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.

A Correspondent (New Brighton) suggests that as "other branches of business have been instrumental in providing lifeboats, we should not be behind in doing our share towards saving men's lives," and recommends that a fund be formed for that purpose.

Chemists' Charges.—J. H. gives the following specimen, and suggests as a remedy that there should be "a fixed minimum charge for different size mixtures, drops, etc.:"—"A lady came to our place of business with the following prescription. ℞ Benzol. ʒij; ol. menth. pip. ʒss; ol. olivæ ʒx. M. Cap. gtt xl bis die. Having prepared it, we charged sixpence for the same. 'Why,' she exclaimed, 'Mr. —— always makes it up for threepence halfpenny.'"

C. B. H. (Harwich).—In dispensing the prescription referred to, the soap may be dissolved in the alcohol, by the application of gentle heat, and when cold the tar should be added, but whether prepared with or without heat, the resulting mixture would be *fluid.*

"*Pill Box*" (Liverpool).—No: see page 51 of the present volume.

E. E. (Portsmouth).—We recommend our correspondent to read attentively the remarks at page 265 of our last number; it would be difficult to define the articles, the sale of which constitutes the legitimate business of a chemist and druggist.

C. and Y. (Bath.)—(1) Mr. W. Ladd, Beak Street, Regent Street; (2) Carpenter's 'Manual of Physiology,' 12*s.* 6*d.*; Shea's 'Manual of Animal Physiology,' 5*s.* 6*d.*; Dana's 'Manual of Minerology,' 7*s.* 6*d.*

"*Inquirer*" (Tamworth).—(1) The objection referred to arises from the acid of the confection of roses in the Blue Pill. (2) The yeast was ordered with the idea that fresh lemon-juice, which contains saccharine matter, would be used in the process for making citric acid, but, as the juice used by manufacturers is free from sugar, the precaution is unnecessary.

W. L. (Bristol).—The examinations are conducted according to the nomenclature adopted in the Pharmacopœia, but a knowledge of both systems of nomenclature is desirable.

"*Servitor.*"—We cannot publish anonymous communications of a personal nature.

"*A Student.*"—A knowledge of both is expected.

"*An Assistant*" (Stourbridge).—The addition of more acid than is necessary to neutralize the alkali is quite a matter of taste; it would probably produce a more agreeable draught.

"*A Manchester Assistant,*" writing on "Early Closing," complains that the interest in the subject appears to have subsided in many districts, and thinks that the desired object might be attained by the formation of an association.

Y. J. (Newport).—No.

"*Forceps*" (Barking).—Yes; but they cannot recover the amount of any charge for the same.

Mr. Buott's letter was received too late for insertion this month.

Mr. Thornton (Wedmore), and *Mr. W. Botham* (Sheffield), are thanked for their communications.

Wanted, the January number of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. VII.—JANUARY, 1867.

EIGHTEEN HUNDRED AND SIXTY-SEVEN.

If Zadkiel were a contributor to the 'Pharmaceutical Journal,' we should doubtless have a very lucid forecast of the events of 1867 to lay before our readers. We should be told, perhaps, that about August great excitement might arise in the pharmaceutical world, and far north in Great Britain a coruscation of pharma-chemico genius be expected, which would draw many votaries of science to the beautiful banks of the Tay; that probably the spring of the new year would be a favourable season for turning the fallow, and putting in seed to germinate and fructify for our winter store; and, it may be, he would point mysteriously also to the month of February as a time for great activity in the body politic of the House of Pharmacy.

But Zadkiel is not on our editorial staff, so we must endeavour to read the future for ourselves, and, possessing no spirit of divination, to do it only by the light of the past and present. Looking, then, to the year which has just departed, we find there has been a lull in the action of our Society in the work which they promoted so earnestly in the preceding year. We do not mean to imply that the Council has fallen off from its duty, or failed to promote the great object commenced by our founders; but for certain reasons, which were set forth some months ago in this Journal, 1866 was deemed an unfavourable season for intruding pharmaceutical legislation on a pre-occupied House of Commons. The subject, though left in abeyance, was not lost sight of, and, to keep it in remembrance, a paper of suggestions was deposited with the Home Secretary, which to this day we believe occupies a pigeon-hole in the office of his successor. The present seems to us a fitting time to exhume that paper. Many circumstances incline us to that opinion. First, as regards the Pharmaceutical Society. At no period of its existence has it exhibited greater union and vitality, or more certain proof of material prosperity; candidates for examination are more numerous than ever, and the mere fact of the increase in the number of those who passed the "Minor" and "Classical" Examinations in 1866 is sufficient evidence in itself that, voluntary though it be, the necessity for qualification is becoming a fixed principle in the minds of the rising generation,—the men from whom this Society will hereafter be reinforced. As a voluntary institution, with nothing but its titles protected by law, the Society might continue to work steadily, as it has done for the last quarter of a century, attracting to itself the rising talent of the pharmaceutical community, gaining the confidence of the medical profession, and through them, as well as by other means, the trust and approbation of the public; but it has a more extended field of operation bequeathed to it by those enlightened individuals who commenced its work. They associated themselves together (so says the Charter) "for the purpose of advancing chemistry and pharmacy, and promoting an *uniform* system of education of those who should practise the same; and also for the protection of those who carry on the business of chemists and druggists;" and whereas, according to the opening words of the Pharmacy Act, "it is expedient for the safety of the public, that persons exercising the business or calling of Pharmaceutical Chemists in Great Britain, should possess a competent practical knowledge of pharmaceutical and general chemistry and other branches of useful knowledge," the members of the Society have always interpreted these expressions to apply to the whole body of dispensing chemists, and endeavoured, as far as in them lay, by liberal concessions, to be granted in the event of the examinations being made compulsory, to bring all pre-existing dispensers into one body, assured that a present sacrifice would produce ultimate success alike to pharmacy, pharmaceutists, and the public. That this is no sudden outburst of liberality we will presently show; but we first proceed to consider the other party to the transaction, as a further corroboration of our opinion that the present is a fitting time for action. By "the other party" we mean here those who by common consent have for some time been called the "outsiders."

In speaking of those gentlemen who have not hitherto deemed it wise or desirable to assist in our work, we have in this Journal always studiously avoided anything which might savour of personality or recrimination; and if, in our remarks now on a change of feeling which seems to have come over a section of them, we have to allude to things which are past, we beg that such allusion may be regarded as a necessity, and not a matter of choice. It must be almost superfluous to say, that when two parties have to come to an understanding, there can be no greater hindrance to success in arriving at it than a feeling of distrust or antagonism between them. Now such a feeling has undoubtedly influenced some of the parties to the present question. It has been stated openly, therefore it would be folly to ignore the fact, that the Pharmaceutical Society was a clique, only seeking its own aggrandisement, and desirous of subjecting the whole trade to its authority. That the Society has accomplished its own success—aggrandisement, if you will—we are proud to admit, or, using a stronger term, to *assert;* but the first and third charges we utterly deny. Beyond the subjects for examination, and those are according to the general instruction of an Act of Parliament, the Society exercises no more control over the conduct of its own trade than it does over the trade of a horse-dealer. For exclusiveness, be it remembered that the Council, on the first passing of the Act, opened its door so wide as to give ground for long and expensive litigation, and since that time has had no power, even if it had the will, to admit members on any other terms than the right of qualification according to the Act.

Now at this time it happens that some of those who have been loudest in declaiming against the Pharmacy Act, have come forward to propose its extension; and those who two years ago would have persuaded Government to institute a second Society, now desire that all chemists and druggists should be united in one body. And what hinders? We will not go into the question of what has hindered. If all are of one mind,—and looking at the proposals of the Pharmaceutical Society, made twelve months ago, on the one hand, and the resolutions of the chemists and druggists at Manchester, as published in the 'Chemist and Druggist' of December 15th, on the other,—we are really puzzled to find a fair answer to the question.

It is true indeed, as our contemporary states in his able remarks on "The Manchester Meeting," "that the Executive Committee of the United Society cannot be acknowledged as the representatives of all the unincorporated druggists of the country,—it would be as reasonable to suppose the Marylebone Vestry represented the parishioners of St. George, Hanover Square,—and whether that meeting was one of the united Society, or of chemists and druggists generally, we are not informed; but we have very little misgiving about the good-will of those who are "outsiders" to both Societies, and we therefore copy from the 'Chemist and Druggist' the four resolutions passed at Manchester, to compare them immediately after with the proposals of the Pharmaceutical Society.

"That, as voluntary examination has failed to protect the public against incompetent druggists, this meeting recommends that a Bill be brought into Parliament to alter and amend the Pharmacy Act, so as to embrace all chemists and druggists within the Pharmaceutical Society, upon the principle of compulsory examination.

"That under the new Act, all examined members of the Pharmaceutical Society shall be entitled to distinction, whilst all other chemists and druggists, now in business, shall be members of the Society on payment of an annual fee, and be eligible to nominate, or to be nominated, upon the Council.

"That all existing assistants and apprentices may be registered as such, and be admitted as members of the Society on becoming chemists and druggists in business; but that all other persons, on becoming chemists and druggists, shall be required to pass a certain examination, and to pay such fees as may be agreed upon.

"That the Executive Committee of the United Society be requested, as the representatives of the unincorporated chemists and druggists of the country, whose interests must chiefly be affected by any measure to regulate the trade, to lay these proposals before the Pharmaceutical Council for consideration; and that the Pharmaceutical Council be respectfully requested to communicate their answer to such proposals, unreservedly, to the Executive Committee, so that that Committee may take the sense of the unincorporated chemists and druggists upon it before the meeting of Parliament."

Outline of Memorandum sent to the Home Office by the Council of the Pharmaceutical Society, in February, 1866.

"1. That in future all persons, before assuming the name or title of Chemist and Druggist, or keeping open shop for the compounding of medicines under physicians' and surgeons' prescriptions, or for vending, dispensing, or compounding certain dangerous drugs, chemicals, and other poisonous substances to be enumerated in a schedule, should undergo an examination and be registered as Pharmaceutical Chemists or Chemists and Druggists.

"2. The Examination for 'Pharmaceutical Chemists' should be, as heretofore, that which is known as the Major examination of the Pharmaceutical Society.

"3. The Examination for 'Chemists and Druggists' should be that which is known as the 'Minor Examination,' and to which persons hitherto registered as 'Assistants' have been subjected.

"4. That all persons registered as chemists and druggists should be eligible for election to membership of the Pharmaceutical Society, under the bye-laws thereof; but they should not by virtue of that membership be entitled to registration as 'Pharmaceutical Chemists,' that title being strictly kept for those only who pass the Major examination. They should have the right of nominating and voting for Members of Council, but the Council should consist only of members who are Pharmaceutical Chemists.

"5. All persons registered under the Bill as chemists and druggists to be exempt from serving on juries.

"6. Nothing in the Bill to interfere with, or curtail the rights of chemists already in business, or of persons of the full age of twenty-one years, who should, at a given date, be assistants to chemists and druggists. Other necessary exemptions to be made for apothecaries, veterinary surgeons, wholesale dealers, etc.

"7. That chemists and druggists already in business may, if they choose, be placed on the register of chemists and druggists, if within a certain time after the passing of the Bill, they make application, and produce to the Registrar satisfactory evidence that they were actually in business on their own account, and engaged in the compounding and dispensing of medicines under physicians' and surgeons' prescriptions, and vending, compounding, and dispensing the dangerous poisons, as per schedule, prior to that date."

We really see very little difference between these two plans of settling the question of legislation. It will be remembered that the Committee of the House of Commons recommended that after a certain day *no person, except those already in business, should sell certain dangerous drugs, unless he be examined and registered; that the Government should, early in the new Parliament, bring in a Bill on the subjects in question; and that there should be no compulsory examination or registration of persons already in business.*

The vested interests of chemists already in business, and assistants also, would, by the proposed scheme, remain untouched; but if such persons should desire a voice in what would be the governing body, they would have easy means of securing it by mere registration under the 7th clause, and election under the 4th. The vested interests of Pharmaceutical Chemists would be held sacred, like all others, but that title would be open to all who chose to win it by education. The proposition that the second examination should entitle a man to the rank of "chemist and druggist," was made in the belief that an education deemed to qualify an assistant, to whom is entrusted the responsible business of dispensing, would in practice be sufficient for a principal; but it may, nevertheless, be hoped, that the higher distinction would be attractive enough to tempt most chemists to attain it, and so advance both pharmacy and its votaries.

The time for action was left with the Government, and, even if Parliament had not been so unsettled last Session, it might have been right, under such circumstances, for the Pharmaceutical Society to wait awhile; but having waited one year, we deem it their duty now to endeavour once more to prosecute their object.

As we have endeavoured to show, there seems evidence forthcoming that opposition, which produced so much mischief in 1865, would not reappear in 1867. It is not merely the result of the Manchester meeting which leads us to this conclusion; the feeling of desire for legislation and union with the Pharmaceutical Society took a definite form there, and has consequently been specially alluded to; but the same feeling has been expressed in many places; in some publicly, in others privately, as our correspondence would attest. For all these reasons, we say that the year on which we are now entering is a fitting time for action, and we earnestly trust the opportunity may not be lost.

THE BENEVOLENT FUND, AND THE PROPOSED DINNER IN AID OF IT.

The financial statement, which will be found in another part of this Journal, showing the present position of the Benevolent Fund, together with the additions recently made to it, and the benefits it has conferred within the last year in necessitous cases, will be considered satisfactory in every respect, excepting the amount to which the invested capital has been raised. This still falls short of the sum of ten thousand pounds, which was originally fixed upon as a safe and suitable foundation fund from the interest of which annuities might be granted. The decision of the Council two years ago to anticipate the investment of the contemplated amount, by at once granting annuities to a limited extent, trusting that by this means increased interest in the objects of the fund would be created, and the capital proportionately augmented, has been fully justified by the result. The list of subscriptions and donations has considerably increased since the fund has been brought into more active operation, and additions have been annually made to the capital; but it would be long before the required amount could be realized, while so much is being annually dispensed, unless some active steps were taken to bring the Benevolent Fund, as an important feature of our institution, more prominently under the notice of members of the trade throughout the country.

It has been by applying the fund that a knowledge of the extent to which assistance is required from such a source has been gradually obtained; and the diffusion of this knowledge has no doubt contributed more than anything else to increase the list of subscriptions. Numerous cases of urgent necessity have come to light, in which not only temporary but also permanent relief has been afforded, and many more remain to be dealt with as means are provided for doing so. No less than seven cases of distress, from different parts of England, will, we have reason to believe, be brought under the notice of the Council at their meeting in January. We feel assured that nothing more would, under any circumstances, be required to stimulate our members throughout the country to active exertions in support of such a fund, than a knowledge of the real distress existing among some of their brethren; and we desire, especially on this occasion, to impress the fact upon our country friends, that the Benevolent Fund is not in any sense a local London charity, but one the benefits of which are applicable wherever members, their widows, or orphans, may be found in necessitous circumstances, such as are contemplated in the distribution of the fund.

This is the season at which it is most usual to make appeals to the sympathies of those who are placed beyond the pressure of want, for the means of assisting their less fortunate fellow-creatures, and we hope it may not prove an unfavourable occasion for renewing a direct appeal to the members of our Society, and especially to the Local Secretaries throughout the country, to assist in extending the benefits of our Benevolent Fund by promoting the success of the Dinner to be given in aid of it. The Dinner has been fixed for the 20th of February, at Willis's Rooms; and judging from the list of stewards whose names have already been received, and which will be found among the official notices on the cover of the Journal, we have no doubt it will be an occasion for the interchange of much social feeling among men of kindred pursuits, as well as for the promotion of the immediate object of the meeting.

THE LAW AFFECTING METHYLATED MEDICINES.

We desire to remind our readers that the law passed in the last Session of Parliament, for preventing the unrestricted use of methylated spirit in the preparation of medicines, will be in full operation on and after the 1st of January, 1867. The object of this law is to prevent the use of methylated spirit in the production of any spirituous compound or mixture that could be used either as a beverage, or internally as a medicine. The Act states that "if any person shall use methylated spirit, or any derivative thereof, in the manufacture, composition, or preparation of any article, as aforesaid, or shall sell or have in his possession any such article in the manufacture, composition, or preparation whereof any methylated spirit, or any derivative thereof, shall have been used, *he shall forfeit the sum of* ONE HUNDRED POUNDS, and such article shall be forfeited, together with the vessels or packages containing the same." Immediately after the passing of the Act an ORDER was issued by the authorities at Somerset House, in which it was stated, that those persons who had methylated medicines, the production and sale of which had been prohibited, would not be interfered with by the Board, provided it could be proved that such medicines were made before the passing of the Act, and provided that they were disposed of before the 1st of January, 1867. The period from the passing the Act up to the present time has therefore been allowed for those who had methylated medicines in stock, to get rid of them. It is to be hoped that this has been completely accomplished, and that there will be no occasion to put the law into force, to the injury of any of our members, and to the discredit of the body to which they belong.

The following correspondence, which has been sent to us for publication, will serve, in addition to what we have previously published, to explain the existing regulations relating to the sale and use of methylated spirit:—

"To WILLIAM CORBETT, ESQ.

"Sir,—Will you have the kindness to inform me—

"1st. If it will be allowable, after the 1st January, 1867, to use methylated spirit for burning in lamps without an authorization?

"2ndly. Will an authorization be required *to sell* preparations for external use made with methylated spirit?

"3rdly. Will an authorization be required *to make* preparations for external use, in large or small quantities, with methylated spirit, and to keep the spirit in stock for that purpose?

"4thly. Will it be allowable to make preparations for internal administration to animals with methylated spirit, either with or without an authorization?

"Your reply will oblige,

"Yours truly,
"JOHN HORNCASTLE."

COPY OF REPLY.

"*Inland Revenue, Somerset House, London, W.C.*
17th December, 1866.

"Sir,—The Secretary having laid before the Board your letter of the 12th instant, I am directed to acquaint you that—

"1. Methylated spirit may, after the 31st, be used, without any special authority, for burning in lamps.

"2. No special authority will be required for selling such medicines for external use, as have been made with methylated spirit, and are not capable of being used internally or as beverages.

"3. Methylated spirit may after the 31st be kept in stock, and used in making such medicines as above named, under the regulations now in force.

"4. Medicines for internal administration to animals must not be made with methylated spirit.

"I am, Sir, your obedient servant,
"ADAM YOUNG, *Assistant-Secretary.*

"*John Horncastle, Esq.*,
"12, *Stanhope Terrace, Hyde Park Gardens.*"

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *5th December*, 1866,

Present—Messrs. Bird, Bottle, Brady, Carteighe, Deane, Edwards, Hanbury, Haselden, Hills, Ince, Mackay, Morson, Palmer, Randall, Sandford, Squire, and Waugh.

The following were restored to Membership—

Edward George Jones ....Staines.
Richard Trumper ....New Ferry.

A memorial from the Bath Chemists' Association was read and referred to Committee to consider and report thereon.

The Treasurer was requested to purchase one thousand pounds Consols to the General Fund account.

BOARD OF EXAMINERS, *19th December*, 1866.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Gale, Garle, Haselden, and Squire.

Seventeen candidates presented themselves for the Major and Minor Examinations: the following passed and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Allkins, Thomas Boulton ....Tamworth.
Cornelius, Richard Bayly ....Clapham.
Ford, Edward Beeks ....Hereford.
Johnson, Edwin Eli ....Nottingham.

MINOR (as Assistants).

Bird, Alfred, Jun. ....Birmingham.
Cole, Frederick ....London.
Gillman, Henry ....Reading.
Harries, Howell ....Carmarthen.
Harwood, Henry Thomas ....Yeovil.
Owen, Edward ....Montgomery.
*Palmer, Francis ....Chard.
Prime, Thomas Robert ....Diss.
*Rew, Walter ....London.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Adams, Frank	Mr. Savage	Brighton.
Barrett, Frederic John	Mr. Nicholson	Fakenham.
Bothamley, Richard Broughton	Mr. Martin	Guildford.
Byerly, Fabian	Mr. Mumby	Gosport.
Chaplin, William	Mr. Allen	Tottenham.
Crossby, Richard Summerby	Mr. Ekin	Grantham.
Hall, Alfred James	Mr. Browne	Rugby.
Jackson, Alfred Henrick	Mr. Jackson	Manchester.
Kitchen, William	Mr. Garsett	Kendal.
Tranter, Frederic James	Mr. Kent	Bath.
Williams, Jabez Vivian	Mr. Stevens	Ramsgate.

* Passed in Honours; eligible, at the end of the Session, to compete for the Prize of Books.

BENEVOLENT FUND.

Subscriptions* and Donations received during the year 1866

Subscriptions.—London.

	£.	s.	d.
Allchin, Alfred, Barnsbury	0	10	6
Allen, Warner, and Co., 20, Charterhouse Square	2	2	0
A. M.	1	1	0
Anderson, Charles, 23, Lower Belgrave Street	1	1	0
Applegate, E., Upper Holloway	0	10	6
Argles, Charles, 1, East India Avenue, Leadenhall Street	1	1	0
Attfield, J., 17, Bloomsbury Sq.	1	1	0
Attwood and Hugill, 61, Cannon Street	2	2	0
Bacon, J. T., 21, Moorgate St.	1	1	0
Baker, A. P., 374, Old Kent Road	0	10	6
Balch, Edwin, Brixton	0	5	0
Barnes, James B., Knightsbridge	0	10	6
Barron, Frederick, Bush Lane	2	2	0
Barron, Harvey, Becket, and Simpson, 6, Giltspur Street	2	2	0
Bell, W. H., 96, Albany Street	0	10	6
Bentley, R., 17, Bloomsbury Sq.	1	1	0
Berdoe, Edw., Hackney Road	0	10	6
Best, James, Harrow Road	0	10	6
Binge, Thomas, 23, Stockbridge Terrace, Pimlico	0	10	6
Bird, A., Shepherd's Bush	2	2	0
Bird, Robert, Clapham	0	10	6
Bird, W. L., 42, Castle St. East	1	1	0
Bishop, Alfred, 17, Speck's Fields, Mile End New Town	2	2	0
Blake, C. T., 47, Piccadilly	1	1	0
Borchert, Heinrich T. G., German Hospital, Dalston	0	10	6
Bourdas, Isaiah, 10, Pont Street	1	1	0
Bower, W., 96, Tottenham Court Road	0	10	6
Bradley, John, Kilburn	1	1	0
Breton, W., 137, Cannon Street	0	10	6
Bromley, R. M., Denmark Hill	0	10	6
Brooks, C., Wandsworth Road	0	10	6
Buckle, Christopher F., 77, Gray's Inn Road	0	10	6
Burgoyne and Burbidge, 16, Coleman Street	2	2	0
Carr, J., 171, High Holborn	0	10	6
Charity, William, Swan Lane	1	1	0
Chubb, J. C., 59, St. John Street	1	1	0
Clayton, Francis Corder, 40, Aldersgate Street	0	10	6
Cocksedge, Henry B., 20, Bucklersbury	0	5	0
Coles, C., 1, King's College Road	0	10	6
Coles, Ferdinand, 248, King's Road, Chelsea	0	10	6
Coles, J., Camberwell New Road	0	10	6
Constance, E., 37, Leadenhall St.	0	10	6
Cooke, John, 171, Hoxton Old Town	0	5	0
Cooper, Albert, Kensington	0	10	6
Cooper, W. T., 26, Oxford St.	0	10	6
Cracknell, C., 107, Edgware Road	2	2	0
Croyden, C., 37, Wigmore St.	0	10	6
Darby and Gosden, 140, Leadenhall Street	2	2	0
Davenport, John T., 33, Great Russell Street	2	2	0
Davies, H. E., 43, Wood Street	0	10	6
Davies, William, 292, Gray's Inn Road	0	5	0
Davy, Yates, and Routledge, 100, Upper Thames Street	2	2	0
Deane, Henry, Clapham	1	1	0
Dinneford and Co., 172, New Bond Street	2	2	0
Dyson, W. B., South Kensington	0	10	6
Elvey, T., 8, Halkin Street West	1	1	0
Evans, J. H., 60, Bartholomew Close	1	1	0
Faulconer, Robert S., 270, Walworth Road	1	1	0
Fenn, John T., 83, Regent Street, Westminster	0	5	0
Field, W, 83, Brompton Road	1	1	0
Fincham, Robert, 57, Baker St.	2	2	0
Fisher and Haselden, 18, Conduit Street	1	1	0
Flux, W., 1, East India Avenue	1	1	0
Foott, Richard Rogers, 8, Lower Eaton Street	0	10	6
Forrest, Richard, 20, Cork St., Bond Street	1	1	0
Fox, William, 48, Church Street, Bethnal Green	1	1	0
Francis, G. B., 5, Coleman St.	1	1	0
Gadd, Charles, 1, New Bridge Street, Vauxhall	0	5	0
Gale, Henry, Camden Town	0	10	6

* Subscribers of half-a-guinea are entitled to one vote; of one guinea, two votes; and to increase in the same proportion.

	£.	s.	d.
Gaunt and Fuller, 221, Union Street, Southwark	1	1	0
Gedge, W. S., 65, St. John St...	0	10	6
Glover, George, 19, Goodge St.	1	1	0
Goodbarne, Thomas, 13, Charles Place, Hoxton	0	10	6
Goodwin, J., Lower Clapton ...	1	1	0
Goosey, W., 6, Ocean Row, Stepney	0	10	6
Gorton, John G., 144, Whitechapel	0	10	6
Granger, E. J., Upper Clapton..	1	1	0
Griffiths, J., Clerkenwell Green	0	10	6
Gristock, Thomas, 42, South Street, Manchester Square ...	1	1	0
Groves, E., Regent's Park Road	0	10	6
Hall, Robert, 48, Wigmore St...	0	10	6
Hanbury, D. B., Plough Court..	1	1	0
Henty, H. M., St. John's Wood	0	5	0
Herrings and Co., Aldersgate St.	2	2	0
Hickley, Thomas P., 15, St. Alban's Place, Edgware Road	0	10	6
Hill and Son, 11, Little Britain	2	2	0
Hills, Thomas Hyde, 338, Oxford Street	1	1	0
Barnard, John...do.	0	10	6
Cornelius, Richard B...... „	0	5	0
Dunkley, Edward .... „	0	5	0
Fletcher, John.............. „	0	5	0
Gale, Samuel .... „	0	10	6
Haddock, George J. ...... „	0	5	0
Hardy, Samuel C. .... „	0	5	0
Harris, Henry William ... „	0	5	0
Kinch, Charles James...... „	0	5	0
Machray, William .... „	0	5	0
Middleton, Francis......... „	0	10	6
Provost, James .... „	0	5	0
Tanner, Benjamin .... „	0	5	0
Wearing, Richard H....... „	0	5	0
Wigg, Henry John......... „	0	5	0
Wilson, Thomas............ „	0	5	0
Hodgkinson, Tonge, and Stead, 213, Upper Thames Street ...	2	2	0
Hodgson, W. H., St. Bartholomew's Hospital	0	10	6
Hooper, B., 43, King William St.	1	1	0
Hopkin and Williams, 5, New Cavendish Street	2	2	0
Hora, H. W., 58, Minories......	1	1	0
Horncastle, J., 12, Stanhope Ter.	0	10	6
Horton, A. T., 18, Conduit Street	0	5	0
Howden, R., 78, Gracechurch St.	1	1	0
Howell, M., High St., Peckham	0	10	6
Howell, Thomas, 168, High St., Camden Town	0	10	6
Humpage, Benj., 51, Judd St...	0	10	6
Huskisson, W., 12, Swinton St..	0	10	6

	£.	s.	d
Huskisson, William, jun., 76, Swinton Street	1	1	0
Huxtable, John, 104, St. John Street Road	1	1	0
Hyslop, John Cahill, 54, New Church Street	0	10	6
Ince, J., 26, St. George's Place..	1	1	0
Jackson, J., Southampton Row	1	1	0
Jacobson, Nathl., 38, Walbrook	1	1	0
Jefferson, Thomas, Clapham	0	10	6
Jeynes, George W., 42, Princess Street, Edgware Road	0	5	0
Johnson, Benjamin M., 70, Tottenham Court Road	0	10	6
Jones, William, Allason Terrace, Kensington	0	5	0
Kemp, R., 205, Holloway Road	0	10	6
Kendall, C. F., Clapham Road..	0	10	6
Kent, T., 226, Blackfriars Road	0	10	6
Kernot, G. C., 3, Chrisp St., Poplar	0	10	6
Kershaw, George, 113, Park St., Camden Town	0	10	6
Knowles, R. J., 96, Lansdown Rd.	2	2	0
Large, J. H., 65, New North Rd.	0	10	6
Lawrence, F., Kentish Town Rd.	0	10	6
Lescher, Joseph Sidney, 60, Bartholomew Close	1	1	0
Lidwell, J. E., Notting Hill ...	0	10	6
Long, Henry, Notting Hill	1	1	0
Matthews, W., 1, Wigmore St...	0	10	6
Maw and Son, 11, Aldersgate St.	2	2	0
May, John, Battersea	0	10	6
Merrell, James, 1, Queen's Terrace, Camden Villas	0	10	6
Mitchell, J., 254, Upper Street..	0	10	6
Morris, H., St. John's Wood ...	1	1	0
Mould, S., 21, Moorgate Street	0	10	6
Nicholson, F., 216, St. Paul's Rd.	1	1	0
Orpe, T. M., 329, Old Kent Rd.	0	10	6
Orridge, B. B., 30, Bucklersbury	1	1	0
Palmer, R., 35, Ovington Sq....	1	1	0
Parkinson and Son, 27, Southampton Row	1	1	0
Penrose, A. W., 5, Amwell St...	0	10	6
Peppin, S. H., 25, Princes Street	0	10	6
Pidduck, John, Harrow Road...	0	10	6
Pollock, Thomas, Fenchurch St.	1	1	0
Porter, William H., Brixton ...	0	10	6
Pratt, Edmund, 49, Berners St.	1	1	0
Preston and Son, Leadenhall St.	2	2	0
Quiller, C. R., 15, Sloane Square	0	10	6
Richardson, Geo., Notting Hill..	0	10	6
Roach, Pope, 8, St. James's St.	0	10	6
Robbins, John, 372, Oxford St.	1	1	0
Roberts, A. J., 270, Walworth Rd.	0	10	6
Rowntree, Thomas, Islington ...	0	10	6
Rowson, H., 18, Chichester St..	0	10	6

	£.	s.	d.
Sandford, G. W., 47, Piccadilly	1	1	0
Sanger, John, and Sons, 150, Oxford Street	2	2	0
Sanger, William Albert, do.	1	1	0
Shirley, J. G., Westbourne Grove	1	1	0
Sims, J. F., Hemingford Road..	0	5	0
Slipper, J., 87, Leather Lane ...	0	10	6
Smith, Thomas and Henry, and Co., Coleman Street	2	2	0
Smith, W. F., 280, Walworth Rd.	0	10	6
Snelling, F., 23, Farringdon St.	1	1	0
Starkie, Richard S., 4, Strand...	1	1	0
Stathers, John, Notting Hill ...	0	10	6
Stevenson, W. L., 81, Connaught Terrace	1	1	0
Stocken, James, 33, Euston Sq.	0	5	0
Strawson, George F., 101, High Holborn	0	5	0
Taylor, J. E., and Co., Little Queen Street	1	1	0
Taylor, Thomas, Peckham	0	5	0
Thompson, H. A., Chiswell St...	1	1	0
Tippett, B. M., 3, Sloane Street	0	10	6
Towerzey, A., 35, Glasshouse St.	0	10	6
Treloar, T., 67, Ludgate Hill ...	0	10	6
Tupholme, John T., 38, Lamb's Conduit Street	0	10	6
Turner, C. E., Great Russell St.	0	10	6
Urwick, W. W., 60, George's Rd.	1	1	0
Vizer, E. B., 63, Lupus Street..	1	1	0
Warner, C. H., 55, Fore Street	1	1	0
Waugh, Alexr., 177, Regent St.	0	10	6
Weston, S. J., Westbourne Ter.	1	1	0
Whitburn, A. R., 174, Regent St.	0	10	6
White, Daniel, and Son, 19, Park Terrace, Regent's Park	1	1	0
Whysall, W., 199, Fleet Street..	0	5	0
Williams, J. J., Harrow Road..	0	10	6
Willows, John and Jesse, 101, High Holborn	2	2	0
Wilson, Thos., Upper Holloway	0	10	6
Windle, W., 48, Portman Place	0	10	6
Wooldridge, John, Euston Rd.	0	10	6
Wright and Co., 11, Old Fish St.	1	1	0
Wyman, John, 122, Fore St ...	1	1	0
Yarde, Giles, 28, Lamb's Conduit Street	1	1	0
Young, George, Millwall, Poplar	0	5	0
Young, William, Balls Pond Rd.	0	10	6

Subscriptions.—Country.

	£.	s.	d.
Abergavenny, Ackrill, George ...	0	10	6
Alderley Edge, Hampson, Robert	0	10	6
Alfreton, Robinson, Joseph S...	1	1	0
Ashby-de-la-Zouch, Redfern, J..	1	1	0
Ashton-under-Lyne, Bostock, W.	0	5	0
Axbridge, Hallam, Edward......	0	10	6
Barnstaple, Goss, Samuel.........	0	5	0
Bath, Bright, William...........	0	2	6
,, Brooke, Charles...........	0	10	6
,, Commans, Robert D.	1	1	0
,, Davies, Jameson, and Barnett	1	1	0
,, Dutton, Charles H.	0	10	6
,, Ekin, Charles..............	0	10	6
,, Fish, Joseph P............	0	5	0
,, Hancock, Edwin	0	10	6
,, Harding, T. T.	0	5	0
,, Keane —	0	5	0
,, Kent, Frederick Wm. ...	0	10	6
,, Lear, William M.	0	10	6
,, Merriken, John B........	0	10	6
,, Nurthen, Frederick	0	10	6
,, Parker, Matthew	0	10	6
,, Pooley, John Carpenter...	0	10	6
,, Potts, Francis E.	0	5	0
,, Rickwood, Henry	0	5	0
,, Rolfe, Wm. Adolphus ...	0	5	0
,, Steele and Marsh	1	1	0
Bath, Tylee, John P.	1	1	0
,, Walker, Henry John	0	10	6
,, Williams, George	0	5	0
,, Willison, Alfred...........	0	10	6
Bedford, Anthony and Son......	0	10	6
,, Taylor and Cuthbert...	0	10	6
Berwick, Carr, William Graham	0	10	6
,, Davidson, John.........	0	10	6
Beverley, Hobson, Charles	0	5	0
,, Robinson, James Mould	0	5	0
Bewdley, Newman, Robert	0	10	6
Birmingham, Churchill, John ...	0	5	0
,, Foster, Alfred Hood	0	10	6
,, J. T. D.	0	10	6
,, Johnson, George...	0	5	0
,, Lucas, Joseph......	0	10	6
,, Musson, T. G.......	0	10	6
,, Palmer, Charles F.	0	10	6
,, Pegg, Herbert......	0	10	6
,, Price, William......	0	10	6
,, Snape, Edward.....	0	10	6
,, Southall, Son, and Dymond	1	1	0
,, Sumner, William...	0	5	0
Blackheath, Ford, Charles	0	10	6
Blandford, Groves, W. E.	0	10	6
Boston, Thomas, John H.........	0	10	6

	£.	s.	d.
Bradford, Yorks., Harrison and Parkinson	2	2	0
„ Hick, Joseph	0	10	6
„ Rogerson, Michael	1	1	0
Brecon, Bright, Philip	1	1	0
Bridge, Thomas, James	0	5	0
Bridgnorth, Steward, William	0	10	6
Bridport, Beach, James	0	10	6
„ Tucker, Charles	0	10	6
Brighton, Cornish, William	0	5	0
„ Gwatkin, James T.	0	10	6
„ Noakes, Richard	0	10	6
„ Robson, Thomas	0	10	6
„ Savage, Wm. Dawson	0	10	6
„ Savage, Wm. Wallace	0	10	6
„ Smith, William	0	10	6
Bristol, Ackerman, Theophilus	1	1	0
„ Butler, Samuel	0	10	6
„ Hodder, Henry	0	5	0
„ Sircom, Richard	0	10	6
„ Stoddart, William W.	0	10	6
Broadstairs, Doubell, James	0	5	0
Bromley, Baxter, William W.	0	10	6
Burslem, Blackshaw, Thomas	0	10	6
Bury St. Edmunds, Portway, J.	1	1	0
Cambridge, Deck, Arthur	0	10	6
Canterbury, Amos, Daniel	0	10	6
„ Hall, John R.	0	10	6
„ Harvey, Sidney	0	10	6
„ Paine, William	0	10	6
Cardiff, Greaves, E. T.	0	5	0
„ Haddock, B. P.	0	2	6
„ James and Williams	0	5	0
„ Joy, Francis William	0	10	6
„ Treharne, J. T.	0	5	0
Carlisle, Sawyer, James	0	5	0
„ Sowerby, John	0	10	6
Chatham, Crofts, Holmes C.	0	10	6
„ French, Gabriel	0	10	6
„ Tribe, John	0	10	6
Chelmsford, Baker, Charles P.	0	10	6
„ Baker, Garrad	0	10	6
„ Seaton, George	1	1	0
Cheltenham, Butcher, Thomas	0	10	6
„ Fletcher and Palmer	0	10	6
„ Forth, William	0	5	0
„ Proctor, Richard E.	0	10	6
„ Smith, Nathaniel	0	10	6
Chertsey, Boyce, John Pierce	0	5	0
Cheshunt, Butt, Edward N.	0	10	6
Chester, Baxter, George	0	10	6
„ Bowles, Charles A.	0	5	0
„ Grindley and Son	1	1	0
„ Mills, John	0	5	0
Chichester, Long, William E.	0	10	6
„ Pratt, John	0	10	6
Chipping Sodbury, Wheeler, J.	0	5	0

	£.	s.	d.
Chowbent, Warburton, Thomas	0	5	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
Coningsby, Brown, Samuel	0	5	0
Corsham, Stantial, John	0	5	0
Cottingham, Lister, George	0	10	6
Coventry, Hinds, James	0	10	6
Crewkerne, Strawson, Henry	1	1	0
Crickhowell, Christopher, Wm.	0	5	0
Croydon, Barritt, George	0	10	6
„ Crafton, Ralph C.	1	1	0
„ Lancaster, Henry	1	1	0
„ Long, Henry	0	5	0
Darlington, Abbott, John T.	0	5	0
Deptford, Lloyd, Henry	0	10	6
„ Lockyer, George	0	10	6
Denbigh, Edwards, William	0	5	0
Devizes, Madge, James C.	0	5	0
Diss, Cupiss, Francis	0	10	6
Doncaster, Howorth, James	0	10	6
Dorchester, Davis, R. and J.	0	10	6
Dorking, Clift, Joseph	1	1	0
Dover, Bottle, Alexander	1	1	0
Dudley, Hollier, Elliott	0	10	6
Durham, Burdon, John	0	10	6
„ Coward, Edward	0	5	0
„ Morton, John	0	5	0
„ Peele, Henry Anthony	0	10	6
„ Prest, Ven. Archdeacon	1	1	0
„ Prudhoe, Robert	0	10	6
„ Robson, George	0	10	6
„ Sarsfield, William	0	10	6
„ Scawin and Wortley	0	10	6
Edinburgh, Allan, Bruce	0	5	0
„ Baildon, Henry C.	1	1	0
„ Buchanan, James	0	10	0
„ Gardner and Ainslie	0	10	6
„ Macfarlan, J. F., & Co.	1	1	0
„ Mackay, John	1	1	0
„ Newton, Christopher	0	5	0
„ Raimes, Blanshard, and Co.	1	1	0
„ Tait, William	1	1	0
Exeter, Bromfield, Charles	0	5	0
„ Cooper, George	0	10	6
„ Husband, Matthew	0	10	6
„ Palk, John	0	10	6
„ Stone, John	0	5	0
„ Tanner, Nicholas W.	0	5	0
„ Wood, Edward	0	10	6
Exmouth, Thornton, Samuel	0	5	0
Fareham, Peat, Walter	0	5	0
Florence, Groves, Henry	1	1	0
Folkestone, Hammon, Richard	0	5	0
Fordingbridge, Haydon, F. W.	0	5	0

	£.	s.	d.
Gateshead, Garbutt, Cornelius D.	1	1	0
Glasgow, Currie, John	0	5	0
„ Hart, Hugh	0	5	0
Gloucester, Berry, Edward	0	5	0
„ Hurst, W. F. H.	0	5	0
„ Stafford, William	0	5	0
Goole, Hasselby, Thomas J.	0	5	0
„ Squire, William	0	5	0
Gravesend, Beaumont, W. H.	1	1	0
„ Spencer, Charles	1	1	0
Great Malvern, Burrows, Messrs.	1	1	0
Great Yarmouth, Bond, John	0	5	0
Greenwich, Tugwell, William H.	0	10	6
Guildford, Martin, Edward W.	0	10	6
„ Saunders, Henry B.	0	5	0
„ Shepherd, George P.	1	1	0
Halifax, Jennings, William	1	1	0
Harleston, Muskett, James	0	5	0
Harlow, Wood, John Edward	0	5	0
Harrogate, Coupland, Joseph	0	10	6
„ Greenwood, John	0	10	0
Harwich, Bevan, Charles F.	0	5	0
Hastings, Amoore, Charles	0	10	6
Haverfordwest, Saunders, D. P.	0	10	0
Hay, Davies, John L.	0	5	0
Heavitree, Brailey, Charles	0	5	0
Hendon, Goldfinch, George	0	10	6
Hertford, H. G.	0	10	6
Heywood, Beckett, William	0	10	6
Hirwain, Sims, Joseph	0	10	6
Honiton, Turner, George	0	5	0
Horsham, Jull, Thomas	0	10	6
„ Williams, Philip	0	10	6
Howden, Saville, John	0	10	6
Huddersfield, Duffin, Thomas	0	5	0
„ Fryer and King	1	1	0
„ Higgins, Tom S.	0	10	6
Hull, Baynes, James	0	10	6
„ Earle, Francis	0	10	6
„ Hall, Henry R. F.	0	5	0
„ Metcalfe, Christopher L.	0	10	6
Ilford, Beal, Edmund John	0	10	6
Ingatestone, Stuart, Henry J.	0	10	6
Ipswich, Chapman, Henry	0	10	0
Jersey, Millais, Thomas	1	1	0
Kaffraria, Daines, Thomas	0	10	6
Kendal, Bateson, Thomas	0	10	6
Kidderminster, Bond, Charles	0	5	0
„ Steward, Josiah	0	10	6
„ Steward, T.	0	10	6
Kilmarnock, Borland, John	0	10	6
„ Rankin, William	1	1	0
Kingston-on-Thames, Jones, W. B.	0	10	6
Lancaster, Wearing, William	0	10	6
„ Whimpray, John	0	10	6
Lasswade, N.B., Macdonald, John	0	5	0
Leamington, Davis, Henry	0	5	0
Leamington, Jones, Samuel U.	0	10	6
„ Pullin, William H.	0	5	0
Leatherhead, Hewlins, Edward	0	10	6
Leeds, Brown, Edward	0	10	6
„ Harvey, Thomas	0	10	6
„ Reynolds, Richard	0	10	6
Lees, nr. Oldham, Marlor, Jabez	0	5	0
Leicester, Butler, Thomas E.	0	5	0
„ Cooper, Thomas	0	5	0
„ Merryweather, C.	0	5	0
„ Salisbury, William B.	0	10	6
Leighton Buzzard, Richmond, R.	0	10	6
Leominster, Davis, D. Frederick	1	1	0
Lewisham, Clift, Edward	1	1	0
Leytonstone, Telfer, Frederick	0	5	0
Lincoln, Peppercorn, Benjamin	0	10	6
„ Tomlinson, Charles K.	0	10	6
„ Woodcock, Page D.	0	5	0
Liverpool, Evans, H. Sugden	2	2	0
„ Evans, Son, and Co.	2	2	0
„ Hunt, Thomas	0	10	6
„ Thompson, John	0	5	0
Llangollen, Jones, Humphrey	0	5	0
Louth, Hurst, John	0	10	6
Lower Norwood, Rose, Alfred	0	10	6
Lower Tooting, Medcalf, Ebenezer	0	10	6
Ludlow, Cocking, George	0	5	0
Maidenhead, Thompson, C. H.	1	1	0
Maidstone, Rogers, William	0	10	6
Manchester, Benger, F. B.	0	5	0
„ Brown, William S.	1	1	0
„ Carter, William	0	10	6
„ Halliday, William J.	0	10	6
„ Jackson, Thomas	0	10	6
„ Mitchell, John	0	10	6
„ Paine, Standen	0	5	0
„ Walsh, Edward	0	10	6
„ Wilkinson, William	0	10	6
„ Williams, Edwin	0	5	0
„ Wright, Charles	1	1	0
Market Drayton, King, Wm. G.	0	10	6
Market Harboro', Bragg, W. B.	1	1	0
Maryport, Cockton, John	0	5	0
Merthyr Tydfil, Thomas, Rees	0	5	0
Minehead, Bond, John	0	5	0
Monmouth, Dawe, Sampson	0	10	6
Montreal, Mercer, Nathan	0	10	6
„ Hickman and Son	1	1	0
Newcastle-on-Tyne, Brady, H. B.	1	1	0
„ Proctor, B. S.	1	1	0
Newcastle-u.-Lyne, Cartwright, William	0	10	6
Newport, Pearman, Henry	0	5	0
Newton Abbot, Poulton, John	0	10	6
Northallerton, Warrior, William	0	10	6
Northampton, Negus, Samuel	0	10	0
Norwich, Arnold, Edward	0	5	0

	£.	s.	d.
Norwich, Caley, Albert Jarman	0	10	6
,, Cooke, William	0	5	0
,, Sutton, Francis	0	10	0
Nottingham, Fitzhugh, Richard	1	1	0
,, Jenkins, Joseph ...	0	10	6
,, Parr and Atherton	1	1	0
Odiham, Hornsby, John H.......	0	10	6
Oldham, Bagshaw, William......	1	1	0
,, Hargraves, Henry L....	0	10	6
,, Henthorn, Joshua	0	10	6
Oswestry, Saunders, George J...	0	5	0
Otley, Pratt, Richard M..........	0	10	6
Oxford, Prior, George T..........	0	10	6
Paris, Rowe, Robert	0	5	0
Partick, N. B., Rait, Robert C...	0	10	0
Pembroke Dock, Saer, David P..	0	10	6
Plymouth, Burdwood, James ...	0	2	6
,, Essery, William......	0	5	0
,, Gibbons, William ...	0	5	0
,, Hill, Simon...........	0	2	6
,, Northcroft, Jonathan	0	5	0
,, Sloggett, Thomas C..	0	2	6
Pontypool, Wood, William	0	5	0
Pontypridd, Bassett, Charles ...	0	10	6
Portobello, N. B., Kemp, David	0	10	6
Portsea, Tryon, William G. ...	0	5	0
Portsmouth, Parsons, William..	0	10	6
Preston, Armstrong, Henry......	0	10	6
,, Hogarth, William	0	10	6
,, Houghton, William ...	0	10	6
,, Oakey, Joseph M.......	0	10	6
,, Sharples, George	1	1	0
Putney, Farmer, John...........	0	5	6
Ramsgate, Morton, Henry	0	5	0
,, Sawyer, Thomas......	0	5	0
Rhyl, Jones, Ellis Powell.........	0	10	6
Richmond, Yorks., Thompson, T.	0	10	6
Rochdale, Mercer, Thomas W...	0	5	0
,, Taylor, Edward	0	5	0
Rochester, King, Thomas S......	0	10	6
Rock Ferry, Dutton, John	1	1	0
Romford, Lasham, John	0	5	0
Rotherham, Ellinor, George	0	10	6
Rugby, Garratt, John C..........	0	5	0
,, Garratt, Samuel	0	5	0
,, Lewis, Thomas Cooper...	0	5	0
Ruthin, Bancroft, John James..	0	5	0
Ryde, Dixon, Henry	0	10	6
,, Gibbs, William	0	10	6
,, Wavell, John.............	0	10	6
St. Albans, Roberts, Albinus ...	1	1	0
St. Day, Corfield, Thomas J. T.	0	10	6
St. Leonards, Maggs, Samuel B.	1	1	0
Salford, Manfield, John W......	0	5	0
Scarborough, Whitfield, John ...	1	1	0
Shaftesbury, Powell, John	0	10	6
Sheffield, Botham, William	0	10	0

	£.	s.	d.
Sheffield, Gowland, W. and G. R.	1	1	0
,, Jennings, John E. H..	0	10	6
,, Maleham, Henry	0	10	0
,, Radley, William V. ...	0	10	6
Shefford, Baigent, W. H.........	0	10	6
Shepton Mallett, Ellis, Benjamin	1	1	0
Shields, South, Mays, R. J. J. ...	0	5	0
Shildon, Veitch, William.........	0	10	6
Shrewsbury, Blunt, Thomas	0	10	6
,, Cross, William G...	0	10	6
Sidmouth, Chessall, Rowland ...	0	5	0
Sittingbourne, Gordelier, P. W. G.	0	10	6
,, Rook, Edward ...	0	5	0
Southampton, Palk, Edward ...	1	1	0
,, Randall and Son..	1	1	0
,, Smith, John	0	10	6
Southport, Ashton, William	0	10	6
,, Walker, William H..	0	10	6
Southsea, Rastrick and Son......	0	10	6
Sowerby Bridge, Stott, William..	0	5	0
Stamford, Patterson, George ...	0	10	6
Stockport, Brooke, Frederick ...	1	1	0
,, Shaw, Alexander H..	1	1	0
,, Yeoman, John	0	10	6
Stockton, Hodgson, E. and Son..	0	10	6
Stourbridge, Bland, John H. ...	0	10	6
,, Hughes, Samuel...	0	10	6
,, Morris, Alfred P...	0	10	6
,, Nickolls, James ...	0	4	0
Stowmarket, Simpson, T. & Son	0	5	0
,, Sutton, Charles W.	0	5	0
Stratford, Essex, Morton, George	0	10	6
Strood, Picnot, Charles	1	1	0
Sunbury, Leare, James...........	0	5	0
Sunderland, Aslin, John	0	10	6
,, Ritson, John G. ...	0	10	6
,, Ritson, Thomas ...	0	10	6
,, Searrow, William...	0	5	0
,, Walton, John	0	10	6
Swansea, Brend, Thomas.........	1	1	0
,, Pearson, Charles J. ...	0	10	0
Sydenham, Pocklington, James..	0	10	6
Taunton, Gregory, George H....	0	5	0
,, Prince, Henry	0	10	6
Teignmouth, Cornelius, R. B....	0	5	0
Tenterden, Bolton, Thomas......	0	5	0
,, Willsher, Stephen H.	0	10	6
Thame, Booth, Samuel	0	10	6
Thornbury, Ellis, Richard	0	5	0
Thornton-in-Craven, Wilson, T..	2	2	0
Tickhill, Crowther, Thomas	0	10	6
Todmorden, Lord, Charles	1	1	0
Torpoint, Down, Richard H. ...	0	10	6
Torquay, Guyer, James B.	0	10	6
,, Millar, F. C. M.	0	10	6
,, Narracott, Henry......	0	2	6
,, Whiteway, William H.	0	10	6

	£.	s.	d.
Torrington, Fowler, Henry	0	5	0
Tring, Chapman, John	0	10	6
Tunbridge Wells, Gardener, C.	0	5	0
,, Howard, R.	0	5	0
,, Sells, Robert J.	0	5	0
Uttoxeter, Johnson, John B.	0	10	6
Wandsworth, Nind, George	0	10	6
Warrington, Redmayne, Christr.	0	2	6
,, Webster, S. M.	0	5	0
Waterloo, Pheysey, Richard	1	1	0
Watford, Chater, J., and Son	1	11	6
Wath-upon-Dearne, Hick, Allan	0	5	0
Weaverham, Manifold, John J.	0	10	6
Wellingborough, Thorne, John	0	5	6
Weston-super-Mare, Gibbons, G.	0	10	6
Weymouth, Groves, Thomas B.	0	10	6
Whitchurch, Bailey, J. Bassatt	0	5	0
Willenhall, Seyde, John F.	0	10	0
Winchester, Powell, Edward	0	10	6
Windsor, Russell, Charles J. L.	0	10	6
Wisbeach, Oldham, William T.	0	5	0
Wolverhampton, Hamp, John	0	10	6
Woolwich, Bishop, Thomas	0	10	6
,, Parkes, John C.	0	10	6
,, Rastrick, John A.	0	10	6
Worcester, Witherington, T.	1	1	0
Worle, Watson, Edward M.	0	10	0
Wrexham, Francis, John	0	10	6
Wymondham, Skoulding, Wm.	0	5	0
York, Linsley, Thomas	0	5	0

Donations.—London.

	£.	s.	d.
Anonymous (Conscience Money)	13	15	0
Bailey, Delamore J., 30, Conduit Street, W. (2nd Don.)	5	5	0
Ballard, Charles B., 39, St. Paul's Road, N.	1	1	0
Evans and Webb, 21, Old Cavendish Street, W.	0	10	6
Hughes, John, and Friends, York Glass Co., 3, West Street, Finsbury Circus, E.C.	15	15	0
Orridge, Mrs. B. B., per Mr. Orridge, 30, Bucklersbury	1	1	0
Twinberrow, William, 2, Edwards St., Portman Sq., W.	5	5	0

Donations.—Country.

Ampthill, Allen, George	5	5	0
Blackheath, Lavers, Thomas Howard	1	1	0
Bournemouth, Blacklock, Henry	1	1	0
Durham, Belough, Henry M.	1	1	0
,, Boyd, William, (Mayor of Durham)	0	10	0
,, Monks, Capt. (7th North Durham R. V.)	0	5	0
Great Yarmouth, Owles, James John	0	10	6
Leicester, Clark, John Webster	1	0	0
,, Watson, David	0	10	6
Liverpool, Sumner, Robert, and Co.	5	5	0
Manchester, Brown, William Scott	2	2	0
Pendleton, Taylor, Sydney	0	10	0
Plymouth, Loye, Philip	1	0	0
Ramsgate, Franks, Alfred	5	5	0
Reigate, Forbes, William	1	1	0
Shefford, Baigent, William H.	10	10	0
Torquay, Brown, —	0	5	0
,, Breeze, —	0	5	0
,, Hearder, Davis, and Co.	0	10	0
Walsall, Highway, Henry	1	0	0
Winchester, Hunt, Richard	5	5	0

Evans, Alfred John	1	1	0
Field, John	1	1	0
Lacey, Walter	1	0	0
Trilfield, George	1	0	0

BENEVOLENT FUND ACCOUNT FOR THE YEAR 1866.

	£.	s.	d.	£.	s.	d.
Subscriptions	391	6	0			
Donations	90	16	6			
				482	2	6
Dividends				202	10	8
				£684	13	2

	£.	s.	d.
One Year's Annuities to Mrs. Goldfinch and David Peart	60	0	0
One Quarter's Annuities to Wm. Jacob's Froom and Thomas Novis	15	0	0
Widow (with one child, a cripple) of a late Member at Ramsgate; husband was drowned	20	0	0
Member, late at Pontefract, with wife and three children	25	0	0
Widow of a late Member at Sunderland towards expenses in getting her child in an Orphan Asylum	10	0	0
Member, late at Bury St. Edmunds	10	0	0
Widow of a Member late at Dover	21	0	0
Member, late at Twickenham, with wife and two children (wife in a consumption, son suffering from an affection of the heart)	15	0	0
Widow of a Member, late at Poplar	15	0	0
Premium on the orphan Bentley's Policy of Assurance	1	11	2
Advertisements	3	1	0
Postage	10	0	0
Printing and Stationery	13	17	6
Purchase of Consols—£519. 3*s*. 4*d*.	458	6	11
Balance in Treasurer's hands	6	16	7
	£684	13	2

	£.	s.	d.
Invested in Consols, 31st December, 1865	6,730	16	8
Purchase of Consols, as above	519	3	4
	£7,250	0	0

PHARMACEUTICAL MEETING.

Wednesday, December 5th, 1866.

MR. T. H. HILLS, VICE-PRESIDENT, IN THE CHAIR.

PLATINIZED METALS FOR PHARMACEUTICAL PURPOSES.

Professor Redwood brought under the notice of the meeting some specimens of platinized metals which he had received from Messrs. Johnson and Matthey, of Hatton Garden. A notice had appeared in the Pharmaceutical Journal a short time ago* to the effect that platinized scale-pans were about to be introduced to pharmaceutists for use in dispensing, and as this seemed to indicate that the platinized metal had not previously been applied to such purpose,

* Page 232 of the present volume.

Messrs. Johnson and Matthey wished it to be stated that as long as thirty years ago the late Mr. Percival Johnson, of their firm, had prepared platinized copper and supplied it to Messrs. De Grave and Fanner, scale makers, for the construction of scale-pans. He (Professor Redwood) could state that he had used platinized scale-pans about that time, so that it certainly could not be represented as a modern introduction. He could also say, as the result of his own experience, as well as that of others, that the platinized metal answered exceedingly well for that purpose. There were also on the table, supplied by the same house, some copper and silver dishes coated with platinum, and pieces of platinized metals of different sorts which had been prepared experimentally several years ago. The platinized dishes had proved a failure, as it was difficult to ensure and especially to maintain perfect continuity in the thin coating of platinum which was applied by rolling over the surface of the copper. The slightest defect allowed acids to act on the copper and then of course the dish was rendered useless.

Mr. Mackay, of Edinburgh, said he had tried the platinized scale-pans and found them a perfect success. He thought they answered better than those made of glass.

The Chairman remarked that Messrs. Crosse and Blackwell had made some experiments on the use of platinum in the construction of vessels used in the manufacture of pickles, and he believed they now used this metal extensively for that purpose.

Dr. Attfield said there was no doubt that platinized metals were first applied to the construction of scale-pans and for other similar purposes by Messrs. Johnson and Matthey, of Hatton Garden. The platinized metal appeared to answer well for scale-pans, but not in all cases for dishes intended for chemical use. The dishes exhibited on a recent occasion at Nottingham, were supplied by Messrs. Johnson and Co., who professed to supply a superior article.

PESSARY MOULDS.

Professor Redwood drew the attention of the meeting to a method of forming pessaries and suppositories which had been suggested by Mr. Redford, of Liverpool. A mould turned in wood, with a mandril fitting into it, being provided, these were used for making little moulds of tinfoil or paper, into which the melted ingredients of the pessaries or suppositories were to be poured.

The Chairman thought this a cheap and easy method of accomplishing the object contemplated.

Mr. Mackay said he had tried several methods of forming suppositories, and thought that moulds made of pipe-clay were better than any others. The method he adopted was to provide a flat piece of pipe-clay, and to make holes in it of the required size and form, into which the melted materials were to be poured.

SPIRITUS AMMONIÆ AROMATICUS.

BY MR. JOHN T. MILLER.

It is stated in Pereira's 'Materia Medica' that the aromatic spirit of ammonia of the London Pharmacopœia "is a solution of the carbonate of ammonia."

Philips also describes it as containing the neutral carbonate, and remarks that "as this carbonate contains only two-thirds as much carbonic acid as that procured by the carbonate of lime, the greater pungency of spiritus ammoniæ aromaticus, than of liquor ammoniæ sesquicarbonatis, is readily accounted for."

Of the process and preparation of the British Pharmacopœia, Mr. Squire says, "This is a great improvement on the London process; it contains a larger quantity of carbonate of ammonia, and does not change in colour by keeping."

However, the determination of the ammonia and carbonic acid, in good specimens of the two preparations, throws a different light upon their composition. In a fluid ounce of each, the following quantities were found:—

	P. L.	B. P.
Ammonia (NH_3)	7·48 grains . . .	10·71 grains.
Carbonic acid .	6·38 ,, . . .	7·04 ,,

It appears, then, that the London preparation is not a solution of the carbonate of ammonia, but that it contains three equivalents of ammonia to two of carbonic acid; or say one equivalent of ammonia to every two equivalents of the neutral carbonate. This is a more cogent reason than the one assigned by Philips for its "greater pungency," etc. When a spirituous solution of the monocarbonate of ammonia is submitted to distillation, as in the process of the British Pharmacopœia, nearly one-half of the carbonic acid is expelled in the early part of the operation, and there are found in the distillate about two equivalents of ammonia to one of carbonic acid.

The aromatic spirit of ammonia of the Pharmacopœia contains, as the above figures show, nearly half as much more ammonia, but only a tenth as much more carbonic acid as the London preparation; and may be regarded as a solution of ammonia and neutral carbonate of ammonia, in equivalent proportions.

If the framers of the process were aware of the composition of the distillate, it seems to me that they chose a roundabout and unphilosophical mode of effecting their object.

A more direct one is the following:—

Take of Carbonate of Ammonia, four ounces.
Strong Solution of Ammonia, eight fluid ounces.
Volatile Oil of Nutmeg, four fluid drachms.
Distilled Oil of Lemon, six fluid drachms.
Rectified Spirit, six pints.
Distilled Water, eight and a half ounces.

Powder the carbonate of ammonia, introduce it into a bottle, add the water and solution of ammonia, and shake occasionally until solution is complete; then add the spirit and essential oils. At first a portion of the salt is precipitated, but it is redissolved in a few hours if the bottle be shaken now and then. The solution may be cleared by subsidence, or filtered through white blotting-paper, with care, to avoid loss of ammonia.

This differs from the preparation of the British Pharmacopœia, merely in having a slight tinge of colour, similar to that of spirit of nitrous ether. If, before adding the essential oils to the bulk of the solution, they be distilled with three or four ounces of it, and an ounce or two of water, that trifling difference will be prevented. I look upon this, however, as a needless refinement.

Lastly, there is an error in the Pharmacopœia touching the strength of the strong solution of ammonia, which seems to have escaped notice. That solution is to contain 32·5 per cent. of NH_3, to be of specific gravity 0·891, and to require for the neutralization of 1 fluid drachm 102 measures of the volumetric solution of oxalic acid. But if it had the specific gravity and saturating power stated, it would contain 35·5 per cent. of NH_3. The fluid drachm ought not to require more than 93 measures of the oxalic acid solution for neutralization.

Sheffield, October, 1866.

Professor Redwood said he could not in one respect agree with the author of the paper, and that was in recommending the omission of distillation. His experience was, that preparations of this character were greatly improved by distillation, especially where they contained essential oils, such as oil of lemons. This essential oil, as met with in commerce, although sometimes distilled, was generally an expressed oil, and in either case it resembled oil of turpentine in the readiness with which it became resinified. When submitted to distillation there was a considerable residue of a bitter substance left, which, if added to sal-volatile, would not improve its quality.

Mr. UMNEY agreed with what had just been stated. He had found that essence of lemon, even after it had been once distilled, underwent a similar change to that which occurred in oil of turpentine.

Dr. ATTFIELD thought that distillation was not only desirable in the case of sal-volatile but also in that of essence of lemon.

The CHAIRMAN said spirit of sal-volatile was extensively used, and was a remedy the qualities of which the public thought themselves capable of appreciating, and he thought it important in such a case that no means should be omitted by which it could be made to suit the public taste.

Mr. MACKAY's experience was strongly in favour of carrying out the process as ordered in the Pharmacopœia; in fact, he might say, that not an ounce would ever leave his establishment that was not distilled. He had had much experience in the different qualities of oil of lemons, and thought the best oil ought to be used for making sal-volatile. He thought the nose was the best criterion of quality.

ON THE CAUSE OF EXPLOSIONS IN LAMPS.

BY JOHN ATTFIELD, PH.D., F.C.S.,

DIRECTOR OF THE LABORATORY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

During the last two months I have been investigating the inflammable properties of mineral oils; at first, for the scientific interest the subject presented, then by desire of the Committee of the Petroleum Association of the City of London, and recently in elucidating the cause of an explosion of a lamp, at the house of a gentleman in the country, Thomas Smith, Esq., the Croft, Sudbury. I am now, consequently, in a position to state the immediate cause of explosions in lamps, to show how it is that oils having dangerous properties occur in trade, and to point to more than one means whereby the use of mineral oils for illuminating purposes may become as safe as that of the old, less valuable, vegetable oils.

The oil in a lamp passes up a wick by capillary attraction, comes in contact with the brasswork of the lamp in the long slit or channel which holds the wick, and finally burns at the top of the wick by help of a strong current of air. The flame heats the brasswork in its vicinity, the heat is conducted downward through the metal to the body of the lamp, and thence to the oil, which, after two or three hours, becomes considerably warmer than when the lamp was first lit. Now mineral oils, when sufficiently heated, emit vapours which form, with air, a dangerously explosive mixture. The point to which any specimen of mineral oil must be heated before it yields this mixture can be ascertained readily and with perfect safety by the method proposed in my last paper "On the Igniting-point of Petroleum," namely, by half-filling an ordinary chemist's test-tube, 6 in. long and $1\frac{1}{8}$ in. broad, warming, and well stirring with a naked thermometer until a small flame, frequently introduced into the upper part of the tube, occasions an explosive flash; the temperature indicated by the thermometer at this moment is the point of danger. Tested in this way, the oil from Sudbury afforded inflammable vapour at 83 degrees. But, curiously enough, the temperature of the bulk of the oil in the lamp that exploded never reached this point; for besides the greater part of the two gallons of oil, a portion of which was in the lamp at the time of explosion, the brasswork and fragments of the lamp had been forwarded to me, and I was thus enabled, after fitting on another glass body to experiment on what might be considered as the original lamp and original oil, and found by actual observations with thermometers, introduced through holes bored in the sides of the lamp, that the oil in the interior rose no higher than 78 degrees, even after five hours' burning in an unusually warm room. On applying a light, however, at this temperature, to an opening in the lamp, an explosion ensued. In short, it was found that even when the oil in the lower part of the body of the lamp was not warmer than 65 degrees, a mixture of vapour and air had formed in the upper part of the body and exploded on a flame being introduced. Here, then, was a sample of oil, a portion of which had been the source of an explosion under ordinary domestic circumstances, which emitted no inflammable vapour under 83 degrees, when tried outside the lamp, and yet which inside the lamp gave, at 60 to 70 degrees, such a mixture of vapour and air that, should it catch fire, would inevitably explode. The explanation of this state of things was obvious. The oil, though at 75, 65, or even colder, had, in its passage up the wick to pass through the heated brasswork, the temperature of the gateway of which, the temperature of that part presented to the interior of the lamp, must have been high enough to cause the evolution of vapour into the air in the upper part of the interior. This temperature was taken by appropriate means and found to be 108 degrees; in a smaller lamp it was 105, and in other experiments varied from 100 to 110 degrees during an evening. The cause of the explosion was thus perfectly clear. An oil giving inflammable vapour at 83 degrees, and not apparently heated beyond 60 to 70 degrees, had actually been exposed, in a most complete manner, to a temperature of 108 degrees, resulting in the formation of an explosive mixture, which accidentally ignited on turning down the wick. Every person who had used this oil in a paraffin lamp of the usual form had, so to speak, been burning his candle over a charge of gunpowder, and were it not that the chances of the explosive mixture becoming ignited were exceedingly small, as will be presently shown, many explosions, before that now recorded, must have attended the use of the oil. So, then, an oil giving inflammable vapour below 110 degrees, and burnt in a lamp of ordinary construction, yields, sooner or later, a gaseous mixture which, should it catch fire, will burst the lamp and scatter the oil, to the possible injury of property and danger to life. Practically, I have only obtained lamp-explosions with oils which give off vapour below 100 degrees, when examined in the test-tube in the manner above described. Unfortunately, fourteen out of every fifteen specimens of "crystal oil," "photogen," "American paraffin oil," and other varieties of petroleum now sold for illuminating purposes, generate the explosive mixture at temperatures much below 100 degrees, and hence are dangerous. The same remark does not apply to Young's paraffin oil, but there is reason to fear that this mineral oil is often diluted with dangerous American oils. Other home-made mineral oils also vary in explosibility.

The explanation of the occurrence of dangerous mineral oil in trade was fully traced out in my last paper; three sentences, therefore, will be sufficient on this head. Crude petroleum having been found to be inflammable at common temperatures, an Act was passed in 1862, forbidding, except by license, the storing of petroleum and its products near a dwelling-house or warehouse in larger quantities than forty gallons, unless proof was forthcoming that it gave off no "inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer." Unfortunately this was taken to mean, and probably did mean, that the petroleum itself should not ignite under 100 degrees when heated by a flame or a water-bath in an open saucer or small bowl,—a most fallacious test, first, because the time employed in the operation, the amount of stirring practised, the form of the vessel, its arrangement over the source of heat, the quantity of liquid used, and the distance of the test-flame from the surface of the petroleum, all influenced the result to the extent of causing two observations to vary from 4 to 40 degrees from each other; and, second, because the experiment thus performed invariably gave the igniting-point many degrees higher than the temperature at which inflammable vapour was evolved,—than the temperature, therefore, at which the oil was dangerous. Shippers, merchants, brokers, adopted this fallacious mode of testing; oil changed ownership under a warrant that it would not ignite under 100 degrees, not, however, without occasional litigation caused by the uncertainty of the test, and hence the market was and is supplied with oil which emits inflammable vapour in most cases below 90 and often below 80 degrees.

The remedy is plain. Let those who sell and those who buy discountenance the sale and use of those qualities of mineral oil which generate inflammable vapour at temperatures below 100 (better 110) degrees, when examined in a test-tube in the manner already indicated. Such tubes may be purchased for a few pence of any chemical apparatus maker, naked thermometers can be obtained at the same places, or these articles, together with an instrument for ascertaining the power of the oil to ascend a wick, a spirit lamp, test-flame jet, directions for use, etc., all enclosed in a neat pocket case under the name of the *Petroleometer*, are now kept in stock by Mr. Casella, Hatton Garden, London. Oils which stand this test may be considered safe, and such oils can be supplied by refiners as easily as unsafe ones,—it is only a matter of carrying the refining operation a little further. Indeed, safe oils are even now occasionally met with. At a shop in Drury Lane I purchased petroleum at 4*d*. and at 4½*d*. per pint; the former yielded inflammable vapour at 86 degrees, and gave me an explosion the first hour it was burnt in a lamp; the latter only emitted vapour at 114 degrees, and gave no explosive mixture in a lamp, even after seven hours' burning. The use of safe oils will be the chief means of avoiding explosions. But the lamps themselves are not altogether faultless. The air-hole which allows of air entering the lamp and taking the place of escaping oil is usually within about half an inch of the flame, it might very well be placed at some other part of the lamp; for it is this aperture which forms the touch-hole by which fire is conveyed from the flame to the explosive mixture within. Fortunately there is always a strong draught of air in the opposite direction, so that the chances are perhaps five hundred against, to one in favour of an accident, even though an explosive mixture be constantly in the reservoir. Were this not so, explosions with the petroleum now in commerce would be the rule rather than exception. Blowing down the chimney of a lamp neutralizes this current, and doubless increases the chances of the flame reaching what I have already termed the touch-hole. Then this channel of communication might be packed with wires after the principle of the oxyhydrogen safety-jet. Again, the portion of the brasswork facing the interior of the lamp should be covered with bone, glass, or some other material, having bad conducting powers for heat, so that the gateway, as I have before called it, through which all the oil has to pass in ascending from the reservoir to the flame shall be cool instead of hot. By these means, and especially by demanding that all mineral oils shall comply with the letter instead of what is said to be the spirit of the Petroleum Act of 1862, explosions in lamps will seldom or never be heard of.

A few words in conclusion. I have pointed out the cause and the remedy; with whom will begin the adoption of the means of prevention of these explosions? It is useless to say the refiner ought to do this; the refiner at New York and

Philadelphia satisfies the requirements of the shipper; the shipper sends whatever is wanted by the British merchant; the merchant imports according to the demands of the dealer; the dealer supplies the wants of the retailer; and the retailer finds ready sale for any mineral oil that will give a good light without smoke, and is cheap. Then the adoption of preventive measures scarcely lies with the public; for the consumer seldom knows anything about thermometers, petroleometers, igniting-points and exploding-points, and the only test I can suggest to him, by which to assure himself that a given specimen of oil is or is not dangerous, is to unscrew the brasswork after the lamp has been burning for an hour or two, and to introduce the flame of a lucifer or thin splint of wood into the reservoir of the lamp. A light blue flash of flame, visible within the aperture, and scarcely audible explosion will result if the mixture of air and vapour in the upper part of the reservoir is inflammable. Such an experiment is as harmless as that of lighting raisins soaked in brandy in the game of Christmas snapdragons. If the explosive mixture is met with, the oil is dangerous, as the ignition of the mixture may occur when the aperture is closed by the brasswork; in that case the resulting flame and expanded products of combustion, having no other vent, will escape by bursting the reservoir, and scattering the oil, to the risk of a conflagration if the oil catches light. If there is no explosive mixture in the reservoir the oil is safe, and will even extinguish the test-flame if the latter is plunged beneath the surface. Experiments of this sort would, of course result in a demand, which, passing on from mouth to mouth, would at last produce supply of safe oil from the refiner. But we must not expect such tests to be performed to a commensurate extent by the public. We must turn to the trade in this matter, and look to them to adopt this experiment, in its, to them, easier form of the test-tube and thermometer, already described, and to regard no refined oil as merchantable if it gives off inflammable vapour, or, in other words, if it affords an explosive mixture below 100 degrees Fahrenheit. But with which of the above-named classes of the trade will this reform begin? Who will find it to his interest to discard his old standard of 100 degrees as the temperature below which the oil itself shall not ignite, and adopt instead the higher standard just given? Perhaps the Committee of the Petroleum Association will bring about this reform, and thus ensure safety to the public? If the trade will not help the consumer, possibly the excise, the press, or Parliament will take the matter up? If neither comes to the rescue, we must put up with an occasional explosion and its attendant fright, fire, or loss of life, or else leave off burning these valuable oils altogether.

17, *Bloomsbury Square, London.*

ON THE MEDICINAL VALUE AND DOSES OF TINCTURA CONII FRUCTUS OF THE BRITISH PHARMACOPŒIA.

Mr. Hemingway said that he had attended that evening for the purpose of calling the attention of the meeting to a few facts in connection with the medicinal value of the tincture of conium fruits of the British Pharmacopœia. He had had a conversation with Dr. Harley, of King's College Hospital, who informed him that he had made several experiments with the view of ascertaining its medicinal value, and, not finding the results satisfactory with the tincture furnished to him at the hospital, he obtained a fresh supply from a chemist at the West End of London. The result obtained upon trial was equally unsatisfactory, and the impression left on Dr. Harley's mind was that tincture of conium fruits was useless as a remedial agent. He (Mr. Hemingway) was so taken by surprise by the facts communicated to him by Dr. Harley, that he requested Dr. Harley to continue his experiments with some tincture that he would prepare for him. For that purpose he obtained some fruits of conium from Covent Garden, and in order to guard against all possibility of doubt as to their quality and genuineness, he had given some of them to Professor Bentley, who, being present, could state the result of his examination. He had also made the tincture in the presence of Dr. Harley, with some fruits which were taken from the same sample forwarded to Professor Bentley. Dr. Harley had kindly, at his request, attended there that evening, and would now state to the meeting the results he had obtained.

Dr. HARLEY said, I have never been able to regard the *Conium maculatum* as being the poisonous plant it is commonly reputed to be, and am dissatisfied with the evidence from which the conclusions as to its venomous character are derived.

I have occasionally given a large dose (ʒij–ʒiij) of tincture of conium without effect, and last autumn, upon taking charge of Dr. Garrod's hospital patients, my interest in the matter was excited anew by finding that two of the patients were taking each ʒiv doses of the tincture of the fruit, prepared according to the British Pharmacopœia. On mentioning these facts to Mr. Hemingway, Pharmaceutical Chemist, of Portman Street, Portman Square, he kindly fell in with my views, and prepared me, under my own supervision, a quantity of the tincture of the fruit. I at once instituted experiments with it, selecting as the subjects, myself and a delicate woman who was ill and confined to bed from the effects of a large abscess in the loins. Beginning with ʒss doses and increasing the dose by ʒss or ʒj, we finished the supply of tincture,—the woman, by taking f ℥iss, and myself f ℥ij, which I drank in Mr. Hemingway's presence. No effects followed the exhibition of the drug on any occasion. (Dr. Harley touched upon other particulars, but as these are given in detail in another part of the present number it is unnecessary to mention them here.)

Dr. GARROD remarked that for several years he had from time to time made clinical observations on the effect of *Conium maculatum* upon the animal economy, and the result of such observations he would shortly lay before the Society. In the first place he would remark, that there was great evidence to show that the activity of the plant depended chiefly, if not entirely, upon the presence of a liquid alkaloid called conia, and that this was a powerful body is rendered evident by the fact of its poisonous action upon the lower animals, even when administered in minute quantities. This being premised, it is found that the alkaloid is contained in much larger quantities in the fruit of the plant than in leaves, and manufacturers of conia have always employed the fruit. In the the don Pharmacopœia the tincture is ordered to be prepared from the dry leaf, Lonin the proportion of 2½ oz. to the pint; in the British Pharmacopœia the same amount of the fruit (omitting the difference between avoirdupois and apothecaries' weight) is made use of, and, therefore, from the above considerations we should be led to infer that the tincture of the British Pharmacopœia is more potent than that of the old London Pharmacopœia. With regard to the relative proportions of conia in the leaf and in the fruit, it may be stated that Geiger obtained from 19 lbs. of the dried fruit about 1 fluid ounce of conia, whereas 100 lbs. of the leaves only yielded a drachm or so.

In reference to the clinical observations, Dr. Garrod remarked, that in a case of paraplegia, the details of which he had had an opportunity of referring to in one of his hospital case-books that day, he had administered at first 2 drms. of the London tincture three times each day without appreciable physiological effect; the dose was, after two days, increased to 3 drms., after another two days to 4 drms., and after another forty-eight hours to 5 drms., and yet no symptoms were manifested. On the subsequent administration of 6 drm. doses, slight symptoms occurred which led to the omission of the remedy, although it was somewhat questionable whether they depended on the drug. After about a fortnight's interval, the tincture of the fruit of the British Pharmacopœia was administered to the same patient in doses varying from 1 to 5 drms. three times each day. The last-mentioned quantity produced, after each dose, giddiness and a sensation of heaviness over the forehead; and when the tincture was increased to 6 drms., a sensation of mist before the eyes was also produced about twenty minutes after each dose. The remedy was therefore discontinued, and after an interval of several days the London tincture was again given, in doses varying from 6 drms. up to a fluid ounce, but even this last dose failed to produce the slightest symptom. The two tinctures have been used in several other cases, and it has usually been found that half-ounce doses of the British Pharmacopœia produce slight symptoms, whereas the same quantity of the London failed to induce such phenomena. The sensation of warmth, so frequently felt in the paralysed limbs when these large doses of the tinctures of hemlock are given, has been found by Dr. Garrod to depend simply upon the alcohol contained in them, and is equally produced by a like amount of tincture of cardamoms.

Dr. Garrod, in conclusion, stated that he fully agreed with Dr. John Harley, with regard to the weakness of the tincture of the British Pharmacopœia; but, at the same time, he considered the London Pharmacopœia tincture even weaker, and he thought that before any member of the Society came to the conclusion that the Pharmacopœia Committee had acted wrongly in substituting the fruit for the leaf of the hemlock, he should be in a position to show (which Dr. Harley had not done) that the leaf of the plant possessed more power than the fruit.

Professor Bentley said that the subject introduced by Mr. Hemingway was one of great interest, and it was most desirable that all instances should be recorded in which very large doses of medicines, commonly reputed to be of an active nature, had been administered without appreciable effect, and evidence given of every precaution having been taken to guard against any possibility of accident in their preparation. On the present occasion, every care appeared to have been taken. Mr. Hemingway had placed in his hands a portion of the fruits of conium used, and after examination, he (Professor Bentley) pronounced them to be a good average sample, containing but a very small portion of any foreign substances. Dr. Garrod had so fully gone into the subject of the activity of tincture of conium fruits, and had given the results of his experiments, that it would be unnecessary for him to go over these facts again. He must say, however, that he quite agreed with Dr. Garrod in thinking that Dr. Harley had under-estimated the activity of *Conium maculatum* and its preparations. Cases had been recorded in which their poisonous properties had been evidently exhibited. Chemical analysis clearly proved the much larger proportion of conia in the fruits than in the leaves, and hence the present tincture of the fruits was certainly more active than that of the London Pharmacopœia, which was prepared from the leaves. Professor Bentley thought, however, that the directions given in the Pharmacopœia might be more explicit. Thus, as chemical analysis had shown that the fruit contained the largest amount of conia just before arriving at maturity, it was desirable to direct the fruits to be gathered as nearly as possible at that time; and moreover, as there were grave doubts whether the fruits did not deteriorate by keeping, it would be desirable to use fruits of not more than a twelvemonth old.

The Chairman said that the meeting was very much indebted to the gentlemen who had taken part in the present interesting discussion; and he trusted that should Drs. Garrod and Harley try any further experiments, they would communicate the results at a future Pharmaceutical Meeting.

PHARMACEUTICAL MEETING, EDINBURGH.

A meeting of the Society was held in St. George's Hall, on Tuesday evening, 18th December; Mr. Kemp, President, in the chair.

After a few remarks by the Chairman, he introduced Dr. Scoresby-Jackson, F.R.C.P., and Lecturer on Materia Medica, who read the following communication:—

"Analytical Review of the Codex Medicamentarius or Pharmacopée Française;" by R. E. Scoresby-Jackson, M.D., F.R.S.E., Fellow of the Royal College of Physicians, Physician to the Royal Infirmary, Lecturer on Clinical Medicine and on Materia Medica, Edinburgh.

Mr. President and Gentlemen,—When I received your secretary's note, stating that the Council wished me to read a paper to the Society, I had before me the new edition of the 'Codex Medicamentarius' of France, studying it, as I think we ought to do all such works from whatever country they may come, with the view of enlarging, confirming, and modifying my knowledge of materia medica; and it occurred to me that it might be interesting to you to get a bird's-eye view of the volume before proceeding to study it more minutely. Now, in the examination of a work such as this, it seems to me that the best mode of procedure is to divide the labour into two parts, analytical and critical: that is, in the first place, to approach the subject with an impartial mind and with the determination to grasp it in its integrity, before we proceed to inquire to what extent it quadrates with our preconceived notions of the various matters of which it treats. In order to accomplish the first part of this process, we must adopt a plan directly opposed to that of the anatomist in his dissections. Instead of beginning at the surface, we must get at the skeleton at once; and having done this, we may next proceed to the consideration of the finer textures; and lastly, when we have made ourselves familiar with the work as a whole, we may try to improve it, or, in other words, we may pass to the second or critical review of the work. In a single address, and that of comparatively short duration, I can hope to do little more than to show you the skeleton; but since even in this elementary part of the work some portion may be more interesting than others, I shall endeavour to direct your attention to such of the bones of the skeleton as will be most likely to interest you, and perhaps I shall not be very far wrong if I fix upon the galenical preparations for this purpose. But in the first place a general survey. The 'French Pharmacopœia'—at least the copy of it which I have before me as I write—is a handsome, portly volume, royal octavo in size, and consisting of 831 pages. It is published with the sanction and by the direction of the Government, and is supposed to contain a reference to every medicinal preparation which the pharmaceutist is likely to be called upon to supply. It is a code of instruction imposed equally upon physicians and pharmaceutists, and professes to be at once the guide of the practitioner, and the security of the Government for the protection of the people. To this end, it is admitted that it must not be a stereotyped work, but one essentially progressive, brought up at definite intervals for complete revision, in order that it may be a faithful reflex of existing science. The first edition of the present Codex appeared in 1818, the second in 1837. In 1850, the Codex having by that time fallen to the rear of science, it was deemed necessary to grant a dispensation from its formulæ in order that medicines of more recent origin and others of more trustworthy preparation might be legally employed, and from that time such remedies as were recommended by the Academy of Medicine, and the formulæ for which had been sanctioned by the Minister of Agriculture and Commerce, were admitted either to rank with or to supersede those of the Codex. But in 1861 the Codex was so far out of date, that its revision became imperative; an application to that effect was made to the Emperor, who signified his approval at Fontainebleau on the 20th of June of that year, and by subsequent ministerial decrees, a commission charged with the undertaking was appointed. The Commission consisted of eighteen members, sixteen of whom were selected for their knowledge of medicine and pharmacy. Their names, a sufficient guarantee for the excellence of the work, are MM. Dumas (President), Rayer, Bouchardat, Grisolle, Regnault, Tardieu, Wurtz, Bussy, Chatin, Guibourt, Le Canu, Buignet, Gobley, Mayet, Mialhe, and Schaeuffele, with whom were associated MM. Petit and Mourier, of the first and second division of the Department of Public Instruction. The work of that Commission, published in July of the present year, is what we have now to examine.

The volume sets out with a preface of twenty-six pages. The scope of the work is limited by the definition of the word *médicament*—a name, it is said, which is applied to every substance introduced into the economy in the treatment of disease. A distinction, however, is made between a *medicine* and a *remedy*, the latter word being understood not only to include the former, but also to extend to whatever is capable of combating the disorder, improving the condition of the patient, and effecting a cure; thus, blood-letting, electricity, *hydrothérapie*, and regimen are mentioned as examples of remedies, whilst tartar emetic, sulphate of quinia, and chloroform are named as belonging to that class of medicines of which alone the Codex professes to treat. The commissioners, whilst admitting the perfect freedom of the physician to prescribe and the pharmaceutist to dispense whatever it may be deemed expedient to employ in the treatment of disease, and to call all such substances medicines, nevertheless have thought it right to withhold the sanction and authority of the Codex from all substances which though formerly esteemed have by maturer judgment been discarded, as well as from others which have only or chiefly the personal interest of the inventor or manufacturer to recommend them; in other words, they profess to have purged the old Codex of its bygone substances, both simple and compound, and to have accepted only such new ones as bear the impress of serious investigation. They admit, moreover, that the Codex of to-day will in its turn become old and threadbare, and that it will fall to the lot of another generation to restore it to a fitting place amongst the practical results of progressive experimental science. The commissioners foresee that medicines of simple character and recognized physiological effect will tend to displace the complex masses of traditional authority; that instead of burying opium in the midst of Theriaca, that drug will itself undergo a still finer subdivision into active principles, each of which will be found to subserve some distinct therapeutical purposes. And what then? Will Materia Medica be rendered so simple and exact that there will be no longer any necessity for pharmacopœias, for dispensatories, for the Pharmaceutical Chemist himself? Will the time not arrive when a mere medicine-vendor will replace the educated pharmaceutist, when the practical chemist will supply substances so neatly and accurately prepared that the dispenser of them can no longer pretend to scientific merit or professional status? No, the commissioners say, this will not be so: for, we perceive, day by day, how in proportion as these energetic medicines increase in number, in purity, in concentration, in power, it becomes more essential that the pharmaceutist, charged with their preparation, their preservation, their manipulation, their posology, be well-informed, careful and trustworthy. Intelligence must keep pace with increasing responsibility. The pharmaceutist requires increasing breadth and depth of instruction, in proportion as the progress of therapeutics places at his disposal medicines more numerous, more powerful, more changeable, more readily sophisticated; respecting which the most trifling mistakes threaten the life of the patient, the slightest modifications of which blight the physician's hope. "When," the Commission adds, "this conviction is pervading England herself, enlightened by mistakes which are multiplying under her eyes, and the infinite evils which they entail, it is not the moment which France, where it has ever been entertained, should choose to abandon it."

Animated by views such as these, the Commission set themselves to the work of revising the Codex, upon the following plan:—

The *Codex Medicamentarius* consists of three parts: preliminary matters, Materia Medica, and Pharmacopœia.

The preliminary part is contained in twenty-nine pages, and refers chiefly to weights and measures, densities, fusion-points, boiling-points, relative solubility of substances in comn on u:e, and the chemical equivalents of the elementary bodies. In this part there are a good many tables, both absolute and comparative. The second part, comprising the Materia Medica, is contained in ninety pages, and is divided into two parts:—(*a*) Substances obtained immediately from vegetables or animals; (*b*) Substances obtained from minerals and chemical products. Animals, their parts and products, of medicinal use, are dismissed with the brief statement that they are few in number, are all supplied by commerce, and are to be selected according to the excellence of their respective qualities. Vegetables, their parts and products, on the contrary, furnish nearly the whole of the organic Materia Medica, and a caution is added that whilst those which are procured in the way of commerce must be selected carefully, others of indigenous production are to be collected under those conditions of age, season, and development, in which they afford in the highest degree their desirable properties. A summary of such conditions occupies a few pages.

The substances derived from animals and vegetables, arranged in alphabetical order, together number more than five hundred, but of these about two hundred only are distinguished by an asterisk, indicating that they ought to be kept in stock by every pharmaceutical chemist. Comparatively few of these substances are accompanied by any description,—usually merely the name of the plant, and the part employed is given; but in some instances their principal characters are mentioned. The substances derived from minerals and chemical products, also arranged in alphabetical order, number from seventy to eighty, of which thirty-one are marked with an asterisk; with each substance in this part are usually given its principal characters and the tests for its purity.

The third part—comprising the Pharmacopœia—is contained in 561 pages, and is subdivided in the following manner:—In the first place, into two large classes, the one constituted of the simple medicines furnished by chemistry, the other of compound medicines prepared by the mixture of various substances; in other words, into chemicals and galenicals as they are commonly styled in this country. In the next place, into seventy-five chapters, occupied as follows:—Elementary substances, acids, oxides, alkalies, ammonia, chlorides, bromides, iodides, cyanides, sulphides, and mineral salts, in the first fourteen chapters; vegetable acids and alkaloids, salts of the vegetable acids, salts of vegetable bases, soaps, alcohol and its derivatives, neutral vegetable principles, and pyrogenic products form a second group of eight chapters; factitious mineral waters have a chapter to themselves; then follow fifty-one chapters devoted to the following subjects: Simple powders, pulps, vegetable juices, oils and fats; ptisans, apozems. broths, emulsions, mucilages, and mixtures; alcoholic tinctures, *alcoolateurs*, ethereal tinctures, medicated wines and vinegars, medicated beers, and oils; distilled waters, volatile oils, and spirits; extracts, resins, and gum-resins; simple and compound syrups, honeys and oxymels, conserves and chocolates, electuaries, confections, and opiates, jellies, pastes, *oleo-saccharures*, *saccharures;* lozenges and pastilles; species and compound powders; pill masses, pills and granules, and capsules; cerates, pomades, ointments, plasters, *sparadraps*, and *papiers emplastiques;* suppositories and prepared sponges; cataplasms, fomentations, lotions, injections, collutoria, gargles, and medicated baths; collyria, glycerates, liniments, escharotics, and fumigations,

The seventy-fifth and last chapter is devoted to a collection of foreign formulæ, such as are not likely to be prescribed by French physicians, but which, the Commission bearing in mind the present rapidity and facilities of travelling, the *pharmacien* may occasionally be called upon to dispense for a foreigner. In looking through this chapter, I find that the selection made from the British Pharmacopœia consists of the following:—

Decoctum Sarsæ Compositum
Extractum Colocynthidis Compositum
Hydrargyrum cum Creta
Infusum Gentianæ Compositum
Infusum Sennæ Compositum
Linimentum Camphoræ
Linimentum Camphoræ Compositum
Linimentum Chloroformi
Linimentum Saponis
Liquor Sodæ Arseniatus
Mistura Cretæ
Pilula Aloes et Myrrhæ
Pilula Rhei Composita
Pilula Calomelanos Composita
Pilula Plumbi cum Opio
Pilula Rhei Composita
Pilula Scillæ Composita
Pulvis Aromaticus
Pulvis Cretæ Aromaticus
Pulvis Cretæ Aromaticus cum Opio
Pulvis Ipecacuanhæ cum Opio
Pulvis Scammonii Compositus
Tinctura Aurantii
Tinctura Calumbæ
Tinctura Cardamomi Composita
Tinctura Cinchonæ Composita
Tinctura Cinchonæ Flavæ
Tinctura Gentianæ Composita
Tinctura Hyoscyami
Tinctura Krameriæ
Tinctura Lavandulæ Composita
Tinctura Opii
Tinctura Rhei Composita
Tinctura Scillæ
Tinctura Sennæ Composita
Vinum Antimoniale, and
Vinum Ipecacuanhæ.

Then, lastly, twenty-pages are appended, containing extracts of the laws and regulations affecting the practice of pharmacy, and the book closes with two copious indices, the one in Latin, "Index Alphabeticus," the other in French, "Table Alphabétique."

Such, then, is the framework of the 'Codex Medicamentarius,' and it is obvious that we can make but little further progress in our examination of it to-night. What I first proposed was to dip into one part of it, that, namely, which is devoted to the galenical preparations; but even that is too extensive, and perhaps, therefore, I shall be more likely to engage your attention, and to awaken the minds of the younger members of the Society to new lines of thought if I confine my remaining observations to the consideration of such of the galenical preparations as are not common to this country, concluding with a hasty review of the laws which govern the practice of pharmacy in France.

Pulps.—In addition to the ordinary pulps for internal use,—three of which are officinal, namely, those of cassia, tamarinds, and prunes,—the Codex has others which, analogous in some respects to our poultices, are for external application. Formulæ are given for hemlock, carrot, potato, and garlic pulps for external use. *Cataplasmata* constitute a distinct class.

Tisanes.—Ptisans are drinks consisting of water but slightly medicated. They are prepared, according to the nature of the substance to be operated upon, either by solution, maceration, digestion, or decoction, and are sweetened with liquorice root, honey, sugar, or syrup. They are extensively used in France, and are of endless variety. They are usually prepared only on demand, as they do not keep well. They are taken by the glass or cupful, and either hot or cold, according to the desired effect. The Codex has no less than seventy-one formulæ for ptisans. Barley-water and linseed-tea are our chief examples of ptisans, but some of the mild vegetable infusions may also rank in the same class.

Bouillons are light broths made with the flesh of animals, with or without the addition of herbs. In this country the preparation of beef-tea, chicken-broth, and the like is left to the domestic culinary department, but there is doubtless much wisdom in publishing authoritative formulæ for them. The want of uniformity of strength and other characters of the sick-room diet of this country is much to be regretted. The Codex has formulæ for several broths, such as veal, chicken, frog, turtle, and snail. Perhaps *snail-broth* may sound rather oddly in the ears of some of the younger members, but no doubt it has some commendable qualities. Should any member wish to try it, here is the formula for its preparation :—

"Flesh of the Vine Snail	120 grammes (1853 grains).
Water	1000 grammes (15,438 grains).
Canadian Maidenhair	5 grammes (77·2 grains).

Throw the snails into boiling water, and allow them to remain there until they can be easily drawn from their shells. Remove the entrails; wash the flesh in a little tepid water, and weigh it. Cut it into pieces, and cook it by means of a water bath for two hours in a covered vessel with the prescribed quantity of water. Add the maidenhair; infuse for a quarter of an hour, and strain."

The Vine Snail (=Escargot des Vignes=Limaçon des Vignes=*Helix pomatia*, Linn.) is the well-known edible snail, met with abundantly in the gardens and vineyards of some parts of France. By many persons it is esteemed as a delicacy. In the south of France other species of the *Helices* are frequently used, such as *H. aspera* and *H. vermiculata*. Canadian Maidenhair is *Adiantum pedatum*, another species of the same genus being *A. Capillus-Veneris*, or Montpellier Maidenhair.

Alcoholic Tinctures (Alcoolés).—These tinctures are prepared by one of three processes—solution, maceration, or displacement. Alcohol of three strengths is used, according to the nature of the substances to be operated upon, namely, of the respective densities, ·8956, ·8483, and ·8228. The tinctures are arranged in two classes, simple and compound; of the latter, one or two are exceedingly complex. Take, for example, the compound tincture of aloes (*Elixir de Longue Vie*), which consists, in the first place, of eight ingredients; but as one of these ingredients is itself compounded of fifty-nine constituents, the life-prolonging elixir is, in reality, a compound of not less than sixty-six substances. Or, again, take the Vulnerary Tincture, which is composed of nineteen ingredients—namely, fresh leaves of absinth, angelica, basil, calamint, fennel, hyssop, sweet marjoram, balm, peppermint, common marjoram, rosemary, rue, savory, sage, wild thyme, and common thyme; flowering tops of perforated St. John's wort, and lavender, and, finally, alcohol. This does not look like hastening to simplicity; the most composite tincture of the British Pharmacopœia consists only of six ingredients, including the vehicle, and of the remaining fifty-five, twelve only contain more than one substance, and these seldom more than two or three. The most composite preparation of the British Pharmacopœia is compound decoction of aloes, which consists of eleven ingredients, including the constituents of the compound tincture of cardamoms.

This is professedly an analytical, not a critical review of the Codex; but, even in going through it for the first time, these huge accumulations of medicines force themselves into notice. Another example of this polypharmacy is seen in the *Baume Tranquille*, which is placed amongst medicated oils. It consists of nineteen ingredients,—namely, the fresh leaves of belladonna, hyoscyamus, *Solanum nigrum*, tobacco, white poppy, and stramonium; dried leaves of balsamita, rosemary, rue, and sage; dried tops of absinthium, hyssop, marjoram, peppermint, perforated St. John's wort, and thyme; flowers of lavender and elder, and olive oil. I was curious enough to turn up one or two French authorities, to find out the estimation in which this soothing compound is held therapeutically; and perhaps the keenest criticism that it could be subjected to lies in the commentary upon it by Bouchardat—himself one of the compilers of the Codex. He says that "it is frequently employed for the purpose of calmative friction;" but, he adds, "I prefer a solution of atropine in chloroform,"—certainly a wonderful simplification. That we may run to an opposite extreme, however, and one that might be equally regretted, is quite true; some compound medicines are, doubtless, of great value, but many of the formulæ of the Codex are still rather ponderous. Take another example from the "Species," the *Espèces Vulnéraires*, or Swiss tea, *Thea Helvetica;* it consists of the leaves and tops of seventeen plants (chiefly labiates), and the flowers of three more,—in all twenty ingredients, exclusive of the vehicle. Like its namesake, the tincture, it belongs to the class of carminatives and moderate stimulants.

But the chief offender in this respect is the old *Theriaca*, which still retains its place in the Codex, in the midst of the chapter on Electuaries, Confections, and Opiates. If the claims of ancestry have any weight in the preservation of a place in the Codex, then Theriaca is justly retained, for it belongs to an old family, of which Mithridatium, Dioscordium, Philonium, Orvietanum, and Requies Nicolai, amongst others, are long-forgotten members. Perhaps I should except Dioscordium from the list of relicts, as it still occupies, in a modified form, a place in the Codex. Not only amongst the ancients, however, from whom these formulæ have had their traditional descent, but even in modern Europe have such modes of polypharmacy had their origin, for some of Huxham's prescriptions may still be seen which contain above a hundred ingredients. I should be truly sorry by a single word to hasten the departure of any valuable medicine, however composite or nauseous it may be, and still more so to bring about that highly objectionable state of matters anticipated by Sir Alexander Crichton, "when modern pharmacopœias are shorn so much of old and approved receipts, on account of their being extraordinary compounds, as to be almost useless in some cases." On the contrary, let me try to preserve the ancient remedy by giving it once more a local habitation and a name in English literature. Let me say, before reproducing the formula, however, that I doubt whether this is the real theriaca, as at first prescribed by Andromachus, Nero's physician. I have seen several formulæ for its preparation, differing widely in the number of their ingredients. According to Spielmann, that which was left by Galen consisted of sixty-five ingredients; another, I know, consists of not less than seventy-two. Formerly the preparation of theriaca was confined to Venice, a monopoly from whence all Europe was supplied; but now it may be prepared by any pharmaceutist, unless, perhaps, at Madrid, where not many years ago the College of Physicians in full conclave alone was allowed to make it. Should any of our young friends here this evening wish to try his hand at it, let him begin with the formula of the Codex, namely:—

	Grammes.		Grammes.
Root of Ginger	60	Root of Gentian	20
„ Florentine Iris	60	„ Meum athamanticum	20
„ Officinal Valerian	60	„ Aristolochia Clematitis	10
„ Celtic Valerian	20	„ Asarabacca	10
„ Sweet Sedge	36	Aloes Wood	10
„ Potentilla reptans	30	Cinnamon	100
„ Rhapontic Rhubarb	30	Dried Squill Scales	60

	Grammes.		Grammes.
Lemon Grass	30	Fruit of Athamanta Cretensis	01
Origanum Dictamnus	30	Seeds of Tares	200
Dried Laurel Leaves	30	„ Wild Turnips	60
Tops of Water Germander	60	„ Malabar Cardamoms	80
„ Calamint	30	Polyporus officinalis	60
„ White Horehound	30	Smyrna Opium	120
„ Germander (spec. var.)	30	Liquorice Juice	60
„ Wall-Germander	20	Catechu	40
„ Teucrium Chamæpitys	20	Gum Arabic	20
„ Perforated St. John's Wort	20	Myrrh	40
„ Common Centaury	10	Olibanum	30
Red Rose Petals	60	Sagapenum	20
Lavandula Stœchas	30	Galbanum	10
Dried Lemon Peel	30	Opopanax	10
Fruit of Long Pepper	120	Benzoin in Tears	20
„ Black Pepper	60	Dried Vipers	60
„ Common Parsley	30	Castor	10
„ Ptychotis fœniculifolia	20	Dried Bread-crumbs	60
„ Anise	20	Terra Sigillata	29
„ Fennel	20	Dried Sulphate of Iron	20
„ Hartwort of Marseilles	20	Asphaltum	10

Pound these substances together, and sift them, so as to obtain a fine powder, with the least possible residue. This powder is known as *Theriacal Powder*. Then take of—

Theriacal Powder	grammes	1000
Chian Turpentine	„	50
Narbonne Honey	„	3500
Malaga Wine	„	250

Put the Chian turpentine into a pan, and liquefy it by a gentle heat, add to it as much of the theriacal powder as will mix with it. Melt the honey, and whilst hot pour it by degrees into the pan to dilute the first mixture. Add, gradually, the rest of the powder and the Malaga wine, which should bring the mass to the consistence of a softish paste. When the mixture has been rendered quite homogeneous, preserve it in an earthen vessel. At the expiration of a few months empty the theriaca into a mortar, and pound it again so as to mix it thoroughly. Four grammes of theriaca contain about 0·05 of a gramme of crude opium, equal to 0·025 of a gramme of extract of opium.

Such is the formula of the Codex for Theriaca, a medicine which has passed through every degree of laudation and contumely; by some esteemed as a panacea for every ailment; by others denounced as the trashiest farrago. Borden used to say of it, that it succeeded in a thousand opposite cases, because it had a thousand aspects favourable to health, uniting every possible relish for every sort of stomach. On turning up recent authorities, I find that Trousseau and Pidoux, whilst admitting that its virtues have been exaggerated, still feel bound to state that, with such pharmaceutical compounds as *Theriaca* and *Dioscordium*, cures can occasionally be effected when opium alone has failed. According to these most esteemed authorities, theriaca is particularly indicated in certain malignant forms of fever, in confluent small-pox, in measles, when serious complications, whether of the head or chest, ensue upon the disappearance of the eruption; or, on the other hand, when, at the outset of the eruption, a profuse diarrhœa so weakens the patient as to prevent the due elimination of the morbific principle. Again, theriaca is preferable to opium in gastralgias and enteralgias, especially when these are complicated with chlorosis; for it establishes a tolerance of ferruginous preparations, and completes the cure which iron alone could not effect.

One feels sorely tempted to compare the above formula with the Shakspearian mixture decocted by the weird sisters—

"Fillet of a fenny snake,
In the cauldron boil and bake," etc.

That any rational explanation can be given of the physiological or therapeutical action of theriaca seems to be out of the question; but that may be said of many a simpler medicine. Perhaps there may be some principle involved in it, however, not unlike that which guided the physician whose prescriptions were very composite, the idea being, as he said, that failing all the rest, one chance at least might hit the mark and cure the disease. Or there may be some classified antagonistic action produced, possibly somewhat on the principle mentioned by Dr. Paris, in his story of the practitioner who administered three draughts to a lady—one to warm her, the second to cool her, and the third to moderate the too violent effects of either! But to return from this digression.

Alcoolatures.—This name is applied to alcoholic tinctures made with recent plants, especially those containing energetic principles which would be injured by drying. The tinctures of aconite, belladonna, digitalis, hyoscyamus, and others enter into this group. There is also another class of tinctures (*Ethéroles*) in which ether is used as the solvent, several of the substances already mentioned being repeated in this form; thus there are ethereal tinctures of digitalis, belladonna, conium, hyoscyamus, valerian, assafœtida, balsam of tolu, castor, ambergris, musk, camphor, mastic, and cantharides.

Medicated Beers.—These are preparations in which beer is used as the solvent; they are chiefly prepared from magistral formulæ, and in small quantities, as they are exceedingly prone to change. The Codex gives only one officinal formula, for what is called *Antiscorbutic Beer;* it consists of the leaves of *Cochlearia officinalis*, the root of *Cochlearia Armoracia*, and dried fir-tops, macerated for four days in fresh beer, then expressed and filtered.

Extracts.—The extracts of the Codex are divided into five classes, namely—1. Those made with the juice of fruits; 2. Those prepared with the juices of entire plants, or portions of them; 3. Aqueous extracts; 4. Alcoholic extracts; 5. Ethereal extracts.

Syrups.—The Codex is remarkably rich in syrups, having no less than one hundred and fifteen, of which, however, only forty-seven bear the asterisk of importance.

Chocolates—Are medicines of the nature of conserves, having a mixture of cacao and sugar for a basis: there are several formulæ for their preparation, as for simple chocolate, chocolate with vanilla, chocolate with Iceland moss, chocolate with salep (also with arrowroot, tapioca, and other feculæ), and chocolate with iron-filings.

Gelées.—The jellies of the Codex are of two kinds, medicinal and alimentary; they owe their consistence either to animal gelatine, or to a variety of vegetable principles, such as pectine, feculæ, etc. The formulæ of the Codex are for hartshorn, Iceland moss, Iceland moss and quinine, Carragheen, and Corsican-moss jellies.

Pâtes.—The pastes of the Codex are substances of firm but plastic consistency, and which, though soft, do not stick to the fingers. They consist essentially of sugar and gum, dissolved either in simple or aromatic water, or in water containing medicinal principles. There are two varieties of *pâtes*, transparent and opaque, the difference arising in the mode of preparation. The transparent kind is prepared without agitation, it is run into moulds, and reduced to a suitable consistence by a gentle stove-heat evaporation. The opaque kind is kept on the fire, and constantly stirred, until it is sufficiently thickened; its opacity is due either to the action of the atmosphere, caused by the stirring, or to the presence of white of egg. Both varieties may be covered with a layer of crystallized sugar, which preserves them for a long time; they are then known as *pâtes au candi*. These preparations resemble our jujubes, and are not to be confounded with another kind of *pâtes*, which are caustic, such as those of arsenic, phosphorus, etc. The officinal *pâtes* are termed respectively gum arabic, jujubes, pectoral, lichen (Iceland moss), and two of liquorice, brown and black.

Oléo-saccharures are mixtures or compounds of essential oils with sugar. They are made in one of two ways, either by simply saturating the oil with the sugar in a mortar, or by rubbing lump-sugar upon the rind of the fruit which contains the oil, and then powdering it in a mortar. *Oléo-saccharures* are kept in the form of powders, but should be miscible with water, so that they may be added to powders, mixtures, or other preparations. Anise, lemon, bergamot, and orange are the officinal *oléo-saccharures.*

Saccharures are pulverulent substances, consisting of sugar and certain medicinal principles, derived from vegetable juices. The officinal *saccharures* are those of Iceland moss and Carragheen.

Tablettes et Pastilles are solid substances, consisting of sugar and one or more medicinal principles. The name *tablette* (*i. e.* lozenge) is generally applied to those which have as their basis finely-powdered sugar, made into a paste by the aid of mucilage;

whilst the name *pastille* is reserved for those which are made with granular sugar and water, by the aid of heat. The mucilage employed in the preparation of *tablettes* is almost always made with tragacanth, and is carefully prepared so as to be of uniform consistence. The officinal *tablettes* are tolu, bicarbonate of soda, catechu, calomel, charcoal, chlorate of potash, burnt sponge, ferruginous, gum arabic, althæa, ipecacuanha, kermes mineral, Iceland moss, magnesia, magnesia and catechu, manna, peppermint, santonin, sulphur, bismuth. The only officinal *pastille* is that of peppermint; but the bicarbonate of soda *tablette* is also known as the *Pastille de Vichy ou de D'Arcet*, and the peppermint *tablette* is also known as *Pastille de Menthe Anglaise*.

Amongst the compound powders, a formula is given for *Poudre de Dower*, or *Pulvis Doweri* (as the French alphabet does not contain a *w*, the authorities seem to have taken unnecessary trouble in borrowing one for this occasion). The formula given for this powder (also called *Poudre d'Ipécacuanha Opiacée*) is as follows:—

Powder of Nitrate of Potash, forty grammes (617·52 grains).
" " Sulphate of Potash, forty grammes (ditto).
" " Ipecacuanha, ten grammes (154·38 grains).
" " Liquorice, ten grammes (ditto).
Extract of Opium, powdered and dried, ten grammes (ditto).

Dry all these powders completely, and mix them with the greatest care. One gramme (15·438 grains) of this powder contains 0·09 gr. (9 centigrammes = 1·3887 grains) of dry extract of opium. Custom has consecrated this formula in France, although it includes extract of opium instead of crude opium, and the powder possesses about twice the activity of that of the English formula.

Amongst the pills, a formula is given for *Pilules Écossaises ou d'Anderson* (= *Pilules d'Anderson* = *Pilules d'Aloès et de Gomme-Gutte*), namely, of powdered Barbadoes aloes 20 parts; of powdered gamboge 20 parts; volatile oil of anise 1 part; of Narbonne honey 10 parts.

Pommades and ointments, which we separated into distinct classes, differ chiefly in this, that *pommades* never contain resinous substances, whilst ointments do not contain metallic medicines; otherwise they are almost identical.

Sparadraps are plasters, composed of a variety of substances, spread upon cotton, silk, or paper. The word is applied to such preparations as sticking-plaster, court-plaster, blistering tissues, etc., such as are kept in readiness, and are thus distinguished from the ordinary class of medicinal plasters, termed *emplâtres*, which are made to order.

Cacao Butter, I may note in passing, is employed as the basis of the officinal suppositories; it is generally considered to be better than wax.

Medicated Baths.—These baths are susceptible of great variation,—saline solutions, acids, alkalies, sulphurated or iodized. Gelatine or vegetable infusions are also sometimes added. The quantity of water prescribed by the Codex for a complete bath is from 250 to 300 litres (55 to 66 gallons). Baths which contain metallic, sulphurated, iodized, or other preparations capable of acting upon the lining of ordinary baths, are directed to be prepared in baths of wood or zinc. The officinal medicated baths are:—The *alkaline bath*, made with carbonate of soda (250 grammes); *artificial Vichy bath*, made with bicarbonate of soda (500 grammes); *Plombières bath*, made with carbonate of soda (100 grammes), chloride of sodium (20), sulphate of soda (60), bicarbonate of soda (20), gelatine (100); *artificial Baréges bath*, made with crystallized protosulphuret of sodium (60 grammes), dry chloride of sodium (60), dried carbonate of soda (30); *sulphurous bath*, made with solid tersulphuret of potassium (100 grammes); *liquid sulphur bath*, made with solid tersulphuret of potassium (100 grammes), water (200 grammes); in the former case the sulphuret is put into the bath solid, in the latter in a state of solution; *sulphuro-gelatinous bath*, made with solid sulphuret of potassium (100 grammes), gelatine (250); *iodurated bath*, made with iodine (10 grammes), iodide of potassium (20), water (250); these ingredients are to be added to the usual quantity of water in a wooden bath; *corrosive sublimate bath*, made with corrosive sublimate (20 grammes), alcohol of the density ·8228 (50), distilled water (200); *salt-water bath*, made with sea-salt (5000 grammes): "if," says the Codex, "you would approach as nearly as possible to a sea-water bath, you will employ the residue of the evaporation of 250 litres of sea-water, adding it to an ordinary fresh-water bath;" *gelatinous bath*, made with gelatine (500 grammes); *aromatic bath*, made with aromatic spices (500 grammes), boiling water

(10 litres); *lime-tree bath*, and other baths made with leaves or flowers, prepared in the same manner as the aromatic bath. Besides the foregoing there are two officinal pediluvia, one of hydrochloric acid, the other of mustard. These officinal formulæ for baths are intended to guide the druggist; he is to supply, in a suitable bottle, the quantities sufficient for a bath; in two instances, directions are especially given to prevent accident, one in the case of the liquid sulphurous bath, for which the directions are, "Dissolve and filter: enclose this solution in a bottle of peculiar form, in order to avoid mistakes;" the other in the case of the corrosive sublimate bath, the directions for which are, "Dissolve, and enclose the liquid in a bottle, which you will label in a very distinct manner '*Solution for Bath.*'"

Glycérés is the name applied to a class of medicines which have either glycerine or glycerated starch as their basis. The formula for glycerate of starch is as follows:—Powdered starch (10 grammes); glycerine (150 grammes); mix the substances, heat them gently in a porcelain capsule, with constant stirring, until the mass becomes gelatinous.

With glycerine or glycerate of starch as their basis, there are the following officinal preparations:—Glycerates of iodide of potassium, iodurated iodide of potassium, tar, sulphur, extract of belladonna, and tannin.

Escharotiques are described as substances which, taking the title of *Cathérétiques* when of milder action, are employed to cauterize the skin, or to destroy fungous growths of wounds or ulcers, for the purpose of converting them into an eschar, which is detached more or less promptly. Red oxide of mercury, arsenious acid, mineral acid, caustic alkalies, chlorides of antimony, mercury, zinc, concentrated solution of iodine, and other substances, as different in their nature as in their action, are employed as escharotics or catheretics. These are the formulæ given for this class of preparations, two of which are entitled *Trochisci*, but it is to be remembered they are for external use.

Fumigations.—With this class are combined odoriferous pastilles. The following description is given of the class:—Fumigations consist in the expansion of a gas or vapour, which is either dispersed through the atmosphere or directed to a particular part of the body. All substances which are susceptible of volatilization, or which by their decomposition give rise to elastic fluids, may be employed as the basis of fumigations. Water or alcohol, either pure or charged with aromatic principles, ether and ethereal solutions, sugar, juniper-berries, resins, amber, chlorine, iodine, sulphur, sulphurous acid, hypochlorite of lime, and red sulphuret of mercury are the substances in most common use for mechanical fumigation. Certain fumigations are intended to operate upon the atmosphere, and not upon the body. Sometimes they serve to mask offensive odours, for which purpose any of the volatilizable substances which afford agreeable perfumes may be employed. Sometimes their object is, by a chemical decomposition, to attack and destroy deleterious miasmata, which we suppose to be floating in the atmosphere. The acids and chlorine are more commonly employed for hygienic fumigations. Formulæ are given for the following preparations:—Odoriferous fumigating pastilles, fumigatory or antiasthmatic paper (containing nitrate of potash, belladonna, stramonium, digitalis, *Lobelia inflata*, *Œnanthe Phellandrium*, myrrh, and olibanum), nitre-paper, arsenical-paper, and cigarettes of belladonna, digitalis, hyoscyamus, tobacco, and stramonium.

The last Chapter (LXXV.) is devoted to formulæ extracted from the principal foreign Pharmacopœias. I have already mentioned those taken from the British Pharmacopœia; others are collected from the Pharmacopœias of Austria, Baden, Bavaria, Belgium, Denmark, Germany (Magdeburgi), Hamburg, Hanover, Norway, Saxony, and Würtemberg. The appendix of the Codex contains extracts from the laws and regulations which govern the practice of pharmacy in France. Time will scarcely permit me to do more than merely dip into this part of the work, but, in the prospect of legislation in this country, it may not be uninteresting to the Society to get even a slight insight into the position of the *pharmacien*. I am not quite sure that you will entirely approve of the paternal interest manifested by the Imperial Government for the welfare of its people; some of the regulations you will doubtless concur in, others may perhaps seem to affect the liberty of the subject more than you would desire. But this you will, I think, admit, that—whether in consequence of these laws, or in spite of them, I do not pretend to say—pharmacy holds a very honourable position in France, and that some of the most prominent scientific men of that country have emanated from its schools. Besides, it is to be remembered that laws and regulations which look severe upon paper, and sound harshly when their technical verbiage is grated upon the ears of those whom they are to affect, are not necessarily of a character to be practically intolerable. Laws are to be viewed in two aspects, in their spirit and in their letter. There are, perhaps, few laws which could not be made actually cruel, if rigidly and offensively enforced, by persons constantly and repulsively seeking an occasion; but the object of all good government is not to annoy the good, but to terrify the bad, and it is more than possible that what, in the letter of the French regulations, may seem to be a little stringent, and to savour somewhat of bureaucracy, may in the spirit of their administration be very inoffensive. Moreover, a form of legislation which is quite in accordance with the habits of one country may not be adapted to the people of another, so that what may appear to you to be unnecessary restraint, may possibly be accepted by the French without a murmur. One thing is certain, that no government will grant protection to any class of its people without assuring themselves that by affording privileges to that they are not prejudicing the interests of others. If you get, you must give also; if you seek monopoly, you must grant security.

The Society will probably be aware that in France there are three principal or superior schools of pharmacy, namely, at Paris, Montpellier, and Strasbourg, where are also situated the three large medical schools, and that besides these there are many minor or preparatory schools of medicine and pharmacy. These schools were established by the Loi du 21 Germinal, an XI., that is, in April, 1803, during the first French Republic, and at that time they received certain powers, and were endowed with certain functions which they yet retain. They have the power to receive pupils destined to the practice of pharmacy in France, and to examine them, and they are charged with the duties of teaching the principles of pharmacy by public lectures, of watching over its practice throughout the country, of denouncing abuses to the authorities, and of extending its investigations.

The *pharmacien* is protected in his calling; for, by a declaration of the King, bearing date 27th April, 1777, grocers and all other persons are prohibited from the manufacture, sale, or traffic in any salts, compounds, or preparations entering into the human body in the form of medicine, and from making any mixture of simple drugs to be administered in the form of medicine, under the penalty of five hundred livres (about £25). Moreover, by another article of the same decree, it was forbidden to every association, whether secular or clerical, even to hospitals and to mendicant orders, to have an apothecary's shop, except for their own internal service; they were prohibited from trafficking in drugs, whether simple or compound, under a penalty of five hundred livres. Officers of health, however, in situations where there is no pharmaceutist having an open shop, may, notwithstanding the above decretal, supply medicines, simple or compound, to persons requiring their aid; but they may not keep an open shop.

Wholesale druggists are not allowed to compete with pharmaceutists; for it is decreed that grocers and druggists may not sell any pharmaceutical composition or preparation, under a penalty of five hundred francs. They may continue a wholesale trade in simple drugs, but they are not allowed to retail them in medicinal quantities. Any sale in medicinal quantities, any exposure of drugs and medicinal preparations on stalls, in public places, fairs, and markets, any announcement or printed advertisement indicating secret remedies, under whatever denomination they may be presented, is strictly forbidden. Whoever renders himself culpable of this misdemeanour is liable to prosecution by the police, and to be punished conformably to Article LXXXIII. of the Code. The punishment which attends an infraction of this Article (XXXVI.), according to the Loi du 29 Pluviose, an XIII., is a fine varying from twenty-five to six hundred livres, and, in case of a repetition of the offence, an imprisonment of from three to ten days.

No person may even deal in indigenous medicinal plants, or parts of plants, fresh or dried, nor exercise the profession of herbalist, unless he have previously satisfied a school of pharmacy, or a board of examiners, that he is accurately acquainted with the characters of such plants.

In order that there may be no doubt in the public mind as to the persons who are legally entitled to dispense medicines, the Préfets are required to print and post up each year a list of the pharmaceutists established in the different towns of their departments. These lists contain the christian and surname of the pharmaceutists, the dates of their diplomas, and their places of residence.

Then, on the other hand, pharmaceutists are themselves subject to certain regulations. It is the law that at Paris, Montpellier, and Strasbourg, where are situated the superior schools of medicine and pharmacy, two doctors and professors in the schools of medicine, accompanied by members of the schools of pharmacy, and assisted by a commissary of police, shall visit at least once a year the shops and warehouses of pharmaceutists and druggists, in order to test the quality of the drugs and medicines, simple and compound. The jurisdiction of this commission extends to a radius of ten leagues around the above-named places, and authority is given to enter all warehouses, shops, and manufactories, whether recognized or illegal. The magistrates are required to prepare an official report of their visits, so that in the event of any infraction of the law the delinquent may be proceeded against. In other parts of the country these visits were formerly made by a board of medical examiners, associated with four pharmaceutists; but by an Imperial decree, dated 3rd March, 1859, the duty of inspection in the country districts was transferred from that commission to the Board of Health, three members of which still make the annual inspection. The superior schools of Paris, Montpellier, and Strasbourg, however, still continue to make the visits to their districts as formerly.

Again, pharmaceutists may not sell any secret remedy. They are required to conform —respecting the preparations and compositions which they are expected to keep in their shops—to the formulæ inserted and described in the 'Codex Medicamentarius.' They are not allowed to conduct in the same locality or shop any other trade than that relating to drugs or medicinal preparations. No pharmaceutical preparation or other remedy can be patented, nor can any secret remedy legally be sold; but any new remedies which have been recognized by the Academy of Medicine, the formulæ for the preparation of which has been approved by the Secretary of State for Agriculture and Commerce, with the sanction of the inventors or proprietors, cease to be considered in the light of secret medicines, and may be sold by pharmaceutists, although the formulæ be not yet in the Codex.

Adulterations of medicines, as well as of articles of diet, false weights, and false measures, are severely punished by the Code Pénal.

Let me add but a few sentences with reference to the education of pharmaceutists, for this may not be without interest to some of my younger hearers, and I think it will serve to reconcile them to the prospect of a little compulsory education and examination. In France, in order to be received into the community of pharmaceutists, candidates must not be less than twenty-five years of age; they must give evidence not only of having passed through the curriculum of professional study, but also that they have obtained the degree of *Bachelor of Sciences,* and at their examinations they must be approved by at least two-thirds of the Board. Having accomplished this, the newly-made pharmaceutist receives from the School of Pharmacy, or from the Board of Examiners, a diploma, which he has to present to the Préfet de Police if at Paris, or if in any other town to the Préfet de Département, before whom he takes the oath of probity and fidelity in the exercise of his art. The Préfet then returns to him his diploma, and along with it a copy of the register of the oath. No person can obtain a licence to exercise the profession of a pharmaceutist, to open an apothecary's shop, to prepare, sell, or traffic in drugs, who has not fulfilled the prescribed laws and been regularly admitted by one of the schools of pharmacy, or by a board of examiners. According to a decree dated August, 1854, every candidate for the title of Pharmaceutist of the First Class must produce evidence of three years' study at one of the three superior schools of pharmacy, and also of three years' pupilage in a shop, except in the cases of those who have kept ten terms at a preparatory school of medicine and pharmacy, when one year at a superior school of pharmacy will be accepted. Candidates for the title of *first-class* pharmaceutists are not allowed to keep their first term, whether at a preparatory or superior school, until they have obtained the degree of Bachelor in Science. The fees exigible in the superior schools of pharmacy for the title of pharmaceutist of the first class are fixed as follows:—

Terms (12 to 30 francs each)	360	francs.
Practical operations during three years, at 100 francs each year .	300	,,
Five half-yearly examinations (30 francs each)	150	,,
The two first examinations at the end of studies at 60 francs each .	120	,,
The third examination at the end of studies	200	,,

Three certificates of fitness (40 francs each)	120 francs.
Diploma	100 „
Total	1390 = 53 guineas.

For the title of pharmaceutist of the second class, a shorter course of study is required, and the fees amount to 460 francs, or a little over eighteen pounds sterling.

In conclusion, a word or two about the sale of poisons, and the dispensing of medicines which are poisonous and only for external use, as this subject has recently been discussed at your meetings. With reference to medicines for external use, a ministerial circular was issued in June 1855, from which the following is an extract:—One of the most frequent causes of accidental poisoning, is the confusion which persons in charge of invalids fall into with reference to medicines for internal use and for external application. It is true that with the view of obviating such uncertainty, pharmaceutists usually are careful to indicate by the words 'for external use,' that the medicine would be dangerous if taken internally. But, besides the fact that this indication is frequently neglected, it is only addressed to persons who can read, and it is only useful when they have the prudence to ascertain from the label the nature and distinction of the remedy. With the view of putting an end to the danger now mentioned, I have [says the Minister] consulted the Board of Health, and, according to its advice, I think it right to address to MM. les Préfets the following instructions: one method at all times efficacious in the prevention of fatal mistakes, would be to have a visible sign which each one might easily recognize, and which would be calculated to attract the attention and to waken the suspicions of illiterate persons. It has been thought that this object might be attained if the obligation were imposed upon pharmaceutists of placing upon the phials and packets containing medicines for external use, a label of striking colour, bearing the indications of its use. Such a conventional use would only be presented on the condition of its being universally adopted. Otherwise it would but increase the risk which it is sought to abolish. It is of little importance what the colour be, provided it be everywhere the same. I have selected an orange-red colour, the brightness of which is likely to catch the eye. Upon this ground will be printed in black letters, and in characters as distinct as possible, the words *Medicine for external use.* It is important that the orange-red label bear uniformly these words. It is, of course, to be understood that this special label is not to replace or interfere with the ordinary label written upon white paper, bearing the name of the pharmaceutist, the designation of the medicine, and all the instructions necessary for its administration. It is inexpedient to apply this measure to druggists and herbalists. Druggists are so affected by the Loi du 21 Germinal, an XI., that *they can only sell simple drugs wholesale.* They are forbidden to sell them in medicinal quantities. The result is that the druggist, unless he be also pharmaceutist, does not sell directly to the patient. He does not know whether the drug is suitable for internal or for external use, or even whether it will be applied to pharmacy or to the industrial arts. From the moment at which it leaves his warehouse, under the conditions determined by the ordinance of 29th October, 1846, concerning poisonous substances, he is no longer responsible. As to herbalists, the sale of poisonous substances for medicinal use is implicitly forbidden them by the above ordinance. They can only deal in plants fresh or dried; and these plants, which are not used in their natural state, are destined to be prepared by another than the herbalist. The formality of the orange-red label, therefore, was imposed neither upon druggists nor herbalists; but it ought to be made obligatory upon medical men in country districts, who, in the absence of pharmaceutists, supply medicines, as well as upon those who manage the laboratories of hospitals and of other public charities.

From an *Ordonnance Royale,* dated 29th October, 1846, relating to the sale of poisonous substances, I extract only that part which affects pharmaceutists. It is as follows:—The sale of poisonous substances for medicinal purposes is confined to pharmaceutists, and by them only when prescribed by a physician, surgeon, officer of health, or veterinary surgeon. The prescription must be signed and dated, and should express without abbreviation the dose of the ingredients, as well as the manner of administering the medicine. Pharmaceutists will transcribe such prescriptions in a register, of the form determined by the first paragraph of Article 3. The transcriptions should be made in succession, and without any blank spaces. Pharmaceutists will not return these prescriptions without first stamping them with their seal, affixing the date at which the medicine was supplied, as well as the number of the transcription into the register. This register must be preserved for at least twenty years, and must be shown whenever it is demanded by the authorities. Before sending out the medicine, the pharmaceutist will place upon it a label indicating his name and residence, and reminding the patient of its destination, whether it be for internal or for external use. Arsenic and its compounds cannot be sold for other than medicinal purposes, without being combined with other substances. The formulæ of such preparations will be determined, with the approbation of one *Ministre*, Secretary of State for Agriculture and Commerce: namely, for the treatment of domestic animals, by the advice of the Professors of the Royal Veterinary College of Alfort; for the destruction of noxious animals, and for the preservation of skins and objects of natural history, by the School of Pharmacy. The above-mentioned preparations can be sold and sent out only by pharmaceutists, and only to persons known and householders. The quantity obtained, as well as the name and residence of the purchaser, are to be inscribed in the special register, the keeping of which is ordered by Article 6. The sale and employment of arsenic and its compounds are forbidden for steeping grain, for embalming bodies, and for the destruction of insects.

We have thus, Mr. President, scrambled over the 'Codex Medicamentarius,' dipping in a little here and there, but at no part deeply. I think that we must all be ready to express our thanks to those eminent and hardworking men who have produced this noble work. It is a book worthy of study, and I trust that the very superficial manner in which I have been able to bring it before the Society this evening will only tend to turn the attention of your members from this paper to a careful perusal of the Codex itself.

Some discussion took place at the close of the paper, and on the motion of the President a hearty vote of thanks was accorded to Dr. Jackson for his excellent and interesting communication, which was seconded by Mr. Mackay, and carried with acclamation.

The SECRETARY then introduced Mr. Kemp, one of the members of the Society, but resident in Bombay, who had come on a short visit to his friends in Edinburgh, and who had very kindly brought with him one or two articles to be found in the Indian bazaars, and which he thought might interest the Society here.

Mr. KEMP then made the following remarks:—

The few specimens now before the meeting I brought home from Bombay for Mr. Mackay to place, if he thought they were worth it, in the Society's Museum. There are not many drugs among those sold in the bazaars of Western India that possess characters very interesting to the pharmaceutical chemist. Those on the table, however, I thought would be looked upon with curiosity by such as ourselves.

Kaladana.—There are two specimens of this drug. An interesting article on it by Dr. Waring will be found in the last volume of the 'Pharmaceutical Journal.' It is noticed also in Pereira and other Materia Medica books, as "Pharbitis Nil," the seeds of the *Ipomœa cærulea.* In one of the specimens the seeds are small, and correspond in size with Pereira's description; in the other, they are about half as large again. Both are got in the Bombay bazaars, but I believe the larger kind is imported from Persia. The drug forms an excellent substitute, when powdered, for jalap, and yields to spirit an extract which, when purified by boiling water and a salt of lead, leaves a pure hard resin of jalap or jalapine. It also contains a bland fixed oil, about 6 per cent. of jalapine and 10 per cent. of oil. The proportion of oil is, of course, far too small to extract by pressure.

Cocum Oil.—A hard vegetable fat, got by boiling the berries of *Garcinia purpurea.* Found in the bazaars in long egg-shaped pieces, very hard, and capable of pulverization at ordinary temperatures, but melting at the temperature of 108° F. It is equalled by nothing as a material for suppositories or pessaries, a mass for which can be made with great facility by rubbing up the cocum in a mortar with a few drops of olive oil as an excipient, the active ingredients being previously mixed in as in a powder. Many more uses would suggest themselves if the drug were obtainable in this market. It does not, however, answer for ointments, causing early rancidity.

The other three drugs are specimens of Elæoptene and Stearoptene of volatile oils.

Liquid Camphor.—Got from the Borneo camphor-tree at an early stage of its growth. A description will be found in Pereira's 'Materia Medica.' The drug found in the bazaars is commonly very dark in colour; the specimen before you has been re-distilled with water.

Camphor of Peppermint.—Crystalline stearoptene of oil of peppermint, imported into India from China. A notice will be found of it in Christison and Pereira. It is, I fancy, obtained by freezing down the volatile oil obtained by the Chinese, who thus export the oil in two forms, solid and liquid. I think Pereira states that the stearoptene can be got also from the American oil, but not from the English.

Camphor of Ajwan.—Stearoptene from the volatile oil of *Ptychotis Ajwan*—an Indian drug (the plant) sometimes to be had in the London market. It smells very like Oleum Origani. An excellent account of it, by the late Dr. Haines, of Bombay, will be found in the 'Journal of the Chemical Society' of some years back.

The liquid camphor possesses the same medicinal properties as solid camphor. The latter has been a common remedy with homœopathists lately, in alcoholic solution, for cholera. I am not doctor enough to say of what value it is, but we are all chemists enough to know that the camphor must separate in the solid form immediately on its reaching the stomach. I would recommend the liquid camphor as possessing the property of maintaining its liquidity in the presence of water.

The camphor of peppermint possesses the same properties as the oil of peppermint. I would recommend it as a substitute, in the oleo-saccharates, of which we have heard from Dr. Jackson this evening, and in other powders.

Camphor of ajwan is a favourite carminative among the natives of India, and would probably be found as useful as the peppermint, if procurable here.

To the best of my recollection the prices of these drugs in the Bombay bazaar are:—

Kaladana, from	1*s*. to 2*s*. per lb.
Cocum Oil, from	9*d*. ,, 1*s*. ,,
Liquid Camphor, from	2*s*. ,, 4*s*. ,,
Camphor of Peppermint, from	4*s*. ,, 6*s*. per oz.
Camphor of Ajwan, from	4*s*. to 6*s*. ,,

After some remarks, Dr. Scoresby-Jackson proposed a vote of thanks to Mr. Kemp for his communication and presentation to the Museum of the Society, which was carried unanimously.

PROVINCIAL TRANSACTIONS.

LEEDS CHEMISTS' ASSOCIATION.

The third meeting of the Session was held in the library of the Philosophical Society, on the evening of December 12, 1866; the President, Mr. Edward Thompson, in the chair.

Mr. H. W. Anderson and Mr. J. P. Jackson were elected Associates.

The following communication from Mr. Orridge was read:—

"30, *Bucklersbury, London, December* 11*th*, 1866.

"TO THE PRESIDENT AND MEMBERS OF THE LEEDS CHEMISTS' ASSOCIATION.

"Gentlemen,—Through the Pharmaceutical Journal of this month, I became aware that your President (Mr. Thompson) had commented at considerable length and in an adverse spirit upon some passages from a letter of mine addressed to Mr. Ince, and quoted by that gentleman in his paper on 'Pharmaceutical Ethics.'

"It was my intention to have had a paper on the subject, in readiness for the next meeting of your Society, but as I have just learned that you meet to-morrow, it is not possible to find leisure at this time to do more than to refer you to the 'Pharmaceutical Journal,' vol. i. p. 176, *The Apothecaries' Company* v. *Greenhough*, 1842; vol. vi. pp. 341, 347, 558, 597, *The Queen* v. *Flitcroft*, 1847; vol. viii. pp. 544, 549, *The Apothecaries' Company* v. *Wells*, 1848; vol. viii. p. 487, *The Apothecaries' Company* v. *Lobo*, 1848; vol. viii. p. 585, *The Apothecaries' Company* v. *Kelly*; vol. ii. pp. 483, 532, *The*

Apothecaries' Company v. *Crowther*, 1852; vol. xiv. pp. 246, 285, *The Apothecaries' Company* v. *Brownridge*, 1854; vol. xvi. pp. 105, 106, *The Apothecaries' Company* v. *Broadbent*, 1856. After reading these cases, and bearing in mind that in *the year following* the case last cited, the Medical Reform Bill was introduced into Parliament, you will be able to contrast the facts disclosed with your President's statement, that 'according to his recollection' of the Apothecaries Act of 1815, 'it came to pass that long before the Act was virtually repealed, it had become a dead letter, practically allowing every one to do that which was right in his own eyes; that is to say, the Act produced very little legal effect in the *earlier* period of its history, and none at all in the *later*' (!). As I hope shortly to be at liberty to address you at more length on the subject, I have only at this moment to beg you to excuse a hurried communication, and have the honour to be,

"Gentlemen, your obedient servant,

"B. B. ORRIDGE."

It was resolved, "That this meeting thanks Mr. Orridge for his communication, and begs to assure him that it will give the members of the Association much pleasure to have his presence at one of their subsequent meetings, if convenient to himself, and to hear his opinions more fully."

Mr. W. SMEETON then read the paper of the evening, upon "The Importance of Study to the Chemist."

"Gentlemen,—Your Secretary has requested me to furnish you with a paper on the Importance of Study, especially to those who are to form our future chemists and druggists. The main difficulty I find in the subject is, its extent, and to treat it rightly would fairly demand the best efforts of an abler pen than my own. However, I do not wish to point out too glaringly the defects of my paper, feeling sure that they will soon be apparent enough to you all. I will only state, as some apology for my temerity in undertaking this subject, that there were two reasons which I thought might have some weight with you, and justify me for the course I have adopted.

"The first is that I am not, in point of age, very far removed from those to whom I specially address myself to-night, namely, the apprentices and assistants,—at any rate, I am still young enough to know how I felt when I occupied the position which they now fill, and, therefore, if what I have to say does not come with that grace and dignity which the weight of advanced years confers, it may perhaps seem to you more as a voice from one of yourselves,—one enough in advance to know the way you have to tread, but yet not so far ahead as to be quite out of sight and hearing of those who are coming after. My other claim on your attention is, that I have had two businesses in my care since I left your ranks; one I made entirely, the other I bought; but though very different in style and character, the conclusion I have come to is, that to a great extent, the qualifications required are alike, and the steady prosecution of the same principles will produce a similar result in either case.

"To commence at the beginning, I will suppose for the moment that I am talking to the apprentices only. You have then, probably, without any particular reason further than this, that you were tired of school, and wanted, as you thought, to be doing something, decided on being a chemist and druggist. Your friends have paid so much premium, and you have agreed to serve for a certain time, and be in all respects a true and faithful apprentice. Probably you have already discovered that all is not gold that glitters, that the business of a chemist is something more than glass tubes, retorts, and interesting experiments, and reminiscences of the cricket-ground, of holidays every week, do not brighten the prospect which every day opens out to you. The trade is not half so clean or respectable as you thought it would be; to say nothing of the cattle-medicines and pill-masses, and powdering operations, more or less diabolical, there's the dusting, the scale cleaning, the long hours, and, what to some is almost the greatest evil of all, the white apron, and this for the term of an apprenticeship, and perhaps longer. Even the clean part of the work has an amount of monotony about it; one day's work is the same as the preceding, nothing new to be learnt in either capping bottles or weighing Seidlitz powders, but the same weary round over and over again. Now there is truth in all this, and it is best, once and for all, to admit that making horse-balls and dusting bottles are not dignified pursuits; and lately you know that we have been taught in the 'Pharmaceutical Journal' that some of these servile operations are not what apprentices ought to be expected to do. But so long as horses require medicine, and druggists sell it, or dust abounds where it is not urgently wanted, some one or other must fill this very important post; and knowing, as I do, that we cannot all be kid-glove gentlemen, I dissent entirely from any view which favours the notion that work of this kind is not fitting or honourable work. I believe if a man would learn anything he must begin at the bottom, and these menial operations are to the druggist a part of the necessary drill and discipline to fit him for the station he has to fill. Therefore I have faith in the dirty work, and do not think it is doing any real kindness to an apprentice to give it all to porters, as most assuredly the day will come when its value will be appreciated. It will give habits of thoroughness and neatness, it will give the ability to teach those who come after, and, most of all, when they begin business on their own account (with very limited means in many instances), they will be thankful that they can, if need be, open shop themselves, and do the rough as well as the smooth work, with equal comfort and respectability. Therefore, do not despise these common operations and think them beneath you, but let them be well and thoroughly done, and if it is only a dirty bottle that you clean, do not think of it too much in that light; there is another, a brighter and a better, namely, this,—you are doing your duty, doing your part in the world's work, filling a gap that wanted filling, and the main thing you have to remember is, that it does not so much matter *what* a man does, as *how* he does it. If you can gather no other thought from my paper than this, it is certainly worth your having, not because it is my thought, for I have only embodied in other words that old Scriptural aphorism, of doing what your hand findeth to do with your might; and I am sure, if this one principle is fairly carried out, your shop, in a little country town, will not present the dire picture drawn by Mr. Ince in his admirable essay.

"For this leaves
In act no trifle, and no blank in time.
This greatens, fills, immortalizes all;
This, the blest art of turning all to gold;
This, the good heart's prerogative to raise
A royal tribute from the poorest hours,
Immense revenue! Every moment pays.
If nothing more than purpose in thy power,
Thy purpose firm is equal to the deed:
Who does the best his circumstance allows,
Does well, acts nobly; angels could no more."

"Why have I said so much about this, and so little about scientific study? Because I would lay the foundation before the superstructure; because, however much order, cleanliness, etc., may be necessary in the shop, it is just as much so in the warehouse, and it is the want of some of these characteristics which has made some of our trade look with suspicion on our efforts to educate the rising generation of chemists and druggists. Doubtless it is, for the most part, a groundless fear, for work and true science go hand-in-hand, and excellence in one can hardly exist without excellence in the other.

"Thus far I have looked at our business from the apprentices' point of view, and tried to show that even elementary work is not entirely without its uses. The field enlarges rapidly when we come to the dispensing counter, for here we are brought face to face with the varied phenomena of disease and suffering. True it is that use habituates us to our work, and it is possible to make up a prescription without the remotest thought of the purpose for which it is intended. Yet one source of interest is lost by this course, for each prescription has its own tale to tell. If we could now and then draw aside the veil which hides the result of our work, it would often steady the thoughtless, and teach us all, that a chemist must be not only a student but a man of thorough honesty of purpose and integrity. Let us in imagination visit one of the many similar scenes of suffering, and learn the lesson it should teach.

"Here is a sick child, feverish, restless, sleepless, and its parents worse, possibly, from mental anguish, than the child from physical suffering. What will they give to see the little one calmly at sleep, the fever subdued, and the half-wild, anxious look of disease replaced by the beauty of health? A medical man is called in, a prescription written and sent to the nearest chemist's to be dispensed. Now what will he do with it? It is only spirit of nitre, mindererus spirit, water, and so much opium or henbane as may be thought requisite to allay the unnatural excitement of fever. Will the nitre be methylated, and partaking more of the nature of an emetic than the cooling diaphoretic it should be? And the opium, will it be Turkey or Egyptian? or half-strength or methylated too? Do you think it matters which? You know very well that some think one is as good as the other, and cheaper too,—to them the strongest argument of all; but only consider how much it may matter to that saddened household, whether that little spark of life shall brighten and live or go out for ever. That draught on the frail frame of a child may possibly decide the question. Every dose has, we presume, been so calculated by the physician, that either more or less will not be carrying out his views; and surely, if the heavy responsibility of prescribing be his, the accurate fulfilment of his directions is of the utmost importance and interest too. And supposing all goes well, and the little patient recovers, it is something to have contributed to that happy result. Probably no meed of gratitude will be awarded to the careful dispenser, but surely he has his reward; he was an agent, however humble his position, and the satisfaction which honest work will ever give is of itself recompense enough.

"Let us now look into our imaginary prescription and see if its ingredients have any special interest for us. It is certainly simple, and yet an entire knowledge of its constituents will demand a considerable amount of chemical knowledge; in fact, it is marvellous how much is involved in the manufacture of the simplest chemical. Even liq. am. acetatis is not made by rule of thumb. You cannot say certainly that so much carbonate of ammonia and acetic acid will produce the neutral compound we require, and even when most carefully made there is a tendency to change and become alkaline. Consider, too, how much there is to interest us in the component parts of our preparation—acetic acid and ammonia. How strange that carbon, hydrogen, and oxygen should be so combined as to form this same acid liquid, and, stranger still, that the laboratory where these elements were first brought together was the forest tree, and the distiller's art was all that was required to render it available for our use. And ammonium too, what is it? metal or gas? or what? One of nitrogen, four of hydrogen, we are told,—extremely volatile, yet comporting itself frequently as a metallic base. Think how universal it is,—the product of animal decomposition and death, yet the food of vegetable life and the stimulant of our own, present everywhere, forcing itself on your notice, whether you will attend to it or not. These are common things, the outskirts of that world of wonders which chemistry has for its diligent explorer. This calling of ours, call it what you will, has a wealth of interest no other has; and if you will only follow its leadings, you may find paths of beauty and subjects for thought that the careless and superficial never dream of. The question is, not shall the chemist be a scientific student, but where shall he stop? How can he give the requisite attention to the host of things demanding it? He must not trespass on the province of the medical man, nor will he wish, if he rightly considers his position; yet he must be well acquainted with the effects and doses of the medicines he supplies, in order to protect himself, the patient, and the prescriber from error. I do not think I am saying too much when I assert that even that part of a medical man's education which treats of disease, must, to some extent, be the druggist's also, for circumstances may and do arise when something must be done, no medical man is near, and the friendly druggist's aid is required, and doubtless with good effect in the majority of instances. I have often thought what a sanitary agent, so to speak, an intelligent chemist might be whose lot is cast in low localities; what wholesome advice he might give as to the treatment of the sick, the nursing of children, without invading the territory the surgeon claims as his own. Surely a strong protest against the messes poor people and poor people's children take, such as Godfrey's Cordial, Irish slate, and the like, would, from a man with any character, have some weight, and be much to the benefit of many who err from ignorance, and who would be glad to be put right. Again, the calling of a druggist is one requiring so much personal attention that there is a danger of its cramping the energies of the mind unless the scientific element is largely introduced. Other trades either take a man out more, or bring him more in contact with his fellows. The druggist's life is always more or less an exclusive one. He does not often figure as a town councillor, for instance. The exacting public requires so much personal attendance that the affairs of the State must be left to others, probably not more competent but more at liberty than he. He, forsooth, must mind his shop, and, if he does not mind, he will become shoppy too; and I think there is nothing more undesirable than the lot of the man who must for the whole of his life—and in our trade it amounts to that—live for his business and nothing more. Mere buying and selling has little elevating in it, and even dispensing may have so little actual thought as to be almost as mechanical an act as the motion of the pestle or pill-machine. What we want, and what I wish my paper to show, is, the need of something to call out the soul of the man, and to make his business interesting to him. To a great extent the study of those sciences akin to our business will do this; but there is another opening, perhaps more practical, which I think may afford amusement and profit too. I mean the manufacture of preparations so often supplied by the wholesale houses, such, for instance, as concentrated infusions, sal volatile, etc.; and supposing that in some instances a good deal of time has been spent, and the product is not quite up to the mark, you can hardly have done this without learning something; even the difficulties you met with may have taught as much as success could have done.

"Suppose you commence business in some obscure country town; for long enough after opening you will find little out-of-the-way things required that you never thought of, but which a little chemical and pharmaceutical knowledge would soon furnish for you. To be very simple in our illustrations,—and one or two instances from my own experience will do as well as a dozen,—you may some fine day have a prescription brought with cherry-laurel water ordered. Of course you haven't it, you never dreamt of that being wanted so soon; or some biniodide of mercury is required by the farrier living hard by, or even liquor valangii may be demanded from you. It will be very awkward to say you cannot dispense such a prescription, but it will establish your credit considerably if you can gain time and furnish the article without having to wait till it can be obtained from London.

"Again, don't you think it is better to know what you are doing, what you are selling, than I am afraid many of our assistants do? Don't you think it is a shame that our customers, clergymen for instance, who have been dabbling in photography, know often really more about chemistry than we do? I suppose if some inquisitive customer (and customers will be inquisitive) was to ask nine out of ten of our assistants how calomel was made, or extract of colocynth, or even an every-day article such as carbonate of soda, the answers would often be wide of the mark; and I believe if you would only be as inquisitive yourselves, and every day learn the history of one of these substances, you would soon acquire information of use to yourselves as men and druggists. What is to hinder you, after shop, from making, as a commencement, that popular chemical sold by chemists of all persuasions, namely, sugar of lead? Litharge, oxide of lead, and acetic acid are both cheap enough: boil them together, filter, and set it aside to crystallize. You will get such fine bold crystals of acetate of lead as you never saw in your shop-drawer; and when you have fairly studied these, go a step further: dissolve your crystals, add some solution of washing soda, and so make carbonate of lead. Collect this precipitate, wash it, and draw a diagram showing what decomposition has taken place. Now, then, make your carbonate into nitrate, and this into iodide, and so on, ever pursuing the same base through different combinations, and to make the experiments complete, add to your solutions such reagents as show the presence of lead. This was pretty much what the students at the Square did some years ago, and though it may seem to some of you a very simple, very elementary sort of chemistry, I believe it is the best; and one metal carefully worked with will show the way to all the rest. Or take the 'London Pharmacopœia' and make some of the preparations of iron, they are by no means difficult, and one chemical actually made by yourself will teach you more than much reading without experiment. Gradually you will find that to be a chemist is really something better than it looks; it is not so dreary and dull as you thought; a halo of light begins to illumine the monotonous array of bottles, and you begin to realize the possibility of your business being what Mr. Deane recommends—work and recreation too. Yet I am sure you will not stop here; the whole domain of philosophy is so linked together that you are imperceptibly drawn into wider fields of research, each possessed of intense interest, each worthy the study of a lifetime. By no means would I have you confine your studies to objects immediately connected with your business, for general literature must have a place. History is more neglected than it ought to be, for the study of the past has many a lesson for the men of the present, and would make us not only wiser men but sounder politicians too. And poetry, all unpractical and unbusiness-like as it may be, has an elevating and refining influence, and while your memory is unburdened it is very well worth your while to learn by heart such poetry as may commend itself to your taste. I can assure you that in years to come, when the care and worry of business presses thick upon you, some remembrances of the grand old strains will come like music to your soul, and help you onward.

"Much has been said lately about superficial acquirements, and doubtless there is truth in all that is said; yet, on the other hand, it may be urged that there are so many things demanding attention, all equally important, that it is wellnigh impossible to master any, and I think the attempt to do this may be a stumbling-block to some. You may love chemistry and science so much as to forget the claims of the counter—your master's now, your own in the future. Therefore do not, in the laudable desire to be thorough, forget that you are a business man as well as a scientific one. The chemist is expected, rightly or wrongly, to know something of everything, and I am inclined to think he had better be somewhat superficial than sacrifice to pure science the interests of his business.

"May I give another word of friendly advice to our young friends here before I close? As I said at the outset, I am young enough to have sympathy with you and your feelings. Read sound good books; no one expects you to read scientific works only after a hard day's work, but I may say this—don't read trash. Read something that will make you intelligent, whether it makes you a chemist or not. There are books of questionable tendency,—leave the perusal of them to those whose character is questionable. For yourselves, choose those which will elevate and refine, remembering that books are like companions, insensibly they mould your character. You could not read the lives of Fowell Buxton or William Allen, of Plough Court, without the desire, at any rate, to be in some respects like them; and you cannot read English history, if you read it rightly, without feeling your bosom swell within you as the stirring memory of old times comes before you. All the long line from Alfred to Victoria is hallowed ground, marked here and there by altars, whereon have been laid continual sacrifice of all that man counts dear, in order to hand down to our day a fair possession, an inheritance so rich in all its boundless stores of learning and wisdom, that not to claim our part in this great legacy were to show ourselves utterly unworthy of the race from which we are sprung, and the name we bear as Englishmen. I know quite well that this is not the time or place to give you a discourse on morals, but I may be forgiven if I say, that an acquaintance with the real, the noble, and the true, will leave little room for the false, the unworthy, and the low. The state of the times seems to demand that the rising generation of men should be pre-eminently thoughtful men. A great movement is going on in the world of mind, and no one may say whither it tends; on the one hand, we see a tendency to revive the past, and, on the other, a desire to quit all the old paths; certainly it is each one's duty to acquire that solidity of character which is ever the best safeguard amid the changing currents of popular feeling. I recollect reading a short memoir of James Outram, who, without patronage or favour, fought his way to the front in our Indian army, and the closing lines of that memoir deeply impressed me. They embody the feeling I have attempted to infuse into my paper, that in the path of duty there is dignity, whatever the occupation, and therefore may fitly conclude my observations.

> "'Not once or twice in our rough island story,
> The path of duty was the way to glory.
> He that walks it, only thirsting
> For the right, before his journey closes,
> He shall find the stubborn thistle bursting
> Into glossy purples, which outredden
> The voluptuous garden roses.
> Not once or twice in our fair island story,
> The path of duty was the way to glory.'"

Several members joined in a discussion.

Mr. Cordingley (Associate) moved a vote of thanks to the author of the paper. He said that when he was an apprentice, which was in a town having between thirty and forty chemists, he availed himself of the scientific teachings afforded by the Chemical Class of the Mechanics' Institution, but that he was the only student connected with the drug business. When taking a situation afterwards, he had found the knowledge so gained to be invaluable to him, as without it he could not have understood and executed the orders sent by teachers of science classes.

Mr. Arkle (Associate) seconded the vote of thanks, which was duly acknowledged by Mr. Smeeton.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The first general meeting of the Session was held on Thursday evening, 9th October; Alexander Kinninmont, Esq., President, in the chair.

On opening the session, the Chairman said that the meetings had commenced rather earlier than usual, but this had been done to allow the successful competitor for the Assistant's Prize—who was leaving Glasgow—an opportunity of reading his paper. He then introduced Mr. W. L. Howie, who read the following paper on "Liquor Bismuthi: being the successful Essay for the Assistant's Prize of the Glasgow Chemists and Druggists' Association, Session 1865–66:"—

Early in the year 1855, Mr. G. F. Schacht, of Clifton, introduced to a few medical friends a fluid preparation of bismuth, said to have numerous advantages over the pulverulent subnitrate. From the success which its exhibition met with, it was publicly submitted to the notice of the profession, through the 'Lancet,' in the summer of 1863, and since which time it has rapidly gained favour both at home and abroad.

The chief features which this preparation was said to possess were, fluidity—being miscible with water and proof spirit in all proportions, and thereby rendering its exhibition, in many instances, much more convenient, as in gastralgia, etc.; with hydrocyanic acid, solutions of morphia and potash, tinctures of henbane, belladonna, stramonium, and the tonic vegetal infusions; more efficacious and certain in its action than the subnitrate, which is found in many cases to be of little service, apparently on account of its insolubility, being often evacuated as a black powder, having been converted into sulphide in its passage through the system; alkalinity, which is so desirable in therapeutic agents in many derangements of the stomach; and also, from its being almost tasteless. With advantages such as these, it is not surprising that liquor bismuthi should have excited the amount of attention which has been bestowed upon it—to all appearance deservedly, as there has been but one opinion as to its superiority as regards internal administration over the well-known subnitrate.

Since a fluid preparation of bismuth is found to be such a valuable agent, it behoves the chemist to turn his attention towards ascertaining the best and most practicable method for its preparation. Under this aspect does liquor bismuthi possess an interest to the pharmaceutist.

Of the formulæ put forward to assist in its preparation, the first was that of Mr. Tichborne (Pharm. Journal, January 1864); since which time a number of others have appeared in the same publication. Mr. Tichborne suggested that metallic bismuth be dissolved in nitric acid, and the oxide thrown down with ammonia, washed, and then added to a boiling solution of citrate of ammonia, by which, he says, the oxide is slowly but perfectly taken up. This the other writers on the subject agree not to be the case; and, in my own hands, Mr. Tichborne's process has never succeeded perfectly. The quantity of undissolved oxide is found to vary very much in different instances—from about $\frac{1}{20}$ to $\frac{3}{4}$ of the moist oxide used. Mr. Tichborne, at the same time, mentioned another method by which the same result might be attained—viz. by dissolving citrate of bismuth in solution of ammonia or citrate of ammonia. Mr. Bartlett, of America, apparently finding Mr. Tichborne's first process a failure, seems to have acted on his second suggestion; for, in an exceedingly interesting and instructive paper in the 'American Journal of Pharmacy,' he gives details for the preparation of liquor bismuthi from citrate of bismuth. Subcarbonate of bismuth he directs to be dissolved in nitric acid, then the nitrate thus formed decomposed by citrate of potash, and the resulting citrate of bismuth washed and dissolved in solution of ammonia. A modification of the above was afterwards suggested by Mr. Blunt (Pharm. Journal, May 1865), who directed the citric acid to be dissolved in nitrate of bismuth solution, and potash added till nearly neutralized. Subsequently, at the commencement of the present year, a paper appeared by Mr. Ebert (Pharm. Journal, March 1866), giving the exact proportion of potash to be used. If the quantity of potash added be insufficient to neutralize the nitric acid, a portion of the bismuth is thus retained in solution as ternitrate; while, if added to excess, the potash at once combines with the citrate of bismuth to form soluble potassio-citrate, which is carried off in washing the precipitate. This process, therefore, requires the finest chemicals and nicest manipulation to work it successfully. The reason for adding the potash and citric acid separately, instead of combined, as Mr. Bartlett directs, is that the *chance* of getting a soluble precipitate is greater by Mr. Blount's than by Mr. Bartlett's method.

The chief objections to the citrate of bismuth process are—1st, That there is a considerable loss, on account of the solubility of the citrate, in the nitrate of potash solution from which it is precipitated, necessitating an analysis before the solution can be made of a definite strength; and, 2nd, That the precipitate is often not wholly soluble, either in ammonia or citrate of ammonia. The quantity dissolved in the washing, and therefore practically lost, is equal to 5 or 6 per cent. oxide; but the loss on account of insolubility in the solution of ammonia sometimes exceeds this, and makes in all a loss varying from 7 to 12 per cent. Mr. Ebert puts the total loss down at 7·6 per cent.; but this must be the minimum, as, on one occasion, I found the loss by this process to be as high as 22 per cent.

The solubility of citrate of bismuth in the solution from which it is precipitated is much influenced by the proportion of nitric acid present. If there be an excess, but a small quantity of citrate will be thrown down; if too little, part of the carbonate remains unaltered, and the maximum proportion of citrate is precipitated. The quantity of nitric acid given by Mr. Ebert is not sufficient to dissolve the carbonate of bismuth, and part is therefore carried through the whole process unaltered, without being taken up in the solution of ammonia, and a loss is thus sustained.

By Mr. Tichborne's method of dissolving the oxide in citrate of ammonia, the loss is much greater than by the above process. The insoluble oxide might again be dissolved in nitric acid, precipitated, and added to another portion of the citrate; but this gives much unnecessary labour, and consequently considerable loss in manipulation. On this subject Mr. Ebert says—"Teroxide of bismuth, though recently precipitated, is but sparingly soluble in citrate of ammonia even at the boiling temperature: the presence of a portion of nitrate of ammonia, through insufficient washing of the teroxide, will effect a solution." This is the case if the quantity of nitrate is great; but, if the oxide is but slightly washed, the nitrate of ammonia retained apparently in no way assists solution.

Having observed, in following the oxide process of Mr. Tichborne, that the precipitate had sometimes a lustrous silky or pearly appearance, and that after being boiled in citrate of ammonia, the insoluble part was wholly composed of these lustrous particles, I inferred that oxide of bismuth, under certain circumstances, assumed the crystalline form, and that in this state it in a great measure resisted the action of citrate of ammonia. Subsequent observation has borne out this theory. Under a powerful microscope the lustrous oxide appears to be composed of partially dissolved crystals, with scaly and amorphous particles interspersed—the proportion crystalline and amorphous varying very much in samples from different precipitations. When the crystalline or scaly particles predominate much over the amorphous, the oxide is found to be very insoluble; while, if but few crystals are perceptible, very little is left undissolved. Investigating the cause of this condition of oxide of bismuth, I found that, as a rule, a crystalline oxide was thrown down if strong solution of ammonia, or an exceedingly dilute solution, was employed in precipitation; and if sufficient ammonia was not added at once, and the oxide suffered to remain for some time in contact with the acid liquor, the same effect was produced. Christison has apparently noticed this appearance in the trisnitrate. Making remarks on its preparation, he says—"We have to guard against the pulverulent precipitate assuming the crystalline form, which is done by throwing the nitric acid solution into a large quantity of water, and not allowing the precipitate to remain long in contact with the acidulated water. By attending to this a trisnitrate, in an exceedingly minute state of division, is obtained." All attempts at producing an oxide free from crystals, by varying the strength or quantity of ammonia or nitric acid, I found to be fruitless: the same effect being produced in apparently quite opposite circumstances; a particular process producing a precipitate at one time nearly amorphous, and at another highly lustrous and crystalline.

Having observed that citrate of ammonia present in the nitric acid solution determined the formation of an exceedingly light and bulky precipitate, which, on examination, proved to be entirely free from crystals, and perfectly soluble in boiling citrate of ammonia solution, I endeavoured to render this fact of practical value, and made a series of experiments which have resulted in my adopting the following formula for the preparation of liquor bismuthi:—

Take of Purified Metallic Bismuth . . . . . 147 grains
Citric Acid . . . . 400 grains
Nitric Acid, sp. gr. 1·42 . . . . . 6 fluid drachms
Solution of Ammonia, Ph. Br., sp. gr. 0·959; and
Water,—of each a sufficiency.

Dilute the nitric acid with an equal volume of water, and add the bismuth in fragments when dissolved, take 12 grains of the citric acid, neutralize with ammonia, and add this to the solution of bismuth; then add water to make two fluid ounces in all, and filter through a small plug of tow packed in the tube of a glass funnel, displacing with dilute nitric acid. Take $1\frac{1}{2}$ oz. solution of ammonia, dilute with $4\frac{1}{2}$ oz. of water, to which add the bismuthic solution with constant stirring, pour at once on a paper filter, and wash the precipitate thoroughly. Take the remaining 388 grains of citric acid, neutralize with solution of ammonia, and heat to the boiling-point; to this add gradually the washed precipitate, continuing the boiling till perfectly bright—taking care that the solution at this part of the process shall have an alkaline reation (if acid, a little solution of ammonia should be added)—then dilute with water to one pint. Each fluid drachm contains one grain BiO_3.

In dissolving the metal, a blackish flaky deposit separates, which is best got quit of by filtering through tow, as directed. Paper is objectionable, on account of the quantity of solution it would retain. In throwing down the precipitate, care should be taken that the nitric acid be neutralized, and the solution give a decidedly alkaline reaction: solution of ammonia should be added until this result be attained; an excess is of no consequence. The precipitated oxide can be readily and completely washed, the operation usually occupying about eight hours. An easy and effectual method of ascertaining when the washing is complete, is to test with turmeric paper for free ammonia: the nitrate will have passed away when the paper is but feebly tinged. The citrate of ammonia solution should be kept boiling during the addition of the oxide. If citrate of ammonia be not in excess, and the boiling continued for some time beyond complete solution, the ammonio-citrate of bismuth is decomposed with the evolution of ammonia, insoluble citrate of bismuth being thrown down. Should this take place, the precipitate will be completely re-dissolved on the addition of ammonia. These recapitulations I consider necessary, because liquor bismuthi is a preparation which, to make at all times successfully, requires an exact and careful manipulation; and perhaps some of the above observations may save a great amount of trouble, and at the same time secure a more perfect preparation.

The advantages of the above process may be briefly stated to be—1st, A perfect solution of the metallic bismuth being easily obtained, there is consequently no loss by a portion being carried through the process unaltered. 2nd, The precipitate being for the most part oxide, and therefore insoluble in water or solution of nitrate of ammonia, there is consequently very little loss in washing,—the largest quantity I have found dissolved being equal to 0·12 per cent. metal. Since so little, then, is dissolved in washing, and the precipitate being so readily and completely taken up by the citrate of ammonia solution, loss is thus reduced to a minimum which, with ordinary care, usually averages 1·5 per cent. The only real loss is 0·12 per cent. soluble, the rest being loss by contact, and therefore much depending on the delicacy and skill of the operator. In the formula there is two per cent. metal allowed for loss, this being in all cases quite sufficient. 3rd, The quantity of bismuth irrecoverable varying so little, analysis is thus rendered unnecessary—a point much to be desired. Messrs. Blunt and Ebert seem to think that it in no way detracts from the working value of the process; in fact, that it is an advantage to introduce an analysis. This may be the case in the laboratory of an analytical chemist; but if we remember how seldom a chemical balance to turn with 1-100th of a grain is to be found on the counter of a retail drug-shop—and without which the analysis of liquor bismuthi cannot be successfully carried out,—it will be at once seen that the operation is quite impracticable to most retail chemists. Analysis is absolutely necessary in Mr. Bartlett's process, on account of the great variation in the quantity of bismuth lost.

In making liquor bismuthi, I prefer metallic bismuth before either the subcarbonate or subnitrate. Much has been said against its use, so that this may require a word in explanation. The chief objection is that, as found in commerce, it is invariably contaminated with arsenic—an impurity from which the subcarbonate is entirely free. As nothing has yet been written explaining the purification of metallic bismuth in connection with liquor bismuthi, it may not be out of place, or entirely without interest, to trace the impurities through the process, and show how, by starting with an impure metal, we can have a solution of a salt of that metal chemically pure.

Metallic bismuth of commerce is usually found to contain as impurities sulphur, arsenic, copper, and sometimes iron. The first of these, though not poisonous in small quantities and uncombined, is still no less an impurity. Existing in the metal as sulphide, it is found, when added to strong nitric acid, to comport itself in a peculiar manner. The acid, in the first place, decomposes the sulphide of bismuth, the sulphur separates in blackish flakes, then, the action becoming violent and the temperature raised, it is oxidized and converted into sulphuric acid, which, unless the nitric acid be in excess, forms insoluble sulphate of bismuth. This, however, would not be of great consequence, as this salt is decomposed by ammonia in much the same manner as the nitrate. The result of experiments in this direction has convinced me that it is objectionable to employ concentrated nitric acid for dissolving bismuth—the heat generated by the violent action being sufficient to determine the formation of sulphuric acid; and that if a dilute acid be employed for solution, as directed, this combination does not take place, the whole of the sulphur being deposited, carrying with it the earthy impurities, which may be readily separated by filtration through tow. The quantity of sulphur present in metallic bismuth seldom exceeds 0·5 per cent.

Arsenic, on account of its poisonous action on the animal system, is the only impurity present in objectionable quantity, and the presence of which in liquor bismuthi would interfere very much with its therapeutic action. If metallic bismuth containing arsenic be dissolved in strong nitric acid, the bismuth is converted into nitrate, and the arsenic into arsenic acid. If water be added, and the solution set in a cool place, a white powder is deposited, which is found to be insoluble arseniate of bismuth. If sufficient water has been added (from two to three volumes), all the arsenic will thus be got quit of at once, and the liquid only requires to be filtered to effect a separation. Supposing a part is still left in solution, and the process for liquor bismuthi goes on; on excess of ammonia being added to throw down the bismuth, the arsenic acid combines to form arseniate of ammonia—an exceedingly soluble salt, which, with careful washing, will be completely removed. These are the processes for separating arsenic from bismuth for obtaining a chemically pure metal for experimental purposes. I, however, prefer a modification which, I think, is more convenient and safe. The metal is first purified as follows:—

Take of metallic bismuth . . . . . 1 oz.,
nitrate of potash . . . . . 40 grains,

reduce the metal to powder in a mortar, and mix intimately with the nitrate of potash, then introduce into a crucible and fuse; the purified metallic bismuth will occupy the lower part of the crucible. The greater part of the arsenic is thus oxidized and separated, and no arseniate of bismuth is deposited from the nitric acid solution, thus rendering filtration through paper unnecessary. The trace which is left is completely removed in washing the oxide.

The third impurity, copper, is dissolved in the nitric acid along with the bismuth, and remains in solution as nitrate. On the addition of ammonia, ammonio-nitrate of copper is precipitated—a salt soluble in excess of the precipitant, and possessing a deep blue colour; so that, if copper be present in any quantity, the first washings will have a bluish tinge. The precipitate, thrown down as directed, from a nitric acid solution, containing citrate of ammonia, has naturally a slight misty blue or opalescent appearance. This is not to be confounded with the blue colour of the liquid, as indicative of the presence of copper,—the latter passing off with the first washing, while the former appearance will remain so long as the amorphous condition of the oxide is retained. In fact, to this condition, and the exceedingly minute division of the precipitate, is the opalescent appearance due—a crystalline oxide, possessing a beautiful white lustre. I have found the quantity of copper present in different samples of bismuth to vary from 0·04 to ·1 per cent.

Iron is but seldom found in commercial bismuth. When present, on ammonia being added to the nitric acid solution, it is thrown down along with the oxide of bismuth, giving the precipitate a yellowish colour, which renders it unfit for the preparation of liquor bismuthi. On the solution of the bismuth oxide in citrate of ammonia, the oxide of iron is likewise dissolved, and forms the well-known salt ammonio-citrate of iron, which communicates a yellow colour to the liquor. Iron must therefore be separated when the bismuth is in a metallic state. This is done, as directed for arsenic, by fusing with nitrate of potash, the foreign metals becoming oxidized and separated from the metallic bismuth.

From the above, it will be seen to be quite superfluous to employ an expensive salt of bismuth, which cannot in any way be superior to the metal, either in furnishing a more pure liquor, or in convenience as regards complete solution. In fact, in this latter respect, the salt is decidedly inferior, it being almost impossible to get the requisite quantity dissolved in the nitric acid; besides, the process followed in the preparation of the oxide for liquor bismuthi is essentially the same, as regards purification, as in the preparation of the subcarbonate, viz. solution of the metal in nitric acid, then precipitation—in the one case with a free alkali, and in the other with an alkaline carbonate,—then careful washing. So that since it is so easy to get the subcarbonate pure, there can be nothing to hinder the separation of impurities from the oxide.

Subcarbonate of bismuth is sometimes adulterated with carbonate of lead, which, if existing to any extent, proves a source of much annoyance. The occurrence of impurities in the metal, other than those just mentioned, is exceedingly rare,—perhaps the only other being cobalt; but it is so seldom found, and is of so little consequence, that I think it unnecessary to do more than mention the name. There being so little facility, the wilful adulteration of metallic bismuth is almost unknown.

It has been said that a solution of bismuth, containing one grain BiO_3 to the drachm, will keep but a short time, being liable to decomposition. Mr. Tichborne is of opinion that the cause of this is, that when ammonia (as Mr. Bartlett directs) is added (instead of excess of citrate of ammonia) to the citrate of bismuth, a more basic compound is formed, which is prone to decomposition even with the addition of spirit; while Mr. Ebert says, the change is not attended by the deposition of a basic salt, but by the formation of humus, and the liquid acquiring, meanwhile, a disagreeable taste and smell. I have found that if a solution of ammonio-citrate of bismuth, having no excess of citrate of ammonia, nor free ammonia in solution, be exposed to the air for some time, a deposit will form, not of a more basic salt than the ammonio-citrate, but simply citrate of bismuth thrown down on account of loss of ammonia, in the same manner as before noticed in boiling the liquor after the solution of the oxide. In order to prevent this deposit, it is necessary that the solution shall be made alkaline with ammonia, and that an excess of citrate of ammonia be present. In the process given these conditions are complied with, so that it is impossible that a deposit of citrate can separate. As to the decomposition noticed by Mr. Ebert, this must have been caused by the use of impure citric acid, or water containing organic matter. Only on one occasion have I noticed the formation of humus, and then the liquor was made with "so-called" distilled water. Since that time I have always employed "Loch Katrine," and have never experienced the least annoyance in consequence. As a precaution against decomposition arising from accidental impurity, I employ 400 grains of citric acid—which is greatly in excess of the quantity required to form the bismuthic salt, and is quite sufficient to preserve the liquor, even should the citric acid or water be slightly contaminated: it at the same time ensures a perfectly bright liquor, which is difficult to obtain if the equivalent only of citric acid be employed.

Liquor bismuthi is compatible, and may be given in combination, with tinctures of hyoscyamus, belladonna, and stramonium seeds; the tonic infusions, dilute solution of potash, aqua camphoræ B. P.; Murray's fluid camphor, if the liquor bismuthi be in excess; solution of morphia, if *minus* acid. hydrochlor.; or, if the acid be neutralized, with ammonia; and the alkaline carbonates, potash, soda, and ammonia, all of which occasion no precipitate. In prescribing hydrocyanic acid with liquor bismuthi, it should be remembered that the acid combines with the free alkali to form hydrocyanate of ammonia.

The following are incompatible:—Tincture of steel, the mineral acids, concentrated solution of potash, fluid camphor in excess, and fluid magnesia.

I cannot conclude without mentioning, that I think we are much indebted to Mr. Schacht for the introduction of his solution of bismuth, and thereby placing at the disposal of the physician a preparation at once elegant and efficacious, and altogether free from the objections which usually accompany the exhibition of the insoluble bismuthic salts.

At its conclusion a hearty vote of thanks was awarded Mr. Howie; after which the Chairman presented him with the Prize, which consisted of the following works:—Fownes's 'Chemistry,' Balfour's 'Botany,' Waring's 'Therapeutics,' and Beasley's 'Formulary.'

Mr. James Reid, whose Essay on Rhubarb carried off the Apprentices' Prize, was next presented with Balfour's 'Botany,' and Fownes's 'Chemistry,' and was complimented on his maiden effort. After a vote of thanks to the President, the meeting separated.

PHARMACEUTICAL SOCIETY, DURHAM.

At a meeting of the local members of the Pharmaceutical Society, held in Durham, Friday, December 14, 1866, it was resolved:

"That Mr. John Burdon be elected Secretary, in the place of Mr. G. Robson, who had retired from the business.

"That the best thanks of the meeting be given to Mr. G. Robson for his uniform courtesy and kindness to his brethren in the trade, extending over a long period of years."

ORIGINAL AND EXTRACTED ARTICLES.

ON THE ANATOMY OF DRUGS.

BY HENRY B. BRADY, F.L.S., ETC.

We once heard a naturalist of the old school, one who had done good work in his day, declare, that when a scientific man bought a microscope he ceased to be able to see with his own proper eyes,—a fine untruth with the shadow of a truth for a basis. Generation after generation of observers have studied natural objects so well, up to the limits of unassisted vision, that the difficulty of finding new facts in connection with their conspicuous external forms is a thousand-fold greater than it used to be, whilst the results obtained in the comparatively new and unexplored field of histology are abundant and striking. Phenomena, long known and thought to be well understood, are found under this new light to bear a fresh and widely different reading; old systems of classification give place to newer ones based upon characters the microscope has revealed; entire tribes, both in the animal and vegetable kingdom, have become known to us, and each little division of science, with any bearing on organized objects, has its histological department. Thus a work on general histology, in the present day, would be a treatise *de omnibus rebus;* the microscope itself has ceased to be looked upon with interest as an instrument, except by the few who concern themselves with its optical and mechanical arrangements; things have fallen, or are gradually falling, into their proper places, and students in each branch of natural science have come to regard the magnifying powers they now possess only as a means of seeing something more of the objects they are engaged upon than they could do without such assistance. But, from the general mass of microscopical observations, it is long before those pertaining to special subjects acquire sufficient importance or completeness to segregate themselves from the rest, and become, as it were, independent. Thus, many years elapsed during which earnest microscopists employed themselves in collecting facts concerning the tissues of plants before any work on structural botany could be produced. The mere fact of the publication of a work on the subject, showed that sufficient knowledge had been obtained to lay the basis of a fresh division of the study of plants,—a division comprising the phenomena which could only be noted by means of magnifying glasses.

In the course of time structural botany has become, through successive additions, so vast a field, that it, in its turn, becomes subject to the same process of subdivision into sections, to meet the requirements of the specialist; for men no longer claim to be universal philosophers, but each is content to take his own little portion of science and work it out exhaustively. In this way, objects scarcely considered of sufficient importance to be worth notice in the text-books of a past generation, become, in the present, the subjects of monographs, many of which, from their magnitude and elaborateness, might seem to contain the work of a lifetime.

The publication of Dr. Otto Berg's 'Anatomical Atlas of Pharmaceutical Substances,'* a work to which we shall, after awhile, ask the reader's attention, marks the point of development such as that just indicated. It is not that the observations of which the 'Atlas' is a record are entirely or even chiefly new, nor that in many cases more reliable information might not be found in books on general Materia Medica, but it is to the simple fact that it is a work devoted solely to the elucidation of the *structure* of pharmaceutical substances, that its importance appears to us to rest. Our knowledge of the subject was previously represented by the scattered observations of a multitude of writers, and, like a book of reference without an index, we scarcely knew either its amount or its value. The collecting and orderly arrangement of already known facts have been but one portion of the labour entailed in the production of the volume; not only was much needed in verifying previously published statements and drawings, but there still remained large gaps representing hitherto unexplored ground, and the original matter needed to complete the series is supplied from the author's own researches.

We shall be better able to form a proper estimate of the labours of Dr. Berg, if we make a preliminary acquaintance with those of some of our earlier scientific writers, who included in their more general treatises passing notices on the same or similar subjects. We must not turn to the works of Gerard, or Parkinson, or Culpepper, or the other compilers of quaint and ponderous herbals, the forerunners of our manuals of Materia Medica, but rather to the dissertations of the early microscopists, notably to those of Hooke, and Grew, and Baker, and Adams, if we would see the beginnings of the study of which this 'Atlas' may said to mark the result of two centuries' growth.

First of all, not only in point of date, but also in importance, the 'Micrographia' of Robert Hooke † attracts our attention—a delightful folio, wherein it is hard to say whether the wonderfully beautiful plates, the vigorous English descriptions, or the drollery of some of the chapters, most excite our admiration.

Amongst the numerous substances whose structure he studied, we find about half-a-dozen that may be regarded as pharmaceutical. The most prominent are rosemary leaves, cork, cowhage, charcoal (that prepared from guaiacum wood is particularly noticed), poppy-seeds, and sponge. His chapter "*Of the*

* Anatomischer Atlas zur Pharmazeutischen Waarenkunde, in Illustrationen auf funfzig in Kreidemanier lithographierten Tafeln nebst erläuterndem Texte von Dr. Otto Berg, Professor an der Universität zu Berlin. Berlin, 1865.

† Micrographia: or, some Physiological Descriptions of Minute Bodies made by Magnifying Glasses, with Observations and Inquiries thereupon. By R. Hooke, Fellow of the Royal Society. London, 1667.

Schematisme or Texture of Cork, and of the Cells and Pores of some other such Frothy Bodies," shows, in an interesting way, the dependence of one discovery upon another, and how the most painstaking and laborious researches may miss a right conclusion, from the lack of one little item of knowledge which it may take another century to supply. The descriptions of the appearances of both transverse and longitudinal sections of cork are elaborate and the figures accurate; the inferences drawn are as right as it was possible they could be without the knowledge of the true nature and functions of the vegetable cell. Cowhage is another substance to which he seems to have given particular attention. Its botanical origin was well known to him, and its microscopical appearance is correctly figured. As to its peculiar irritating effects upon the skin, he regards it in the same category as the stings of insects or nettles, concluding that the cells or "canes" being hollow, they "might have some caustic part sticking on them or residing within them," and that this "might be dissolved and mixed with the ambient juices" of the places where the fibres penetrated, "and the tender parts adjoining become as it were corroded by it."

We shall perhaps illustrate our author most satisfactorily by quoting one of his chapters entire; that on Rosemary-leaves is shortest, and will therefore best suit our purpose.

Observ. xxiv. *Of the Surfaces of* Rosemary, *and other leaves.*

"This which is delineated within the circle of the ſecond *Figure*, is a ſmall part of the back or under ſide of a leaf of Roſemary, which I did not therefore make choice of, becauſe it had anything peculiar which was not obſervable with a *Microſcope* in ſeveral other Plants, but becauſe it exhibits at one view—

"Firſt, a smooth and ſhining ſurface, which is a part of the upper ſide of the leaf, that by a kind of hem or doubling of the leaf appears on this ſide. There are multitudes of leaves, whoſe ſurfaces are like this ſmooth, and as it were quilted, which look like a curious quilted bagg of green Silk, or like a Bladder, or ſome ſuch pliable tranſparent ſubſtance, full ſtuffed out with a green juice or liquor; the ſurface of Rue, or Herbgrass, is poliſh'd, and all over indented, or pitted, like the Silk-worm's Egg, which I ſhall anon deſcribe; the ſmooth ſurfaces of other Plants are otherwiſe quilted, Nature in this, as it were, expreſſing her Needle-work, or imbroidery.

"Next a downy or buſhy ſurface, ſuch as is all the under ſide almoſt, appearing through the *Microſcope* much like a thicket of buſhes, and with this kind of Down or Hair the leaves and ſtalks of multitudes of Vegetables are covered; and there ſeems to as great a variety in the ſhape, bulk, and manner of the growing of theſe ſecundary plants, as I may call them (they being, as it were, a Plant growing out of a Plant, or ſomewhat like the hairs of Animals) as there is to be found amongſt ſmall ſhrubs that compoſe buſhes; but for the moſt part, they conſiſt of small tranſparent parts, ſome of which grow in the ſhape of ſmall Needles or Bodkins, as on the Thiſtle, Cowag-ecod and Nettle; others in the form of Cat's claws, as in Cliders, the beards of Barley, the edges of ſeveral ſorts of Graſs and Reeds, &c. in other, as Coltsfoot, Roſe-campion, Aps, Poplar, Willow, and almoſt all other downy Plants, they grow in the form of buſhes very much diverſify'd in each particular Plant. That which I have before in the 19th Obſervation noted on Roſe-leaves, is of a quite differing kind, and ſeems indeed a real Vegetable, diſtinct from the leaf.

"Thirdly, among theſe ſmall buſhes are obſervable an infinite company of ſmall round Balls, exactly Globular, and very much reſembling Pearls, of theſe there may be multitudes obſerv'd in Sage, and ſeveral other Plants, which I ſuppoſe was the reaſon why *Athanaſius Kircher* ſuppoſed them to be all cover'd with Spider's Eggs, or young Spiders, which indeed is nothing elſe but ſome kind of gummous exſudation, which is always much of the same bigneſs. At firſt ſight of theſe I confeſs, I imagin'd that they might have been ſome kind of *matrices*, or nouriſhing receptacles for ſome ſmall Inſect, juſt as I have found Oak-apples, and multitudes of ſuch other large excreſcencies on the leaves and other parts of Trees and ſhrubs to be for Flyes, and divers other Inſects, but obſerving them to be there all the year, and ſcarce at all to change their magnitude, that conjecture ſeem'd not ſo probable. But what ever be the ufe of it, it affords a very pleafant object through the *Microfcope*, and may, perhaps, upon further examination, prove very luciferous."

With this extract we must take our leave of one who has been called the "father of microscopical science in this country." We would gladly have dwelt more at length upon this his great work, but for considerations of space. His book is far in advance of the age in which he lived, and holds a place in the world of microscopical literature, not a whit less striking than that assigned to the elaborate volumes of Soldani in the eighteenth century, or the ponderous folios of Ehrenberg in the nineteenth.

The various papers on the "Anatomy of Plants," read before the Royal Society by Nehemiah Grew, M.D., F.R.S., and published in a collected form in 1682, we need not review at length, as they have much less direct bearing upon the special subject of our paper than might have been expected, judging from the title. The author seems to have cared for anatomy only in relation to physiology, and his eighty-three fine folio plates are used as a sort of text whereon to discourse of general laws of the growth in plants, and of the supposed functions of their different organs. Structure rather than physiology is our present subject, hence Dr. Grew's papers are almost entirely beyond our limits. How fully he appreciated the importance of minute anatomy as a means of gaining a philosophical knowledge of plants, we may gather from a sentence or two in his preliminary remarks. After speaking of considerations arising out of the study of external conditions, he says :—

"THE NEXT General Mean which I propofe, and that a moft neceffary one, is *Anatomy*. For when upon the Diffection of *Vegetables* we fee fo great a difference in them, that not only their Outward *Figures* but alfo their Inward *Structure*, is fo Elegant; and in all, fo Various; it muft needs lead us to Think, That thefe Inward *Varieties* were either to no *End*; or if they were we muft affign to what. To imagine the firft were exceeding vain, as if *Nature* the Handmaid of *Divine Wifdom* fhould with her fine *Needle* and *Thred*, ftitch up fo many feveral *Pieces*, of fo difficult and yet fo groundlefs a work. But if for fome *End*, then either only to be looked upon, or fome other befides. If for this only, then this muft be fuch as in refpect whereof, Her Work is at no time, nor in any degree fruftrate; the contrary whereunto, is moft manifeft. * * * If then the *Anatomy of Vegetables* be fo ufeful a *Mean*, we ought not to ftreighten it; but to force this, as well as the reft, to its utmoft extent."

A large number of medicinal plants appear amongst those selected for dissection; amongst them not less than twenty still recognized as officinal are spoken of in the text, and have some portion of their structure further illustrated by magnified drawings. Indeed, a more interesting volume than this of Dr. Grew's one need not wish. Whilst lacking the philosophic vein of Dr. Hooke, and in point of vigorous diction far his inferior, we can scarcely too highly estimate the care and patience manifested in his observations, and the systematic way in which his researches were conducted. It is a pleasant thing, too, in these days of doubts and limitations to find an author who is never at a loss for an explanation. No that his theories always help us much, but rather themselves require an explanation; for instance, in a chapter on the behaviour of certain animal and vegetable substances with different reagents, we find the following paragraph, which we quote entire,—its pharmaceutical interest must stand in place of any direct bearing on anatomy. It is a fair sample of much that is to be found in the book, and an instance of the judicious mystery in which the worthy Doctor delights at times to enshroud himself :—

"*Ruffian Caftor with Oyl of Vitriol, ftirs not. But with Spirit of Nitre makes a confiderable huff and froth. Yet it requires time.* Wherefore it feemeth, That *Caftor* by virtue of its *alkaline Sulphur* becomes fo good a *Corrector* of the *acid-alkaline Sulphur* of *Opium*; fo I take leave to call it, having fome reafons to believe it fuch."

2 E 2

In the year 1744, the Copley medal of the Royal Society was awarded to Henry Baker, F.R.S., "for his curious experiments relating to the crystallization or configuration of the minute particles of saline bodies dissolved in a menstruum," in other words, for micro-chemical researches. Our business is, at present, with organized rather than crystallized substances, and we should have been content with merely mentioning the fact, were it not that some of his observations seem to foreshadow a line of investigation which has only recently received increased attention. Baker's first work, 'The Microscope made Easy,' was, like many other such books, dedicated to the Royal Society. It contains but little original matter; or, at least, whatever there is of new in it, is better detailed in his 'Employment for the Microscope,' published twenty years later (1764). Here we have figures of crystals to our heart's content, not only of simple salts of mineral origin, such as alum, borax, blue, green, and white vitriol, nitre, verdigris, corrosive sublimate, and many others, but, what is of more interest, crystallizations from certain mineral waters, especially those of Cheltenham and Scarborough. The appearances of manna (mannite?), benzoic acid, and camphor, crystallized from their respective solutions, are also well delineated. The author seems to have had an idea that every plant contained some definite crystalline matter peculiar to itself, and he figures no less than fifteen "salts" obtained from various vegetables; amongst them we find salt of Peruvian bark, salt of berberry, salt of wormwood, salt of cucumber, and salt of chamomile. It is not very clear what these "salts" may be. It is scarcely likely that they were obtained by the evaporation of the portions of the plant directly soluble in water; if so, the process would bear much similarity to one recently proposed for the estimation of the value of certain extracts and inspissated juices by means of the microscope. We suspect that they are rather inorganic salts obtained from the ashes of the substances named. Whether organic or inorganic is not of great moment; the fact of their observation is only brought forward in order to show that the crystalline constituents of vegetables had attracted the attention of microscopists before the middle of the eighteenth century.

Adams's 'Essays on the Microscope,' published a few years later than the last named work, though in many respects valuable, contain little that need lengthen these introductory remarks. His list of bodies suitable for he microscope embraces but few pertaining to pharmacy, with the exception of those noticed in his chapter on seeds. Herein we find pretty accurate figures and descriptions of the fruits of a number of the medicinal *Umbelliferæ*,—anise, fennel, cummin, coriander, and parsley; and even sections of one or two of them, to show the disposition of the external ridges and furrows which form their most striking character, but, as a matter of course, they are regarded as seeds, in accordance with the views of scientific men of the time. The fruits of the juniper and the bay are similarly treated, and the structure of the various parts well made out. Amongst seeds proper, those of Artemisia (worm-seed), Papaver, Hyoscyamus, and the Areca palm, comprise all that can be regarded as pharmaceutical. The work contains probably the first investigations in the structure of vegetable tissues by means of thin transparent sections, and the figures of transverse sections of the stems of sugar-cane, bamboo, Althæa, Chenopodium, and some other plants are not only carefully drawn, but from characteristic well-selected specimens. It will be recollected that Hooke, Grew, and the other earlier writers, were content to cut a smooth surface of the structure to be examined, and view it as an opaque object, and their drawings are always made as from a solid body of considerable thickness.

We may now leave the early literature of the subject, with the intention of reviewing briefly, in another paper, the present state of our knowledge of the structure of pharmaceutical substances.

THE PREPARATIONS OF CONIUM MACULATUM OF THE BRITISH PHARMACOPŒIA, 1864.

BY JOHN HARLEY, M.D. LOND., F.L.S.,

ASSISTANT PHYSICIAN TO KING'S COLLEGE HOSPITAL, AND TO THE LONDON FEVER HOSPITAL, ETC.

In furnishing four preparations,—poultice, juice, tincture, and extract,—the *Conium maculatum* occupies a prominent position in the British Pharmacopœia. Yet, perhaps, there is no plant in any Materia Medica of whose medicinal value we have less assurance than of that of Hemlock. It is commonly reputed to be a very poisonous plant, and medical practitioners of the present day partake of this opinion, and prescribe it in very small doses.

The object of my inquiries is to ascertain how far this impression is correct, and at the same time to determine the medicinal value of its preparations more accurately than has yet been done.

I have occasionally prescribed the extract and tincture of the London Pharmacopœia in much larger doses than are usually given, but without effect. Negative results have been too uniformly present to allow me to attribute them, in every case, to carelessness in the manufacture or preservation of the particular drug used; and a very old impression that the potency of the plant is greatly exaggerated, has, for several years past, gained strength in my mind. Wishing to give the officinal preparations fair trial, I have long waited for an opportunity of getting the fresh, well-grown plant in its proper season, so that I might have a sound basis for my experiments.

On mentioning the subject to Mr. Hemingway, the distinguished pharmaceutical chemist, of Portman Street, Portman Square, he has most kindly relieved me of my chief difficulty, and while he has given me the benefit of a most cordial interest in the matter, he has provided me with most reliable means for conducting my experiments. The first object of my inquiries has been the—

Tinctura Conii fructûs.—The tincture with which the following observations were made, was most carefully prepared by Mr. Hemingway, in the early part of November last, under my own inspection. In investigations of this kind it is of fundamental importance to ascertain the characters of the materials employed and the processes adopted. I shall not scruple therefore to enter into a somewhat minute description of them.

Preparation of the Tincture.—Two ounces and a half of the powdered fruit, mixed with fine sand, in order to separate the vegetable particles, and bring the spirit into more ready contact with them, were packed in the percolator, with a layer of sand above and below, the lower aperture of the percolator being closed with a piece of wash-leather. The fruit was then exhausted by the passage, drop by drop, and at a temperature of 62° F. of ℥xx of proof spirit. The percolation was preceded and occasionally interrupted by maceration,—the one process being substituted for the other by a slight rotation of the stopper. The supernatant spirit was preserved perfectly colourless by the upper layer of sand during the whole of the time, and thus fresh portions of pure spirit were constantly brought into contact with the separated fragments of the fruit. It is obvious that no more perfect process of exhaustion than this can be devised. It is one which Mr. Hemingway tells me he has constantly adopted in the preparation of tinctures, and it certainly appears desirable that such a thoroughly practical, cleanly, and effectual process should be universally prescribed for the preparation of this and similar pharmaceutical products.

The fruit used was a fine specimen, and probably of this year's growth. It was clean, and free from admixture with other umbelliferous fruits. The albumen was firm and solid, the commissure convex, the groove indicating the involution of the albumen broad and deep, and the crenations of the ridges well-formed—all of which I take to be essential characters of a well-matured fruit. My friend Professor Bentley has also examined the fruit and pronounced it mature and good. The powder was prepared by means of a fineish hair sieve, and *without the application of heat*. It evolved a strong heavy mousy odour.

When 14 ounces of the spirit had percolated, I collected f ʒss in a watch-glass, and allowed it to evaporate spontaneously. Only a slight yellowish-brown film of varnish remained upon the glass. The last six ounces of spirit came through colourless.

Mr. Hemingway exposed *the marc* to powerful pressure, and obtained about two ounces of colourless spirit rendered turbid by a little greyish feculent matter. On examining this fluid, I found that it contained minute spherules of a colourless fixed oil. After exposure to the light for a few days the oil assumed a bright sap-green colour. The whole was evaporated to dryness over a water-bath, and the oil separated from a minute portion of brown residue, by means of ether. *This fixed oil* was of an emerald-green colour, and possessed an odour resembling that of boiled linseed oil, and a nauseous rancid and bitter taste. It weighed 2 grains. I applied to the eye, and swallowed a drop of it without any result. Its specific gravity was less than that of proof spirit (0·920).

The following are the *characters of the tincture:*—Reaction slightly acid, colour light greenish-brown with an internal opalescence, a strong mousy odour. A mixture of f ʒss of the tincture and f ℥j of water was nearly colourless, but after exposure to light and air for twenty-four hours, it had assumed a leaf-green colour. This change is probably characteristic and depending upon a resinous matter allied to the green oil above described. It is no doubt one of a similar nature to that which affects guaiacum resin, but unlike this substance, neither the tincture nor the oil were rendered blue on exposure to protoxide of nitrogen.

In order to ascertain the physiological effects of the tincture, I selected two individuals,—a weakly emaciated woman, M. A. R—h, aged thirty-seven, and myself.

I began, November 11th, by taking f ʒss, and increased the dose f ʒss each day for the seven succeeding days, so that on November 18th I took f ʒiv, on the 19th I took f ʒv, and on the 20th f ʒvj. On the 21st I was called out of town, and was thus obliged to intermit my experiments for a few days. On the 28th of November I began again by taking f ʒvj. On each of the three following days I increased the dose by f ʒij, taking f ʒviij, f ʒx, and f ʒxij, on November 29th, 30th, and December 1st respectively. I did not take any conium on the 2nd December; on the 3rd I swallowed f ℥ij in Mr. Hemingway's presence.

The quantities above stated were taken in single doses, mixed with a little water, from $1\frac{1}{2}$ to $2\frac{1}{2}$ hours after breakfast. In order that the body should be well prepared for the poison, I took, most mornings, on getting out of bed, ʒj of bicarbonate of potash in a draught of water, sometimes alone, sometimes with a small proportion of tartaric acid. By this means the urine was preserved alkaline until late in the afternoon. The other mornings I purposely abstained from this or any other preparative measure.

I carefully looked for effects, but found none after any of the doses, excepting a stimulant action from the larger quantities of spirit. There was no disorder, nor diminution of muscular power. The pupil, definition in the vision of near and distant objects, the pulse and all the functions remained in their usual state, and the secretions were active and normal. During the whole of the time I was working harder and longer than usual, and sleeping less; nevertheless there was no sense of fatigue, neither drowsiness nor tendency to inaction. Every other day I was actively engaged with body and mind, and usually walked from four to seven miles. On the alternate day I remained quiet, and was chiefly employed in study. Immediately after taking the ℥ij of tincture on the 3rd of December, I sat down and wrote my letters, and then entered upon some microscopical investigations, and continued them, with a single break of an hour, for eight hours consecutively. On this and other similar occasions I retired to bed without the feeling of mental fatigue which I frequently experience after prolonged microscopical work. It so happened, in fact, that at the time I was following my experiment upon the tincture of conium, I was in vigorous health, and this was in no way affected by the drug.

The other subject of my experiments was in a very different condition. She was a pale, delicate, emaciated woman, and confined to bed by the pain and constitutional disturbance attendant upon the formation of a very large abscess in the right loin. Her pulse was 108 and feeble, and she was restless and unable to sleep. The abscess was opened on November 13th, and a pint of pus discharged. The same night I ordered as an anodyne f ʒij of the tincture above described, and directed the dose to be increased each night, provided, as in my own case, no effects should follow. She slept well. On the following night f ʒiij were given, and there was no sleep. On the 18th she took f ℥ss at night, but did not sleep well after it. On the 19th f ʒvij were given, and she had a good night's rest. Having used her supply, the conium was suspended for a few days, and opiates (♏xv to ♏xxx tincturæ opii) administered instead. Meanwhile the abscess was closing, the appetite returning, and the health rapidly improving. On December 1st she took f ℥j, and on the 2nd f ℥iss, which exhausted my supply. On carefully examining this woman from day to day, and with special reference to the effects of conium, neither Dr. Collie, one of the resident medical officers of the hospital, nor myself, could detect any result. Sleep followed some of the doses, but was, no doubt, totally independent of conium. Great relief followed the evacuation of the matter, and her health began to improve directly afterwards. She is now convalescent.

Examination of the Marc.—In order to make my experiments more satisfactory, I subjected the marc which Mr. Hemingway returned to me to the following process:—Placing it again in the percolator, I passed a solution of ʒj of caustic potash in f ℥viij of water through it, and subsequently washed it with water until it passed through colourless; f ℥xiv of dark brown fluid, resembling tincture of henbane in depth of colour, were thus procured. I subjected this to distillation, drop by drop, collecting the first ounce and a half separately. I allowed f ℥vij more to distil, and set this aside. I then put one-half of the marc (which had been exhausted by spirit and solution of potash) into the retort to the remaining fluid, and distilled f ℥iv more. Having satisfied myself that these three fluids differed in no respect from each other, they were mixed, and presented the following physical and chemical characters, which are those of a dilute aqueous solution of conia:—Colourless at first, but becoming brown on exposure, a dirty-looking, greyish, flocculent scum of greasy matter floated upon its surface; odour rank and disagreeable, yet somewhat resembling elder-flowers; taste partook of the smell, it somewhat resembled hydrocyanic acid, and left a slight acrid impression. Reaction alkaline; nitric acid added to a few drops in a test-tube produced, after a few seconds, violent effervescence from the liberation of binoxide of nitrogen, and a yellow liquid resulted. When the action was moderated by spreading the fluids on a porcelain plate, a greenish-yellow or bright green turbidity appeared, and after a few minutes bubbles of binoxide of nitrogen began to form, and the evolution continued until the green colour was removed, and a faint yellowish fluid remained. Solution of nitrate of silver produced a dirty white curdy precipitate, which readily dissolved in ammonia. When dried and heated, a flame ran instantly through it; and on further heating the charred residue, only metallic silver remained.

Solution of chloride of mercury caused an abundant white precipitate, which, when boiled with potash, became yellow and heavy, and evolved an alkaline vapour. When heated, the precipitate blackened, evolved mercurial vapours, and ultimately disappeared.

With solution of acetate of lead, the fluid gave a heavy drab-coloured precipitate. With sulphate of copper, a pale blue deposit. Both precipitates dissolved in dilute nitric acid, the former with effervescence.

This fluid was carefully preserved, and, on December 4th, I took f ʒss at 11 A.M., and f ʒj at 5 P.M. On December 5th, I took ʒii at 10.30 A.M., and ʒiij at 3.30 P.M. On the 6th, I took a single dose of f ʒvj. On the 7th, a single dose of f ʒx. On the 8th, a single dose of f ʒxij, and on the 9th a single dose of f ℥ij. I then subjected the remainder to the same reagents as before, and found that the fluid possessed the same reactions as it did on the day I distilled it.

No effect followed any of the doses. After taking the last dose I walked across the square to church, and, during the early part of the service, thrice experienced, within as many minutes, a momentary fluttering in the cardiac region, such as precedes faintness, but I could not fairly attribute it to the conium, for I awoke with a headache and slight nausea, and these had not altogether subsided at the time when I experienced the above-mentioned sensation. Of this there was no repetition, the remainder of the headache passed off, and I was well and active during the rest of the day. During the prosecution of these experiments upon the tincture and the distillate from the marc, I abstained from alcoholic or other stimulants.

The result of these experiments goes far to prove that the tinctura conii fructûs recently introduced into our Pharmacopœia is, at least in all proper medicinal doses, an inert preparation. From Geiger's and Dr. Christison's experiments it appears that the fruit contains a larger quantity of conia than the other parts of the plant, but the fact that the green fruits contain a much larger proportion than the dry, seems to have been overlooked. We know that the active principle of the poppy is more abundant in the circulating juices of the green fruit than in any other part of the plant, and that the quantity contained in the fruit diminishes in proportion as it becomes hard and dry. It is very probable that this is the case with the conium, and that we must look for the greatest accumulation of its active principle in the green immature fruit. One question relative to the tincture still presents itself, viz. does alcohol possess an influence antagonistic to that of conium, and, if so, how great is that influence?

78, *Upper Berkeley Street, Portman Square, W.*,
Dec. 14, 1866.

(*To be continued.*)

ADDITIONAL REMARKS ON KERR'S SOLUTION OF PERNITRATE OF IRON.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

In the 'Pharmaceutical Journal' for November we submitted a process for the preparation of Kerr's solution of pernitrate of iron, and now beg to append the following, regarding points on which we have since had communications.

The colour of the solution, when prepared according to the process already referred to, is very considerably paler than if the customary method be employed. This depth of colour in the latter instance may be accounted for chiefly by the presence of the products of the decomposition of the nitric acid,—a change which is foreign to the preparation in itself.

Further, we would draw attention to the necessity of being careful to ensure complete peroxidation before proceeding finally to precipitate the oxide. This may be readily ascertained, either by the addition of ammonia to a small quantity of the solution, freely diluted, in order to determine the absence of the black oxide in the resulting precipitate, or, by the addition of red prussiate of potash to another portion of the solution, likewise diluted, in which case no blue coloration must be perceptible.

If it be found, upon the application of these tests, that the iron has not yet been entirely peroxidized, increased heat, or, should that fail, a fresh supply of acid will produce the desired effect.

Yours sincerely,

Edinburgh, December 19th, 1866. T. AND H. SMITH.

SOLUTION OF PERNITRATE OF IRON.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I was much pleased to see, in the November Journal, the description of a new process originated by the Messrs. Smith, for the preparation of solution of pernitrate of iron; and one which, if generally adopted by chemists, would conduce to a greater uniformity in the production of an article so unstable and variable in its nature, as that prepared by the recognized formula.

It not unfrequently happens that customers though apparently convinced, after explanation, of the superiority of the light-coloured preparation, will again have recourse to the darker-coloured and sometimes even turbid solution, more especially if the latter has been sent out by a house with an "historic name."

The decomposition to which that prepared by the recognized formula is subject, I believe altogether to arise from the use of an acid of insufficient strength. This may be excusable when Kerr's formula is adopted, as in it the strength of acid is not stated, but will not apply to the B. P. process, as it distinctly states nitric acid to be of sp. gr. 1·5, and to contain 80 per cent. of anhydrous acid. When an acid of this strength is employed, the product is of a beautiful, transparent, reddish-brown colour, and not in my experience subject to change, though containing a minute quantity of protonitrate, which is necessarily present from the acid being insufficient in quantity to form the whole of the iron into pernitrate, and which will appear from the following proportion:—

56 or 2 equivalents of iron require 54 or 1 equivalent of anhydrous nitric acid to form it into peroxide; consequently 437·5 parts of iron will require—

56 : 54 : : 437·5 : 421·8 pts. of anhydrous nitric acid.

56 or 2 equivalents of iron, converted into peroxide, require 162 or 3 equivalents of anhydrous acid to form pernitrate; consequently 437·5 will require—

56 : 162 : : 437·5 : : 1265·6 pts. of anhydrous nitric acid.

To form 1 ounce of iron into pernitrate, 421·8 + 1265·6 = 1687·4 grs. of anhydrous acid is required.

B. P. acid contains 80 per cent. of anhydrous acid, consequently—

80 : 100 : : 1687·4 : 2109·25 grs. by weight of B. P. acid.

To reduce this to fluid measure—

1·5 : 10 : : 2109·25 : 1406·17 grs.

Or 3 fluid ounces 1 drm. $42\frac{2}{10}$ minims is required to form 1 ounce of iron into pernitrate.

However carefully the process may be conducted, the product must contain more or less protonitrate; this, however, may be easily remedied, by using a slight excess of acid, which is rather an advantage than otherwise.

I have lately used 3 drms. more than that ordered in the B. P., which I find to produce an article of a beautiful transparent reddish-brown colour; and though when newly prepared it contains a small quantity of protonitrate, this is practically of no consequence, as after having been kept a few weeks, it changes entirely into the pernitrate; and that so gradually and with so little evolution of nitrous gases, as neither to endanger the bottle, nor blow out the stopper.

I am, Sir, yours respectfully,
J. Nesbit.

Portobello, N. B., December 19, 1866.

CHEMISTS' CHARGES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In your Journal of last month, one of your correspondents refers to "Chemists' Charges," and gives an example of a bottle of drops, one and a half ounce, charged as 3½*d.* and 6*d.*, both charges to be condemned by the majority of dispensing chemists.

I think the present competition and lowness of prices for dispensing to be a matter of deep regret, and worthy of consideration by the respectable body of pharmaceutical chemists; we should remember it is not only for the commercial value of the drugs we charge for, but also for the *skill, and great responsibility* which rests upon us, *responsibility as great as resting on any body of professional men.*

We also should bear in mind that it is not fair to reckon by the rule. Benzole costs so much, olive oil and peppermint so much, but must add to that other costs; for, in the majority of good dispensing businesses, we cannot keep apprentices, neither can we have porters or uneducated men about us to give assistance, but must employ thoroughly competent assistants, and all this adds to the original expense.

Cheap drugs do not raise the demand. *Cheap physic* shops and *cheap* dispensing, neither raise the pharmaceutical chemist, or give satisfaction to the public. Cheapness and *purity*, cheapness and *intellectual* and *scientific* qualifications, cannot go together,—the intrinsic value of the latter will always command a higher price.

Another reason one may add. In the present day everything is rising in price, from the raw material to that of labour, rents, etc.; why, then, should we be the first to lower prices, which the public do not ask for, and give our labour and skill for nothing, which we cannot afford?

I am, Sir, yours obediently,
11, *Strand, Torquay.* J. B. Guyer.

CHEMISTS' ASSISTANTS' ASSOCIATION.

London, with all its brilliance, has its shadows; one of the darkest being the small accommodation for the enjoyment of social life offered to young men engaged in business. It cannot be expected but that those whose time is fully occupied for many hours, should seek some mode of relaxation. It is therefore matter for congratulation, that such an Association as this should have been attempted. Its future prosperity will depend absolutely on the wisdom and energy of its conductors. Their task is by no means easy, and success will be infinitely to their honour. Similar projects have been entertained; but whether through apathy or the temptation of more powerful attractions, the design has failed. This Association starts with the double object of affording a means of friendly intercourse, and of elevating the character of English pharmacy.

The following are some of the rules :—

"That the Association consist of an unlimited number of chemists' assistants, who shall meet for the discussion of matters relating to their profession, and for any other purposes that a majority of the members may deem expedient.

"That the meetings shall be held at 14, Air Street, Regent Street, on every Thursday evening, from 9.15 to 10.30, and that at each meeting a chairman be appointed for the ensuing meeting.

"That every member pay on his election the sum of 1*s.* 6*d.*, and a subscription of 6*d.* per calendar month afterwards; the first subscription to become due on the first meeting-night in the month following his election.

"That any member be at liberty to introduce a friend on meeting-nights, but such friend shall not be allowed to take any part in the business of the Association. Any misconduct on the part of such friend to be considered as having been committed by the member by whom he was introduced.

"That card-playing and gambling be forbidden at meetings."

The origin of the Association is thus stated. On the 7th day of April, 1864, a few gentlemen met by mutual arrangement in this room to consider the idea of establishing an association or club (to be composed of chemists' assistants only), for chemical and pharmaceutical discussions. The "few gentlemen" referred to, soon added to their number, and in June, 1864 (two months after their first meeting), they started on their career with twenty-eight members. The first quarter thirteen new members joined, the second quarter eighteen, the third six, and the fourth twelve. Thus at the end of the first twelve months the Society numbered something like seventy-seven members. The first quarter of the second year eight new members joined, and the second quarter (now just completed) four; thus making the total number who have joined our Society, from its first formation, eighty-eight.

These numbers are subject to variation; *about* ninety members represent their present strength. The Society has now been in existence two and a half years, and its meetings are continued, as usual, with a good share of success. Subjects connected with pharmacy are introduced almost weekly, whilst all matters of a personal character, together with those having reference to the relation between employers and assistants, are rigidly excluded. Smoking and refreshments are both allowed, and seem, in fact, to assist in the favourable reception of the scientific details (not always of an easy or simple character) often introduced for discussion. The business of the evening commences at ten o'clock, and closes about eleven (see "Abstract of Proceedings"), the only necessary expenses to members being the usual monthly subscription, and the waiter's fee of one penny on each occasion of personal attendance. A supper is held half-yearly, when from thirty to forty members meet together.

Objection might be taken to the meetings being held at a place of public resort or "tavern," where, of necessity, the usual refreshments, in the shape of wine, beer, and tobacco, are introduced; but without attempting any defence of this position, it is considered that such an arrangement is necessary to the existence of the Society, and, as no harm has hitherto accrued from it, it is regarded quite in a subordinate sense *as means to an end* (that end being the advancement of pharmaceutical knowledge, and the consequent elevation of the trade), it is perhaps scarcely open to that severe comment which a misunderstanding of its objects might evoke.

From the printed Transactions it appears that certain evenings are devoted to the reading of papers (time allowed for each, twenty minutes), and on other nights convivial gatherings are held. No working pharmaceutist can do otherwise than wish success to the Chemists' Assistants' Association; but it cannot be too strongly stated that this will depend on the skill and good management of the directors. Should they be able to effect the permanent establishment of the Association, no slight praise will be their due.

MISCELLANEA.

Illegal Sale of Arsenic.—Mr. Joseph Walls, a grocer and provision merchant at Wrotham, has been charged with selling arsenic without making the entries required by the statute. In 1861, a quantity of flour sold from defendant's shop was found to have been mixed with arsenic, and several persons were taken ill. An application was afterwards made to the Secretary of State in reference to defendant, who had sold 7lb. of arsenic in a pure state, and by order of the Secretary of State defendant was cautioned. In the course of the present year another quantity of flour from defendant's shop was found to be impregnated with arsenic, and again several persons were sufferers. The defendant and his family partook of the same flour and were also seriously ill, the defendant suffering for many weeks. Defendant admitted that the poison was not locked up, but open to access to any one in the shop. That he sold other poisons, and without licence, and was ignorant that the law required printed labels to be used, and proper precautions to be taken. He further stated he was of opinion, with respect to the admixture of arsenic in 1861, that it came in the flour to his shop, but he had no doubt that during the present year the poison was put into the flour by some one on his own premises. He was fined £5, including costs.

Accidental Poisoning by "Burnett's Disinfecting Fluid."—An inquest has been held, by Mr. Humphreys, on the body of Henry Webb, aged fifty-five years. Mr. John Swaine, inspector of the General Post-Office in the Commercial Road East, stated that deceased was a letter-carrier attached to that office. On the 22nd of May last he came to the office and complained of diarrhœa. It was usual to keep medicines for such attacks at all the offices, the mixture being supplied by order of Dr. Lewis, of the head office in St. Martin's-le-Grand. Witness had just come from the N.E. Post-office, where the mixture was kept in a stone jar, and seeing a precisely similar jar in the Commercial Road office, he gave Webb two tablespoonfuls of the liquid, and Webb swallowed it, but immediately complained of being burnt. Witness then examined the bottle more carefully, and observed that there was a label showing that the contents were Burnett's disinfecting fluid. The label was nearly obliterated by the action of the liquid. Witness at once sent the deceased to Dr. Tainton. Dr. Henry Tainton said that he found the deceased suffering from poison, which had already become largely absorbed into the system. Remedies were applied, and deceased was kept alive until Saturday, December 8th, when he died from the effects of the poison. The *post-mortem* examination showed that the stomach was shrivelled up and extensively ulcerated. The jury returned a verdict "That the deceased died from poison administered by mistake for medicine, and that Mr. Swaine showed want of care in so administering it."

A New Substitute for Collodion.—M. Persoz, fils, has recently discovered a method for obtaining a material possessing the same characteristic qualities as collodion. *La Lumière* says:—This new substance is produced by dissolving silk in a suitable solvent, and then separating the latter by means of dialysis. If the film be of a certain degree of thickness, it assumes on drying a golden tint, but this would no doubt be scarcely perceptible in a thin film, such as would be used in photography. The solvent chosen by M. Persoz is chloride of zinc, which, when kept at a warm temperature, readily dissolves the silk, but if the solvent be not warmed the silk takes a much longer time to dissolve. Before employing the chloride of zinc, it is heated with a small quantity of oxide of zinc, in order to neutralize any excess of acid in the chloride, and then filtered through a piece of fine cambric to remove the superabundant oxide. To separate the chloride of zinc from the solution of silk, M. Persoz has recourse to Professor Graham's method of dialysis. The apparatus for dialysis, which is a kind of sieve, is made by means of a broad strip of gutta-percha, bent round and cemented in the form of a cylinder, at one end of which is fixed a disc of parchment to form the bottom. The apparatus is floated upon a vessel of water, and the silk solution, previously diluted with water to the consistency of collodion, is poured into it. The chloride of zinc percolates through the moistened disc of parchment, and mixes with the water in which the apparatus is floating. In a few days the whole of the chloride of zinc will be found to have become separated from the silk solution, but the presence of a slight quantity of the chloride in the material is of no great consequence, as it merely gives rise to the formation, in the sensitive film, of a minute quantity of chloride of silver. Although M. Persoz does not mention the fact, there is no doubt that a dry film of this substance would be quite insoluble in water. Its employment is very simple. It is first iodized by mixing with it an aqueous solution of iodide, and then dried and sensitized; the exposure and development are conducted in the ordinary manner.—*Journal of the Society of Arts.*

Identification of Strychnine.—Mr. T. P. Blunt, in the 'Chemical News' of November 30, writes as follows:—"The following means of identifying strychnine may prove useful, under certain circumstances, as a corroboration of other tests; I do not think it has been previously noticed. In the examination of animal mixtures for strychnine, it is very difficult to separate that base from traces of organic matter; these may nearly always be recognised in the residue of evaporation from ether or alcohol by their smell, and appear—especially where the latter solvent is used—to interfere with the characteristic crystallization of that base in tufts of needles, which we find replaced, either wholly or partially, by granules, which to the naked eye appear to be devoid of crystalline character, but, under the microscope, are seen to consist of short and generally very irregular prisms. If a drop of dilute sulphuric acid (one of strong acid to five of water) be now added, the fragments will in a few seconds be observed to swell, assuming at the same time a rounded appearance, and if examined after an hour will be seen to form the centres of tufts of acicular crystals, sometimes of great beauty and regularity, sometimes appearing more like a mass of radiating hairs, retaining the shape of the original crystal, but much increased in size. The fragment is wasted in the process, its residue often appearing as a nucleus for the stellar tuft. The drop of liquid at the same time becomes filled with well-defined stars, formed of radiating needles of smaller size and scattered amongst the greater tufts. If an acid stronger than that described above be used, solution ensues immediately without any of these phenomena. In crystallizing pure strychnine from alcohol, especially where the original solution is weak, portions of the base will often take the irregular prismatic form above mentioned, appearing thus upon the sides of the vessel exposed during evaporation."

Cochineal.—The imports of cochineal from the 1st of January to the 1st of September last amounted to 4662 bags of Honduras, 870 bags of Mexican, and 6460 bags of Teneriffe, making a total of 11,992 bags; the deliveries to 3928 bags of Honduras, 809 bags of Mexican, and 7852 bags of Teneriffe, making a total of 12,589 bags; and the stock in hand to 2687 bags of Honduras, 666 bags of Mexican, and 1709 bags of Teneriffe, making a total of 5062 bags. The imports to the same period last year amounted to a total of 8535 bags, the deliveries to 10,664 bags, and the stock on hand to 4939 bags.

Thoroughly Disinfected.—According to the 'New York Journal of Medicine, Dr. Charles Brockhausen, assistant physician at the City Hospital, St. Louis, having finished his rounds through the hospital wards one day recently, was about to proceed to the cholera tents, but before doing so concluded to take a glass of what he termed metaphorically "disinfectant," but what in the vulgar is known as brandy. There happened to be on his shelf two demijohns, very similar in appearance, one of which contained brandy, while in the other was a disinfectant known as chloride of zinc. The doctor hastily mixed him a potation and swallowed it at a draught. His sensations after taking it were peculiar. He perceived at once that he had taken his disinfectant out of the wrong bottle. He communicated without loss of time with his two brother esculapians, who, by the timely administration of antidotes, neutralized the action of the poison, and saved his life. Dr. Brockhausen has no fear of catching the cholera for some time to come. He deems himself thoroughly disinfected.—*British Medical Journal.*

Poisoning Whales.—M. Balard has been occupying himself with the problem how to poison whales rapidly. He combines a soluble salt of strychnia with a twentieth part of woorara. He loaded some explosive cartridges with two ounces each of this delectable compound, and started off on a whaler. He gives particulars of the whales which he shot at and wounded. They all either died almost immediately or very rapidly (usually in less than ten minutes) after general convulsion. He concludes that whales are even more sensitive to poison than land mammals, and that, in future, it will be well to diminish the dose of poison, in order to determine a rather slower death.—*British Medical Journal.*

The Sale of Almond Flavour.—A case has been brought before the Bolton Borough Court, in which Mr. Thomas Goodman, druggist, was charged with having sold to a young woman, named Catherine Joyce, "a certain quantity of virulent poison to wit, half an ounce of almond flavour, such sale not being made in the presence of a witness," etc., as directed by the "Bolton Improvement Act of 1854." The sale of the poison having been proved, Dr. Settle, who made the *post-mortem* examination of the body of Catherine Joyce, stated that in his opinion "almond flavour" was a virulent poison, and he was sure that in this case it had produced death; and although Mr. Goodman stated that he purchased the essential oil of almonds free from prussic acid, and was of opinion that the poison had been produced by the decomposition of the oil, Dr. Settle stated that the oil was *always* poisonous; he never heard of its being sold free from prussic acid. The Bench was of opinion that the case would be met by the infliction of a nominal fine of five shillings, by way of caution.

A Fire Self-extinguished.—A fire broke out on Saturday in the cellar of a druggist named Christian, in the Avenue Montaigne, Paris, and was brought to a termination in a singular manner. A boy had let a lighted lucifer fall on some rags, which became ignited, and the flames spread to some bottles and carboys containing various kinds of spirits and alcohol; these bursting soon flooded the cellar with a blazing liquid which emitted a smoke so suffocating that the firemen were unable to enter. Suddenly a loud explosion was heard, and the flames became extinguished as if by enchantment. Three bottles of sulphuric ether, containing in all about three quarts, had burst, and the vapour mixing with the atmospheric air had put an end to the combustion.—*Chemical News.*

Oxalate of Iron a New Tonic.—The following communication from Mr. J. Emerson Reynolds has been addressed to 'The Medical Press and Circular' of Nov. 28.—"Allow me to draw your attention to a preparation of iron, which has been much neglected, if not altogether overlooked. I refer to the oxalate of the protoxide of iron. Having lately used it in cases requiring the exhibition of a compound of the metal, I observed that it was borne with remarkable ease by the stomach, possessed little if any astringency, and produced the usual constitutional effect with sufficient rapidity. The salt is easily prepared by adding a solution of protosulphate of iron to an excess of oxalate of ammonia solution containing a little free oxalic acid, a yellow precipitate is thrown down, which is the compound in question; this should be well washed and then dried. By having an excess of oxalic acid present any per-salt formed is held in solution. The precipitate yielded on analysis results agreeing with the formula $FeO, C_2O_3 + 4HO$, and therefore contains one-third of its weight of oxide of iron, one-third of oxalic anhydride, and the rest of water. The salt, when prepared as above directed, is a fine powder of a straw-yellow colour, almost devoid of taste and singularly slow to oxidise in contact with the air. It is slightly soluble in water, but more easily acted upon by a dilute acid, and is decomposed by the alkalies or their carbonates. When burned in the open air it leaves a residue of pure peroxide of iron in a condition particularly favourable for the production of *fer réduit*. In conclusion, I may remark that the oxalate of iron requires but *three* atoms of oxygen for its complete oxidation in the system, whereas for a given weight of iron the tartrate of the peroxide needs *ten* equivalents, and the citrate *eighteen* of oxygen, to effect the same end."

REVIEW.

NOTE-BOOK OF MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS. By R. E. SCORESBY-JACKSON, M.D., F.R.S.E. Maclachlan and Stewart, Edinburgh.

The author states that this book "is only a *Note-Book*, and its aim is to be suggestive rather than dogmatic." In other words, he says, it "will relieve the student from much of the mechanical labour of note-taking," and "whilst it supplies a good deal of useful information, it will suggest the necessity of a more complete investigation of the subject." We think the purpose for which the purpose was thus designed has been very successfully accomplished. The pharmaceutical student will find it a useful auxiliary in his studies; in fact, it supplies a want that has been much felt. Including under Materia Medica not only all the medicines ordered in the British Pharmacopœia, but many others not mentioned in that work, that are in frequent use, it gives a brief but explicit and generally comprehensive account of each. These notices also comprise pharmacology, descriptions of the chemical changes which occur in the processes referred to, and as much of therapeutics as the pharmaceutical student requires.

The following quotation will serve to indicate the way in which the subjects are generally treated:—

Ferri Phosphas. *Synonyms:* Phosphate of Iron—Blue Phosphate of Iron—Phosphate of Iron, $3FeO,PO_5$, partially oxidated.

PREPARATION.—*Take of sulphate of iron, three ounces; phosphate of soda, two ounces and a half; acetate of soda, one ounce; boiling distilled water, four pints. Dissolve the sulphate of iron in one half of the water, and the phosphate and acetate of soda in the remaining half. Mix the two solutions, and, after careful stirring, transfer the precipitate to a calico filter, and wash it with hot distilled water, till the filtrate ceases to give a precipitate with chloride of barium. Finally dry on porous bricks in a stove whose temperature does not exceed* 100°. *Preserve the dried salt in a stoppered bottle.*

Rationale.—The phosphate of iron being tribasic, three equivalents of sulphate of iron are required, from which the sulphuric acid is to be removed by means of soda. But the phosphate of soda contains only two equivalents of soda, the third atom of base being constituted by water, therefore another atom of soda is required to saturate the third atom of sulphuric acid, which if left free would prove injurious; this is provided for by the acetate, whereby an equivalent of acetic acid is set free, which is not prejudicial to the salt desired. Thus $(2NaO,HO,PO_5) + NaO,C_4H_3O_3 + 3FeOSO_3 = 3NaOSO_3 + HO + C_4H_3O_3 + 3FeO,PO_5$.

CHARACTERS.—*A slate-blue amorphous powder, insoluble in water, soluble in hydrochloric acid. The solution yields a precipitate with both the ferrocyanide and the ferridcyanide of potassium, that afforded by the latter being the more abundant,*[1] *and when treated with tartaric acid and an excess of ammonia, and subsequently with the solution of ammonio-sulphate of magnesia, lets fall a crystalline precipitate.*[2]

PURITY TEST.—*If it is digested in hydrochloric acid with a lamina of pure copper, a dark deposit does not form on the metal.*[3] PREPARATION.—*Syrupus.*

[1] Showing that it is chiefly a protosalt, but that it also contains a higher oxide, which s converted into perchloride by the hydrochloric acid. [2] Of the ammonio-phosphate of magnesia. [3] Absence of arsenic.

Dose.—Of the powder, three to ten grains, in powder, or pill, or dissolved in dilute phosphoric acid, sufficiently diluted; of the syrup, from twenty minims to a drachm, well diluted, each drachm containing one grain of phosphate of iron, and about half a drachm of dilute phosphoric acid.

Phosphate of iron has been recommended as a mild chalybeate, and is said to be useful in consequence of its combination with phosphoric acid, in cases of anæmia, chlorosis, etc., in conjunction with scrofula and rickets; in cases complicated with great nervous exhaustion and depression of spirits, and where there is a tendency to deposits of phosphates in the urine; it has also been recommended in diabetes. Several phosphates have been used in medicine, and a variety of syrups have been prepared, such as syrup of the phosphate of iron and lime, syrup of the phosphate of iron and ammonia, syrup of pyrophosphate of iron, syrup of superphosphate of iron, etc. Parrish's compound syrup of phosphates contains, in a teaspoonful, two and a half grains of phosphate of lime, one grain of phosphate of iron, with parts of a grain of phosphates of soda and potash, in addition to free phosphoric and hydrochloric acids. This and the above syrups may be given in doses of from thirty drops to a teaspoonful.

BOOKS RECEIVED.

On the Action of Medicines in the System. By Frederick William Headland, M.D., etc. Fourth Edition, Revised and Enlarged. London: John Churchill and Sons, New Burlington Street. 8vo., pp. 449. 1867. (From the Publishers.)

The British Association for the Advancement of Science: Nottingham Meeting, August, 1866. Report of the Papers, Discussions, and General Proceedings. Edited by W. Tindal Robertson, Esq., M.D. Dedicated, by permission, to W. R. Grove, Esq., Q.C., M.A., etc., President of the Association. Nottingham: Thomas Forman, 'Daily Guardian' Office. London: Robert Hardwicke, 192, Piccadilly.

The Pill-Book; or Pills, Boluses, Globules, Grains, and Granules, Pharmacopœial, Hospital, and Magistral, their preparations, formulæ, doses, leading uses, and synonyms, including Quack Medicines. By Arnold J. Cooley, Author of 'Cyclopædia of Receipts,' etc. London: Robert Hardwicke, 192, Piccadilly. 1866.

The nature of this little book is sufficiently described in its title; it forms a very useful addition to the dispensing counter; but those who turn to it expecting to find the most approved method of making "globules" and "granules" will, we fear, be disappointed. That the range of the formulæ is sufficiently extensive will be seen from the following quotation from the Preface:—

"It includes the whole of the formulæ for the preparations of the classes referred to, found in our national Pharmacopœias, those of the formularies of our leading hospitals, which are not included in, or which, under like names, differ from those of the Pharmacopœias; a large collection of valuable magistral formulæ, gathered from the practice of our leading physicians and surgeons, or approved by them; numerous formulæ occurring in foreign Pharmacopœias, hospital formularies, and private practice, and formulæ and notices of the leading proprietary preparations and nostrums commonly called quack medicines."

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.

"*A Chemist and Druggist*" (Mile End).—We are unable to assist our correspondent in the matter referred to; the system of advertising, even if successful, has seldom anything to do with the intrinsic value of the article advertised.

W. V. W. M. (Plymouth).—Of the two labels sent, that only for the "Liniment" is liable to medicine stamp duty.

"*An Associate.*"—*Acetum Scillæ.* A good formula is as follows:—Dried squills 5 lb. troy; Acet. distillat. 3 gallons imperial. Let it macerate for a month in a *glass* receiver in a cool place, then strain. Carefully avoid the directions "to digest with a gentle heat for three days, and strain;" and "to add a certain quantity of proof spirit."

"*M. P. S.*" (Walworth).—We are unable to give the information required.

A. M. (Hanley).—(1) The label sent would render the article liable to stamp duty. (2) We know of no such word:—most probably a misreading.

E. H. (Axbridge).—We know of no published formula for "*Dr. Budd's Liquor Hæmatoxyli.*"

"*Scandens.*"—An acquaintance with both theories is desirable, but ignorance of the new theory does not necessitate the rejection of the candidate.

Mr. Mumbray is thanked for his communication, which arrived too late for insertion.

Wanted, the January number of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. VIII.—FEBRUARY, 1867.

PHARMACEUTICAL LEGISLATION.

We see no reason to alter the opinion we expressed in our Journal of last month as to the desire prevalent among chemists throughout the country to settle the vexed question of pharmaceutical legislation, and by an extension of the existing Pharmacy Act to incorporate all members of our trade in one Society; but possibly we were too sanguine in hoping that the voice of opposition would not reappear. The voice has been heard again; it does not come from the Chemists and Druggists who assembled at Manchester in November last, and passed resolutions to be forwarded to the Council of the Pharmaceutical Society; those gentlemen, as will be seen by a correspondence published in this Journal, have not yet received the answer to their communication, but it is the voice of the Local Committee of the United Society, through whom that answer was sent.

We find it stated, that the only important difference in the "suggestions" and the Pharmaceutical Society's Bill of 1865 is in "*the limitation of the sale of poisons to examined persons, and exemption from jury service, which were essential principles of the Bill of the United Society, and approved by the Select Committee of the House of Commons.*"

Touching the exemption from jury service we have only to say, that the Committee of the House of Commons never considered, and therefore certainly never approved it. But it concerns us more to point out to our readers the great difference ignored; the proposed admission to membership of the Pharmaceutical Society of all persons on the register of chemists and druggists, who may choose to apply for such admission, whether they be registered after examination, or simply by virtue of the fact of their being in business at such time as the proposed Bill may become law. We should call this a very important difference.

Passing on, we find, "*that according to these 'suggestions,' every unincorporated chemist must submit either to register as a chemist, or abandon his business.*"

Now seeing that the sixth "suggestion" specially protects *all* the rights, not only of persons already in business, but also of those who may be assistants to chemists at the time of the passing of the Act, this seems rather a peculiar view to take on that point.

"*And if he registers,*" the paper from which we are quoting continues, "*he must risk the contingency of being elected as a member by the Pharmaceutical Council, before he can enjoy any privilege or exercise any right whatever in that capacity.*"

Of course he must *be* a member before he *acts* as a member. If the mode of election be objectionable, what other could be substituted? Should a man declare himself a member *without* election? Or should he call on five or six thousand persons to vote for his admission? The Council must always be chosen by the Society annually, and surely the Council of the Pharmaceutical Society can, like the Councils of all other societies, perform such functions for their constituents. It must be remembered, too, that when a man has a legal right, under Act of Parliament, to ask for membership, *that membership must be granted*, unless good cause of disqualification can be shown against him; the mere caprice of the Council would not be sufficient to exclude him, for they would not only have the *privilege*, but also the *duty* of electing thrown on them, and must act according to the "*intent and meaning*" of the law. We feel here to be almost offering a gratuitous insult to a Council which has never, as far as we know, rejected a proper candidate for membership.

The next passage is intended to go to the heart of every free-born man, and so speaks "*of the great principles of equality of all unexamined chemists, and the right to nominate and be nominated upon the Council, which is the constitutional right of every Englishman taxed for the support of an institution;*" a little further on, "*that so long as these rights are withheld, it is an outrage to propose compulsory registration to the existing unincorporated chemists of the country.*"

This anticipation of insult is entirely gratuitous, inasmuch as no compulsory registration of existing unincorporated chemists has been proposed; whatever propositions there are concerning those gentlemen are for entirely voluntary action on their part; and certainly all likely to improve their position. There is no taxation for them unless they seek it; and if they do, their constitutional right will come with it. Let all have their "constitutional rights," and let it not be forgotten that the title of "Pharmaceutical Chemist," and the privileges belonging thereto, are as much the right and vested interest of the unexamined men who now possess them, and but for whom the Pharmaceutical Society would never have existed, as the title of Chemist and Druggist is of the outsiders.

As to the constitution of the Council, there are ample precedents for the limitation proposed. The Councils of the Colleges of Physicians and Surgeons are composed of "Fellows" only. In framing an Act of Parliament intended for all time, present personal considerations must not be allowed to stand in the way of future benefit; and it can scarcely be denied that the ultimate hope of all chemists taking the higher qualification in time to come is reasonable, and that inducements for their doing so should be provided. But even here the objectors would do well to consider that chemists already in business, having been so for a period of five years, need not submit to what they might call the indignity of presenting themselves to the Board of Examiners in the company of their assistants, there being a "*separate examination*" expressly provided for them, on passing which they would be at once registered as Pharmaceutical Chemists.

In taking note of these objections, which appeared in the proceedings of the Executive Committee of the United Society recorded in the 'Chemist and Druggist' of January 15th, we are not oblivious of the fair and candid spirit in which the question is discussed in other parts of the same journal, or of the assurances of approval received from such societies as the "Bath Chemists' Association," and published in our number of to-day; but it is our business to correct the misrepresentation and misinterpretation which have been put on the propositions we published last month, and which have since been officially issued by the Council.

So long as the unincorporated chemists think for themselves, and speak for themselves, the way seems clear and easy; but when they allow those duties to be usurped by others, whose interests are not identical with their own, there can be very little hope of progress for them. The Pharmaceutical Society, indeed, has but small cause to complain of such a state of things, seeing the advantage which has accrued to it by the agitation of the last three or four years. We do not mean simply the increase of its internal prosperity, but rather of its position in the estimation of the public, of whom, comparing the two periods of 1863 and 1867, fifty to one now know of its existence and appreciate its work. This might fairly be considered by many as a reason to "rest and be thankful;" to let the public complete the work commenced by the Society. The Society has really nothing to gain for its members as individuals, but in 1841 it set itself to do a great work, and we trust many of the Founders may yet see that work accomplished.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *2nd January*, 1867,

Present—Messrs. Bottle, Carteighe, Hills, Ince, Morson, Sandford, and Savage.
The following were elected Members—

Baker, Parson Custance	Swaffham.
Cornelius, Richard Bayly	Teignmouth.
Fitt, Francis Edward	Barking.
Forth, William	Cheltenham.
Moussempés, Jules	Biarritz.
Spearing, James	Southampton.

THE BATH CHEMISTS' ASSOCIATION.

To the Council of the Pharmaceutical Society of Great Britain.

Gentlemen,—We, the undersigned Chemists of Bath, in meeting assembled, beg to assure you of our confidence and respect.

We have read with much interest the Report of the last meeting of the Pharmaceutical Conference, and desire to express our hearty approval of the sentiment contained in Mr. Giles's resolution, following Mr. Ince's paper on the Ethics of Pharmacy, viz.:—

"That this meeting considers that the practice of pharmacy requires to be limited to fully qualified persons, and that it is necessary, in order to attain this result, that an appropriate examination should be enforced by legislative authority."

We beg to assure you that we appreciate the consideration shown by you, in making arrangements whereby chemists who have been in business for five years, or are thirty years of age, are permitted to pass a *limited* examination, and we take it as an evidence of your desire to meet the legitimate wants of all, who are anxious to share the privileges and immunities of Pharmaceutical Chemists.

Impressed with this conviction, we venture to make a few remarks and suggestions, in the assured confidence that you will give them your best consideration, and in the hope that we may be the means of uniting the great majority of the chemists of the United Kingdom, in the support of a Bill embracing the object expressed in Mr. Giles's resolution.

Permit us, then, respectfully to remind you, that there are six classes of persons engaged in the practice of pharmacy in this kingdom, whose interests have to be considered, viz.:—

1st. The founders of the Pharmaceutical Society.
2nd. The members by examination.
3rd. Those persons who were eligible at the time to be registered under the Act of 1852.
4th. Those who have commenced business on their own account since that period.
5th. Assistants.
6th. Apprentices.

1st. With regard to the class first named, we freely acknowledge that to them we owe all the benefits received or to be derived from the Pharmaceutical Society.

We consider that to their perseverance and liberality towards it for a long series of years we are indebted for the position of the Society at this time; and as in the event of your adopting the suggestions hereinafter named, you may reasonably calculate upon a large addition to the numbers and revenue of the Society, we beg respectfully to suggest that the founders of the Society be relieved from the necessity of further contributions to its funds.

2ndly. In considering the claims of the members by examination, we beg to record our high sense of the honourable position they have attained, and we would desire to see it recognized and acknowledged by every suitable means.

3rdly. Those persons who were eligible at the time to be registered under the Act of 1852, need your special consideration. We must conclude that with an additional fourteen years' experience, they are better qualified now than they were at that time. We freely acknowledge that they might have availed themselves of the opportunities of joining the Society, afforded them from time to time, and that their not doing so may reasonably be attributed to inadvertence, indifference, or want of confidence. By this large class the offer of a limited examination, we believe, is duly appreciated, but from various causes over which they have no control, the majority of them are quite unable to take advantage of it. Knowing, as we do, the many difficulties, mental and material, with which this class have to contend, and as we are anxious to disarm opposition without a compromise of principle, we beg respectfully to suggest, that the Council of the Pharmaceutical Society do appoint in every suitable locality a temporary Board of Examiners, whose certificate of qualification shall be considered by the Council a sufficient guarantee of eligibility of each candidate to be placed in the position of those who now pass the limited examination in London. The local Boards to act gratuitously, but each successful candidate to pay to the Council a fee not exceeding £

4thly. We would now consider the interests of those chemists who have entered into business on their own account since the passing of the aforesaid Act. We readily acknowledge that they have not *the same* claims to indulgence as those who were eligible at the time the Act was passed, yet much might be said on their behalf; we will, however, content ourselves with reminding you, that they have their own peculiar difficulties to contend with, and these difficulties prevent their taking advantage of the opportunity of passing the present limited examination in London. We, therefore, respectfully suggest, that the privilege of passing a local limited examination be extended to this class also.

5thly. We would venture also to suggest that the privilege of passing the present limited examination in London, might, with propriety, be extended to assistants of a certain standing.

Lastly. We cordially approve, that all other assistants and apprentices should be required to pass the full examination before being registered as Pharmaceutical Chemists.

Again expressing our confidence and esteem,

We remain, Gentlemen, your obedient servants,
(Signed on behalf of the Meeting) JOHN B. MERRIKIN, *President.*

November 20, 1866.

The Secretary was requested to send the following reply :—

Dear Sir,—The Council having very fully considered the memorial addressed to them by the Bath Chemists' Association, on the 20th November, 1866, have instructed me to communicate to you their opinion on the suggestions contained therein.

They are glad to find that although in some matters of detail there may be difference of opinion, on the main principle involved in Mr. Giles's resolution the Bath Chemists'

Association are in perfect accord with the Pharmaceutical Society, inasmuch as that resolution is really a reiteration of the preamble of our Charter and Act, and of every draft Act which the Society has hitherto submitted to the Legislature.

The Council cannot separate the interests of the two classes marked "1" and "2;" in the first place, because they consider it would be unjust to do so, "No. 1" having been absolutely necessary for the foundation of the Society, and the creation of "No. 2;" in the second place, because the Pharmacy Act placed the two classes on one legislative level; and to derogate one of them from this position would be contrary to law, and, as a disregard of vested interests, to custom also.

If it were attempted to elevate "No. 2," an equal inconvenience would arise, as it must be done by introducing a new title not known to the Act of Parliament, and, consequently, not legally protected. There is nothing *now* to prevent a man calling himself a "member by examination," but such a practice would complicate matters very much, and, as in a very few years there can be no other members in existence than those who have passed an examination, it would not be worth venturing on such a difficulty.

With reference to the proposition that Class 1 be exonerated from further subscription, it is only necessary to observe that in ceasing to subscribe they would cease also to be "Pharmaceutical Chemists," inasmuch as they are so registered under the Pharmacy Act by *virtue of their membership.*

Classes 3 and 4. All persons mentioned in these clauses are entitled to avail themselves of the "Separate Examinations," established in an arrangement of which the Bath Chemists' Association expresses approval, but somewhat disparages by the term "limited." Those examinations are practical, as fitted for a man in business rather than a student, and, on passing them, the candidate being *registered as a Pharmaceutical Chemist* is eligible for membership. Under the Act of Parliament there can be but three examinations, one for each grade,—Pharmaceutical Chemists, Assistants, and Apprentices or Students,—and the Bye-laws are very stringent in providing that no person shall be elected a member who is not on the register of Pharmaceutical Chemists.

With regard to local examinations, the Council has no power to appoint more than one Board of Examiners for England and Wales, and if it had, the question would be one on which great difference of opinion has always existed, and would continue to exist, the more especially as many circumstances tend to the conclusion that the day is not far distant when an extension of the Pharmacy Act may be obtained, in the event of which, beyond the mere protection of vested interests, advantages even might be assured to chemists not previously connected with our Society by providing a voluntary registration which would enable them afterwards to become members without examination.

Class 5. The separate examination has, by a recent resolution of Council, been thrown open to Assistants of certain standing.

I am, dear Sir, yours truly,
ELIAS BREMRIDGE, *Secretary.*

John B. Merrikin, Esq., President of the Bath Chemists' Association."

Bath, January 17, 1867.

Dear Sir,—I have great pleasure in enclosing you the accompanying Resolutions, passed at a meeting of the Bath Chemists' Association, held last night, Wednesday, January 16, at the Commercial Rooms, and beg you will present them to the Council.

I would just remark that a general feeling of satisfaction appeared to pervade the meeting, at the prospect of an easy settlement of the question in hand.

I am, dear Sir, faithfully yours,
JOHN B. MERRIKIN.

To Elias Bremridge, Esq.,
Secretary to the Pharmaceutical Society.

EXTRACTS FROM THE MINUTES OF THE BATH CHEMISTS' ASSOCIATION.

Resolved,—That this meeting cordially approves of the suggestions emanating from the Council of the Pharmaceutical Society, subject to the explanations given by the Secretary, Mr. Bremridge, for the proposed Pharmacy Bill, and pledges itself to give the Council its earnest support in obtaining the sanction of the Legislature thereto.

Resolved,—That this meeting cannot separate without expressing its high sense of the great courtesy shown by the Council in its correspondence with this Association.

Resolved,—That the President be requested to communicate the above Resolutions to the Council of the Pharmaceutical Society.

Signed on behalf of the Association,
JOHN B. MERRIKIN,
President.

Bath, January 16, 1867.

COMMUNICATION FROM THE CHEMISTS AND DRUGGISTS OF MANCHESTER.

United Society of Chemists and Druggists.
Offices, 20, *New Ormond Street, W.C.,*
London, 8*th December*, 1866.

The Secretary and Registrar of
The Pharmaceutical Society of Great Britain.

Sir,—I am instructed by the Executive Committee of this Society to forward you a copy of resolutions passed at a public meeting of chemists and druggists of the Manchester district, for the consideration of the Council of the Pharmaceutical Society, in compliance with the request therein embodied.

I am, Sir, your obedient servant,
C. F. BUOTT,
Pro Registrar and Secretary.

(COPY.)

"*Resolutions passed at a Public Meeting held at the Clarence Hotel, Manchester,* 23*rd November*, 1866.

"WM. BOWKER, ESQ., *Ex-Mayor of Manchester, in the Chair.*

"1. That, as voluntary examination has failed to protect the public against incompetent druggists, this Meeting recommends that a Bill be brought into Parliament to alter and amend the Pharmacy Act, so as to embrace all chemists and druggists in the Pharmaceutical Society, upon the principle of compulsory examination.

"2. That, under the New Act, all examined members of the Pharmaceutical Society shall be entitled to distinction, whilst all other chemists and druggists, now in business, shall be members of the Society on payment of an annual fee, and be eligible to nominate or to be nominated upon the Council.

"3. That all existing assistants and apprentices may be registered as such, and be admitted as members of the Society, on becoming chemists and druggists in business, but all other persons, on becoming chemists and druggists, shall be required to pass a certain examination, and to pay such fees as may be agreed upon.

"4. That the Executive Committee of the United Society of Chemists and Druggists, as the representatives of the unincorporated chemists and druggists of the country, whose interests must be chiefly affected by any measure to regulate the trade, be respectfully requested to lay these proposals before the Pharmaceutical Council for consideration; and that the Pharmaceutical Council be respectfully requested to communicate their answer to such proposals, unreservedly, to the Executive Committee, so that that Committee may take the sense of the unincorporated chemists and druggists upon it before the meeting of Parliament."

The resolutions having been considered, it was resolved—

"That a copy of the suggestions* for an extension of the Pharmacy Act, handed to the Under-Secretary of State for the Home Department, in February, 1866, be forwarded to the Executive Committee of the United Society, with a request that the same may be transmitted to the Chairman of the Manchester meeting, with an intimation that this Council is still impressed with the necessity for legislation, and of opinion that, in the ensuing session of Parliament, success might be achieved if chemists and druggists generally would unite in supporting a measure based on those propositions; comparing

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* See Pharm. Journ. Transactions, January, p. 363.

them with the Manchester resolutions, the Council cannot but hope for the hearty co-operation not only of the gentlemen who were present at that meeting, but also of all interested in the question.

This resolution was accordingly sent, with the copy of the "suggestions" mentioned therein, accompanied by the following note to the Chairman of the Executive Committee of the United Society of Chemists and Druggists :—

TO THE CHAIRMAN OF THE EXECUTIVE COMMITTEE OF THE UNITED SOCIETY OF CHEMISTS AND DRUGGISTS.

Sir,—Having received, through your Committee, certain Resolutions passed at a meeting of the chemists and druggists at Manchester, on the 23rd November last, and being requested therein to communicate the views of the Council on the subject of Pharmaceutical Legislation, I am directed to hand you an extract from their Minutes of this day's proceedings, and to request that you will forward the same, with the annexed copy of "Suggestions for an extension of the Pharmacy Act," to the Chairman of that meeting.

I am, Sir, yours obediently,
ELIAS BREMRIDGE,
Secretary and Registrar.

January 2, 1867.

In consequence of the following letter having appeared in the 'Chemist and Druggist' of 15th January, a correspondence has taken place between the Secretary and Mr. Alderman Bowker (the Chairman of the Manchester meeting) :—

Manchester, January 9th, 1867.

Dear Sir,—I am directed by the Committee of the Manchester District of the United Society to transmit the following considerations to be placed before the Executive Committee on the 10th inst., as the result of their opinions on the Suggestions published in the 'Pharmaceutical Journal' of the 1st inst. in reply to the Manchester resolutions.

1st. That the only important difference berween the suggestions now put forward by the Council and those embodied in the Pharmacy Bill of 1865, lies in the limitation of the sale of poisons to examined persons, and exemption from jury service, which were essential principles of the Bill of the United Society, and approved of by the Select Committee of the House of Commons.

2nd. That in all other respects these Suggestions prove to be substantially the same as those of the Pharmacy Bill of 1865, which was thrown out by the Parliamentary Committee.

3rd. That according to these Suggestions, every existing unincorporated chemist must submit either to register as a chemist or abandon his business; and if he registers, he must risk the contingency of being elected as a member by the Pharmaceutical Council before he can enjoy any privilege or exercise any right whatever in that capacity.

4th. That the great principles of equality for all unexamined chemists, and the right to nominate and be nominated upon the Council, which is the constitutional right of every Englishman taxed for the support of an institution—those very principles for the triumph of which our Society was formed, and has worked and paid its money for six years, and to which Parliament has given its sanction,—are completely ignored.

5th. That so long as these rights are withheld, it is an outrage to propose compulsory registration to the existing unincorporated chemists of the country.

6th. That the Suggestions also ignore the vested rights of all assistants and apprentices under the age of twenty-one years.

These being the opinions of our Committee, we would strongly urge on our Executive the imperative necessity of immediate action, being confident, from the display of feeling indicated by the publication of the suggestions of the unincorporated in the whole of this district, of the hearty support of not only the members of the United Society, but all the trade likewise; feeling sure that such action will be assisted by a material strengthening of our ranks, which will undoubtedly follow, and is already in movement.

Receive, therefore, our assurance that though not present at your meeting, we are with you in heart, and earnestly hope for the success which will surely follow the individual action of the society. I remain, dear Sir, yours truly,

EDMUND HOLT.

Hon. Sec. U. S. C. and D. Manchester District.

Mr. C. Buott, Secretary of the United Society of Chemists and Druggists.

(CORRESPONDENCE.)

17th January, 1867.

Dear Sir,—Will you kindly inform me whether the reply of the Council of this Society to the communication which you sent me from a meeting of chemists and druggists, held at Manchester, on the 23rd November, of which you were chairman, and which was reported to have been numerously attended, has been put before the persons by whom the Resolutions in your communication were passed? I ask this, because I see by the 'Chemist and Druggist' of the present month, that a letter was read at the meeting of the Executive Committee of the United Society, on the 10th instant, from a Mr. Holt, of Manchester, expressing the disapproval, not of the chemists and druggists who sent the Resolution to this Society, but of the "Committee of the Manchester District of the United Society," and that steps were at once taken to discredit in every possible way, not even excepting misrepresentation, the proposals and suggestions put into the hands of the Government by the Pharmaceutical Society.

I am, dear Sir, faithfully yours,

To W. Bowker, Esq., Manchester. ELIAS BREMRIDGE, *Secretary.*

Deansgate, Manchester, January 22, 1867.

Dear Sir,—Absence from home has prevented me from replying earlier to your letter. The meeting held here, of which I was Chairman, was a meeting of chemists and druggists; the majority present were not members of the United Society. It was a large and influential meeting of the trade in Manchester and the districts for many miles around this city. Speaking candidly, I believe Mr. Buott was the main instrument in promoting the meeting, but it was distinctly understood that it was a meeting independent of the United Society.

The Resolutions passed were unanimous, and were sent to the United Society as the best parties to present them to the Pharmaceutical Board, as they had already communicated with that Society; since that, I have not seen the reply sent by your Board to the United Society. We have had no public meeting here since the one you allude to. I believe there has been a Committee meeting since, which I could not attend.

Yours sincerely,

To Mr. Bremridge. WM. BOWKER.

January 23, 1867.

Dear Sir,—Enclosed is a copy of the Resolution of the Council on the 22nd instant, in reply to the Resolutions of the Manchester meeting of the 23rd November last, of which you were Chairman.

I send also a copy of the note to the Executive Committee of the United Society, accompanying the Resolution, and specially requesting that it might be sent to you.

The resolutions passed at Manchester, and the reply will necessarily appear in the Society's Journal and Transactions in the ensuing month; and, as action has been taken by a section in Manchester in reference to that reply, as referred to in my last, I would, in justice to the chemists and druggists who attended the meeting of the 23rd November, and with a view of exemplifying the unfair course adopted, ask permission to publish your note to me of yesterday's date.

Having so far taken a public and prominent part in the proceedings, I must leave it to you to decide whether any or what further steps you may deem necessary to take so as to bring the opinion of the Council of the Society before the chemists and druggists in your district.

For your guidance, I enclose copy of Resolutions passed by the Bath Chemists' Association, and I believe these would be the opinions of the majority of *unbiassed chemists* throughout the country. Waiting the favour of your reply in course of post,

I am, dear Sir, faithfully yours,

To Wm. Bowker, Esq., Manchester. ELIAS BREMRIDGE, *Secretary.*

Deansgate, Manchester, January 24, 1867.

Dear Sir,—Thanks for your kindness in sending the information, which I shall find valuable; with regard to your request to publish my letter, you may act as you think discreet, although I never intended or thought you would publish it, and perhaps was not as guarded in the language as I might have been—still I leave it with you.

With regard to what may be done in Manchester or elsewhere, it is not for me to say in the absence of any meeting, but I can tell you we shall look after our *interests* in Parliament,—a tribunal which, I have no doubt, will respect the interests of those who are in business and have legally served their time to the business. Individually, I should very much like the whole body of chemists members of the Pharmaceutical Society, if the terms offered are honourable.

Yours in haste, very sincerely,
Wm. Bowker.

To Mr. Bremridge.

ADJOURNED MEETING OF THE COUNCIL, 9*th January*, 1867.

Present—Messrs. Carteighe, Deane, Edwards, Evans, Hanbury, Haselden, Hills, Morson, Orridge, Randall, Sandford, and Waugh.

The following were elected Members—

Norrish, Henry ....Tiverton.
Trollope, William Thomas ....Landport.

Resolved—That the Parliamentary Committee be requested to confer with the Home Secretary on the subject of legislation as regards an amended Pharmacy Act.

In accordance with the above resolution, the following had an interview with the Under-Secretary, Earl Belmore, at the Home Office, January 16th:—The President, Vice-President, Messrs. Carteighe, Edwards, Orridge, Morson, Waugh, the Secretary, and the Society's Solicitor (Mr. Flux).

BENEVOLENT FUND.

Memorials for assistance from this fund were considered, and the following amounts granted:—

	£	s.	d.
Widow of a member late at Romsey, age 54. (*See Pharm. Journ., Dec.* 1848, p. 298)	20	0	0
Member, late at Bakewell, age 45, with six children. Wife ill and in the hospital	20	0	0
Member at Atherstone, age 50, eight children, four still dependent on him for support, and an aged mother	20	0	0
Member, late at New Ferry, age 60, wholly incapacitated from rheumatic-gout	20	0	0
Widow of a member, late at Sunderland, towards expenses in endeavouring to get her child into the British Orphan Asylum	10	10	0

BOARD OF EXAMINERS, 16*th January*, 1867.

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

Five candidates presented themselves for the Major and Minor Examinations: the following passed and were duly registered:—

MAJOR (as Pharmaceutical Chemist).

*Selfe, William Gilbert..Gloucester.

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* Passed in honours; eligible, at the end of the Session, to compete for the Pereira medal.

MINOR (as Assistants).

Bryant, John	Bath.
Knight, John	London.
Williams, James	Mildenhall.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Butten, Joseph	Mr. Hemmings	Penzance.
Cadoux, Samuel Henry	Mr. Chaplin	Colchester.
Ground, William Davie	Mr. Ekin	Grantham.
Tomkins, Henry	Mr. Ekins	Bedford.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Third general meeting, held at the Royal Institution, November 22nd. The President in the chair.

The minutes of the previous meeting were read and passed.

The following gentlemen were elected members:—Mr. John Boustead, 94, London Road; Mr. L. Fleming, Prescot Street.

The Secretary exhibited a new aquatic firework, called the "Devil's Tears," and explained their composition and mode of action.

The President then called upon Mr. Charles Symes to read his paper on "Pharmaceutical Education and Examination, from a Business Point of View."

Mr. Symes said: Our calling is one of a very peculiar kind, inasmuch as it involves considerable responsibility, requires a large amount of both special and general information for the proper performance of its duties, yet includes many minor operations which do not require the application of more than ordinary common sense, neither do they tend to develope the latent powers of the mind. It is from this inclusive character that it must be considered both a profession and trade. He then referred to the low standard of qualification demanded by the public some thirty years since; to the difficulties necessarily and bravely encountered by the founders of the Pharmaceutical Society, the boon that Society had proved, not only to those within, but also to those outside its pale, and the debt of gratitude we owed to its early members (and one in particular) for their self-denial and large-heartedness in sacrificing personal advantages for the benefit of the profession to which they belonged. That Society had already done a great work, but it still had a greater one to do.

In reference to the education of youths intended for the pharmaceutical calling, Mr. Symes thought that it should be less classical and more scientific; he was aware that the study of Latin and Greek authors was intended for the development of the mental faculties, but whilst a useful object was gained, the means was almost entirely lost; why not use a means which, whilst equally effectual, was also valuable in itself? He thought, also, that far too little attention was given by masters requiring apprentices as to whether they were really suitable in themselves, or properly educated for the duties they would have to perform. He did not wish to speak discouragingly, but equality of mind was a thing the world had not, and probably would not ever know. A youth unsuited to a dispensing business in town might suit a mixed country business admirably, and this appeared to be a favourable point from which to argue classification. Every reflecting mind saw around it many evils which would be remedied if examination became more general, and all must agree that compulsory examination would be far better than voluntary in effecting this change; in his opinion, however, there should be two degrees of qualification; take a man from the west and another from the east, one from town, another from the country, and how diverse are the duties they have to perform. The pharmaceutical examinations are excellent, and demand nothing which a well qualified pharmaceutist does not require to know, but for the man who has to sell groceries, and a host of other things, to eke out an existence in a village or small country town, there are some technicalities in the Major Examination that might be dispensed with, in fact the Minor Examination, carefully conducted, would be sufficient; botany should, however, form one of the subjects for examination.

Mr. SYMES pointed out a routine of study which he considered necessary to qualify a pharmaceutist for his calling; speaking highly of the lectures provided by the Pharmaceutical Society; he also advocated local examinations.

A long discussion followed, in which the PRESIDENT, Mr. ABRAHAM, Mr. BETTS, and Mr. REDFORD advocated the desirability of the higher attainments being required; and Mr. SHARP, Mr. MURPHY, and the SECRETARY, while admitting the value of high scientific knowledge, thought that perhaps, at present, it would be better to have a generally diffused knowledge, if not so profound, than an examination which frightened the majority.

Other members took part in the discussion, after which a vote of thanks was proposed by Mr. REDFORD, and seconded by the PRESIDENT, to Mr. Symes for his interesting and suggestive paper. The motion was carried by acclamation.

Fourth general meeting, held December 6, 1866. The PRESIDENT in the chair.

The following donations to the Society were announced:—'Pharmaceutical Journal' for December, from the Society; 'Proceedings of the British Pharmaceutical Conference;' 'Proceedings of the Liverpool Polytechnic Society;' 'Proceedings of the Architectural Society, Third and Fourth Meetings.'

The thanks of the meeting were voted to the donors.

Mr. EVANS referred to the paper read at the previous meeting, and deprecated any reduction in the examination on botany, giving an instance in his own experience, in which hemlock was mistaken for wild carrot.

The PRESIDENT then called upon members to bring forward miscellaneous communications, to which the evening was to be devoted. He expressed his belief that these meetings would prove attractive to young members, and regretted that there were so few associates connected with the Society.

Mr. REDFORD read a letter from Mr. Ince, requesting 'Hints on Laboratory Work, and Dispensing Pharmacy,' to be laid before the next Pharmaceutical Conference.

Mr. SHARP thought that our own meetings were the means by which these should be communicated.

The PRESIDENT advocated the adoption of both methods.

Mr. CHARLES SYMES then brought forward the subject of extracts of bark. He had found that the extract of pale bark was usually supplied instead of that of yellow bark, and that he had to apply specially for the latter, which was charged a much higher price. He asked whether it was not the intention of the Medical Council that yellow bark should be used. He had also met with a sample of phosphate of lime containing 40 per cent. of carbonate.

Mr. MURPHY then drew attention to the fact, that in many instances alcoholic extracts would give much more uniform and reliable preparations than aqueous ones.

Mr. BETTS described a sample of Epsom salts which contained a large quantity of sulphate of iron.

The SECRETARY expressed himself strongly on the subject of the adulteration of drugs, giving the results of an investigation made in Manchester.

Mr. SHARP excused the weakening of some drugs, especially the preparations of opium when sold in low localities, and in opium-eating districts. This opinion caused a lively discussion, several members dissenting from it.

Mr. SYMES then described a process for coating pills which he had found to answer well. He dissolved the residue from the preparation of syrup of tolu in ether, 2 drachms to 1 oz. ether. A little solution was put in the cover of a gallipot, and the pills coated with it, after which they were shaken for a few minutes with a little French chalk, and then left to dry, which they did in a minute.

After a short discussion the meeting closed.

LEEDS CHEMISTS' ASSOCIATION.

The fourth meeting of the Session was held in the Library of the Philosophical Society, on the evening of Wednesday, January 9; the President, Mr. THOMPSON, in the chair.

The following communication from Mr. Orridge was read by the Honorary Secretary, Mr. Yewdall:—

Gentlemen,—In the hurried note that I addressed to you about a fortnight since, I referred to the inaugural address of your president (Mr. Thompson), wherein he commented in an adverse spirit upon some passages from a letter of mine, quoted by my friend Mr. Ince in his paper on "Pharmaceutical Ethics."

I now invite your attention to my reply. The importance of the subject can scarcely be over-estimated. It largely concerns the public welfare and affects not only the professional but the social position of every pharmaceutist in this country. If I am wrong in my views, I certainly err in good company. The President of the Medical Council, the President of the Royal College of Physicians, the President of the Royal College of Surgeons, the Hospital Physicians and Surgeons of London,* and of most of the chief country towns, the President and Council of the Pharmaceutical Society, as well as the representatives of other sections of the body of chemists and druggists (so far as they have expressed an opinion) are unanimous, at least in this, viz. that for the public interests it is expedient that men to whom the lives of Her Majesty's subjects are so largely entrusted as they are to the practitioners of pharmacy, should be competent to discharge their duties, and that the Legislature should provide for their compulsory examination.

In justice to myself from the pointed manner in which Mr. Thompson has referred to my name, I find it necessary to remark that the subject is not new to me. Let me add that whatever I may say in reference to my individual action or individual opinions, is said because the impression made upon any man's mind who, for a long series of years, has been in hourly communication with medical men and pharmaceutists, is, if he possess a particle of judgment, in some measure worth ascertaining, in connection with the matter before us.

So long ago, then, as 1840, when no Pharmaceutical Society was in existence, a contribution of mine appeared in the pages of a periodical of the day, indicative of views kindred to those which have been so recently combated by your President.

In 1851,† at a special general meeting of the Pharmaceutical Society, and at the request of the late Mr. Jacob Bell, I moved the following resolution:—"That this meeting recommends the Council to adopt a liberal construction of the terms of the Act in regard to the admission of Chemists in business on their own account before the Act." It is noteworthy that this resolution was drawn by Mr. Bell himself, and handed by me *in his handwriting* to the Chairman.

After Mr. Bell's death, and *before the establishment of the United Society*, namely, on the 2nd of August, 1859, I ventured (through the Secretary) to address the then Council in these terms, having reference to Mr. Bell's bequests to the nation and to the Society:—

"To me it seems that such an opportunity never before offered for appealing to public opinion and asking for fuller powers from the Legislature; you can point to the fact that the prime mover of the agitation for pharmaceutical legislation has not only given his country a splendid legacy as regards the fine arts, but has also left a munificent token of his earnestness in educational

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* See Appendix, No. 1.

† See Pharm. Journ. vol. xii. p. 106.

matters connected with his profession. I think that a short, clear, simple statement of these facts might well be placed in the hands of every member of the Imperial Parliament, together with an appeal for legislative aid in enabling the Council to insist on *all future chemists* availing themselves of the educational advantages that the Society will henceforth be in a position to afford. The very accidents that caused agitation for a Sale of Poisons Bill might indeed be a powerful argument in aid of such an appeal, and with ordinary care the sympathy of the press might surely be elicited."

This suggestion, as I think unfortunately, was not acted upon.

In December, 1863, as one of the Founders of the Society, I again addressed the Council on the subject of compulsory examinations.*

In February, 1864, I drew the requisition to the Council, published on the cover of the March number of the Journal,† which, when signed, I forwarded to Bloomsbury Square, together with an independent requisition from Leeds. On this, a special general meeting was convened, which resulted, as you know, in the determination to apply to Parliament for an Amended Pharmacy Act.

You will see, then, that my letter to Mr. Ince embodies views that I have long held. It may be well before going further to quote the precise language I employed, as follows:—

"In reply to your note I can only suggest, as bearing on your inquiry, that beyond all doubt the passing of the Apothecaries Act of 1815 removed apothecaries from a low position to a high one, and by making education compulsory, reconciled the public to paying good fees (charged in one line), instead of the miserable little details of an old doctor's bill. The ethics of the medical profession in fact were improved by taking away the temptation to charge exorbitantly for physic and substituting a just demand for skilled labour.

"Precisely the same result, I believe, would follow if the examination of chemists were made compulsory prior to their undertaking to compound prescriptions. The public would pay a good price for skilled labour, and every pharmaceutist of legitimate position would be better remunerated. In short, the temptation to quackery would be lessened, and the inducements and incentives to gain a scientific reputation increased."

Your President affirms that in writing thus, I employ "a sort of reasoning upon which we are often obliged to act, but which is not always the most conclusive and never demonstrative;" also that I have "fallen upon the fallacies to which analogical reasoning is exposed."

To sustain this position he says:—

1st. That I have greatly overrated the effect of the Apothecaries Act of 1815.

2ndly. That, according to (his) recollection, not a dozen, perhaps not half-a-dozen were ever prosecuted for violating the Apothecaries' Act! And that "long before it was virtually repealed it had become a dead letter, practically allowing every one to do what was right in his own eyes. That is to say, the Act produced very little legal effect in the earlier period of its history, and none at all in the latter."

3rdly. That, "as Professor Fawcett informs us the exports of this country have trebled during the last twenty years, and the wealth of the class providing capital has vastly increased, it would be strange if a higher quality of medical skill should not have been in demand, and, if found, paid for at a higher rate than an inferior article. The demand has created a supply." Again, "the emolument of medical men has increased not so much in consequence of any single act of legislation as by the operation of ordinary economical laws which govern all classes and professions, all the more surely when parliamentary legislation does not attempt to interfere with them!"

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* See Appendix, No. 2. † See Appendix, No. 3.

4thly. That the Medical Act is a "non-compulsory Act," and a "substitution" for a "compulsory Act." That "if surgeons were willing virtually to have their compulsory Act repealed, then let druggists take warning by their example and avoid seeking a compulsory Act which when obtained will be powerless for good." Again, "are we not all certain that the more intelligent a man is, the more he will seek after real skill on the part of his medical attendant, and the less likely will he be to be deceived by mere pretenders?"

Lastly, he says, "As a general rule, and in the interests of the public, all trades and professions ought to be free to be exercised by all, *unless some special reasons can be given to the contrary.* Our Government leaves the matter to the judgment of the people, considering the natural instinct of preservation will lead men right, It does step in, however, and force some men to be honest against their will, so that the public may be able clearly to distinguish the learned from the unlearned, those who have passed an examination from those that have not. Here, then, in this country we now draw the line. We *almost* but *not quite* make the practice of medicine a monopoly. It would be strange if we were to make the practice of pharmacy, which is confessedly less responsible, *quite* a monopoly."

There are probably some who may think that in addressing a meeting of shrewd Yorkshiremen your worthy President (if I may say it without offence) would have exercised a wise discretion had he scrutinized facts before he ventured into the hazy theoretical regions of political economy; that at the very moment of imputing to others the charge of reasoning from false analogies he should have been very careful not to sin in this particular himself.

It will be seen that the whole fabric of your President's argument in reality rests on his trusting to his "recollection" relative to the working of the Apothecaries Act of 1815, and his assumption that "long before the Act was virtually repealed it had become a dead letter, and that not a dozen persons, perhaps not half-a-dozen, were ever prosecuted under it." I confess that I rubbed my eyes with astonishment when I read this somewhat hardy assertion.

From the year 1815 up perhaps to 1825, I am not aware of any convenient means of reference,—about the latter date, however, the 'Lancet' was established, and I think that any one who will take the trouble to refer to its indices, will find abundant evidence to prove that the Act of 1815 was *not* a dead letter. In 1841 the 'Pharmaceutical Journal' was first published, and this, at all events, can be easily reached by all those whom I am now addressing. They will find record of the following prosecutions under the Act which your President declares had become a dead letter long before the Medical Act became law:—Vol. i. p. 176, *The Apothecaries' Company* v. *Greenhough* (1842).—Vol. vi. pp. 341, 347, 358, and 597, *The Queen* v. *Hitcroft* (1847).—Vol. viii. pp. 544 and 559, *The Apothecaries' Company* v. *Wells* (1848).—Vol. viii. p. 487, *The Apothecaries' Company* v. *Lobo* (1848).—Vol. viii. p. 585, *The Apothecaries' Company* v. *Kelly* (1848).—Vol. xi. pp. 483 and 532, *The Apothecaries' Company* v. *Crowther* (1852).—Vol. xiv. pp. 246 and 285, *The Apothecaries' Company* v. *Brownridge* (1854).—Vol. xvi. pp. 105 and 106, *The Apothecaries' Company* v. *Broadbent* (1856).

In the *following year*, the Medical Reform Bill was introduced into Parliament.

I leave you, Gentlemen, to judge as to whether your President's memory has or has not led him into a false position. If the cases I have quoted are to the point, what becomes of the inferences from his "dead letter" theory?

I wish, however, to add my personal testimony, by declaring that for years it was a not unfrequent thing to receive urgent applications from unqualified practitioners, begging that I would send them qualified assistants, as they wanted to complete their studies in London and pass the Hall, *being threatened with prosecution.**

Further, I submit that it is not the frequency of prosecutions that proves the efficiency of an Act of Parliament. If obedience to a law of the land be the rule, and the violation of it the exception, the prosecutions cannot be numerous; but that proves the value and not the worthlessness of the law.

Your President informs us, upon the authority of Professor Fawcett, that "the exports of this country have trebled during the last twenty years," and cites the fact to prove that it is the main cause of improving the education and position of medical men since 1815. May I ask him if he is quite certain that he is not here "reasoning from imperfect analogy"? To me it seems that he could hardly have hit upon a more decided *non sequitur*, and that it would be just as logical to refer the improvement to the Atlantic cable of 1866.

You have been asked, "Are we not certain that the more intelligent a man is, the more he will seek after real skill on the part of his medical attendant, and the less likely will he be to be deceived by mere pretenders?" It may be well to answer by asking if Mr. Thompson has ever heard of the homœopathic heresy? Has he noticed the triumphant boasts of its professors, that they number the late Archbishop Whately, Lord Ebury, and Mr. William Leaf among their adherents? The logical archbishop, the philanthropic peer, the acute merchant,—would he reject these men and others of similar standing, from the numbers of the "intelligent"? If not, how can you be "certain" that the intelligent man will seek real skill?

But if we assume, for the moment, as an established fact, that wealth and intelligence go together, I would ask what is to be done for the poor and *unintelligent?* Some of us may fancy that thinking men form the small minority in all communities. If this be true, is the great majority to be uncared for by the Legislature? If Dives, the wise, walks in the light of knowledge, is Lazarus, the ignorant, to be left to grope in darkness? In other words, is legislative action to be withheld from the unintelligent, who are damnified by its absence, because the intelligent minority can take care of themselves?

The truth I believe to be, that from the very beginning physical suffering has rendered men willing to reward those whom they think able to alleviate it; that the horror of suffering is a thing common alike to rich and poor, to the intelligent and the uninformed. Prior to 1815 there was not a single apothecary in the land who had been examined as to his competence. How then were the unintelligent many to discriminate between the pretence of skill and the reality, however anxious they might be to make liberal remuneration, and to secure the most efficient service? Now, on the contrary, every village with 800 or 1000 souls has its fully examined medical practitioner, to whom intelligent and unintelligent can turn with the perfect certainty that his professional competence has been tested. I say that this is what the Act of 1815 has effected, and I ask you to contrast it with the state of things that would have now existed if no such Act had been passed, trebled exports notwithstanding. We must surely come to the conclusion that want of mental power or want of cultivation on the part of the larger section of the people, even supposing the intelligent left to their own devices, would have been no justification for leaving our suffering fellow-creatures to the mercy of mendacious quacks or ignorant pretenders.

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* Any member of the Pharmaceutical Council can confirm the fact that *the threat of prosecuting* has, in all cases of transgressing its provisions, sufficed to control offenders against the Pharmacy Act.

Let us now turn to the Medical Act of 1858, which Mr. Thompson declares to be "non-compulsory"! What are its contents?

It provides that evidence of qualification shall be given before registration (Clause XXV.). That none but qualified persons shall recover charges (Clause XXII.). That none but registered persons shall be legally qualified (Clause XXXIV.). That no unregistered person shall hold a public appointment (Clause XXV.). That none but registered persons shall give certificates (Clause XXVII.). That any person who shall wilfully and falsely pretend to be, or take or use the name or title of, a physician, doctor of medicine, licentiate in medicine and surgery, bachelor of medicine, surgeon, general practitioner, or apothecary, or any name, title, addition, or description implying that he is registered under this Act, or that he is recognized by law as a practitioner in medicine or an apothecary shall, upon a summary conviction for any such offence, pay a sum not exceeding twenty pounds (Clause XL.).

Finally, *it does not repeal the Apothecaries Act.*

If this be a *non-compulsory Act,* I can only say that I believe an amended Pharmacy Act, couched in similar terms, and providing that no one after a certain day (except medical practitioners, existing Pharmaceutical Chemists, chemists and druggists, or other compounders of medicines, whether principals, assistants, or pupils) should, unless examined by the Pharmaceutical Board, take the name of Pharmaceutical Chemist, chemist and druggist, or any title to imply that he is a compounder of medicines and on the register, it would wellnigh satisfy the wishes of those who advocate compulsory examination in the science and art of pharmacy.

Exception must next be taken to Mr. Thompson's dicta about the whole course of recent legislation. Special reasons are not difficult to give for compulsory examinations in pharmacy. I agree with the evidence of Mr. Mackay before the Committee of the House of Commons, that the law of *caveat emptor* is insufficient for the protection of the public. A philosopher with homœopathic proclivities may crow out '*caveat emptor;*' but what is to be said on the case of unlettered persons with prescriptions, who wander into the pharmacy of an illiterate instead of that of an educated man?

Under our existing laws "our Government does step in" very frequently to interfere for the public protection. In the discussion that followed your President's address, Mr. Reynolds pointed out that new railways have to pass a Government examination, so have ships' anchors. Steamboats have to be certified, and captains of ships to be examined. We may also notice that equally for the public good does Government interfere in other matters affecting public safety. It prevents dealers in butchers' meat from selling it in an unwholesome condition. It prevents the use of fraudulent scales and weights. It prevents unexamined men from acting as attorneys in courts of law. Nay, more, equally for the public good the State does "step in" to compel every child to be vaccinated (and finds much difficulty in enforcing this salutary law, although, according to your President's theory, there ought to be none, because the exports of the country having trebled in twenty years, the people must have become intelligent, and able to trust to "the natural instinct of self-preservation"). In some other cases, and on behalf of the public, the State interferes still further with the liberty of the subject, even when they hold an indirect relation to sanitary matters. John Bull in London finds that he cannot build his house or alter it without the sanction of a public officer; that he cannot drain it as he pleases, but must obey stringent laws; that if he have pet nuisances on his premises, public authority will call him to account; that when he marries a wife, when he has a child born to him, and when he buries his friends, he must comply with official requirements; that a stranger will invade his dwelling (for the public good), and carry off the contents of his dust-bin by authority; nay, more, that he cannot even keep a pig within several miles of St. Paul's without transgressing an Act of Parliament. Knowing these things, how can we possibly assent to the supposition that compelling dispensers of medicine to be qualified for their important duty would be reversing "the whole course of modern English legislation?"

Before closing this letter, I desire to say two or three words in reference to the labours of the Committee of the House of Commons on the Chemists and Druggists Bills of 1865. I would call your attention particularly to these facts, viz. that the Committee examined Dr. A. S. Taylor, Mr. Simon, Dr. Quain, Dr. Wilson, and Mr. Mackay; that these gentlemen all agreed in recommending compulsory examination, and were favourable to Bill No. 1; that the Committee declined to examine the President or any other member of the Pharmaceutical Society (Mr. Mackay, of Edinburgh, excepted); that they did not examine a single promoter of Bill No. 2; that the report submitted to the House of Commons was in great part flatly opposed to the testimony and recommendation of every witness. Nevertheless, if Mr. Ayrton, or any other honourable Member who served on the Committee, through some blundering druggist have croton oil put into his pills instead of peppermint, I venture to predict that as he rises at midnight from the stool of repentance he will renounce, thenceforth and for ever, his faith in the all-sufficiency of the principle of *caveat emptor*. Finally, to use a phrase common enough to most of us, I believe the case for legislation in reference to pharmacy is as nearly on all-fours with the case for the Apothecaries Act in 1815 as it is in the nature of things to be, and I declare my firm belief that the measure of 1815 was one of the wisest and most beneficent enactments of the present century.

I have the honour to be, Gentlemen,
Your obedient servant,
B. B. Orridge.

London, January 5th, 1867.

APPENDIX I.

The following are among the petitioners in favour of the Bill of the Pharmaceutical Council (Number One):—

Adams, John, F.R.C.S., Surg. to the London Hosp.
Adams, William, F.R.C.S., Pres. Harveian Soc., and Surg. to the Great Northern Hosp. and Orthopædic Hosp.
Allison, Scott, M.D., Phys. to the Consumption Hosp., Brompton.
Andrew, James, M.D., Assist.-Phys. to St. Bartholomew's Hosp.
Anstie, Francis E., M.D., Senior Assist.-Phys., Westminster Hosp.
Arnott, J. Moncrieff, F.R.C.S., F.R.S., Surg. Extraordinary to H.M. the Queen.
Ashton, Thomas J., M.R.C.S., Marylebone Infirmary.
Baker, William M., M.R.C.S., Surg.-Tutor, St. Bartholomew's Hosp.
Barclay, A. W., M.D., Phys. to St. George's Hosp.
Barker, T. A., M.D., Phys. to St. Thomas's Hosp.
Barnes, Robert, M.D., Phys. to the London Hosp.
Basham, William R., M.D., Phys. to the Westminster Hosp.
Bennett, James Risdon, M.D., Phys. to St. Thomas's Hosp.
Bentley, Robert, M.R.C.S., F.L.S., Dean of the Medical Faculty in King's Coll.
Bernays, Albert, Lecturer at St. Thomas's Hosp.

Bird, Frede., M.D., Phys. to Westminster Hosp.
Birkett, E. L., M.D., Phys. to Surrey Dispensary.
Black, Patrick, M.D., Phys. to St. Bartholomew's Hosp.
Bowman, William, F.R.C.S. and F.R.S., Surg. to King's Coll. Hosp.
Bristowe, John Syer, M.D., Phys. to St. Thomas's Hosp.
Brooke, Charles, F.R.C.S. and F.R.S., Surg. to Westminster Hosp., and President of the Micros. Society.
Burrows, George, M.D. and F.R.S., President of the Medical Council.
Busk, George, F.R.C.S. and F.R.S., Surg. to the Seamen's Hosp.
Callender, G. W., F.R.C.S., Assist.-Surg. St. Bartholomew's Hosp.
Canton, Edwin, F.R.C.S., Surg. to Charing Cross Hosp.
Cholmeley, Wm., M.D., Phys. to Great Northern Hosp.
Clapton, Edward, M.D., F.R.C.S., Assist.-Phys. to St. Thomas's Hosp.
Clark, Andrew, M.D., Assist.-Phys. to London Hosp.
Clark, F. Legros, F.R.C.S., Surg. to St. Thomas's Hosp.
Coote, Holme, F.R.C.S., Surg. to St. Bartholomew's Hosp.
Copland, James, M.D. and F.R.S.
Couper, John, M.D., Assist.-Surg. to London Hosp.
Croft, John, F.R.C.S., Assist.-Surg. to St. Thomas's Hosp.
Critchett, George, F.R.C.S., Surg. to the London and Ophthalmic Hosp.
Curling, Thomas B., F.R.C.S. and F.R.S., Surg. to the London Hosp.
Cutler, Edward, F.R.C.S., Cons. Surg. to St. George's and Lock Hosps.
Davies, Herbert, M.D., Phys. to London Hosp.
Davis, J. Hall, M.D., Phys. to Middlesex Hosp.
De Morgan, Campbell, F.R.C.S. and F.R.S., Surg. to Middlesex Hosp.
De Mussy, H. G., M.D., Phys. to Paris Hosp.
Down, J. Langdon H., M.D., Phys. to Asylum for Idiots, and Assist.-Phys. to London Hosp.
Duffin, Alfred Baynard, M.D., F.R.C.S., Assist.-Phys. to King's Coll. Hosp.
Durham, A. E., F.R.C.S., Assist.-Surg. to Guy's Hosp.
Edwards, George N., M.D., Assist.-Phys. to St. Bartholomew's Hosp.
Erichsen, John, F.R.C.S., Surg. to University Coll. Hosp.
Farre, Arthur, M.D. and F.R.S., Phys. to H.R.H. the Princess of Wales.
Farre, Frede. J., M.D., Phys. to St. Bartholomew's Hosp.
Fenwick, Samuel, M.D., M.R.C.S.
Fergusson, William, F.R.C.S. and F.R.S., Surg. Extraordinary to H.M. the Queen, and Surg. to King's Coll. Hosp.
Fincham, George T., M.D., Phys. to Westminster Hosp.
Flower, W. H., F.R.C.S. and F.R.S., Assist.-Surg. to Middlesex Hosp.
Fox, Wilson, M.D., Assist.-Phys. to University Coll. Hosp.
Fuller, H. W., M.D., Phys. to St. George's Hosp.
Garrod, Alfred B., M.D. and F.R.S., Phys. to King's Coll. Hosp.
Gervis, Henry, M.D., Assist.-Phys. to St. Thomas's Hosp.
Gibb, G. D., M.D., F.G.S., Assist.-Phys. to Westminster Hosp.
Gibson, Sir James Brown, K.C.B. and M.D., Dir.-Gen. Army Med. Depart.
Goodfellow, S. J., M.D., Phys. to Middlesex Hosp.
Goolden, Richard H., M.D., Phys. to St. Thomas's Hosp.
Graham, Thomas, M.R.C.S., Surg. to the City Prison.
Gream, George T., M.D., Phys.-Acc. to H.R.H. the Princess of Wales.
Greenhalgh, Robert, M.D., Phys. to St. Bartholomew's Hosp.
Guy, W. Aug., M.B., Phys. to King's Coll. Hosp.
Gull, W. W., M.D., Phys. to Guy's Hosp.
Habershon, S. O., Assist.-Phys. Guy's Hosp.
Halley, Alexander, M.D., F.G.S.
Harley, George, M.D., Assist.-Phys. to University Coll. Hosp.
Harris, Francis, M.D., Assist.-Phys. to St. Bartholomew's Hosp.
Hart, Ernest, M.R.C.S., Surg. to St. Mary's Hosp.
Hawkins, C. S., House Surg. to Westminster Hosp.
Hawkins, Cæsar H., F.R.C.S. and F.R.S., Serjt.-Surg. to Her Majesty, and Cons. Surg. to St. George's Hosp.
Heath, Christopher, F.R.C.S., Surg. to Westminster Hosp.
Hewett, Prescott Gardner, F.R.C.S., Surg. to St. George's Hosp.
Hicks, John Wale, M.B., Lecturer and Curator at St. Thomas's Hosp.

Hillman, W. A., F.R.C.S., Assist.-Surg. Westminster Hosp.
Hodgson, Joseph, F.R.C.S., Pres. Coll. Surgeons.
Holden, Luther, F.R.C.S., Assist.-Surg. St. Bartholomew's Hosp., and Surg. to the Foundling Hosp.
Holland, Sir Henry, Bart., M.D. and F.R.S., Phys. in Ordinary to Her Majesty.
Holt, Barnard, F.R.C.S., Surg. to Westminster Hosp.
Holthouse, Carsten, F.R.C.S., Surg. to Westminster Hosp.
Hutchinson, Jonathan, F.R.C.S., Surg. to London Hosp.
Jackson, J. Hughlings, M.D., Assist.-Phys. to London Hosp.
Jeaffreson, Henry, M.D., Phys. to St. Bartholomew's Hosp.
Johnson, E., M.D. and L.R.C.S.E.
Johnson, George, M.D., Phys. to King's Coll. Hosp.
Jones, T. Rymer, F.R.C.S, King's College.
Jones, Sydney, M.B., F.R.C.S., Assist.-Surg. and Lect. at St. Thomas's Hosp.
Lawrence, William, F.R.C.S. and F.R.S., Serjeant-Surg. to Her Majesty, and Surg. to St. Bartholomew's Hosp.
Lawson, George, F.R.C.S., Assist.-Surg. to Middlesex Hosp.
Leared, Arthur, M.D., Phys. to Great Northern Hosp.
Lee, Henry, F.R.C.S., Surg. to St. George's Hosp.
Letheby, Henry, M.B. and F.C.S., Lecturer at the London Hosp., and Med. Off. of Health to the City of London.
Little, W. John, M.D., Phys. to London Hosp.
Markham, William O., M.D., Phys. to St. Mary's Hosp.
Marshall, John, F.R.C.S. and F.R.S., Surg. to University Coll. Hosp.
Martin, Sir J. Ranald, C.B., F.R.C.S., F.R.S., Inspector-Gen. of Hospitals.
Martin, Robert, M.D., Assist.-Phys. to St. Bartholomew's Hosp.
Mason, Francis, F.R.C.S., Assist.-Surg. King's Coll. Hosp.
Maunder, C. F., F.R.C.S., Assist.-Surg. London Hosp.
Meadows, Alfred, M.D., Phys. Acc. to the General Lying-in Hosp.
Miller, William Allen, M.D., F.R.S., Treasurer of the Royal Society.
Moore, Charles H., F.R.C.S., Surg. to Middlesex Hosp.
Murchison, Charles, M.D., Assist.-Phys. Middlesex Hosp.
Odling, William, M.B. and F.R.S., Lecturer at St. Bartholomew's Hosp.
Ogle, John W., M.D., Assist.-Phys. St. George's Hosp.
Ord, William M., M.B., Lecturer at St. Thomas's Hosp.
Page, William E., M.D., Phys. to St. George's Hosp.
Paget, James, F.R.C.S. and F.R.S., Surg. Extraordinary to Her Majesty.
Parker, H., M.D., Phys. London Hosp.
Partridge, Richard, F.R.C.S. and F.R.S., Surg. to King's Coll. Hosp.
Peacock, Thomas B., M.D., Phys. St. Thomas's Hosp.
Pearse, G. E., Westminster Hosp.
Pitman, H. A., M.D., Phys. to St. George's Hosp.
Playfair, W. S., M.D., Assist.-Phys. King's Coll. Hosp.
Pollock, Arthur J., M.D., King's Coll. Hosp.
Pollock, George D., F.R.C.S., Surg. in Ord. to H.R.H. the Prince of Wales, Surg. to St. George's Hosp.
Pollock, James E., M.D., Phys. to the Hospital for Consumption.
Power, Henry, F.R.C.S., M.B., Assist.-Surg. Westminster Hosp.
Priestley, William O., M.D., F.R.C.S., Phys. King's Coll. Hosp.
Quain, Richard, M.D., Phys. Hospital for Consumption.
Racing, George, Dem. St. Thomas's Hosp.
Radcliffe, John, M.R.C.S., Westminster Hosp.
Rivington, Walter, M.B., F.R.C.S., Assist.-Surg. London Hosp.
Salter, Hyde, M.D. and F.R.S., Assist.-Phys. Charing Cross Hosp.
Savory, W. S., M.B., F.R.C.S. and F.R.S. Assist.-Surg., St. Bartholomew's Hosp.
Shaw, Alexander, F.R.C.S., and Surg. to Middlesex Hosp.
Sibson, Francis, M.D. and F.R.S., Phys to St. Mary's Hosp.
Sieveking, Edward H., M.D., Phys. in Ordinary to H.R.H. the Prince of Wales, and Phys. to St. Mary's Hosp.
Smith, H., F.R.C.S., Assist.-Surg. King's Coll. Hosp.
Smith, Thomas, F.R.C.S., Assist.-Surg. St. Bartholomew's Hosp.
Solly, Samuel, F.R.C.S., Surg. to St. Thomas's Hosp.
Southey, Reginald, M.B., Assist.-Phys. St. Bartholomew's Hosp.
Stone, W. H., Lecturer at St. Thomas's Hosp.

Tamplin, Richard W., F.R.C.S., Surg. to Orthopædic Hosp.
Tatum, Thomas, F.R.C.S., Surg. to St. George's Hosp.
Thompson, Henry, M.D., Phys. to Middlesex Hosp.
Thompson, Henry, F.R.C.S. and M.B., Surg. to University Coll. Hosp.
Tonge, Morris, M.D., King's. Coll. Hosp.
Toynbee, James, F.R.C.S. and F.R.S., Surg. to St. Mary's Hosp.
Watson, Thomas. M.D., Pres. Royal Coll. of Physicians.
Watson, W. Spencer, F.R.C.S. and M.B., Assist.-Surg. King's Coll. Hosp.
Webb, W. W., M.D., Middlesex Hosp.
Wells, Thomas Spencer, F.R.C.S., Surg. to the Queen's Household.
Wells, J. Soelberg, M.D., Surg. to Middlesex Hosp.
Whitfield, R. G., St. Thomas's Hosp.
Williams, C. J. B., M.D. and F.R.S., Phys. to University Coll. Hosp.
Willis, Francis, M.D., Assist.-Phys. Westminster Hosp.
Wood, Fredk., F.R.C.S., St. Bartholomew's Hosp.
Wood, John, F.R.C.S., Assist.-Surg. King's Coll. Hosp.
Wormald, Thomas, F.R.C.S. and V.P.R.C.S., St. Bartholomew's Hosp.

The names of the physicians and surgeons who petitioned from the leading provincial towns are too voluminous for insertion here.

APPENDIX II.

Extracts from a Letter addressed to the Council of the Pharmaceutical Society in December last, on the subject of Compulsory Examinations.

The meeting of Parliament will not probably be deferred beyond eight or ten weeks from this time, and as, in my humble judgment, the opportunity may prove a golden one for giving stability to the Pharmaceutical Society, and prove a means of greatly extending its sphere of usefulness, I venture, as one of its earliest adherents, to address you on the subject. It is obvious, I think—

1. That the public interests require those to whom the compounding of prescriptions is entrusted to be men of fair education and competent to the discharge of their important duties.

2. That it is important to practitioners of medicine that those on whom they rely as Pharmaceutists should be capable and trustworthy.

3. That it is desirable, for the satisfactory working of the Pharmaceutical Society, that larger powers should be given to the Council.

4. That is desirable for the United Society of Chemists and Druggists, and for all chemists and druggists who are not Members of the Pharmaceutical Society, that their vested interests should be duly respected, and that those who practise pharmacy should not be divided into two sections with conflicting interests.

Now, the Apothecaries Act of 1815 was only carried out after long agitation, after much strife, and after incurring much expense. Does it not form a precedent of two-fold value—in respect of what it is now desirable to do, and what to avoid? Is it not desirable to avert an expensive and protracted Parliamentary fight, resulting in abortive efforts on the part of one body to control another? Is it not desirable by *uniting forces* for the public good to disarm opposition and procure a useful Act of Parliament?

May not the Government, on the part of the public, and the respective medical and pharmaceutical bodies, effectively unite for the common good? May not the history of the Apothecaries Act of 1815 teach those who wish to legislate the imperative necessity of recognizing all those already engaged in business?

If an authorized register be compiled of the Members of the Pharmaceutical Society and the chemists and druggists who are engaged in their business prior to any given day in 1864, in the same way that the Medical Register deals with the medical profession (particularizing those who were in practice before 1815), will not legislation become comparatively easy of accomplishment?

It is to this I would earnestly ask your attention. I am quite aware that many points of detail would require grave thought, and would, of course, elicit differences of opinion. But are not the difficulties far more likely to be adjusted if a scheme can be arranged which includes all existing chemists in an authorized Register, and provides for the examination by the Pharmaceutical Society of those who are to follow?

If, after due deliberation, you resolve to take action on this matter, may I express a hope that, together with other important advantages, an improved Pharmacy Act will give you power to place the Benevolent Fund of the Society in more active operation and over a wider field?

I am, Gentlemen, with much respect,
Your obedient servant,
ONE OF THE FOUNDERS OF YOUR SOCIETY.

London, December 8th, 1863.

APPENDIX III.

30, *Bucklersbury, London, February 22nd*, 1864.

Sir,—I beg here to hand you a requisition, signed (inclusive of partners in firms) by about 300 Members of the Pharmaceutical Society, requesting the Council to convene a Special General Meeting.

It is right to inform you that there has been no systematic canvass for signatures, nor any influence brought to bear, beyond the insertion of a single advertisement in the 'Standard' newspaper, and the forwarding copies of the requisition to a few gentlemen who were personally known to the originators of the movement, or supposed to feel a warm interest in the progress of the Pharmaceutical Society.

Another requisition is also sent, signed by no less than forty-five chemists (members and *non*-members), from the important town of Leeds. These gentlemen urge action in concert with another Society, but point to your Board as the proper examining body, in the same words as are employed in the other requisition.

I am of course aware that an application from *non*-members imposes no *legal* obligation on the Council, but I feel assured that their sense of justice and courtesy will ensure it all due consideration.

I am, Sir, yours obediently,
B. B. ORRIDGE,
Hon. Secretary to the Requisitionists.

The Secretary of the Pharmaceutical Society.

To the President, Vice-President, and Council of the Pharmaceutical Society of Great Britain.

Gentlemen,—We, the undersigned, believing that it is highly desirable for the protection of the public that all future chemists and druggists should undergo a due professional examination before commencing business, hereby request you to convene a general meeting of the Members of our Society, for the purpose of considering the expediency of an immediate application to Parliament for an amended Pharmacy Act, by which (following the precedent of the "Apothecaries Act") *the legitimate interests of those already in business should be protected*, and proper provisions made for rendering the examinations of future chemists by your Board a compulsory instead of an optional proceeding:—

Baiss, Brothers, & Co., 102, Leadenhall St.
Barron, Harvey, and Co., 6, Giltspur Street.
Battley and Watts, 32, Whitecross Street.
Burgess, Willows, and Co., 101, High Holborn.
Davey, Mackmurdo, and Co., 100, Upper Thames Street.
Drew, Barron, and Co., 2, Bush Lane.
Evans, Lescher, and Evans, 60, Bartholomew Close.
Hearon, M'Culloch, and Squire, 5, Coleman Street.
Hodgkinson, Tonge, and Stead, 213, Upper Thames Street.
Hodgkinson, Thomas, and Co., 86, Snow Hill.
Preston and Sons, 88, Leadenhall Street.
Westwood and Hopkins, 10, Newgate Street.
Wyman, John, 122, Fore Street.

And about three hundred other firms connected with the Pharmaceutical Society.

February, 1864.

The meeting thanked Mr. Orridge for his letter, and postponed its further consideration to a subsequent meeting.

Mr. Reynolds, F.C.S., read a paper on—

"THE COMMON OBJECTS OF THE SHOP."

In that excellent little book, written by the Rev. J. G. Wood, entitled 'The Common Objects of the Country,' the author gossips so pleasantly of green fields and shady woods and their inhabitants, whether caterpillars or butterflies, beetles or glowworms, that all may learn how much that is deeply interesting may be gathered from things of every-day occurrence. When looking at such a work, we no longer wonder at the old gentleman who expressed profound admiration at seeing, under the microscope, a specimen representing insect anatomy, and, who added the confession, "Why, I always thought a caterpillar was nothing but skin and squash!" Now, though green fields and their inhabitants are too unfamiliar to the town chemist during all the year but his brief summer holiday, it may be that amongst his daily surroundings there are "common objects" that will repay him for many questionings as to their history, their relations to other things, or properties both physical and chemical,—they are, like the caterpillar, something more than what the old gentleman had supposed. But, it is one thing to feel deeply the importance of a thing, unfortunately it is quite another to do it justice. One of the most able of modern historians, Dr. W. H. Russell, acquired the title of "the Pen of the War." In our own profession there is a gentleman who might as justly be named "the Pen of Pharmacy," and I can only regret that instead of the *incisive* style of the writer on "Pharmaceutical Ethics," you must this evening accept my feebler efforts.

I propose to take a few of the commonest drugs in our shops, and to ask your attention to points relating to each that may afford us material for intelligent thought, and which will merely be fair illustrations of hundreds of other substances surrounding us daily, and possessing an equal but varied interest. We well know that the public expect from us a sort of universal knowledge, and how much more must this apply to the common objects of our calling, when even the toys of the present generation must be scientific, else unacceptable to our juveniles. We are liable to be asked why a piece of apparently plain paper exhibits a perfect photograph when immersed in water with a piece of blotting-paper, our inquirers not knowing that the photograph has been first obliterated by corrosive sublimate, and that the bit of blotting-paper being saturated with hyposulphite of soda furnishes the means of its reproduction. The latest trifle of the same class that has arrived from Paris, is a cigar-holder, having an invisible photograph, which is developed and becomes visible under the influence of traces of ammonia, resulting from burning the cigar. We cannot always shirk giving explanations to our young friends, like Paterfamilias who, when questioned as to the meaning of hydrated sulphocyanide of mercury, told the inquisitive young urchin that "Pharaoh's serpents were a venomous sort of snake, and should therefore be avoided."

Let our first object be castor oil. The castor-oil plant was well known to the ancients, and both the root and seeds were employed medicinally. The oil was used for burning in lamps, and is said to be one of five sorts allowed for this purpose by the Jews of the present day. The *Ricinus communis* is supposed to have been the plant called "Kikayon" in the Book of Jonah, and translated gourd in our version. Dr. Royle states "it is doubtless the plant which the sacred penman had in view." A criticism by Dr. Harris may throw some light on the marvellous growth and decay of the gourd named in the Book of Jonah; thus, he would read it, "Son of the night it was, and son of the night it died," an Oriental figure of speech. Gerarde gives the following, in reference to *Ricinus*:—"For on a time a certaine Bishop having an occasion to intreat of this which is mentioned in the fourth chapter of Jonas his prophecie (in a collation or sermon which he made in his cathedrale church, or place of assembly), said that this plant was called *Cucurbita*, a gourde, because it encreased vnto so great a quantitie, in so short a space; or else (saith he) it is called *Hedera*. Vpon the nouelty and vntruth of this his doctrine, the people were greatly offended, and thereof suddenly arose a tumult and hurly-burly; so that the Bishop was inforced to goe to the Jewes to aske their iudgment as touching the name of this plant. And when he had receiued of them the true name, which was *Kikaiyon*, he made his open recantation and confessed his error, and was justly accused for a falsifier of the holy Scripture."

The medicinal use of the expressed oil of the seeds, dates from much more modern times, so much so as to excite some surprise when we regard the firm hold in medical esteem it has long enjoyed, but which is somewhat on the wane in these days of "elegant Pharmacy." About a century ago, viz. in 1769, Peter Cavane, M.D., of Bath, published the second edition of a 'Dissertation on the Oleum Palmæ-Christi, sive Oleum Ricini, or (as it is commonly called) Castor Oil,' etc. etc. The Doctor had made acquaintance with the virtues of this oil, when residing in the West Indies. He traces its name to *Agnus castus*, given it by the French from its "great efficiency in curing and temperating all febrile heats." After describing the preparation of the oil, firstly, by boiling the seeds as now practised in the West Indies, and, secondly, by bruising and pressing them, the Doctor proceeds to laud its virtues in a long list of complaints, including colic, fevers, bilious complaints, cramp, etc. etc. Whilst using it with the Bath waters, in aphthæ chronicæ of the West Indies, he insists that, during recovery, *riding* should be adopted. "The patient," he says, "should now take a *horse* for his physician, and an *ass* for his apothecary. Viresque acquirat eundo." (Huxham.)

The last few years have presented us with something new relating to castor oil, viz. the commercial introduction to English pharmacy of the Italian variety. Mr. H. Phillips, of Naples, has published in the Transactions of the British Pharmaceutical Conference, some account of its manufacture, by which it appears that the outer coat being removed, the seed is then gently pressed for some days in a press lined with filtering-paper. The resulting oil is paler and has less flavour and odour than the East Indian oil. Mr. Phillips points out that exposure to the sun is carefully avoided, since it is known to give a tendency to rancidity,—a fact which may usefully be recollected in England, where, I fear, the sale of bleached castor oil is still the practice with a majority of our brethren. The description of Italian castor oil just given, applies to what that article should be; unfortunately much that is sent over does not reach this standard.*

In having to give an opinion unfavourable to the quality of some samples of this fixed oil, I am reminded of the unsatisfactory position of our means of testing the purity both of fixed and volatile oils. As to the former, we have in cod-liver oil a medicine, of the purity of which we ought to be able to assure ourselves, and yet what guarantee does chemical analysis afford? Almost the only characteristic reactions of fixed oils are those recorded by Dr. Crace Calvert, who uses sulphuric and other acids, and caustic alkalies as reagents, the colours produced being the indications of purity or the converse. Some of these colour tests are not very characteristic when unmixed samples are operated on, but woe to the analyst who has to rely upon them solely in the case of fraudulent mixtures. And yet we owe Dr. Calvert a debt of gratitude for even this glimmering of light in our darkness. But, if chemistry cannot help us, it seems as if experimental physical science might. The properties of essential oils in relation to the polarization of light, have been studied by Mr. H. Sugden Evans, and deserve more notice than they have received. We know what marvellous analytical power was developed in the method of spectrum analysis discovered by Kirchhoff and Bunsen, which embarrasses us by its very delicacy, since the dust of our rooms and bookshelves brings the soda-band of the spectrum into all our experiments. Still later, Mr. Sorby's micro-spectroscopic investigations of the appearances of fluids, as blood, lead us to methods of research still more hopeful for pharmacy.

Mr. Stoddart has given a striking illustration of the superiority of physical over chemical methods of examination in the following case. He was desirous of testing a large number of samples of barks for the presence of an alkaloid which possessed, like

* Castor oil is as useful in the trades as it is as a medicine. It is much better to soften and to redeem old leather than any other oil known. When boots and shoes are greased with it, the oil will not at all interfere with the polishing afterwards, as in the case with lard, olive, or any other oil. In Harrisburg, Pennsylvania, the old leather hose of some of the fire companies was greased with it, and it was found to become almost as soft and flexible as new leather. Leather belts for transmitting motion in machinery will usually last three to five years, according to the wear and tear they are exposed to; when greased with castor oil, they will last ten or more, as they always remain flexible and do not crack. Besides this advantage, castor oil will prevent slipping, so that a belt 3 inches wide impregnated with it will be equal to a belt $4\frac{1}{2}$ inches wide without castor oil. It is necessary, however, to wait twenty-four hours, till the oil has disappeared from the surface and penetrated the leather, otherwise the freshly-greased surface will cause slipping. That rats and other vermin detest anything impregnated with castor oil, and will not touch it, is another advantage.—*Newspaper paragraph.*

quinine, peculiar fluorescent properties. He adopted Professor Stokes's test, in which an acid or alcoholic solution of the bark is placed in a glass tube surrounding a small Geissler's vacuum tube, and the spark from a Ruhmkorff's coil is passed through it. If quinine, or any other substance having fluorescent qualities, be present, these are instantly developed. Mr. Stoddart's experiments upon twenty-seven samples of barks occupied but two hours, showing a great advantage over chemical methods in the element of time. Messrs. Deane and Brady have struck out a new path, by combining microscopical with chemical research, and the fruit they have already culled from such fields may convince us that rich harvests await patient investigators.

Again: Cannot electrical phenomena give us some further aid? The resistances to electrical discharges offered by fluids vary greatly, being the reciprocals of their conductive powers.

Here is a table of resistances:—

Pure Silver	1
Mercury	29
Sulphuric Acid (Sp. gr. 1·2 to 1·36.)	761,732
Solution Sulphate of Zinc (38 p. c. Salt.)	11,019,000
Solution Sulphate of Copper (20 p. c. Salt.)	14,809,000

(*Watts' Dict. Chem.*)

The resistance of distilled water is 700 times greater than that of dilute sulphuric acid.

I have alluded to castor-oil as a medicine whose repute is probably waning, but if any old familiar friends of the shop seem falling in public favour, there are new candidates for its somewhat fickle preference. Thus, *Triticum repens* has insinuated its rhizomes into modern pharmacy with as much pertinacity as into the fields of our farmers; and yet couch-grass is no new medicine. Gerarde says of it,—"'The decoction of the root is good for the kidneys and bladder," and expressly alludes to "the learned physitions of the Colledge and Societie of London" as recognizing its merits. But the most caustic reproof to inconstant physicians is given by the same author, when speaking of the herb Golden Rod (*Solidago Virgaurea*). He says:—

"In my remembrance I have knowne the dry herbe which came from beyond the sea sold in Bucklers Bury, in London, for halfe a crowne an ounce. But since it was found in Hampstead wood, even as it were at our towne's end, no man will give halfe a crowne for an hundred weight of it: which plainly setteth forth our inconstancie and sudden mutabilitie, esteeming no longer of any thing, however pretious soever it be, than whilst it is strange and rare. This verifieth our English proverb,—'Far fetcht and dear boughte is best for Ladies.' Yet it may be more truely said of phantasticall Physitions, who when they have found an approued medicine and perfect remedie neere home againste any disease, yet not content therewith, they wil seeke for a new farther off, and by that meanes many times hurt more than they helpe."

Dr. Aveling, in the introductory address to the Sheffield School of Medicine for the present session, makes the following confession, which may serve to illustrate the way in which reputedly new remedies prove to have been known to our ancestors. He says:—"Nine years since, I published a paper 'On the Use of Gentian Tents for Dilating the Uterine Canal.' Now, I know that gentian root was much used for dilating canals many hundred years since, and that Cooke, in his 'Marrow of Chirurgery,' published in 1685, actually recommends the use of both gentian and sponge tents when the inner orifice of the uterus is closed." Perhaps the stems of seaweed (*Laminaria*), now used as dilators, may not be so novel as we suppose.

Bicarbonate of sodium introduces us to the most important of chemical families, when looked at from a technical point of view. The soda manufacture of England is the principal element of a group of industries which, in the words of Professor Hofmann, "may be regarded as the foundation of the whole edifice of applied chemistry." The manufacture of sulphuric and hydrochloric acids and hypochlorite of lime is almost a necessary sequence to the profitable production of alkali soda. Sulphuric acid plays so important a part in the soda manufacture, from its use to convert chloride of sodium into sulphate of sodium, that the maker of the alkali usually prepares his own sulphuric acid, in order to obtain it at the lowest rate. He is an involuntary producer of hydrochloric acid, the fumes of which were for many years the bugbear of the alkali trade, affording an opportunity to landowners, needy or otherwise, to claim enormous damages for the injury done to trees, etc. on their estates by the hydrochloric acid gas. However, the arrangements now made compulsory by Act of Parliament for passing the evolved gas into towers filled with coke, and having a stream of water flowing through them, have effectually remedied the difficulty, and supplied quantities of hydrochloric acid somewhat larger than the demands of commerce, since several makers do not find it worth while to collect it, but charge their towers with limestone, which is converted into chloride of calcium, and runs off in a state of solution.

The history of the soda manufacture is both interesting and instructive. There are at least four sources from which, in one country or another of the world, soda is produced.

1st. Native carbonate of sodium, found in Egypt, and known as "natron." This is reasonably supposed to be the substance termed *nitre* in our translation of the Bible.* A somewhat similar salt is obtained in Hungary by lixiviating the soil. A native carbonate of sodium is found in a remote part of India. I published an analysis of this (Pharm. Journ. vol. xii. p. 517), the chief interest of which consisted in its proving the salt to be a *sesquicarbonate.*

2nd. By the calcination of plants belonging to the Order *Chenopodiaceæ*, growing upon the seashore chiefly in Spain, the Canary Islands, etc. The product of this operation, under the name *barilla*, used to be the chief source of soda for the supply of England.

3rd. By burning in kilns certain seaweeds on the coast of Scotland, Normandy, etc. Twenty-two tons of wet seaweed yield about a ton of ash, which is known as *kelp.*

4th. Soda is made chiefly by the process of Leblanc, a discovery which dates ninety years back, and which, unlike almost every other manufacturing processs, is now what it was when first enunciated, the best and simplest method of effecting the object in view. The French revolution of 1793 compelled the attention of that nation to Leblanc's process as a means of supplying to such vital industries as the soap and glass manufacturers a substitute for the barilla previously used, but the importation of which was arrested. The influence of war, or other political unsettlement, upon the ordinary currents of commerce is illustrated upon the large scale in the instance of the artificial production of soda by Leblanc's method.

Another and a curious example has occurred more recently, and is not generally known. Pimento grows spontaneously in Jamaica, and the only limit to its production is the existence of prices that will remunerate the labour of picking and preparing the fruit for market. Previous to the Crimean War, Russia was our largest customer for pimento, it being used to flavour the bread generally eaten. The war interrupted this use, which has never been resumed, some substitute for pimento having been found.

The outline of Leblanc's process consists, as is well known, in forming snlphate of sodium by heating common salt with sulphuric acid, and calcining the sulphate of sodium thus formed with chalk and coal in a furnace. The chemical composition of the *black-ash*, as this product is termed, is enveloped in much doubt, the existence of an oxy-sulphide of calcium being urged by some authorities, and denied by later ones. However, when treated with warm water, the solution evaporated, and the dry salt calcined, a white soda-ash, consisting chiefly of carbonate of sodium, is obtained, which is the object of this most important branch of chemical industry An easy stage leads us now to the bicarbonate of sodium, indicated as our subject. The solution of alkali readily yields the soda crystals of commerce, and these being exposed to an atmosphere of carbonic acid, give up a part of their combined water, and absorb another equivalent of carbonic acid.

Before alluding to other methods proposed for the manufacture of soda, I may call your attention to solid caustic soda as a substance which made its appearance in the market during the period between the International Exhibitions of 1851 and 1862. Mr. Dale conceived the ingenious idea of evaporating the weak solutions of caustic alkali by substituting them for the water used in feeding his steam-boilers, the solution being run off when it acquired a specific gravity of 1·25, and the evaporation to a specific gravity of 1·9 being conducted in open pans, when the liquor gives a solid product upon

* "As vinegar upon nitre, so is he that singeth songs with a heavy heart." (Prov. xxv. 20.) "For though thou wash thee with nitre, and take thee much soap, yet," etc. (Jerem. ii. 22.)

cooling. Solid caustic soda is said to be much used by the makers of some descriptions of paper.

A few of the new processes for the preparation of soda, deserve notice. The first is that for its extraction from cryolite, and in the Exhibition of 1862 there were beautiful specimens of this from Prussia and Denmark. Cryolite (frost-stone) is a double fluoride of sodium and aluminium, and it is especially interesting as having been the first commercial source of the metal aluminium. It is found abundantly in Greenland, its previous use by the natives having been for grinding the leaves of tobacco for snuff. In this operation some of the mineral becomes detached and levigated, the increased irritating effect being the same as more civilized (?) and crafty manufacturers obtain by the introduction of powdered glass. When powdered cryolite is boiled with quicklime, insoluble fluoride of calcium, alumina, and caustic soda are produced.

2nd. *By Bicarbonate of Ammonium.*—This method was suggested nearly thirty years since, and presents the merit of much simplicity in the reaction involved. When a strong solution of chloride of sodium is mixed with one of bicarbonate of ammonium, the bicarbonate of sodium is precipitated as a fine powder, whilst chloride of ammonium remains in solution. By calcination the neutral salt is readily obtained, the carbonic acid being utilized at the same time. The salt of ammonium is readily decomposed by lime, and its ammonia set free to work out a new cycle of similar decompositions. The difficulty of the process consists in the fact that a considerable portion of the chloride of sodium escapes decomposition.

Passing over a dozen other plans suggested, I may glance at the latest patent on the subject, viz. that of Mr. Weldon. The patentee introduces into a strong vessel an equivalent each of chloride of sodium and of carbonate of magnesium, with some water. Carbonic acid is forced in, under pressure, forming bicarbonate of magnesium. By the reaction of this salt with the chloride of sodium, it is said that bicarbonate of sodium and chloride of magnesium result, the former falling in minute crystals.

It would not be right to leave this subject without alluding to the fact, that we have in Leeds alkaline springs containing from 20 to 30 grains of carbonate of sodium in a gallon, and that large quantities of this water are used for various industrial and domestic purposes. Since books treating on mineral waters do not recognize such strongly alkaline waters in England, it becomes more desirable to mention them.

Potassium Compounds.—In speaking of these as a class, we are struck by the extensive substitution of soda or ammonia for potash in many manufactories, the most complete being the case of alum, where a period of a very few years has seen the disappearance of potassium alum, and its replacement, for economical reasons, by ammonium alum. Potassium compounds are, however, essentials for some industrial operations, as the manufacture of certain kinds of white glass, gunpowder, etc.

Now, the production of potassium compounds from their original source, the ashes of forest trees, is becoming yearly more restricted in the face of an increasing demand. Fortunately new means of obtaining this essential alkali have lately been pointed out, and the Exhibition of 1862 was especially fertile in such developments.

Firstly. M. Maumené extracts potash from the greasy matter found in sheep's wool, and which is the dried sweat of the animal, being called *suint* by the French. It forms one-third of the weight of merino wool, and though some solid fatty matter is also present, the *suint* may be dissolved out by cold water, and is found to be a neutral compound of an organic acid with potassium. In the woollen manufactories of France, this substance is carefully utilized. M. Maumené estimates that the forty-seven millions of sheep in France would be capable of supplying all the potash required by her industries, whilst at present it is withdrawn from the soil of the sheep-farms, and yet not made remunerative to the farmer.

2nd. *Potash from Beet-juice.*—M. Kuhlmann has shown how a large amount of potassium salts may be obtained from the residue of beet-juice, after the removal of their crystallizable sugar, and the conversion of the molasses into alcohol. In the Exhibition of 1862, medals were awarded to both the processes just described, as also to two others which I must now mention.

3rdly. *Potash derived from Seaweed.*—In the manufacture of kelp on the west coasts of Scotland and of Ireland we have sources of potash deserving notice. The seaweeds used are practically classed as "drift-weed" (*Laminaria digitata* chiefly), and "cut-weed" (various species of *Fucus*), the value of the former in percentage of potash and iodine being greatly superior to the shore weed. About twenty-two tons of wet seaweed, when dried and burnt, yield a ton of kelp, and the crude potash salts of this amount to eight or nine hundredweight, being a mixture of potassic sulphate, chloride, and carbonate, with some sodic admixture. These products are used for the manufacture of prussiate of potash, and of saltpetre from nitrate of sodium. The most thorough change in the method of treating seaweeds for the manufacture of iodine and its allied products is that of my friend Mr. Stanford, which received the distinction of a medal in 1862. Mr. Stanford aims at avoiding the waste of half the iodine, and many other principles which occur in the ordinary method of burning the weeds, and to accomplish this he dries and compresses them, and effects their destructive distillation in retorts, as in the production of coal-gas. Various hydrocarbons, naphtha, acetic acid, ammonia, etc. are obtained in addition to much larger quantities of iodine and bromine than would be got by the old method, whilst the fixed mineral salts, including the potassic ones, are, of course, amongst the assets.

4th. *Potash salts of direct mineral origin.*—In the year 1860, 160 tons of potash salts from a direct mineral source were raised and applied chiefly to agriculture. This was due to the discovery of veins of mixed potassic salts overlying a bed of common salt at Stassfurt, near Magdeburg, in Prussia. Both the chlorides of potassium and magnesium are present in the salt. The position of this deposit in relation to the bed below is of great interest, indicating by the order of superposition found the order in which the salts of sea-water would be deposited by gradual concentration, viz. the bulk of the sodic chloride falling first, then a mixture of the same, with earthy sulphates and some magnesic and potassic chlorides, whilst the bulk of the two salts last named would be deposited at the top. The natural inference is, of course, that potash-beds may exist above other salt-beds.*

5th. *Potash from sea-water.*—M. Balard, who discovered bromium more than forty years ago, has devoted his energies to the problem of extracting potash salts from sea-water, and his efforts have been crowned with so much success that M. Merle, who has extended them, received a medal at the Exhibition of 1862. The salts of soda in sea-water exceed those of potash in the ratio of sixteen to one, and this fact will doubtless act as a barrier to the extensive production of the latter salts from this source. Besides the new sources of potash now enumerated, some very promising experiments have been made for its extraction from felspar.

The moral to be drawn from these various attemps to ransack the stores of nature for this valuable alkali appears to be the following, viz. that when depending upon vitalized agencies such as vegetables, our powers of production are limited by the slow and gradual character of growth of such agents. If we rely upon the forest tree to abstract from the soil, by its countless rootlets, minute quantities of potash, and store them up for our use, or, again, upon the seaweed to separate from sea-water, by some marvellous power of selection (of the nature of which we know nothing), its potash, which in the water exists in the ratio of one to sixteen of soda, but which in the plant will be as one to three of soda, we must wait patiently whilst trees and seaweeds grow. The same truth applies to all other vegetable productions, as, for instance, dye-wares. But observe the difference when we apply to the mineral kingdom for such products

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* Analyses of Potassic Salts from Stassfurt.

No. 1.

Chloride of Potassium	50·55
Chloride of Sodium	40·45
Chloride of Magnesium, moisture, etc.	
	100·00

No. 2.

Sulphate of Potassium	18·20
Sulphate of Magnesium	18·20
Sulphate of Calcium	3·50
Chloride of Sodium	40·40
Chloride of Magnesium	3·40
Magnesia	2·30
Moisture, etc.	14·00
	100·00

as it possesses a joint power of furnishing, whether potash salts or products of the destructive distillation of coal, like aniline and its consequent dyes. In these cases the element *time* no longer appears as a factor in our estimates, and hence we may anticipate that the future developments of industrial chemistry will chiefly relate to inorganic matter.

One result of such development must be the introduction of new remedial agents, and from this almost untrodden field we may anticipate the discovery of medicines, not inferior to those we now obtain from plants. We owe the discovery of aniline dyes to Mr. Perkin's endeavour to make quinine artificially. He failed in this, but achieved a discovery of greater importance. A guide to any such attempts to improve our Materia Medica would be found in the systematic cultivation of the science of Therapeutics, the principles of which are yet unknown; physicians having devoted themselves far more to discriminating the indications of disease or diagnosis, than to studying the principles upon which remedies act. At the late meeting of the General Medical Council, Dr. Acland urged a grant for such experiments, which, however, would not be made from the funds at the disposal of the Council.

And now, Gentlemen, the time at my disposal is exhausted, although it has only sufficed to speak of so very few of our common objects, I have not hesitated to quote freely from the Report of the Jurors from the Chemical Department of the Exhibition of 1862, and there are two reasons for such a course, the first, that Professor Hofmann has made it an exhaustive summary of the progress of technical chemistry for a decade; the second, that from the mode of its publication it is by no means universally known.

We ought not to content ourselves without trying to discover the lessons to be learned from such a Report. One of the most striking, appears to me to be this—that the majority of the new industrial developments which have come under our notice have been made, not by Englishmen, but by the citizens of other countries, having smaller commercial interests, and hence presumably less likely to initiate improvements.

Is not this the result of our neglect of the natural sciences in the educational systems of this country? Look at the position they hold as proved by a blunder that occurred in the 'Times' newspaper of December 13 last. Here is a paragraph giving the names of the Natural Sciences Tripos at Cambridge, on December 12; but the term has been so strange to the staff of the paper (who would have given a Latin or Greek quotation, without an error), that they gravely head the list—NATIONAL Sciences Tripos! The country newspapers copied the blunder without detecting its absurdity, and if any exception to this occurred, it was not here.

This neglect of science is not the fault of the youth of our country, for they would readily embrace the opportunities which they ought to have for studying its principles. I will conclude by quoting Professor Lyon Playfair upon this subject. He truly says, "All the aspirations of youth are towards science, especially that depending on observation, but we quench the God-born flame by freezing drenches of scholastic lore. Is this the education for the youth of a nation depending for its country's progress on their development? How is it possible that dead literature can be the parent of living science and of active industry?"

The meeting concluded with thanks to the author of the paper.

ORIGINAL AND EXTRACTED ARTICLES.

THE PREPARATIONS OF CONIUM OF THE BRITISH PHARMACOPŒIA, 1864, AND THE TINCTURE OF CONIUM OF THE LONDON PHARMACOPŒIA.

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(*Continued from p.* 416.)

In my former communication upon this subject I stated that the results of

* Consult 'Modern Culture, its True Aims and Requirements.' Edited by Edward L. Youmans, M.D. (Macmillan, 1867.)

my experiments with the *Tinctura Conii fructûs* went far to prove that the preparation is practically an inert one. I may mention here that I have prescribed another specimen of this tincture in large doses with similarly negative results. I am informed by Mr. Hemingway that the fruit used in the preparation of the tincture employed in the experiments recorded in my former paper was grown near Prague; and that the whole of the conium fruit used in British pharmacy is obtained from Germany. Doubtless the German fruit is, to say the least, equally potent with that of British growth; and, as far as our present investigations are concerned, the use of the German fruit is the more appropriate, since it was most probably that employed by Geiger in his experiments. He states (Mag. für Pharm. xxxv.) that nine pounds of the dry ripe fruits yield one ounce of conia. Accordingly one ounce of the fruit should yield 3 grains of conia, and the quantity contained in f ℥xx of the tinctura conii fructus—assuming the fruit to be thoroughly exhausted of the alkaloid—would be $7\frac{1}{2}$ grains = to 0·375 in f ℥j. Now Continental physicians prescribe conia in doses of $\frac{1}{16}$th of a grain for a child, and $\frac{1}{4}$ to 1 drop for an adult.* Hence f ℥j of the tincture would be only a medium dose for an adult—assuming, as I have said, that it contain a quantity of conia equivalent to $\frac{1}{20}$th part of the fruit employed. It appears, therefore, that the quantity of fruit employed in the preparation of the tincture is much too small. But even if a much larger quantity were used, it is very doubtful whether the preparation would be an efficacious one, for two reasons:—1st, the active principle, although freely soluble in dilute spirit is effectually protected from its action by the horny albumen with which it is associated in the fruit,—a protection which is very inadequately removed by its comminution; and, secondly, it is very probable that a large dose of alcohol taken simultaneously with a small quantity of conia greatly diminishes the effects of the latter, but of this I hope to furnish further evidence by-and-by.

In order to prove the quality of the fruit used in the tincture with which my experiments were made, I subjected one ounce avoirdupois to the following process for the extraction of conia. Having mixed it with an equal bulk of fine sand, I packed it loosely in the percolator, and passed, after previous maceration, alcoholic (spirit—containing 86·5 per cent. of alcohol—f ℥iv, water f ℥iij, caustic potash 60 grains) and aqueous (water f ℥ij, caustic potash 60 grains) solutions of caustic potash through it, and subsequently alcohol, until it dropped through colourless. By this means, f ℥x of a turbid, brownish-green fluid, of the same depth of colour as the tincture of the leaf of the London Pharmacopœia, were obtained. This was exactly neutralized with sulphuric acid, and the sulphate of potash separated by filtration. The filtrate was placed in a retort, and the whole of the alcohol and the chief bulk of the water distilled off. These distillates were perfectly free, both from ammonia and conia, and also from sulphuric acid. About ʒiv of a blackish-brown syrupy fluid remained in the retort, and to this was added f ʒiv of aqueous solution of caustic potash, containing 16 grains of the alkali. The mixture was exposed to a temperature of 248° Fahr., by means of a chloride of calcium bath, and the distillation rapidly conducted. Colourless water and minute drops of equally colourless oily fluid passed over. About f ʒvj were obtained in all, and a charred black mass, which, when cold, evolved an intensely acrid and ammoniacal odour, remained in the retort. The distillate contained about 2 grains of conia, but I was unable to determine its exact weight, for it soon became opaquish, assumed a faint brownish tinge, and began to dissolve in the highly alkaline fluid upon which it floated. This latter assumed a brownish tinge. It possessed, but in a much greater

* Ann. de Thérap., 1853, p. 73; Archiv. Gén. 4e Sér xxiii. 226. See also Wood and Bache's Disp. United States Pharmacop. 11th ed. p. 295.

degree, the reactions of the distillate from the marc of the tincture formerly described. It formed with iodine a colourless solution, and dissolved sulphur. When heated it became turbid and evolved the intensely acrid fumes of conia under the appearance of a white cloud. As the conia condensed again, it trickled in oily streaks down the sides of the tube. The presence of a little alcohol in the distillate doubtless rendered the conia soluble to this extent.

It appears very conclusively from this experiment that the fruit operated upon, and used in the preparation of the tincture, possessed the full amount of conia.

Before proceeding with my investigations of the remaining preparations of conium of the British Pharmacopœia, I have thought it desirable to ascertain the medicinal value of the tincture of the London Pharmacopœia, for which the tincture of the fruit has been substituted in the British Pharmacopœia. And this is the more necessary, since the dried leaf is still retained in the preparation of the poultice in our own Pharmacopœia, and it is also largely used in some other Pharmacopœias, particularly in that of France.

I obtained two samples of the Tinctura Conii (P.L.): Messrs. J. Bell and Co. kindly furnished me with one, which I will call "Tincture No. 1;" and Mr. Hemingway prepared for my use another, which I will designate "Tincture No. 2." As I had in view a series of comparative experiments, with the tincture of the fruit, No. 2, was prepared in December last by exhausting, after eight days maceration in the percolator, ℥iiss of fine green, strongly smelling, dried leaf, (procured last June, and carefully preserved in a tin canister in a dry place), by the passage of f ℥xx of proof spirit. Thus its strength in comparison with the tincture of the P. L. was as 19 to 20; the London process yielding only f ℥xix out of the f ℥xx of spirit employed. No. 1 was prepared soon after the leaves were dried, and preserved from access of light. There was no apparent difference in the two preparations. Both possessed an acid reaction; a dark greenish-brown colour, a rank odour, and its corresponding flavour with a nauseous, bitterish taste. On admixture with water both became turbid from the separation of a green resinous (?) matter. This was deposited on standing, and the faint yellowish-brown supernatant fluid apparently underwent no further change.

I began my experiments with Tincture No. 2:—

December 19, at 10·45 A.M., I took f ʒii, mixed with a little water, and remained quiet all day.

December 21, at 11·15 A.M., took f ʒiv, and remained quiet for five or six hours afterwards.

December 22, at 10·45 A.M., I took f ʒvj, and was afterwards and during the rest of the day actively engaged. Walked about five miles.

December 24, at 11 A.M., took f ℥j, and sat still conversing with patients for the hour following, and was afterwards actively engaged until midnight, when I retired to bed free from headache or fatigue. Next day I did not take the tincture.

December 26, awoke with a headache, and felt weak and poorly from broken rest, and a sharp attack of diarrhœa during the early morning. At noon I took f ʒx of the tincture, and immediately walked out a distance of three miles. No effects followed, neither was there any increase of the headache or sense of debility.

December 28, at 10·45, took ʒxiij of the tincture, and from half an hour to an hour and half afterwards experienced a slight stimulant effect.

I now began to use Tincture No. 1.

December 29, at 10·30 A.M., I took f ʒv.

December 30, at 10·30 A.M., f ʒvij, and sat quiet for an hour and half afterwards.

December 31, at 12·25 A.M., took f ʒix. I had previously been sitting in a cold room, and felt very cold, and my pulse was only 60. I pursued my writing at the same temperature, and three-quarters of an hour after taking the conium my pulse was 72, and had increased in force; the stimulant action of the alcohol was manifest.

January 1, at 10·45 A.M., I took f ʒxi.

January 3, at 10·30 A.M., took f ʒxiii.

January 4, at 11 A.M., I took *a mixture* of f ℥j of Tincture No. 1, and f ℥ss of Tincture No. 2.

January 8, at noon, took f ℥j of No. 1, and f ʒvj of No. 2.

January 10, at 11·15 A.M., took f ℥j of each of the tinctures at a draught. I remained quiet. An hour after, the stimulant and diuretic effects of the alcohol were fully manifest; the pulse was 76, the pupils normal. I was actively employed during the latter half of the day; worked a considerable time with the microscope, and did not retire to bed until midnight.

Beyond the above-mentioned stimulant and diuretic action, no effects whatever followed the use of the tincture. The quantities mentioned were mixed with an equal quantity of water, and taken at a single draught from an hour and half to three hours after breakfast, which consisted of a moderate quantity of coffee, or occasionally tea, and cold meat and bread.

Generally alcoholic and other stimulants were altogether avoided, the latter indeed altogether, and the former were never taken until at least six hours after the tincture. On only one occasion was an alkali taken, and all other medicines were avoided. During the whole of the time all the functions of body and mind were efficiently performed.

I gave these tinctures, in doses varying from f ʒiij to f ʒviij, in single doses to several of my patients during convalescence from acute disease, and on the day after they were allowed to leave their beds when they were very weak and tottering, but no other effect save that of stimulation from the spirit followed in any case.

78, *Upper Berkeley Street, January* 19, 1867.

(*To be continued.*)

ON THE ANATOMY OF DRUGS.

BY HENRY B. BRADY, F.L.S., ETC.

(*Continued from page* 412.)

The student is often put upon his defence as to the practical use of investigations of the sort we are about to consider; sometimes, indeed, as to the value of scientific observations of any kind in respect to matters ordinarily judged by the rule-of-thumb standard. It is seldom worth while to reply to *cui bono* arguments in such cases; the pursuit of knowledge is, or should be, its own reward; but it may save misunderstanding if we lay down, in a few words, the aim and scope of the study of the minute structure of substances employed in pharmacy.

By far the largest proportion of the Materia Medica is derived from the vegetable kingdom, hence the appearances to be observed in the structure of most officinal bodies may be accounted for, and to some extent foretold by the laws of vegetable physiology. Each species amongst plants may be said to possess a definite structure common to its members, and all the individuals constituting it, share its peculiarities, differing only from each other in a certain limited degree depending on external circumstances of growth. Again, the various species belonging to the same genus commonly have, but in a less degree, a sort of structural affinity, and so on to larger and larger groups. Thus it will be seen that there resides in the properly conducted study of the peculiarities of structure a means of *identification,* and of course this will include facility of detection in case of sophisticated or adulterated samples. Indications of the *age* of many vegetable products, and of their suitability for use in medicine, and in some instances even assistance in the determination of their medicinal value, may be obtained by microscopic examination. Again, it is in the internal anatomy of drugs that we find the key to their external appearances on which market value so often depends. These are considerations which the most practical man will scarcely overlook. But there is a higher wisdom in the endeavour to derive interest from the objects that lie nearest to us, and with which we are necessarily brought in contact daily and hourly, and it is on this ground that we would put in a plea for the microscope.

In a former paper we dealt with history rather than scientific details. The object in doing so was twofold,—firstly, to do justice to a few of the older microscopists, to whose labours we owe our earliest items of knowledge of the subject; and, secondly, to show how gradually the facts, which formed the basis of subsequent more systematic study, had been collected. At the commencement of the present century not less than fifty vegetable substances used in medicine had been examined by microscopists, and their structural peculiarities more or less completely described, and since that time almost every writer on Materia Medica has added some result, small or large, from his own investigations; we propose, therefore, now to give an outline of the present state of our knowledge, based upon the 'Atlas' compiled by the late Dr. Berg, of Berlin.

But before we do so, it may not be out of place to express the regret with which we have heard, since the greater part of our paper was written, of the death of the author whose work we were in the act of reviewing. He had been long out of health, and pharmaceutical science loses in him a diligent and laborious student, as his many works on pharmaceutical botany and the organic portions of Materia Medica testify. We have thought it best to allow the criticisms to stand as they were written, knowing that our readers will accept the endeavour to come at the truth without prejudice to his memory. It would be surprising, indeed, if in the large amount of work Professor Berg was engaged upon, it were all to be found of the same degree of accuracy and completeness.

Plates naturally form the most important part of a treatise on any subject in which the microscope is employed, for mere verbal descriptions avail little by themselves, to carry home an author's meaning. Microscopical drawings may be said to be of two sorts, those which represent objects as they actually appear under the microscope, and those which give, as it were, an ideal diagram from which the real structure may be inferred. Each has its advantages, but we may be excused a preference for the former mode, the one usually practised in this country. However thin a section may be, a drawing of it requires some shading accurately to represent the object, and in many cases the thinnest sections are not the most characteristic. On the other hand, the more mechanical plan is sometimes less liable to confusion, and admits of special characters being made more conspicuous. The reader will often understand the author's meaning more readily, but is apt to be disappointed when he comes to examine the structure under his own microscope, and at first may be unable to identify the various portions he has seen so strikingly figured. Dr. Berg's plates belong to this latter class, and are the best of the sort; they are so good, that after we are once accustomed to his somewhat unnaturally hard lines, we cease to wish to see them altered.

ACOTYLEDONS.—*Thallogens.*—But very few simple cellular plants seem to be possessed of qualities serviceable in medicine. Amongst the *Fungi* we still occasionally hear of Agaric and the common Puff-ball being used to stop bleeding, but in England they have long since lapsed into mere domestic remedies. Possibly their spores may possess some astringent properties, but it is more likely that they do but share, in common with a number of other fibrous and finely divided bodies, styptic qualities dependent on their mechanical condition. The structure of the larger forms is exceedingly variable, but we may always find the characteristic, long, thin-walled cells, either free or united end to end and interwoven so as to form a light felted mass, or occasionally combined into a sort of coral-like network. The minute spores are generally distributed, either singly or in groups, in the fleshy mass formed of these cells. The mycelium, or "spawn," which appears at a certain stage in the process of reproduction, consists of those felted cylindrical cells, and is recognisable by its peculiar cottony appearance.

Were it not for one other substance, Ergot of Rye, the whole family of the *Fungi* might be expunged from the Materia Medica. Few vegetable productions have excited more discussion amongst scientific men than the parasitic growths which are the cause of the various diseased conditions of grasses and cereal grains, and of these Ergot has certainly received the largest share of attention. Its ravages are common to a large number of the *Graminaceæ;* and although that obtained from Rye only is officinal, we hear a preference expressed from time to time, probably without any good reason, for the produce of Wheat, Maize, and even of certain grasses. The most reliable of the numerous researches on Ergot are those of Tulasne,* which should be consulted by any one anxious for detailed information; we can only give here the prominent features of its life-history. The germ of the fungus (*Claviceps purpurea*) attacks the plant, whilst it is in flower, at the base of the pistil, and, gradually penetrating the outer wall of the ovary, forms a soft, white, fungoid mass, which obliterates the ovary itself, by filling the space it would otherwise occupy. This is the first stage. Certain physiological changes follow which we need not enter into, and these give rise to the second stage, which is observable in a new and independent fungoid growth, dark-coloured externally, white within, rising out of the paleæ of the flower, and forming the "spur," or true ergot. It must, therefore, be born in mind that Ergot is not an altered or diseased grain, but a distinct fungus in a particular (myceloid) condition of growth. Let any one who would assure himself of this, and, at the same time, try a pretty experiment, take some clean silver sand, place it in a saucer, moisten it, and lay upon it a few well formed ergot grains, covering the whole with a bell-glass. He will then be able to watch another stage in its development. After a time, beautiful white footstalks grow from the surface of the grains, each of them surmounted by a little ball containing spores.

There is not much to be observed in the structure of Ergot itself as we find it in commerce. The peripheral portion appears, from Dr. Berg's figures, to consist of an intricate network of cells; but it is necessary to treat the specimen with ether in order to remove the fixed oil before examination, and a high magnifying power must be employed. The little prominence at the apex of the grain shows, in transverse section, minute cylindrical cells arranged in sinuous spongy masses, the spores lying between the convolutions.

A chapter might easily be written on other fungi of interest to the pharmaceutist, though not within the limits of our present subject. The mould that appears on his extracts when not carefully kept, the ropy deposit in so many of his solutions, the vegetation infesting some of his powders, and even at times his lozenges, constantly remind him of their strange habits of growth. The subject, too, has of recent years been much simplified, and the number of

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* *Annales des Sciences Naturelles,* 3 sér. vol. xx. p. 5, *et seq.* See also Henfrey in Micrographic Dictionary, 2nd ed. p. 161.

hitherto received species greatly reduced; indeed the infinite variety of form, assumed by the single species of which common "Blue Mould" is an example, affecting not only vegetable substances, but even living animals up to man himself, is one of the most wonderful instances of variation within specific limits with which we are acquainted.

Possibly the Lichens are of even less importance medicinally than the *Fungi*, and the family is represented in the Pharmacopœia by but one species, *Cetraria Islandica*. Whilst closely related to the *Fungi* in many physiological points, Lichens possess several peculiarities of structure which cannot be passed over, and the officinal *Cetraria* is a fair example for description. The plant is familiar enough; it consists of a dry, dull-coloured, leafy thallus or frond growing erect, the margin broken into lobed segments, and edged by a tooth-shaped fringe. A section of the thin portion of the frond shows under the microscope a tolerably distinct separation of the systems of cells. On either surface four or five rows of thick-walled cells form a sort of epidermis, and this is again lined by a layer of long, nearly straight, cylindrical cells, closely compacted. The central portion consists of light spongy tissue, made up of loosely felted cylindrical cells with vacant air-spaces. Lying on the inner surface of the inner layer, between it and the spongy central portion, may be found minute greenish spheres (*gonidia*), which are the means of vegetative reproduction, answering to the buds of higher plants. At the margin of the larger lobes of the frond the true fructification appears, though it is not so commonly seen in commercial specimens as might be expected. This consists of brown or reddish shield-shaped bodies with raised edges (*apothecia*), which contain the *thecæ* or spore-cases.

Passing from the Lichens to the *Algæ*, we again find a few plants of sufficient interest to merit attention, though no species now recognized as officinal. The most familiar to the pharmaceutist is the so-called Carrageen, or Irish Moss (*Chondrus crispus*), but even this can scarcely be considered as a medicine, but rather, in company with some other of our native marine *Algæ*, as a dietetic substance. *Fucus vesiculosus* (Bladder-wrack) has recently been vaunted in the treatment of obesity, but its employment in this country has been limited. The structure of the stems and fronds of the larger marine *Algæ* is more or less conformable to one general type. They are entirely cellular, and can scarcely be said to exhibit any well-defined separation into the systems we recognize in more highly organized plants. The only approach to such a distinction is in the difference between the central and external portions, but they never present anything like a true bark, or even a separable epidermis. A longitudinal section shows the superficial portions to be composed of small, compact, thick-walled cells, whilst the central tissues are formed of cells of much larger size, either oval or angular in form, or of a long cylindrical shape, somewhat interwoven. In some species a moderately well-defined line marks the boundary between the two forms of cells, but in others the transition is very gradual. Through the whole group we find only the changes rung on the various forms of the simple cell. We venture to object to Dr. Pereira's figure of the structure of the frond of *Chondrus* (especially that of the transverse section), as it represents, if correctly drawn, a very exceptional instance of differentiation in the tissues. Dr. Berg's plate gives a much more accurate reading of its microscopic appearance.

A very important medical application has recently been made for the stems of some of the larger *Algæ*, depending for its utility on the peculiar structure of their tissues. The thick-walled character of the cells, and the mode in which they are combined, produces a strong cartilaginous texture, which, when deprived of water by careful drying, shrinks into a relatively very small compass, and becomes tough and hard like gutta-percha. On access of moisture gradual expansion to the original size and form takes place. Hence the exsiccated stems of *Laminaria* (Sea-tangle) are now used in the preparation of bougies and tents for dilating the various secretory passages, and the material appears likely to supersede those hitherto in use.

Acrogens.—Passing from the lowest types of vegetation to those next higher in the scale, a great advance in organization is to observed. In *Acrogens* not only do we find a distinct fibro-vascular system, but it becomes an important element in their structure, forming the framework or skeleton of the plant. Still the plants are all of humble, herbaceous growth, except the few tropical tree-ferns, and none of them possess either true wood or a true bark.

From the lower members of the group but one pharmaceutical substance is derived, that known as *Lycopodium*, which consists of the spores of the common Club-moss (*L. clavatum*). These spores make a pretty microscopical object, but there is nothing we need dwell upon in connection with them. They may be mounted either dry or in diluted glycerine, for examination by reflected or transmitted light.

The various genera of Ferns (*Filices*) constitute the higher portion of the group. Their general anatomy may be readily understood from the section of a good-sized stem of any species, as all are referrible to one common type of structure. Who has not in boyhood cut the stem of the common Bracken (*Pteris aquilina*) near its base, to see the little pictured Oak-tree so plainly marked out by the peculiar disposition of the fibrous bundles? The stem, and the rhizome of course follows the same rule, is built up of cellular tissue, loose in the centre, and more closely packed towards the circumference, and this is traversed by fibro-vascular bundles of peculiar character, arrayed in an irregular circle. The bundles consist of two portions, an outer, hard, dark-coloured border, composed of woody fibre, and enclosed by it, a lighter mass made up of long, angular, reticulated cells, combined so as to form scalariform vessels. The term 'scalariform' is employed, on account of the regular transverse lines of deposit giving a ladder-like appearance. In the rhizomes of some species, especially in that of the Male Fern (*Nephrodium Filix-mas*), in addition to the structure above described, there are to be found certain intercellular spaces, and, from the surface of the cells forming their boundary, minute, dark-coloured, globular oil-glands projecting by a short stalk into the cavity. It is to the oily contents of these cells that the rhizomes owe their anthelmintic properties.

MONOCOTYLEDONS.—The paramount importance to mankind of Endogenous or Monocotyledonous plants depends upon their economic rather than their medicinal products,—chiefly upon the fact that nearly the whole of the farinaceous substances used for food are derived from them. But, in addition to those yielding an edible farina, there are a multitude of species in common medical use. Amongst them the most familiar are—*Crocus sativus*, yielding Saffron; *Elettaria Cardamomum*, Cardamom-seed; *Colchicum autumnale*, corm and seed; *Urginea Scilla*, Squill-bulb; *Smilax officinalis*, Sarsaparilla-root; the rhizomes of *Iris florentina*, "Orris-root;" *Acorus Calamus*, Sweet Flag; *Zingiber officinale*, Ginger; *Curcuma longa*, Turmeric; *Veratrum album*, White Hellebore; and lastly, the fruit of *Asagræa officinalis*, Cevadilla. If we may be allowed to include the fruit of another plant, interesting for its structural peculiarities rather than for any medicinal value, we may add that of *Vanilla planifolia*.

It would be quite beyond the compass of the present paper to attempt a description of the histological characters of all or even of any large number of these; but a brief account of one or two of them may assist those not familiar with the subject to form a correct appreciation of the appearances they present under the microscope. It must be borne in mind that Endogens have no true bark, and, indeed, no true wood; the harder tissues of even arborescent species, like Palm-trees, being composed of distinct fibro-vascular bundles interlacing in a definite manner. From the fact that in no case is any portion of the trunk of a plant of this class used in medicine; it might almost be inferred that the structure is unfavourable to the secretion, or at any rate to the retention, of active substances. In this country, and in most temperate climates, Endogens are represented by herbaceous plants only.

Let us begin with Sarsaparilla. Of six or seven sorts known in commerce, the root of but one species, (*Smilax officinalis*) the so-called "Jamaica or Red Sarza," is esteemed in this country. The others are probably used to a much greater extent on the Continent than with us. Sarsaparillas may be classified roughly either according to their structure or their geographical range; but whilst authors of the standing of Schleiden and Pereira do not agree, it is unnecessary for us to adopt the views of either. Schleiden seems to have fallen into the same error concerning sarza that Dr. Berg has incurred in respect to cinchona bark, that of attaching an absolute value to what are necessarily variable characters; whilst Pereira, on the other hand, does not assign sufficient importance to minute structural peculiarities as a means of diagnosis.

A transverse section of sarsaparilla-root shows, when somewhat magnified, three more or less distinct component parts, viz.—a *central pith*, surrounded by a *zone of wood*, the whole enclosed by a *cortical layer;* and it is in their relative development that the chief differences between the various sorts are found.

A higher magnifying power would show that the "pith" is composed of light, thin-walled, colourless cells, often containing starch;—that the "woody zone" consists of the usual elements of fibro-vascular tissue, viz. elongated wood-cells (prosenchyma), pitted ducts, and spiral vessels; and between the wood and cortical layer would be found a ring of cells, often coloured, and of altogether different nature to either, called the "nucleus-sheath" (*kernscheide*);—and lastly, that the cortical portion is composed of three distinct layers, the thin "cuticle" or "epidermis," a narrow zone of dark-coloured, thick-walled cells, varying considerably in appearance in different species, and forming the "subcuticular tissue" and the wide cellular ring of "inner rind," which constitutes in some varieties the chief portion of the root. The inner rind is never entirely free from starch, and according to the extent to which it is present sarsaparillas are classed into "amylaceous" and "non-amylaceous" sorts.* The starch-granules are themselves worth examination, as they are often compound, or where single have an angular form, as though separated from a mass. "Jamaica sarsaparilla" is the best representative of the non-amylaceous class, and has its structural peculiarities in the dark red colour of the cortical layers, a large development of woody tissue in proportion to the pith, and almost entire absence of starch in the cortex, though sometimes existing to a limited extent in the pith. The relative proportionate thickness of the cortical and central portions seems to vary (hence the discrepancies between English and German authors), and is not a character of much value, but, as a general rule, the amylaceous roots have the largest cortical zone. Amongst Dr. Berg's sections the narrowest cortex is assigned to the Vera Cruz specimen, which is one of the non-mealy class. The Honduras and Caraccas varieties are types of the amylaceous sort.

The nucleus-sheath affords characters of considerable value in determining the origin of a specimen of sarza; and Dr. Berg gives no less than ten figures, on a highly magnified scale, of transverse sections of the root of as many sarsaparilla-yielding plants, to show the peculiar structure of this portion. Without the aid of drawings it is impossible to do justice to them, or even to give an

* Though this is a convenient division for commercial purposes, it is a somewhat arbitrary one; not only do all Sarzas contain starch, to a greater or less extent, but Mr. Hanbury points out that some specimens of root are strikingly amylaceous in one portion of their length, and comparatively free from starch in others, a fact not noted in our works on Materia Medica.

intelligible description that would guide an observer, but, in general terms, it may be stated, that whilst in some species the cells composing the sheath are rounded and equally thickened, in others they are much elongated in the direction of the radius, and have the secondary deposit unsymmetrically arranged; besides which, the size of the cells and the extent to which secondary deposit has taken place within them are points which must be noticed.

Another Endogenous product is Ginger, the dried rhizome of *Zingiber officinale*, but it presents few structural peculiarities that need be dwelt upon. Its transverse section shows a central woody portion, separated from the outer cortical ring by a narrow line representing a sort of vascular sheath. Both the outer and inner portions consist chiefly of ordinary cellular tissue (parenchyma) traversed longitudinally by fibro-vascular bundles; but whilst these bundles are sparingly distributed through the outer layer, they constitute an important element in the central column. The cells are loaded with elongated, oval, or truncate starch granules, having strongly marked lines of deposit. At intervals may be seen dark-coloured cells filled with the resin to which ginger owes its pungency and flavour, and these are to be observed more plentifully in the narrow portions at the base of each lobe of the race. The vascular sheath consists of thick-walled cells elongated in a direction parallel with the growth of the rhizome, and has, inserted at intervals along it, little groups of two or three large spiral vessels.

The Sweet Flag (*Acorus Calamus*), so well known as a water plant, especially in the east and south of England, yields a rhizome having many structural differences from that just described, fitting it for the different external conditions under which it grows. Yet at first sight there is considerable likeness. In their transverse sections we see the same sort of central column, a similar outside zone, consisting almost entirely of cellular tissue, and, as in ginger, a narrow sheath separating the two. The first and chief difference consists in the very loose spongy character of the tissue, giving lightness to the rhizome. Whilst in ginger we have the cells closely packed and taking an angular form, so as completely to fill the space, in Calamus they are small and rounded and joined together in lines, with the seeming object of enclosing the largest possible number of air-canals consistent with due firmness of texture. At the angles formed by the meeting of two or three of these lines of cells are situated certain cells of somewhat different appearance from the rest, and often a little larger, which are the reservoirs for the essential oil that gives the fragrance for which the rhizome is valued. The fibro-vascular bundles are larger than in ginger; and though a few may be found in the outer zone, the principal number are inserted immediately within the border of the central column. The sheath is cellular rather than vascular in structure.

Professor Bentley's paper on the "Adulteration of Saffron"* renders any allusion to the structural characters of this product unnecessary; and the fear of wearying those we design to interest induces us to omit any description of the fruit and seeds of Cevadilla, Colchicum, and Cardamom, but we may be allowed a few words concerning Vanilla.

Few Natural Orders of plants are so anomalous in the disposition and structure of their various organs as the *Orchidaceæ;* and this is not only true of their conspicuous parts, but to a great extent also in those requiring the microscope for their elucidation. Let any one wishing to satisfy himself of the fact obtain a leaf of almost any of the common stove orchids (*Oncidium*, *Saccolabium*, or other) and examine a thin slice cut out of any part of it with a moderate magnifying power. The chances are he will find many large cells differing from

* Pharm. Journ. 1866, 2nd ser. vol. vii. p. 452.

the rest in having curious reticulated markings, due to the peculiar character of the secondary deposit on the inner side of the cell-wall. But if he will take the pod of the Vanilla, and cut a thin section lengthwise, near the outer surface, he will be pretty sure to meet with these beautifully marked cells in considerable numbers. Every portion of the fruit will repay his labour. The structure of the pericarp, the fringe of elongated papillæ on its inner surface, the singular nature of the seminal bodies, may any of them be made the subject of instructive study.

Reverting to Dr. Berg's 'Atlas,' the only omission of importance we need remark, so far as Endogenous plants are concerned, is that of the bulb of *Urginea Scilla* (Squill), which surely ought to have had a place. The *corm* of the Colchicum is, we perceive, spoken of as a *bulb*,—a designation accurate enough for a nurseryman's vocabulary, but scarcely so for scientific purposes.

The absence of any mention of Aloes, or of the peculiarities of the plants yielding the various sorts, is to be regretted, as it gives an effect of incompleteness to the work; for, though it is perfectly true, that no portion of the plants themselves appear, in their natural condition, in the category of drugs, a plate might well have been spared to elucidate the history of so universally used a medicament, and figures of the structure of the leaf, showing the form and arrangements of the canals and reservoirs holding the purgative juice, would have been the acceptable addition to the illustrations.

But, as was stated at the outset, the chief importance of Endogenous vegetation to mankind rests in the supply of esculent farinaceous substances derived therefrom. Not only do wheat, oats, barley, rice, and the rest of the cereal grains belong to this class, but sago, arrowroot, *tous-les-mois*, plantain-meal, Portland arrowroot, and, indeed, almost every starchy material separated on a large scale for use in food, excepting, perhaps, potato-flour and tapioca, are derived from plants belonging to it.

Any of the cereal grains are worth microscopical examination. The entire grain, except certain outer layers, is made up of thin-walled cells loaded with starch. The "bran" or cuticle of the seed is seen in section to be composed of several rows of hard thick-walled cells, and varies considerably in the different sorts of grain. Between the cuticle and the starch cells are seen the dark coloured gluten cells, consisting in some species of a single series of large angular cells, in others of an irregular layer of smaller size arranged two or three deep. In rice and maize the starch granules take an angular form and completely fill the cavities of the parent cells, and to this may be attributed in part the extreme hardness of their tissues.

The infinite variety in size, form, and appearance of the starch granule, and the uniformity in these characters, which prevails in the product of particular species, has, in addition to its general interest, a practical value to pharmaceutists. All will recollect the beautiful frontispiece plates in Pereira's Materia Medica, second to none that we know of in delicacy and accuracy. In addition to the starches there figured, many equally striking may be obtained from the refuse of our laboratories. Amongst them may be noted those of ginger (granules conspicuously laminated), Calabar bean (remarkable for their size), calumba, and jalap, from the marc of their respective tinctures, and those of ipecacuanha and colchicum from the refuse of wines. The starch is easily separated by washing the dregs on a piece of fine muslin to retain the coarser tissues.

The formation of starch has long been a vexed question with vegetable physiologists, and innumerable memoirs have been published advocating as many different hypotheses. We would recommend to the notice of any of our readers interested in the subject the researches of Mr. Rainey, detailed in a short but most careful and philosophical paper in the 'Quarterly Journal of Microscopical Science,'* a few years ago. The experiments therein described leave no doubt that starch, in common with many hard structures found in the animal kingdom, is produced by a simple process of precipitation; and that the normal rounded form of the granules is dependent on the law of spherical coalescence, of whose wide-spread operation so many instances are to be found in the animal and vegetable kingdoms.

ERGOT OF RYE.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—There are few dispensing chemists whose memory does not bear some unpleasing recollection connected with the above-named medicinal substance.

Perhaps after a hard day's work, in a state of profound obliviousness, the pealing night-bell summons the luckless assistant to his duty. It may be a gusty rainy or snowy night,—no matter; huddling on his clothes, and opening the shop door, some miserable shivering object presents itself, and thrusts into his hand a little scrap of paper, on which is scrawled, in scarcely legible characters,

Pulv. Secal. Corn. recent. ʒij.

There is no alternative, so he gets to the bell-metal mortar and pounds away, sifts out the required quantity, carefully folds the packet, writing upon it with special injunctions to the messenger not to deliver to any one but to the doctor, locks the door, turns down the gas, and wearily reascends the stairs. Being now thoroughly awakened he cannot again get to sleep, but tosses about until it is almost time to resume his daily round of toil.

The chief value of the ergot is, in the words of Dr. Pereira, "to hasten delivery when the life of the patient is endangered by some alarming symptoms." As in such an exigency dispatch is imperative, no time must be lost, and the possession of the remedy in a portable form and of efficient virtue is a desideratum.

But there are grave objections to the numerous preparations which have from time to time been proposed.

With the best intentions, the compilers of the 'British Pharmacopœia' have given directions for a "fluid extract of ergot," which is not only very expensive but also very unsatisfactory. A medical gentleman of my acquaintance, being disappointed in the article supplied by a wholesale house, took the trouble to prepare it himself: the result was the same in either case. The directions are—

Take of	Ergot, in coarse powder,	1 pound
„	Ether	1 pint
„	Water	3½ pints
„	Rectified Spirit . . .	8 fl. ounces.

Place the ergot in a percolator, and free it from its oil by passing the *washed* ether through it, etc.; evaporate to 9 fluid ounces, and add the spirit.

Without presuming to question the wisdom of the well-meaning persons who are responsible for this formula, we may venture the query, why add ether to *disturb* the oil, which would otherwise remain quietly imbedded in its own cells? In the tincture no such process is deemed necessary, then why employ so costly a material in one case and not in the other?

The almost playfully reckless manner in which the Council of Medical Education prescribes the use of ether and alcohol would be amusing were it not

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* Quart. Journ. Mic. Sc., 1860, vol. viii. p. 1, plate 1.

ruinously expensive;* besides which, many practitioners object to using a strong spirituous preparation, which, they say, materially impairs the activity of this remedy. Experiment proves that distilled water is the best menstruum for extracting the active qualities of ergot, and the best process is by percolation. The process must be conducted rapidly, or decomposition soon commences, and putridity is the result. Evaporation must be carried on at a low temperature, or an odour like that of mushrooms is developed, and the product impaired.

The best form of percolator is the conical, and the simple apparatus invented by Mr. Sanger, of Oxford Street, claims preference. The advantages of the conical percolator over the old cylindrical form are manifest. The extended surface of the inverted cone admits of a vastly larger amount of atmospheric pressure, the whole of which bears upon its apex, from which the flow may be regulated with the greatest nicety by drawing a piece of tow rather tightly through the aperture before commencing operations. This simple and inexpensive apparatus deserves to be more generally employed.

In conclusion, I may add that in every instance that the aqueous fluid extract has been tested the verdict has been highly satisfactory, the quantity of spirit at 68° over proof required to preserve it being only 20 per cent. of the whole bulk. R. GOODWIN MUMBRAY.

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

On the Employment of Narceine.

BY DR. EULENBURG.

The following is translated in abstract from the 'Répertoire de Pharmacie.'

The doses of narceine commonly employed by Dr. Eulenburg for *internal use*, were from $\frac{1}{6}$th to $\frac{1}{2}$ a grain; and for *hypodermic use* from $\frac{1}{8}$th to $\frac{1}{4}$th of a grain. With healthy persons these doses were generally followed by a slight narcotic effect, without any accompanying disagreeable subjective symptom, such as headache or gastric derangement. When used hypodermically it produced a sensation of burning at the place of puncture, but of little intensity and duration, a sensation in every case less evident than that caused by every other alkaloid (morphia, quinia, etc.). It had never any irritant effect; but in patients with sensitive skins, when the injection was made on the face, it produced an œdematous swelling without redness at the place of puncture, which disappeared in from one to two days, leaving a somewhat sensitive and limited induration. Such an effect has nothing in it of a peculiar nature, as it has been noticed after the injection of other alkaloids, as morphia, for example.

Among the physiological effects of narceine which accompany the narcotism, is its action on the circulation; this consists principally (contrary to the action of atropia) in a diminution of the pulse, succeeded some time after by an acceleration. In rare cases, the pulse is accelerated during its employment by twelve to sixteen strokes in a minute. Its action on the cutaneous nervous system appears to resemble that of other narcotics, and produces its effects directly when used hypodermically, and indirectly, by acting on the centres, when

* The idea suggests itself, why should such traders as varnish-makers, hatters, and others, receive the full benefit of remitted duty on alcohol, while the infinitely more important medical profession, whose labours are paramount, should be debarred from even a participation in the advantage? Further, how is it possible for English manufacturing chemists to compete in price with those of the Continent?

given internally. The repeated use of internal doses often produces from one to two stools, sometimes even diarrhœa. On the other hand, it appears to retard the appearance of the menses. M. Eulenburg concludes, that, for sedative and hypnotic effects, narceine is preferable to every other substance. Besides its employment in some essentially neuralgic affections, its use is indicated in all cases where pain is a prominent symptom, as in articular affections, phlegmons, ocular lesions (iritis, keratitis, etc.), orchitis, blennorrhagic epididymitis, cystitis, cirrhosis of the liver, and in wounds, or after painful operations. In all these cases, narceine, when employed either internally or externally in the doses before mentioned, rapidly lessens the pain, and often produces a sleep of four, five, or even nine hours,—sleep which is soft, tranquil, uninterrupted, and followed by a quiet awaking. These doses never give rise to any derangements or any poisonous effects. Although, by the use of morphia, in numerous cases we obtain the same effects, it often fails; many diseases (especially among women) present, in fact, a kind of idiosyncrasy which renders the employment of morphia impossible; thus, by its internal use vomiting is produced, or else the medicine causes, instead of a refreshing sleep, a state of great excitement, with distressing dreams, delirium, and convulsions; while, in some other diseases, morphia, without appreciable cause, produces only a very slight effect, or one of very short duration. The hypodermic employment of morphia renders it more active and more trustworthy, but it increases in a like degree all the inconveniences, and often give rise to cephalalgia, faintings, vomitings, or profound collapse; often the sleep is very prolonged (according to Semeleder, fifty-four hours); and sometimes the effects of morphia are prolonged even for some days after the awaking.

Narceine, as an anodyne and narcotic, may be always employed in place of morphia, and is in every respect equal to it in value, and even in a great many cases is to be preferred to it.

M. Eulenburg has not as yet had many opportunities of employing narceine in hemicrania, supra-orbital, trifacial, and crural neuralgias, but every time it was tried it produced a rapid cure. In hemicrania $\frac{1}{6}$th of a grain taken at the commencement of the attack, produced a sleep of several hours, followed by an awaking in perfect health.

On Coniferine, a Glucoside contained in the Cambium of the Coniferæ.

BY M. W. KUBEL.

This substance, analogous to Salicine, was discovered by M. Hartig in the "cambium" of several coniferous trees, *Abies excelsa*, *Abies pectinata*, *Pinus Strobus*, *P. Cembra*, *Larix Europæa;* it probably exists also in other species. From its origin the name of Coniferine was given to it by M. Hartig, who left the chemical study of it to the author.

The "cambium" is collected by scraping the surface of the wood recently deprived of its bark, and pressing the mass thus obtained; the thick juice is boiled to coagulate the albuminous matters it contains, which coagulum encloses the cells, the amylaceous matter, etc.; the filtered liquid is then clear, of a sweetish bitter taste; by evaporation to one-fifth of its volume, it deposits a large quantity of Coniferine in acicular crystals. The syrupy liquor, which accompanies them, possesses a very sweet taste, and contains a sugar closely allied to cane sugar. The crystals of Coniferine are re-dissolved in water, decolorized by animal charcoal, and finally crystallized from weak alcohol.

Pure Coniferine forms slender needles of a silky lustre, containing water of crystallization, which is lost at 100° C.; they are efflorescent. It melts at 185° C.; at a higher temperature it turns brown, and ultimately carbonizes, evolving an odour of burnt sugar. Its composition corresponds to the formula,

$$\text{C}_{24}\,\text{H}_{32}\,\text{O}_{12},\,3\,\text{H}_2\text{O}.$$

It is but slightly soluble in cold water, which dissolves only 0·51 per cent., but boiling water dissolves it with facility, absolute alcohol scarcely at all, and it is quite insoluble in ether.

The aqueous solution has a slightly bitter taste, it deviates the plane of polarization to the *left*, it precipitates neither acetate nor sub-acetate of lead, and gives no coloration with ferric chloride. Boiled with weak sulphuric or hydrochloric acid, it turns thick owing to the separation of a resinous substance of a slightly bluish colour, emitting, at the same time, an odour of Vanilla. The precipitate darkens in colour by drying; it dissolves in soda, forming a yellowish solution, from which it is again thrown down by acids; heated—it evolves a very aromatic odour. The liquor filtered from this precipitate is *dextro*-rotatory and contains sugar, the presence of which may be recognised by cupro-potassic tartrate.

Coniferine presents a characteristic reaction. Whilst Salicine is turned red by concentrated sulphuric acid, Coniferine turns a deep violet, on adding afterwards a little water, a precipitate is formed, which colours the liquid a deep indigo blue, and which is probably the same substance as mentioned above.

Cold hydrochloric acid dissolves Coniferine without change of colour, but if the solution formed is heated and evaporated, the same indigo-blue precipitate is formed.

Sulphuric acid is a good reagent for recognizing this substance. It is sufficient to touch a fresh-made cut in a tree of the family Coniferæ, in order to ascertain the presence of Coniferine.—*Journal f. Prakt. Chemie*, t. xcvii. p. 243.

Why do the Leaves Fall?

Not long since it would have been impossible to have given a satisfactory reply to a question, which is frequently asked, "Why do the leaves fall?" True, there were plenty of reasons cited, but they were for the most part merely hypothetical. Some said, that as the leaves were gorged with sap, their functions became in consequence impeded, and at last the leaves died and were pushed off from the tree by the current of the sap. Others said it was the bud, that nestled in the axil of the leaf, that quietly removed the parent leaf as itself increased in bulk,—a strange theory, when it is considered how many more leaves there are than buds! A third notion was, that as the leaves died mortification ensued, a line of demarcation was formed, and the dead portions became separated from the living—a notion evidently derived from the experience of the surgeon rather than from that of the vegetable anatomist. Another of these guesses, and one apparently which finds much favour with compilers of "popular" books, attributes the fall of the leaf to an incrustation or deposit of earthy matters in the cells of the leaf in autumn; this goes on, according to our theorists, to such an extent, that the cells become blocked up, lose their powers, hence dry up, shrivel, and fall to the ground,—true enough, but not sufficient to account for all the phenomena. On turning from these speculative explanations to others offered in more recent times by scientific observers as the result of personal observation, we find so great a conformity of statements in all more important particulars, that it can hardly be doubted that we can now, at least in a general way, answer the question as to why the leaves fall. Several independent observers, among whom Dr. Inman, of Liverpool, is one, have arrived at the conclusion, that the fall of the leaf is due to the formation of a layer of cells, arranged in a plane different from that of the rest of the tissues, thus gradually severing the leaf from its support, much as a knife-blade would do, and moreover serving as a thin skin to protect the surface of what would, otherwise, be an open wound. The cells of this dividing layer, as shown by Inman and confirmed by Mohl, contain a quantity of starch, a substance not found in the adjacent cells. This dividing layer seems first to have been clearly observed by Link; Inman, Schacht, and Mettenius confirmed its existence, and Mohl has added largely to our knowledge of it. We have yet to learn why this peculiar layer is formed. As to the period of its first appearance, that is known to precede the fall of the leaf by but a short interval, though indications of its future formation exist from a very early period. The first stage in the development of the leaf, as shown by Eichler, and recently confirmed by Dr. W. R. M'Nab, is constituted by the appearance on the side of the stem, of a minute process called the "hypophyll," from which, and not directly from the stem itself, the leaf originates. Whether when the leaf falls, the separation takes place immediately from the stem, or between this hypophyll and the leaf it supports, is not a matter of practical importance, and does not affect the explanation above given as to the cause of the defoliation.—*Gardeners' Chronicle.*

On Fruit Essences.

BY M. KLETZINSKI.

The products known under the name of Fruit Essences, are alcoholic solutions of different ethers, to which is sometimes added certain acids, or certain natural essences. Glycerine is found in all; it appears to blend the different odours, and to harmonize them. It is necessary to state, that the alcohol used, as well as all the other substances, must be chemically pure.

Each Column represents in Cubic Centimetres the quantity to be added to 100 *Cubic Centimetres of Alcohol.**

Names of the Essences.	Chloroform.	Nitric Ether.	Aldehyde.	Acetate of Ethyl.	Formiate of Ethyl.	Butyrate of Ethyl.	Valerianate of Ethyl.	Benzoate of Ethyl.	Œnanthylate of Ethyl.	Essence of Persicot.	Sebacic Ether.	Salicylate of Methyl.	Amylic Alcohol.	Acetate of Amyl.	Butyrate of Amyl.	Valerianate of Amyl.	Essence of Lemon.	Essence of Orange.	Alcoholic Solutions saturated in the cold of				Glycerine.
																			Tartaric Acid.	Oxalic Acid.	Succinic Acid.	Benzoic Acid.	
Pine-apple.........	1	...	1	...	...	5	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	3
Melon	...	...	2	...	1	4	5	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	3
Strawberry	...	1	...	5	1	5	...	...	...	...	...	1	...	3	2	...	...	...	...	...	...	...	2
Raspberry.........	...	1	1	5	1	1	...	1	1	...	1	1	...	1	1	...	...	...	5	...	1	...	4
Gooseberry	...	...	1	5	...	...	...	1	1	...	...	...	...	...	...	...	...	...	5	...	1	1	...
Grape	2	...	2	...	2	...	...	...	10	...	...	1	...	...	...	...	...	...	5	...	3	...	10
Apple	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	1	...	...	4
Orange	2	...	2	5	1	1	...	1	...	...	...	1	...	10	...	...	...	10	1	...	...	...	10
Pear	...	...	...	5	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	10
Lemon	1	1	2	10	...	...	...	...	...	...	...	...	...	...	...	10	...	...	10	...	1	...	5
Black Cherry ...	...	...	...	10	...	...	...	5	2	...	...	...	...	...	...	...	...	...	...	1	...	2	...
Cherry	...	...	...	5	...	...	...	5	1	...	...	...	...	...	...	...	...	...	...	...	...	1	3
Plum................	...	...	5	5	1	2	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	8
Apricot	1	...	...	...	...	10	5	...	1	...	...	2	...	...	1	...	...	...	...	1	...	...	4
Peach	...	...	2	5	5	5	5	...	5	...	1	2	...	...	...	...	...	...	...	...	...	...	5

Dingler's Polytech. Journal, clxxx. p. 407.

* In other words, each Column represents the number of measures to be added to every 100 measures of alcohol.

NOTES AND ABSTRACTS IN CHEMISTRY AND PHARMACY.

Nitroprussides, their Composition and Manufacture.

Some doubt has always been attached to the composition of the nitro-prussides since their discovery by Playfair. Some recent researches, however, by E. A. Hadow, which are remarkable for the skill and ability they display, have removed all uncertainty in the matter, and have given us a clear insight into the formula for this interesting class of salts. Mr. Hadow started from the assumption that the nitroprussides are formed from the ferridcyanides, by the displacement of an atom of alkaline cyanide by one of the oxides of nitrogen. Thus :—

$$\underbrace{Fe_2\,Cy_6\,M_3}_{\text{Ferridcyanide.}} - M\,Cy + NO\,x = \underbrace{Fe_2\,Cy_5\,NO\,x\,M_2}_{\text{Nitro-prusside.}}.$$

The question to be solved was, *What* oxide of nitrogen replaces the M Cy? In the first instance, pure binoxide of nitrogen was passed through a warm solution of ferridcyanide of potassium, which was acidulated with sulphuric acid, so that the NO_2 might have the easier work of replacing H Cy, if it could. The liquid became blue and muddy, but no trace of nitro-prusside was formed. The next experiment was to pass the red nitrous vapours from starch and nitric acid through the warm acid solution of ferridcyanide. The difference was wonderful; no prussian blue appeared, the colour changed rapidly to the red of nitro-prusside, and much hydrocyanic acid came off. The conversion to nitro-prusside was almost perfect. It thus became clear that the replacing oxide of nitrogen is either NO_3 or NO_4. That such is the case is further shown by a very simple experiment, the reverse of the last. On adding to a solution of pure nitroprusside a solution of potash and some prussic acid, and warming, the red of the nitro-prusside changes for an instant to deep yellow, and then to pale yellow. The solution is found to contain ferridcyanide, with plenty of nitrite, but no trace of nitroprusside. Hence NO_3 or NO_4 has been replaced by K Cy, and ferridcyanide reproduced.

To determine between NO_3 and NO_4 the author sought to replace the K Cy by pure NO_3, obtained by the action of acetic acid on an alkaline nitrite, whereby NO_4 is absolutely excluded. Ferridcyanide of potassium solution was mixed with a solution of corrosive sublimate and acetic acid, and a nitrite added, and the whole was left for some hours, when, on examining the mixture, nitro-prusside was found in abundance.

The reaction was as follows:—

$$Fe_2\,Cy_6\,K_3 + Hg\,Cl + NO_3' = Fe_2\,Cy_5\,NO_3\,K_2' + Hg\,Cy + K\,Cl.$$

And the true formula of the sodium salt is—

$$Fe_2\,Cy_5\,NO_3' + Na_2 + 4\,HO = 306.$$

Curiously enough, this formula agrees more closely with Playfair's analysis than any yet proposed.

The success of this reaction on the small scale suggested it as a means of manufacturing nitroprusside on the large scale. The following is the process Mr. Hadow gives:—

A strong solution of caustic soda is prepared, and thoroughly saturated with the nitrous acid vapours from starch and nitric acid (old battery acid does well). The amount of true nitrite of soda, $NaONO_3$, in this solution is determined by permanganate, by taking a small measured quantity, diluting largely with water, acidifying with sulphuric acid, and observing the amount of standard permanganate decolorized. $Fe_4 = NaO,NO_3$ in decolorizing power. The amount of real nitrite of soda in the solution being known, is recorded on the bottle.

A mixture of any bulk is then made in the following proportions:—

A	Ferridcyanide of potassium ...	332 grs.	in ½ pint of boiling water,
	Acetic acid (Beaufoy's) ...	800 grs.	
B	Corrosive sublimate	164 grs.	make up to ½ pint with cold water,
	Solution of nitrite of soda	= 80 grs. of true $NaONO_3$	

adding acetic acid, if necessary, until quite clear. Pour the cold solution B into the hot solution A. The mixtures becomes at first turbid, but in a few minutes afterwards quite transparent. It should be kept at a temperature of 140° (at which point little nitrous acid is lost) for some hours, with addition, if necessary, of more nitrite of soda and acetic acid from time to time, until all ferridcyanide has disappeared. When this is the case, the whole mixture may be boiled down, until, on cooling, it solidifies to a thick paste. The right state of concentration has been attained, when, on beating the paste up, and squeezing in linen, a *pale* syrup, chiefly of acetate of potash, is expressed. The pearly-looking mass, freed from acetate of potash as far as possible, must be redissolved in such an amount of boiling water, that on cooling, a large proportion of cyanide of mercury separates in white pearly scales, quite free from nitroprusside crystals. On squeezing in linen, a deep-red solution of nitroprusside is expressed, and a white, pearly mass of cyanide of mercury remains on the linen. On concentrating the red filtrate, a large crop of crystals of nitroprusside of sodium is obtained in a mother-liquid containing more or less cyanide of mercury, in pearly scales, easily separated by throwing the whole on a moderately coarse hair sieve, which will retain the prisms of nitroprussides of sodium, and allow the cyanide of mercury to pass through. The prisms may be washed quite clean by allowing the cyanide of mercury to settle down in the filtrate, and using the clear supernatant fluid for washing. The operation can, of course, be continued as far it may be deemed profitable. If the cyanide of mercury is not wanted as such, it can be made to furnish hydrocyanic acid and corrosive sublimate for use again, by boiling with hydrochloric acid.

It may be added, in conclusion, that nitroprussides react well only with monosulphides. The more of a persulphide the solution contains, and the deeper the yellow colour, the less distinct is the reaction. This difficulty can be overcome by warming the yellow persulphide with sufficient cyanide of potassium to decolorize it, when the beautiful carmine of the monosulphide will be obtained.

Chalk as a Ferment.

M. A. Béchamp has been engaged in investigating the action of the chalk which is generally used in butyric and lactic acid fermentations. Chalk is commonly added to a liquid undergoing this change, for the purpose of neutralizing the acids formed, and thereby augmenting the quantity producible. Although this, no doubt, is its general method of action, yet M. Béchamp now shows that native chalk is of itself capable of acting as a ferment, and when added to a solution of starch or of sugar, will establish the alcoholic, lactic, and butyric fermentations, without the intervention of any other substance.

It is well known that the chalk formation consists almost entirely of the fossil remains of minute organized beings, which are readily detected by the microscope. But independently of these fossils, which represent life which is gone, we are assured by M. Béchamp, that white chalk still contains quite a generation of *living organisms,* much smaller than any we know, and less than all the infusoria and microphytes which have been studied in fermentations. These living organisms, which M. Béchamp names *microzyma cretæ*, are, the author states, the most powerful ferments known. Taking a sample from the very centre of a large block of native chalk, mixing it with pure water, and examining it by the microscope, there will be seen in the field some bright points, often very numerous, endowed with a very lively trepidating movement. These are the microzymæ of M. Béchamp, the smallest living beings to be seen. In further support of his view, M. Béchamp shows that such chalk is capable of acting as a ferment, and also that it contains the elements necessary to organic beings—carbon, hydrogen, and nitrogen.

420 grams of starch paste, and 30 grams of chalk, with 4 drops of creasote, were intimately mixed. At the same time, a similar mixture was made, but the chalk was replaced by pure carbonate of lime. In three days the chalk had liquefied the starch, while the carbonate of lime had effected no change whatever. On the 14th November, 1864, 100 grams of starch, 1500 c.c. of water, and 100 grams of chalk, with 10 drops of creasote, were mixed. On the 30th March, 1866, the mixture was analysed. It yielded 4 c.c. of absolute alcohol, 8 grams butyric acid, and 5·2 grams of crystallized acetate of soda. On the 25th April, 1865, 80 grams of cane sugar, 1400 grams of chalk, and 1500 c.c. of creasotic water, were put together. On the 14th June, the product of the action yielded 2·6 c.c. absolute alcohol, 4·5 grams butyric acid, 6·8 grams acetate of soda, and 9 grains of lactate of lime.

When proper precautions are taken, no other ferment can be found in the liquid after fermentation, besides those which are found in the chalk, but these have become considerably augmented. To prevent chalk from acting as a ferment, it is sufficient to raise it, moist, to a temperature of 300° C.

The organic matter in chalk amounts to 7 per cent., and contains carbon, hydrogen, and nitrogen.

Emulsion of Tar.

M. Lebœuf has proposed to make an emulsion of coal tar by means of a tincture of Panama bark (*Quillaya saponaria*). Twelve parts of the tincture are digested with ten parts of coal tar, and an emulsion is obtained which is stable with common water. M. Lebœuf prepared the tincture by digesting on a sand-bath four parts of alcohol (90°) and one part of finely crushed Panama bark, and filtering after a few days' contact.

Coal tar cannot be made into an emulsion by a weak solution of an alkali, and the above method appears to be the only practicable one for the purpose. *wood tar*, however, differs in this respect, and M. Jeannel has given the following form for converting it into a permanent emulsion:—

Powdered crystals of carbonate of soda	1
Wood tar	1
Water	100

Intimately mix the tar and the carbonate of soda in a mortar, and then introduce the mixture with the water into a large flask, agitate strongly for some minutes, and then filter. Under these circumstances the tar is completely emulsioned, and the filter only retains the grosser impurities. The resinous substance is all to be found in the emulsive fluid. The mixture has the appearance of "*café au lait*;" it filters almost as rapidly as pure water, and froths like a solution of soap. It is perfectly stable, and deposits, after a long time. only slight traces of divided resin, which are again taken up by the slightest agitation. Mixed with water, in any proportions, it gives stable emulsions. Five grammes of this emulsion, containing five centigrammes of tar, when mixed with a litre of water, give a foul liquid which is very little more charged with bitter resin than ordinary tar-water, and it is easily accepted by patients.

This emulsion of one per cent. of wood tar is very active. It is impossible to suspend a larger quantity of tar by the use of more alkaline salt, for when two per cent. of carbonate of soda is employed, a brown liquid is formed, from which a black fluid resin soon separates.

M. Jeannel states that wood tar may be readily distinguished from coal tar by this property of forming an emulsion with a one per cent. solution of carbonate of soda.

EXTRACTS FROM ANCIENT PHARMACY,

COMMUNICATED BY JOSEPH INCE.

1. *The Secrets of Alexis, containing many excellent remedies against divers diseases, wounds, and accidents.* Done in English by W. Warde. A work well approved and very necessary for all men. London. 1568.
2. *Pomet's General History of Drugs, with what is further observed by Lemery, Tournefort, and others on the same subjects.* A.D. 1694. English Translation. 1712.
3. *The Codex.* Paris. 1866.

1. Mr. Robert Howden has presented this curious old work on Pharmacy, the second title of which is, "The Secrets of the Reverend Master Alexis of Piedmont." It is printed in black letter, and, though not a perfect copy, is in fair preservation. The volume is divided into six books. Some extracts, rendered in modern orthography, will perhaps not be unacceptable to the student of antiquarian literature.

"Don Alexis unto the Gentle Reader.

"They that have known me in time past, or, to speak plain, have used me familiarly all my lifetime, can peradventure tell how God, by his great goodness, hath made me to be born of a noble house and blood (according to the common, I will not say vain persuasion, of them that stablish nobility more in the merits of another man than in our own); and that besides this I have always had my pleasures, and great plenty of riches, yea far passing the smallness of my deserts; I will say yet more (not to boast of or to announce myself, but to the end to reform (? inform) the gentle reader, and to give thanks unto God) that there be many which know how I, being given even from my first youth unto study, have gotten not only the knowledge of the Latin, Greek, Hebrew, Chaldee, and Arabic tongues, and also of divers other nations and countries; but, above all things, having by a natural inclination taken a singular pleasure in philosophy and in the secrets of nature, have wandered and travelled abroad in the world the space of twenty-seven years, to the intent to acquaint myself with all sorts of learned and discreet men. By the which diligence and curiosity I have learned many goodly secrets, not alone of men of great knowledge and profound learning, and noblemen, but also of poor women, artificers, peasants, and all sorts of men. Moreover I have been three times in Levant, and sundry times have travelled almost all other parts of the world, without resting or sojourning at any time in one place above five months."

Alexis next states that he was naturally most unwilling to communicate his information; but being in Milan when he was fourscore and two years and seven months of age, a surgeon requested him to cure a poor artificer who was marvellously tormented with the stone. He refused for certain reasons, till, the case being urgent the surgeon brought him to the patient, "whom at my coming I found so nigh his end, that after he had a little lifted up his eyes, casting them piteously toward me, he passed from this into a better life, not having any need, neither of my secret, nor any other receipt to recover his health. With this case I was moved to such a compassion and sorrow, that not only I wished myself evil, but also I desired to die; seeing my ambition and vainglory to have been the cause that this poor man was not succoured with the remedy and gift that God, the Father and Lord of us all, had given me." The result of these reflections was the present work, containing receipts, many of them more curious than valuable. Alexis ends his preface as follows:—

"But of one point I will advertise the reader, and that is, that he do the things with good diligence, and that in medicines concerning man's body, he use the aid and help of physicians. Although indeed many of them, moved with a certain rustic and evil-grounded envy, with a passion of jealousy, are wont to blame, and contemn things that come not of themselves. Wherefore, as well in this, as in every other point, if he that will use these, should perchance find that the thing would not take effect according to his consentation, let him beware that he abuse not himself in the confection of them, and to begin again with more diligence. Assuring himself that, as I have said, there is nothing in this book but is true and experimented. And giving always glory and praise unto God only for all, have a good hope that by means of his divine grace I will consequently make you a present of the rest of all that I have gotten in so many travels, voyages, costs, and diligent study. Farewell."

Some peculiarities may be noticed. The leaves are numbered, not the consecutive pages, in consequence of which, page 122, the last, is in reality page 244. There is considerable variation in the spelling of the same words occurring in different paragraphs. And, lastly, a fact well known to the English scholar receives occasional illustration, namely, that certain familiar words have ceased to bear their original signification. In Book iv. p. 80, we read of an advertisement or lesson concerning the making of powders, and conserves for the teeth. Also (Book iv. p. 82), three advertisements or lessons of importance to keep the teeth white and uncorrupt, and also a sweet breath.

Many other instances might be enumerated.

The Secrets open auspiciously with the manner and secret to conserve a man's youth, and to hold back old age, and to maintain a man always in health and strength, as in the fairest flower of his age.

From the sublime we come to this:—

"To make an oil of a red dog, by the means whereof (besides other infinite virtues that it hath) I have healed a Friar of Saint Onofres, who had by the space of twelve years, a lame and dry withered arm like a stick, so that nature gave it no more nourishment."

The particulars of the cure are thus related:—"I caused him to be anointed with the said oil (which I had set in the sun the summer of the year 1547) by the space of two Misereres, and made him tarry in the sun until the said oil was clean dried up, and had pierced through the said arm; and within four days, men did perceive, and see perfectly, that the veins gave nourishment unto the member. Nine days after the arm was as full of flesh as the other, and, with the help of God, was as whole and sound as though it had never been hurt." A much earlier cure is mentioned in the year 1514, with respect to a Portuguese of the name of Diego.

Leaving these flights of imaginative pharmacy, the celebrated Pil. Ruffi makes its appearance as Pills of Master Michael Scott, the which heal the grief or pain of the head, be it inveterate or recent; purge the brain, clarify the sight, cause a man to have a good memory, good colour in the face, and be also very good for many infirmities.

This formula contains aloes, confection of scammony, mastich, bay berries, roses, saffron and myrrh.

It is needless to mention that there are various remedies against the plague, from which the reader will derive amusement if not much instruction.

In a dangerous time, take three little branches of Rue, a Walnut and a Fig; eat all this and you shall be safe.

The Second Book contains some excellent receipts for perfumed Oils and Odoriferous Sweet Waters. The practical directions for the distillation of aromatics might be copied with advantage by the modern pharmaceutist. One formula may be given, not as the best, but because, although the shortest, it illustrates the true laboratory principle of maceration *before* distillation.

The eighth odoriferous water. (Book ii. p. 46.) Take four pounds of damask rose water, with six ounces of lavender water; the flowers of jessamin three pounds; with half a scruple of fine musk—keep well all this together in a vessel well stopped, by the space of ten days: and after distil it *in balneo Marie*, until all be come out. Then keep it in a phial of glass for your use when you shall occupy it, and you shall find it a marvellous water.

It is remarkable that the process for obtaining the true odour of flowers, by bringing them in direct contact with oils, or fat (only lately understood in this country), was practised at this early date according to the following method, which does not stand alone:—

Oil of Jessamin and of Violets.

Take sweet almonds well peeled and brayed; the flowers of jessamin as much as you will, and laying them rank upon rank, you shall leave them in some moist place, ten days together, or more; then take them away, and press out the oil in a press: the virtue of which oil serveth for divers things. In the like manner you may have oil of violets, and other flowers.

A description of the process of enfleurage is given in the formula for oil of oranges, very excellent.

The following perfumed water resembles our modern *Eau de Cologne*, and is a good elementary form; it suggests a curious speculation for the imaginative, whether this recipe might not have fallen under the observation of the first M. Farina, himself an Italian, and so have been used as a humble stepping-stone towards his great commercial success.

The sixth odoriferous water:—

Take fresh flowers of rosemary, two pounds; amber, a scruple; three pounds of the water of the flowers of oranges, lemons, and citrons, all confusedly together, which the Frenchmen call *Eau de Naphe*. Leave altogether in some vessel well stopped (stoppered) ten days. Then the water being distilled in Balneo Marie, let it be kept in a phial of glass very close and stopped.

Several of these odoriferous waters are variations of the same receipt.

Alexis has a quaint and a flowing style. He elsewhere describes a heavenly water which hath many goodly and notable virtues, as we shall show you hereafter: an oil of cloves very noble. A good way and manner how to make ink, for to carry about a man in a dry powder; which (when he will write with) he must temper with a little wine, water, or vinegar, or with some other liquor, and then he may incontinent put it in experience. With the same powder all other ink may be amended, be it never so evil. Powder of Cypress, very exquisite. An easy water for ladies and gentlewomen. To make a goodly lustre or beautifying of the face: good for ladies and dames.

Enough has been quoted to give a general idea of the work. It is strange to find some modern follies anticipated.

To make hair as yellow as gold. A very goodly way or manner how to make yellow auburn hair, without standing long, or nothing at all in the sun: a rare and very excellent secret.

Nor was Alexis alone in wishing to conceal his information.

A very goodly secret to dye or colour wood, of what colour a man will, which some joiners do use that make tables and other things of divers colours, and do esteem it among themselves to be of such excellence, that one brother will not teach it another.

The reader curious in such details is referred to an odoriferous and precious water, wherewith a man may wet or bathe any linen cloth, to wipe or rub his face, which will make the flesh white and well-coloured: and the more a man rubbeth his face with it, the fairer it is, and also continueth six months. A thing experimented and proved, yea an it were for a queen.

While to such pharmaceutists as may be inclined to prosecute their studies next autumn in a northern region, this last extract may prove of interest.

To make Conserve or Confiture of Quinces, called in Latin, cotoneatum, cydoniàtum, or cidonites: as they do in Valencia, which also the Genoese do use: we call it in English, marmalade.

Before we take leave of Alexis altogether, one passage in the original orthography may be subjoined.

"A merueylous secrete for to preserue a man from the plague and hath bene proued in Englande of all the Phisitions in that great and vehement plague, in the yere 1348, which crepte thorowe oute all the worlde, and there was neuer man that vsed this secrete, but he was preserued from the plague.

"Take Aloe Epaticum, or Cicotrine, fyne Synamom, and Myrre, of eche of them three dragmes, Cloues Mace, Lignum Aloe, Masticke, Bolearmenicke of eche of them halfe a dragme. Let all these thynges be well stamped in a cleane morter, then mingle them together, and after keepe them in some close vessell, and take of it euery morning two penny weyght, in halfe a glasse full of whyte wyne, with a lytle water, and drinke it in the morning at the dawninge of the daye. And so may you (by the grace of God) goo hardlye into all infection of the ayre and plague."

This last passage is translated from the original English, with notes.

"To make lye to wash the head, which (beside that it comforteth the brain, and the memory) maketh the hair long, fair, and yellow like gold. (Page 74.) Take lye that is not too strong, but as women commonly make it to wash their heads: and make as much of it in a kettle as will serve you ten washings, putting to it this following,—the peels of ten oranges, or of sweet lemons, if you have any, if not take sour ones, the peels of citrons, as many as you can get, be they green or dry it is all one; the blossoms of chamomile, bay-leaves, a handful of the herb called maiden-hair, half a handful of agrimony; two or three handfuls of barley straw chopped in pieces, half a dishful of a kind of pulse corn, called in Latin Lupinus, and in French Lupins, having one stalk, the leaf in five divisions, the *cod** creavesed† about, having in it five or six grains, hard, broad, and red, they be commonly in France and in Italy, but here in England unneth‡ known, and therefore they have no English name; they must be dried, a dishful of fenugreek, half a pound of wine lyes, or two or three dishfuls of broom blossoms, whereof it is good always to have some dry in your house to make such things withal. Put all this that I have named in a great vessel with the said lye, leaving it always so, to take thereof and occupy when you will. And the longer the said lye shall be compounded with the foresaid things the better it will be. The said Composition will be good for five or six months or more, and you may renew it at your pleasure. But when you will put it in use, take it handsomely and cleanly up, without

* "*Cod, Pod*, s. (*codde*, Sax.) ? *cosse* or *écosse*. Any case or husk in which seeds are lodged."—*Mortimer*.

"Thy corn thou there may'st safely sow,
Where in full *cods* last year rich pease did grow."—May. (1594-1650).

† *Creavesed about* (Fr. *crevasse*, crack or fissure), puckered or crinkled.

‡ *Unneth*, scarcely, hardly (Spenser); also *uneath*, as "Uneath may she endure the flinty streets" (Henry VI., Part II. act 2, sc. iv.).

touching in any wise the said drugs put in it, and in heating it again you may put in it a little myrrh and a little cinnamon; and thus shall you make it very good, as well for the health of the head, and eyesight, as for to beautify and make the hair fair."

2. Pomet's book is interesting, as it formed one of Pereira's allusions in his lectures on Materia Medica. The following are the passages to which he used to refer:—

I shall here decline treating of the great lights—knowledge and understanding—which the Creator has bestowed on man, and confine myself wholly to the matter of the body, and to the things which may be found in it, living or dead, proper for the relief of others in their sicknesses, and for the prolonging or preserving their days in health; and to keep myself within the bounds of my intended work, and follow the design I have here, of treating of only such things as the animal, vegetable, and mineral world furnish us with, under the name and office of drugs, I judge nothing can be more proper than to begin this part of the work with treating of mummies, which contain in them nearly all the parts of the human body.

Of Mummies.—Amongst all the testimonies of respect which antiquity paid to the bodies of the deceased, that of a decent burial was always in the most esteem; by which last and pious acknowledgment they were willing to honour and preserve the memory of those whose actions had recommended them in their lifetime, and performed a work of charity, tending to the consolation of the living, and the peace and repose of the dead.

The first and most costly kind of embalming was valued at a talent of silver, which may be computed at about eight hundred and fifty livres at that time of day, but reckoned now, would amount to eight thousand livres, or five hundred pounds sterling, and upwards. The second sort of embalming was reckoned at half a talent, which was used to the middle sort of people. The third sort of embalming was for the poorer people, which was made with a mixture of pitch and bitumen of Judæa; or the bodies were dried with lime, or other drugs of little value; and sometimes they used Egyptian natrum, salt, honey, and wax.

[Pomet relates the extreme care that was sometimes taken, and that the household mummy] was reckoned such a valuable pledge and token of their faith, that if any of them happened to want money, he could not give a better security than the embalmed body of his relation in its case.

[The Jews practised great frauds in the manufacture and importation of this strange article of commerce; but Pomet observes,] This is very different from what the ancient physicians imagined when they prescribed mummy. But as I am not able to stop the abuses committed by those who sell this commodity, I shall only advise such as buy, to choose what is of a fine shining black, not full of bones or dirt, of a good smell, and which, being burnt, does not stink of pitch. This is reckoned proper for contusions, and to hinder blood from coagulating in the body; it is also given in epilepsies, vertigoes, and palsies; the dose is two drachms in powder, or made into a bolus. It also stops mortifications, heals wounds, and is an ingredient in many compositions.

Besides the mummy that is met with in the shops, we sell human fat or grease, which is brought us from several parts; but, as everybody knows, in Paris, the public executioner sells it to those that want it, the druggists and apothecaries sell very little. Nevertheless, they vend a sort of it that is prepared with aromatical herbs, and which is without comparison much better than that which comes from the hands of the hangman. This adeps, or axungia, is reckoned very good for rheumatisms, and other diseases proceeding from a cold cause. Many other preparations are to be found in Mr. Charas's Royal Pharmacopœia. As to the choice of all these, the only rule is to buy them of honest people, for otherwise the best judges may be deceived in them.

Of the Moss upon the Human Skull.—The English druggists, especially those of London, sell the heads or skulls of the dead, upon which there is a little greenish moss, which is called Usnea, because of its near resemblance to the moss that grows upon oaks; and as Mr. Charas stayed a considerable time in England, and saw plenty of them, I have only related what he told me on this subject. The English druggists generally bring these heads from Ireland, where they frequently let the bodies of criminals hang on the gibbet till they fall to pieces. You may see in the druggists' shops of London, some of these heads entirely covered with moss, and some that only have the moss growing on some parts. The same druggists send to foreign countries, especially Germany, these skulls covered with moss, to put into the composition of the Sympathetic Ointment, which Crollius describes in his 'Royal Chemist,' and which is very available in the cure of the Falling Sickness. Some virtues are also attributed to the skulls taken from gibbets, but in all probability the heats and colds of the seasons have dissipated the greater part. The skulls of criminals newly hanged, stripped of the fleshy membrane, and the brains taken out, being well washed and dried, and separated with a saw from the lower part, are, or ought to be, what the druggists sell by the name of the human skull.

3. It will seem strange to have included amongst ancient pharmacy, the Codex of 1866; yet in what other light can we view the reproduction of formulæ more consonant with the style of thought which obtained two centuries ago, than adapted to the requirements of the age in which we live?

We have the right to say this, when the preface itself declares that the tendency of modern times is towards simplicity—that men of science trust more to an accurate knowledge of active principles, and to the true therapeutic action of remedial agents, than to the doubtful security of polypharmacy. We forbear to give actual extracts from a standard volume, for which we have such respect. In confirmation of these strictures, we refer the reader to the admirable Analytical Review of the Codex, read at Edinburgh by Dr. Scoresby-Jackson, and printed in the Jauuary number of the Journal. He translates the formula for the Theriaca with its happy family of ingredients. We might also point to the chapter on Electuaries; to many of the Compound Syrups, and to receipts such Alcoolat Vulnéraire, and Alcoolat de Fioraventi. We venture to express a feeling of regret, that a work of such importance as the French Pharmacopœia should have been issued under the sanction of an imperial Commission with these blemishes.

ON THE COMBUSTION OF GAS FOR ECONOMIC PURPOSES.

BY HENRY LETHEBY, ESQ., M.B.

[*A Lecture delivered before the British Association of Gas Managers, at St. Martin's Hall, London, on Wednesday, May* 23, 1866.]

(*Concluded from p.* 307.)

But we shall find that a still higher temperature is obtained by blowing air into a large volume of flame. This is the plan adopted by Mr. Herapath in this blowpipe jet. Observe how intensely it ignites a mass of platinum wire; and by putting together a number of these jets, as Mr. Griffin has done, in this arrangement, which he calls a blast-furnace, you will perceive what a high temperature is obtained; and by surrounding the blast with a case of baked clay, so that the heat may be concentrated, the temperature is sufficiently high to melt all the common metals. As much as a quarter of a hundredweight of cast-iron can be melted at a time in one of these furnaces, and 3 or 4 lbs. of cast-iron or copper can be thus melted in fifteen minutes. Even the very refractory metals, as nickel and cobalt, can be thus fused.

And if instead of atmospheric air a jet of oxygen is used, as I will now show you, the temperature is still higher. This is the principle of Deville's furnace, which is a jet of oxygen blowing into a large flame of coal-gas, and directed down upon the refractory substance, the whole apparatus being enclosed in a chamber of non-conductors. With this furnace large masses of platinum are easily melted, the platinum being placed upon a hollow bed of lime. I have seen a mass of platinum, weighing about 350 lbs., which had been melted in this manner; and I was informed by Messrs. Johnson and Matthey, the platinum assayers of Hatton Garden, that the mass required six hours for its fusion. During that time about 360 cubic feet of coal-gas and the like quantity of oxygen were used; in fact, Deville found in his experiments at the École Normale that it required a little more than a cubic foot of gas and a cubic foot of oxygen to melt a pound of platinum. The temperature of the flame must be enormous; calculated from the thermotic powers of gas with air and oxygen, it may be said that it is equal to about 5228° of Fahr. when air is used, and 14,320° with oxygen.

The temperature of different combustibles is shown on the diagram on the following page, and you will notice that the highest temperature produced by the various constituents of coal gas is that of acetylene, or the vapour of benzole when burned in oxygen, the heat of which exceeds 17,000° Fahr.; the lowest temperature of all the constituents is about 12,700° Fahr., the temperature of burning carbonic oxide.

On the same diagram I have tabulated the thermotic power of a great number of substances. It is expressed in the number of pounds of water raised 1° Fahr. by a pound of the substance, and when the body is capable of being converted into gas or vapour, I have also expressed it in the cubic foot at common temperatures and pressures. Hydrogen, you perceive, is the most powerful thermotic agent, and carbonic oxide is the weakest; a pound of the first of these gases will raise 62,030 lbs. of water 1°, whereas a pound of the latter will only heat about 4325 lbs. of water to that extent. Examined by the cubic foot, and considering that for every pound of water raised 1°, about 48 cubic feet of air are raised to the same extent, we may say the chief constituents of coal gas have this thermotic power:—

Pounds of Water and Cubic Feet of Air raised 1° Fahr. by a Cubic Foot of the Gas Burning in Air.

Cubic Foot of		Lbs. Water raised 1° Fahr.	Cub. Ft. Air raised 1° Fahr.
Hydrogen . . .	heats	329 . .	15,837
Marsh gas . . .	,,	996 . .	47,946
Olefiant gas . .	,,	1585 . .	76,299
Propylene . . .	,,	2376 . .	114,378
Butylene . . .	,,	3168 . .	152,502
Acetylene . . .	,,	1251 . .	60,220
Benzole vapour .	,,	3860 . .	185,814
Carbonic oxide gas	,,	320 . .	15,403
Common coal gas .	,,	650 . .	31,290
Cannel coal gas .	,,	760 . .	36,585

From this we can determine the practical thermotic power of any of these agents. A cubic foot of common gas will heat 65 gallons of water 1°, or 6·5 gallons 10°, or 3·25 gallons 20°; so that a bath containing 250 gallons of water would require about 77 cubic feet of common gas, or 66 of cannel, to raise its temperature from 55° to 75°. In practice, however, this is rarely attained, because of the faulty construction of the heating apparatus. I find, indeed, that a bath in my own house, made by Phillips, of Skinner Street, takes nearly twice this proportion of gas to heat it, and being in a closed room the atmosphere is almost poisoned before the bath is ready; and the circulation of the hot water is so imperfect that the top layer becomes boiling hot before the bottom of the water is warm. This is a subject which requires attention, for it is open to much improvement.

Again, with regard to the boiling power of gas, although in good practice a cubic foot of gas should boil off about 4712 grains of water, or about 22 times its own weight, yet this is not often attained, for in an open vessel we rarely evaporate more than 2866 grains of water, or about 13 times its weight.

Table of the Combustion Temperature and Explosive Power of Gases.

	Per lb. Substance.			Pounds Water Heated 1° Fahr.			Temperature of Combustion.				Explosive Power.		Mechanical Power per lb.
							Open Flame.		Closed Vessel.				
	Ox. Used.	CO^2 Produced.	Air Vitiated.	Per lb. Substance.	Per Cubic Foot Substance.	Per lb. Ox. Used.	With Ox.	With Air.	With Ox.	With Air.	With Ox.	With Air.	Tons Raised 1 Foot High.
	Cub. Ft.	Cub. Ft.	Cub. Ft.	Lbs.	Lbs.	Lbs.	Deg.	Deg.	Deg.	Deg.	At.	At.	Tons.
Hydrogen	93·4	0·0	467	62030	329	7754	14510	5744	19035	7852	25·6	12·5	21390
Marsh gas	47·2	23·6	826	23513	996	5878	14130	4762	18351	6680	37·0	14·0	8108
Olefiant gas	40·5	27·0	878	21344	1585	6225	16535	5217	21344	7200	42·9	15·1	7360
Propylene	40·5	27·0	878	21327	2376	6220	16522	5239	21327	7177	67·3	22·5	7360
Butylene	40·5	27·0	878	21327	3168	6220	16522	5232	21327	7177	85·8	30·2	7360
Acetylene	36·3	29·1	909	18197	1251	5914	17146	5142	22006	7009	37·9	17·6	6275
Benzole	36·3	29·1	909	18197	3860	5915	17146	5142	22006	7009	113·7	52·8	6275
Carbonic oxide	6·7	13·5	371	4325	320	7569	12719	5358	16173	7225	21·8	11·7	1490
Bisulphide carbon	14·9	5·0	689	6120	1239	4845	15280	4314	20031	5917	30·2	11·6	2110
Sulphuretted hydrogen	16·7	0·0	630	7444	671	5271	13688	4388	17542	6026	28·3	12·7	2567
Cyanogen	14·5	14·5	435	6712	925	5142	13488	5028	17645	6167	35·6	17·8	2314
Common coal gas	37·5	17·6	618	21060	650	6816	14320	5228	18101	7001	29·2	14·6	7262
Cannel gas	31·0	22·0	698	20140	760	6503	14826	5121	19046	7186	38·8	18·0	6945
Wood spirit	25·3	11·8	422	9547	819	6363	11435	4641	14902	6347	40·3	15·3	3290
Alcohol	24·6	16·4	533	12929	1597	6195	13305	4831	17223	6629	46·4	16·1	4455
Ether	30·9	20·4	664	16249	3217	6158	14874	5150	19225	6953	58·6	19·0	5603
Camphine	38·9	27·8	880	19573	7134	5942	16271	5026	20953	6922	47·6	16·0	6750
Spermaceti	37·0	25·2	815	17589	......	6088	14599	4413	......	......	......	......	6065
Wax	37·7	25·6	829	15809	......	4995	12921	4122	......	......	......	......	5451
Stearic acid	34·6	24·0	783	17050	......	6061	15885	4818	......	......	......	......	5880
Stearin	34·4	14·2	527	18001	......	6143	15815	5095	......	......	......	......	6207
Paraffin	40·5	27·0	878	21327	......	6220	16522	5239	......	......	......	......	7354
Paraffin oil	40·5	27·0	878	21327	......	6220	16522	5239	......	......	......	......	7354
Rape oil	38·7	24·3	801	17752	......	6123	15830	5087	......	......	......	......	6121
Sperm oil	38·7	24·3	801	17230	......	6088	15363	4937	......	......	......	......	5941
Carbon	31·0	31·5	943	14544	......	5447	18329	3026	......	......	......	......	5015

But the heat of the burning gas is more surely applied to the warming of rooms; for, as you will see by the table, a cubic foot of common gas will heat an apartment containing 3129 cubic feet of air 10°, and the same quantity of cannel gas will heat 3658 cubic feet to the same extent. Other illuminating agents will, however, light for light, heat the atmosphere, and vitiate it to a larger extent. This is seen in the table which I brought under your notice at the last lecture.

Heating and Vitiating Effects of different Illuminating Agents, when burning so as to give the Light of 12 Sperm Candles.

	Lbs. Water raised 1 Fahr.	Oxygen consumed, Cub. Ft.	Carb. Acid produced, Cub. Ft.	Air vitiated, Cub. Ft.
Cannel gas	1950	3·30	2·01	50·2
Common gas	2786	5·45	3·21	80·2
Sperm oil	2335	4·75	3·33	83·3
Benzole	2326	4·46	3·54	88·5
Paraffin	3619	6·81	4·50	112·5
Camphine	3251	6·65	4·77	119·2
Sperm Candles	3517	7·57	5·77	131·7
Wax "	3831	8·41	5·90	149·5
Stearic "	3747	8·82	6·25	156·2
Tallow "	5054	12·00	8·73	218·3

The vitiating effect is calculated on the actual loss of oxygen, and on the power which 4 per cent. of carbonic acid has on the vital qualities of the atmosphere; and, although the results indicate that there should be less discomfort in a room lighted with coal gas than with any other illuminating agent, yet common experience is altogether in the opposite direction. The explanation of this is to be found not only in the fact that gas is used more lavishly than other agents, but also that in burning it produces a larger proportion of aqueous vapour, which becoming diffused into the surrounding atmosphere occasions great discomfort. Professor Tyndall has shown that the molecules of aqueous vapour are endowed with a remarkable power of absorbing the radiant heat of burning gas, and by thus becoming warm they create a sense of oppression; and again, when the warm atmosphere of a room is overcharged with moisture, it checks the action of vaporous or insensible perspiration, and this also causes distress. In all cases, therefore, where gas is largely used in rooms, provision should be made for the quick removal of the products of combustion.

When the heat of gas is required for warming a room, its radiant power should be increased by allowing it to ignite some solid substance, for the radiant heat of a non-luminous flame is very insignificant. I have here a Bunsen's burner, which gives with this gas the highest temperature of combustion, but the amount of heat which radiates from it is very small,—smaller, indeed, than is the case when the gas is burnt in the ordinary way, when every atom of ignited carbon becomes a centre of radiation. The proportions of radiant heat from the same flame under different circumstances is very variable. From Bunsen's burner it is only 12, from the same gas burnt as a luminous flame it is 30, and with a spiral of platinum in it is 85. The introduction of solid matter into a non-luminous flame of high temperature changes its character altogether, and from the heat of convection it becomes heat of radiation. No doubt the quality of the vibrations is greatly changed, and they pass from the large and comparatively slow undulations of obscure heat to the small and quick vibrations of light; and the more this is effected, the greater and greater becomes the intensity of the radiant heat. Professor Tyndall found that the following were the quantities of radiant heat from a platinum spiral, at different degrees of luminosity:—

			Degrees of Heat radiated.
Platinum spiral		Feebly red	19
do.	do.	Dull red	25
do.	do.	Full red	62
do.	do.	Orange red	88
do.	do.	Yellow red	158
do.	do.	Yellow white	200
do.	do.	Blue white	276
do.	do.	Intense white	440

So that, when we wish to economize the radiant heat of burning gas, it is best to use it with some solid body, as fragments of pumice or pieces of asbestos.

The last point to which I would refer is the available or convertible motive power of burning gas.

The calculations of Dr. Mayer, of Heilbronn, and the experimental inquiries of Mr. Joule, of Manchester, show that the mechanical power of heat is 772 lbs., raised a foot high for the heat necessary to raise the temperature of a pound of water 1° Fahr. A cubic foot of hydrogen in burning has therefore the mechanical power of ($329 \times 772 =$)253,988 lbs.; and the same quantity of common gas has the power of ($650 \times 772 =$)501,800 lbs.; while the power of a cubic foot of cannel gas is ($760 \times 772 =$) 586,720 lbs., raised a foot high. But if the same quantity of these gases is exploded with air or oxygen in a closed chamber, the mechanical power is somewhat different. I have here tabulated the expansive force of such a mode of combustion, and I may say that the calculations are deduced from the temperatures of combustion and from the volumes of the products—allowance having been made for the specific heats of the several products. It would seem, therefore, that the explosive powers of the several constituents of coal gas, when mixed with their proper proportions of air or oxygen, are as follows:—

Explosive Power of Mixed Gases.

	Mixed with Air. (Ats.)	Mixed with Oxygen. (Ats.)
Hydrogen	12·5	25·6
Marsh gas	14·0	37·0
Olefiant gas	15·1	42·9
Propylene gas	22·5	67·3
Butylene gas	30·2	85·8
Carbonic oxide	11·7	21·8
Common gas	14·6	29·2
Cannel gas	18·0	38·8

These are the theoretical pressures exerted upon the sides of the containing vessel when these several gases are exploded with their proper proportions of air or oxygen; but as the explosion is never instantaneous, but proceeds from particle to particle, and therefore occupies time, and as the walls of the vessel always cool the products of the exploded gas to a great degree, this theoretical value is never obtained in practice, the highest pressure in the exploding chamber of a gas-engine being only 75 lbs. on the square inch, or five atmospheres. The power of this has been determined experimentally by Mr. Evans, who informs me that with a cubic foot of a mixture of nine air and one gas he has propelled a wooden shot (three inches by four) 50 yards; and he ascertained that the same effect was produced with an ounce of gunpowder. The motive power, therefore, of the exploding mixed gas is considerable.

In the gas-engines of Lenoir it has been found that the best proportions of air and gas are eight volumes of air to one of common gas; theoretically the best proportion for London (13-candle) gas is 5·6 volumes of air to one gas. A larger portion of air is required for cannel gas, as 11 to 1; but in practice it is found that cannel gas does not produce so good an effect as common gas. The time of the explosion is about the 27th part of a second, and the temperature of it is about 2474° Fahr. instead of from 5228° to 7000°—the calculated temperatures for open and closed chambers.

The machines which are used for practically employing this power are all modifications of the original engine of Lenoir. They consist of a cylinder with a double-action piston, receiving the mixed gas alternately on either side of the piston. The arrangement is such that in the movement of the piston the air and gas, in proper proportions (8 to 1), are drawn into the cylinder by a suitable side valve, and when the piston has made half a stroke it shuts off the valve; at that moment the mixed gas is fired in the cylinder by means of an electric spark from a Ruhmkorff's coil passing between the points of two wires in the cylinder. One of these wires is insulated by traversing a rod of porcelain fixed in the cylinder, and, being in connection with a make-and-break contrivance, called a distributor, attached to the fly-wheel of the engine, it receives the charge of electricity, and so fires the mixed gas at the right moment. The expansion caused by the explosion and heat of combustion drives the piston through the rest of the stroke, and it generally ends with a good deal of unutilized pressure. In one case I find that the indicator recorded an initial pressure of 75 lbs. on the inch at the moment of explosion, and a final pressure of 25 lbs. The loss of power in this case must have been considerable, for not only is there the loss of the difference (12·5 lbs.) between the calculated pressure 37·5 lbs. (75÷2), and the real (25), but there is also the total loss of the unavailable final pressure. A part of this loss is no doubt due to leakage, and to the cooling effect of the walls of the cylinder, for the temperature has been observed to fall from 2474° Fahr. at the moment of explosion to 1438° at the end of the stroke—the calculated temperature being 2156°; indeed the management of the temperature is one of the difficulties of the engine, for the cylinder has to be cooled by a stream of water. Improvements will no doubt be made in the construction of the engines, and especially in the utilization of the residual power, and this must be done by shutting off the valve and firing the gas earlier in the stroke. This has already been done to some extent in America with engines of half-horse power, as with cylinders of $4\frac{5}{8}$ inch diameter by $8\frac{3}{4}$ inch stroke; and this with 185 revolutions or 370 explosions in a minute raises 16,280 lbs. one foot high in a minute. In France and in this country much larger engines are made, as from 1 to 3 horse power.

The quantity of gas used in the working of the engine is rather variable. In the American engine, already alluded to, it took 105 cubic feet of gas an hour to work an engine of half-horse power, and a one-horse engine in London takes about 185 cubic feet of London gas—say it is 200 cubic feet—per horse power. This is 1,980,000 lbs. a foot high; whereas the theoretical power of 200 feet is more than 100 millions of pounds.

The advantages of the engine are very great, for it takes up but little room, it is very clean, it works with great regularity, it requires little or no attention, and it costs nothing for fuel when it is not at work.

One thing I ought to mention in speaking of the explosive power of mixed gas, and that is the effect of using mixtures in improper proportions. Sir Humphrey Davy found, in his experiments with marsh gas, that there was but one proportion of air and gas which gave the maximum effect, and that was a mixture of 1 of gas and 7·5 of air (theoretically it should be 1 to 9·5). When the proportions are reduced in either direction the mixture becomes less and less explosive, until with 1 gas and 15 air, or with equal volumes of gas and air, the mixture ceases to explode.

In the case of coal gas, although the theoretical proportions for London gas are 1 of common gas* to 5·6 of air, and 1 of cannel gas to 7·4 of air, yet the best results are obtained with 1 of the former to 8 of air, and 1 of the latter to 11. On either side of this proportion the mixture rapidly becomes less and less explosive.

The effect of mixing other gases with explosive mixtures has been well studied by Davy and others: taking, for example, an explosive mixture of 2 volumes of hydrogen and 1 of oxygen, it is found that 1 of nitrogen to 6 of the gas, or 1 of carbonic acid to 7 of it, will stop its explosion.

Lastly, the temperature at which these gases are fixed is a matter of considerable importance. Davy found that he could not set fire to marsh gas (the firedamp), or to an explosive mixture of it with air, by using the strongest heat of glowing charcoal. He even blew a mixture of the gas upon glowing charcoal until he got it at a maximum heat without firing it; nor can it be fired by the sparks from flint and steel. Not so, however, with hydrogen, or olefiant gas or carbonic oxide, all of which are fired by the sparks and by glowing charcoal—perhaps the igniting temperature is about 3900° Fahr.; and the vapour of bisulphide of carbon is fired at as low a temperature as 300° Fahr.

* *Average Composition of London Gas by Volume.*

	Common Gas.	Cannel Gas.
Hydrogen	46·0	27·7
Light carburetted hydrogen	39·5	50·0
Olefiant, etc.	3·8	13·0
Carbonic Oxide	7·5	6·8
Carbonic acid	0·7	0·1
Aqueous vapour	2·0	2·0
Nitrogen	0·5	0·4
	100·0	100·0

These facts are deserving of attention, for they show that gas leaking from the mains may be fired by a spark from a pick, or from the chipping of a hole in the pipe in laying a service.

And now, Gentlemen, we have gone over the question of the phenomena of gaseous combustion, and of the manner in which gas is to be most profitably and most economically used for illuminating purposes. We have also examined the thermotic powers of coal gas, and I hope if I have the opportunity of meeting you again, I shall be able to bring under your notice one other question of interest to gas engineers, and that is the profitable utilization of the waste products of gas-works.

DEODORIZING INDIA-RUBBER.

The extremely disagreeable odour attaching to india-rubber manufactures, and the power possessed by them of imparting a nauseous taste to liquids or other substances, has long been a difficulty in the way of its use for many purposes for which india-rubber is peculiarly adapted. To obviate this evil many expedients have been resorted to, but none hitherto with perfect success, and this on account of the strong tendency which india-rubber has to acquire and retain odours. The new process, invented by Mr. S. Bourne, depends upon the still greater affinity possessed by charcoal, especially animal charcoal, for all kinds of odours, and its great capacity for the absorption of gases. The practical difficulty lies in so using the charcoal as not to injuriously affect the articles with which it may be brought in contact, and this has now been overcome by very simple means.

The mode of application necessarily varies according to the description of articles which are thus treated. Generally speaking, they are laid in shelves or trays in a hot chamber, with a thin stratum of charcoal beneath and on top, and exposed to a temperature of from 120 to 180 degrees for from three to six hours, after which they are removed from the charcoal, having sustained no other alteration than the all-important one of being rendered devoid of smell and incapable of imparting any taste to liquids or other substances they may touch. Under proper management the most delicate textures can be thus dealt with without being impaired either in substance or appearance. The most convenient mode of applying heat is by hot water or steam surrounding the vessel or chamber in which they are placed. One very considerable advantage of this process is, that for a large number of vulcanized articles it can be carried on in co-operation with the heating or curing by which the vulcanization is effected, and they leave the chamber at once free from odour. It is equally applicable to india-rubber in sheet, spread fabrics, or the garments or other articles made therefrom when fully made up, such as the ordinary "macintosh" clothing, air and water cushions, etc. The use of this process enables the inventor to produce his "flexible diaphragms" (which were first brought before the public at the Dublin Exhibition, where they obtained a prize medal) in so pure a state that they may be at once used with the most delicate wines and other liquids. The diaphragm itself is a contrivance for the division of casks or other vessels into two separate chambers, by means of a flexible partition, which fits to the upper or lower part of the vessel alternately, or into any intermediate position, so that whatever the quantity of liquor contained within it, the air (though still exercising its pressure through the medium of the diaphragm) is separated from it by an impervious shield, and thus the injurious effects of exposure to atmospheric influence are altogether avoided, and any portion of the liquor may be withdrawn at pleasure, and as often as may be, without any admission of air to the remaining portion. In this way vessels of wine and beer are stated to have been actually kept in constant use for six and twelve months without any fermentation or formation of acid resulting. It is equally applicable to other liquids for domestic use or for medicinal or scientific purposes, the fluid remaining as completely secured as if the vessel were actually full.

An adjunct to this invention, and which admits also of independent use, is in the elastic valves, in two varieties—the one for giving vent to the products of fermentation, when desired; such as the carbonic acid gas generated by malt liquors, etc., the other for giving admission to air, so as to enable the liquid to flow through the tap or other orifice. In the one case a circular disk of vulcanized india-rubber is made to cover a small opening through which the gas is free to escape, but meets in its passage with the india-rubber, which being forcibly held down round its edge is at liberty to become distended, and in so distending opens a number of very minute holes, which have been previously pierced through its surface. When the pressure is removed, the disk again becomes flat and its orifices shut. The degree of pressure to be sustained before these perforations open is perfectly under control, and may be adjusted to any required degree.

In the other form a small cylinder of india-rubber, closed at its lower end, is drawn over a corresponding cylinder of wood with a hole through its centre, and then tightly bound at its upper edge. The india-rubber has a number of slits made in its substance, which (when any orifice through which the liquor may flow is opened) receives the pressure of the air, and yielding to this, open, so as to let the air enter the vessel in exactly the same extent as liquor is withdrawn. When the flow of liquor is stopped, the edges of the slits become drawn together, so as to prevent any escape of liquor or gas in a wrong direction. Should there be any pressure from within upon the surface of the india-rubber, this will only tend to the more perfect closing of the slits, and thus, while affording sufficient ingress, altogether restrain egress.—*Journal of the Society of Arts.*

DECIMAL WEIGHTS AND MEASURES.

The following communication from the Astronomer Royal appeared in the 'Athenæum' of January 12th:—

"In the last week's 'Athenæum,' page 9, column 3, I observe the following remarks:—'We should hail a *Permissive* Bill in favour of *allowing* the decimal subdivisions of a mile, a foot, a pound, a gallon, etc., to contracting parties who wish for them.' 'Sir J. Herschel is also of opinion that decimals of our present units should be allowed.'

"I ask leave to make known to the public, through the 'Athenæum,' the present state of the British law on this subject.

"In the 'Act to render Permissive the Use of the Metric System of Weights and Measures,' 27 & 28 Vict. cap. 117, sec. 2, is the following provision:—'Notwithstanding anything contained in any Act of Parliament to the contrary, no contract or dealing shall be deemed to be invalid or open to objection on the ground that the weights or measures expressed or referred to in such contract or dealing are weights or measures of the Metric System, or on the ground that Decimal Subdivisions of legal Weights and Measures, whether Metric or otherwise, are used in such contract or dealing.'

"This appears to contain all that is desired in the 'Athenæum.'

"I greatly doubt whether extensive advantage will be taken of this permission, at least until we have a decimal coinage. I know of only three instances in which the decimal subdivision is really useful: the decimal division of the foot on surveyors' levelling-staves; the decimal division of the avoirdupois pound in certain operations for tare, by rule-of-three, in the Custom House; and the decimal subdivision of the troy ounce for bullion. In the first two of these, the persons concerned introduced them without waiting for an Act, and in the third they promoted a special Act. In ordinary cases, where there are facilities both for decimal and for binary subdivision (as the mile of 80 chains, the ton of 20 cwt.), the decimal subdivision is never used.

"One of the most curious instances, showing the tendency of mankind to adopt some special weight or measure as the standard for some special goods, and then to subdivide it, not by decimalizing, but by successive halving, is that of the stone of 14lb., used throughout Britain as the standard weight for flour, oatmeal, salt, etc. In Scotland it has long since been halved and halved down to the one-sixteenth part, or 14 ounces, there called the 'meal-pound.' In Lancashire it is halved and halved; and applications have been made by the local authorities to the Exchequer for standards of $3\frac{1}{2}$ pounds."

On the same subject the subjoined practical letter, signed "Decimal Point," was published in the 'Times:'—

"I see that under the head 'The Public Health,' quantities are given in 'cubic metres,' and in the Registrar-General's return of the 7th, in a foot-note, it is stated that the cubic metre 'is a much better unit for measuring sewage or water supply than the gallon.' Can it be possible that our engineer to the Board of Works has so far adopted metric measures, or is this simply an attempt on the part of our Registrar-General to substitute French weights and measures for English?

"If the old English tun be equivalent to the cubic metre, why give up what is understood for what is not? We are familiar with hogsheads, and know that four hogsheads make a tun, but who can tell exactly what a cubic metre contains?

"In France the people have been taught to believe that the metre is the ten-millionth part of the distance from the Equator to the Pole, and that there are 1000 litres in a cubic metre. Taking this to be the case, which, by the way, scientific men do not agree about, we should have 220 gallons to the cubic metre, and this is within a fraction of a gallon what the old English tun contains. As to 'measuring sewage or water,' I doubt if any method can be more convenient than that of taking the surface in square chains, and estimating the quantities by the foot in depth. At 125 tuns the square chain, one foot deep, it is easy enough to calculate the number of tons of water or sewage in a reservoir, however large.

"You gave me an opportunity once before of explaining the practical advantage we have in the use of English measures, and I need hardly remind you of the very simple method by which metric may be reduced to English equivalents; it amounts to little more than the multiplication and division by eleven.

"The French people were induced to accept the kilogramme as equal to 2 lb. The half-kilogramme represents the French pound; the half-kilogramme and half-litre have, therefore, to be compared with our pound and gallon. Since the kilogramme has been found to weigh 15,432 grains (of which our pound contains 7000), it follows that the half-kilogramme and half-litre are to our pound and gallon as 10 to 11; 50 kilogrammes are equal to 110 lb., and 50 litres to 11 gallons; 100 litres, at six bottles to the gallon, give 11 dozen; 1000 kilogrammes or litres (the cubic metre) represent the metric as well as the English ton of 220 gallons. This is all so simple that I would ask why substitute metric weights for measures so convenient and so well understood by the people?

"We accept the metric system as purely scientific; it is a theoretical system, and has nothing in practice to recommend it but its decimal character; being purely decimal, you are bound to have a tenth measure of every measure in use, and have to forego the use of simple fractions in calculation. The metric system satisfies theorists, but it only works well on paper. We have a system that is capable of decimalization, as well as easy comparison with foreign weights and measures. People do not understand the metric system, to say nothing of the nomenclature. They cannot realize, much less measure off, the tenth or the fifth of any quantities; whereas, in the use of measures divided on a binary scale, the half, the quarter, and eighth of any measure are easily understood. We have, further, the advantage of being able to write off these subdivisions in decimals for the convenience of calculation, so that our system combines the only practical advantage in the use of the metric. Leave to our neighbours the troubles of the metric system, which began with the great Revolution, and seems to depend upon further attempts to square the circle. Let us deal with standards that are tangible and comprehensible, such as the yard and the pendulum, the half-pint of 10 oz., the gallon of 10 lb., and the cubic foot of 1000 oz. What more do even scientific men require?"

The very obvious error in the sentence beginning "Since the kilogramme," etc., has been corrected by another correspondent as follows:—"Since it follows that the half-kilogramme and half-decalitre (or measure of five litres) are to our pound (avoirdupois) and gallon as 11 to 10 nearly."

BARNSLEY RELIEF FUND.

Recently a most serious accident has occurred to our poor miners in the North, causing the greatest loss and suffering to many families who are unable to assist themselves. Realizing truly the nature of this disastrous event, the students of the Pharmaceutical Society deemed it to be their duty, as far as lay within their power, to relieve the surviving sufferers. Accordingly, Mr. Bass and Mr. Porter were elected Secretaries, and Mr. Knapman Treasurer, by whose efforts the sum of £7. 7*s.* was raised, and duly transmitted to the Relief Committee at the Mansion House.

THE LAW AFFECTING METHYLATED MEDICINES.

We have received a copy of correspondence on this subject from the "York Chemists' Association," but as the questions put to the authorities at Somerset House, and the answer received, are almost identical with those published in our last number, page 366, we have not thought it advisable to print them.

MISCELLANEA.

Alleged Poisoning by Mistletoe Berries.—A singular case of poisoning came before Mr. Richards at an inquest held in the Commercial Road, on a child named Emma Fuller, aged one year and three months. It appeared from the evidence of Maria Fuller, that she gave deceased into the arms of her danghter Margaret, who was only six years old, and told her to mind the baby, and to be sure not to go away from the street-door. The little girl, however, went off with the child, and did not return till one o'clock. The deceased was then very ill, and continued to get worse during the day. At night Margaret confessed that she had got a quantity of berries like white currants, and finding that they were too bitter to eat herself, she had given them to the baby, who had eaten a quantity of them. The jury returned a verdict of "Accidentally poisoned by mistletoe-berries."

With reference to the above case, the 'Lancet' observes:—It is somewhat difficult to make oneself believe that these berries possess any very active poisonous properties. As they contain, however, a viscid principle similar to caoutchouc, and are decidedly purgative, it is just as well at the present time, when children have free access to them, that people should be put upon their guard to prevent their being eaten or chewed. The medicinal virtues traditionally ascribed since the Druids' time to the mistletoe are as marked as the veneration with which the plant was regarded; but the leaves and berries have been frequently exhibited without ill result, and, as report says, with good effect. On the other hand, some of the ancients regarded the plant as poisonous. An old herbalist, Gerarde, in the sixteenth century, speaks of it, however, very favourably:—"A few berries of the mistletoe, bruised and strained into oil, and drunken, hath presently and forthwith rid a grievous and sore stitch;" and Galen affirmed that it was a wondrous remedy applied outwardly for "humours." Birds feed freely on the berries without harm. The wood and bark were used in epilepsy, and Colbach recommended the powdered leaves or twigs in drachm doses or as an infusion. In Prussia the branches and leaves have been mixed with rye-flour, and made into bread, and not unfrequently given to sheep, who have enjoyed them. In none of these instances has any ill effect resulted; nor in its formerly more superstitious use, as a charm to insure fecundity, or a protection against witchcraft and the devil. The verdict, therefore, of the jury in the case referred to is not altogether satisfactory.

The Sale of Methylated Spirit as a Beverage.—The 'North British Daily Mail' gives the following example as one of the effects of the Forbes Mackenzie Act:—Lately, as may have been observed from the police reports, a liquid known as "finish," a compound of methylated spirits and French polish extensively used by furniture-polishers, has, from its superior cheapness and strength, come into vogue, and its effects upon its victims are so dangerously maddening that the police have taken the matter in hand with the view of suppressing the traffic. Latterly these low "druggists" have, in addition to their usual surreptitious Sunday dram-trade, been doing an enormous business in "cholera mixtures," the panacea being of course the whisky. The police authorities determined to make a beginning on one of the most notorious of these druggist-shebeeners, and in order to procure evidence against him sent a detective in plain clothes to his shop on Sunday, with directions to ask for a dose of cholera mixture. The druggist was no fool, however, and, previous to handing his treacherous customer the usual dose, he quietly dropped into his glass a few drops of croton oil. The detective tossed it off, and very soon found to his cost that it was a cholera mixture with a vengeance. The story was not long in spreading through the force, and we are assured that it is not easy now to find men ready to venture on liquor-drinking in plain clothes in shebeens as a means of obtaining evidence. Before the adventure of our friend with the cholera mixture, evidence derived from taste was in high favour in the force.

CASE FOR A BENEVOLENT FUND.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you permit me to appeal, through your pages, to the benevolence of the members of the Society in favour of a case of real distress.

A druggist of Birmingham, who was a member of the Society from soon after its commencement until the last few years, died last autumn, and as he was not a member at the time of his decease, he had no claim upon the Benevolent Fund. The reason he had discontinued his subscription was simply that of poverty, as he had failed in business, and since that time had struggled on in a very small way until his death of a lingering illness.

He left a widow and seven children; the widow is in poor health, and the eldest child—a daughter, aged eighteen—assists her mother in a little shop, but this does not answer, as they are not able to stock it properly. One son earns 8*s*. per week, and another is apprenticed to a Pharmaceutical Chemist.

As local secretary, I have once had the pleasure of obtaining a grant from the Benevolent Fund for the family of a deceased member, and this case shows the importance of members keeping up their subscriptions.

Any remittances may be made to me or to Mr. Bremridge, who is in possession of the facts of the case.

Yours respectfully,

WILLIAM SOUTHALL.

Birmingham, January 4, 1867.

REVIEW.

LECTURE NOTES FOR CHEMICAL STUDENTS. By EDWARD FRANKLAND, F.R.S., For. Sec. C.S. London: John Van Voorst, Paternoster Row.

To the student of modern chemistry this work will prove of great value. If he be old in chemical knowledge, he will here find levelled heaps of anomalies over which he may formerly have stumbled; if commencing study, the book will enable him to journey easier, more rapidly, further, and enjoy a wider view than those who travelled before him. The elder student will best appreciate the volume; to the younger it will be of most value.

The chief feature of these 'Notes' is the aid they afford in the acquirement of all that is known regarding the constitution or internal arrangement of the constituents of chemical substances, the power an atom has of attaching itself to another atom, or forming one of a group. The elements are pictured for us as little circles from whose circumference issue one, two, three, four, five, or six arms, forcibly reminding us of the prehensile organs of animals. Thus the atoms of hydrogen, chlorine, bromine, iodine, potassium, sodium, and silver, are represented as individuals having but one arm with which to form bonds of union between themselves or other elements; barium, calcium, magnesium, zinc, mercury, and copper, as having two such arms; gold, three; carbon, aluminium, platinum, and lead, four; nitrogen, phosphorus, arsenic, and antimony, five,—like some monkeys that hold on as well by their tail as their feet; and, lastly, sulphur, iron, and others, which offer six arms, or claws, or points of attachment, for the embrace of other hexads, pentads, tetrads, triads, dyads or monads, and which, when their predilections are satisfied, afford figures that recall one's ideas of the suckers, arms, and head of Victor Hugo's devil-fish. These figures, introduced some years ago by Crum Brown, and now elaborated by Frankland, will undoubtedly afford assistance to the student in his endeavours to realize the nature of atomicity, the chemical value of the atoms of elementary and other radicals, and the part they are supposed to play in compounds. The apparently varying atomicity of an element is very ingeniously explained. That an atom of sulphur, for example, which in its hexad character offers six points of combination to other atoms, should be engaged by three atoms of two-armed oxygen to form sulphuric anhydride, is what might be expected; but that being a hexad, it should, under the circumstances of the formation of sulphurous anhydride, be satisfied with only two atoms of oxygen, is surely anomalous. In the former case the sulphur must be a hexad, in the latter a tetrad. Not so, says the author, sulphur is always a hexad, but in sulphurous acid two bonds combine with each other and are latent, the arms are shaking hands. In this way all radicals and compounds are figured as being in a happy state of union with each other, dancing about with arms intertwined, often changing partners but seldom or never alone. "It is scarcely necessary to remark that no such material connections exist, the bonds which actually hold together the atoms of a compound being in all probability, as regards their nature, much more like those which connect the members of our solar system."

The nomenclature of this work is, we think, of less value than the notation. Permanence, in a name, is a quality of more importance than scientific chemists seem to imagine. A name which fairly individualizes a body and includes no theory is far more valuable than one descriptive of constitution; for the latter involves theory, and hence is ever liable to alteration. We owe small thanks to those compilers of old Pharmacopœias who adopted chemical names which include the syllables proto, mono, sesqui, di, bi, tris, ter, etc. Nine chemists and druggists or medical men out of ten do not know how to find out whether calomel or corrosive sublimate is meant when protochloride of mercury is mentioned. Hence we fear that this work, in which such terms are extensively adopted, will not find much favour with pharmaceutical or medical students. Indeed, when we see that chrome-alum demands such a name as dipotassic dichromic tetrasulphate, and remember that the name will possibly be altered half-a-dozen times within the next thirty years, we feel strongly inclined to think, with Sir Benjamin Brodie, that purely scientific chemists should be content with formulæ, and leave the giving and using and retaining of names to the followers of applied chemistry. On the other hand, the use of the syllables *ous* and *ic*, which frequently occur in this book, is attended by many advantages. They include scarcely any theory, and as simply pointing to the lower and higher of the two classes of salts which a metal may afford, are useful and permanent guides. We shall soon meet with several examples of difficulty in nomenclature similar to that already referred to regarding corrosive sublimate; in such cases the names mercurous and mercuric chloride, ferrous sulphate, ferric chloride, etc. etc., will be invaluable.

The author recognizes five modes of chemical action, the second and third of which are what were formerly known as single and double decomposition. In illustration of the former he gives the following equation:—

$$2\,H\,Cl + Na_2 = 2\,Na\,Cl + H_2.$$

This is not a happy example, for the molecule of sodium contains two atoms, which become separated, each combining with an atom of chlorine to form two distinct molecules of sodic chloride. The molecules of sodium and hydrochloric acid being both decomposed, this illustration belongs to the third and not to the second mode of chemical action,—it is a case of double, not single decomposition. The following equation we should regard as an example of single decomposition:—

$$2\,H\,Cl + Zn = Zn\,Cl_2 + H_2.$$

For the molecule of zinc contains but one atom. By the way, the author would say of the molecule of zinc that it is monatomic, and sodium diatomic, meaning that the molecules contain one and two atoms respectively: this atomic quality of molecules we should expect to be termed their atomicity, just as the elastic character of a thing is termed its elasticity. But in this work the words atomic and atomicity instead of being naturally related to each other are divorced, and mean opposite things; atomic relating to the number, atomicity to the value of atoms in molecules. The atomic character of zinc, for example, is 1, its atomicity 2; we do not object to the author's use of the word atomic, but we do to atomicity,—the latter would have been advantageously replaced by Hofmann's term quantivalence. We hold a somewhat similar objection to the word anhydride. Hydrides are bodies containing radical hydrogen, hydrates bodies containing water. But in this, and some other modern chemical works, bodies without water are termed anhydrides, as if without hydrogen; we would prefer to see and hear them described as anhydrates.

The above are the only faults we have to find with these 'Notes.' We regard the work as an important addition to the literature of chemistry, and cordially recommend it to those of our readers who desire to keep pace with the onward progress of chemical science.

BOOKS RECEIVED.

MATTER, ITS MINISTRY TO LIFE IN HEALTH AND DISEASE; and EARTH, AS THE NATURAL LINK BETWEEN ORGANIC AND INORGANIC MATTER. By THOMAS HAWKSLEY, M.D., etc. London: John Churchill and Sons, New Burlington Street. 1867.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES. Vol. xliv. July—December, 1866. London: John Churchill and Sons, New Burlington Street. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co.

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.

Messrs. Wootton and Son (Luton), would be glad to know the present address of J. W. Fowkes, M.D.

"*An Exonian.*"—*Aqua Menthæ viridis* is intended.

"*Anthemidis*" (Horncastle).—*De Valangin's Solutio Solventis mineralis*, solution of chloride of arsenic.

G. E. C. (Maldon).—Yes.

W. A. (Dumfries.)—The medicinal properties of Taylor's hypophosphites of lime, of soda, and of potash were described in the 'Lancet,' vol. ii. 1861, pp. 517, 544, 564, and 610, but no formulæ for their preparation have been published; Messrs. Savory and Moore are the agents for the sale of these preparations.

"*Æs.*"—Nitric acid would be the solvent for oxide of silver; our correspondent may easily ascertain for himself how much oxide would be dissolved by a given quantity of cyanide of potassium.

S. Cassia.—There is no work of moderate price that will exactly suit your requirements; you had better obtain Carpenter's 'Manual of the Microscope,' price 12*s.* 6*d.*

A Young Botanist (Brighton).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

An Apprentice (Hastings).—Pereira's 'Manual of Materia Medica,' by Farre, Bentley, and Warington.

Pharmaceutical Chemist (Manchester).—See paper by Professor Bentley "On the Adulteration of Saffron with the Stamens of Crocus," Pharm. Journ. Vol. VII., 2nd ser. p. 452.

Mr. J. L. Goldsmith, 4, *College Street North, N. W.*, wishes to make known the following case of attempted fraud, as a warning to others:—"A written order, in my name, was handed the other day by a well-dressed man in the street, to a boy to go into a certain wholesale house, and obtain the goods while he waited outside. The boy was kept so long waiting that he left the warehouse, and told the man he could not wait any longer. The goods were never called for, and were delivered here next day, when I found the order was forged by some unknown swindler."

Wanted, January numbers of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

ERRATA.—We regret that in consequence of the lateness of the date at which the papers read at the Edinburgh Meeting in December were received by us, we were unable to avail ourselves of the author's corrections to Dr. R. E. Scoresby-Jackson's "Analytical Review of the French Codex," and several typographical errors escaped detection. In the table of fees at the foot of p. 394, in the first line, *for* "12 to 30" *read* "12 at 30." In the fourth line of the same table, *for* "at 60 francs each—120" *read* "at 80 francs each—160."

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. VIII.—No. IX.—MARCH, 1867.

THE PROPOSED EXTENSION OF THE PHARMACY ACT.

We report in our Journal of this month transactions which may, and if followed up in the spirit evinced in the beginning, we believe will, expedite an advantageous solution of the question so long at issue between the Pharmaceutical Society and the "outsiders," making perhaps the term "outsiders" an obsolete word in Pharmaceutical nomenclature. Some three or four years ago, ideas which presented themselves to the minds of the founders of this Society in 1841, dawned also on those who had failed sooner to see the desirability of uniting the chemists and druggists of Great Britain in one association. As might be expected, the first anxiety seemed to be for a benevolent fund and protection to trade interests, both excellent in their way, but having only a *class interest* to recommend them, not important enough to obtain external aid, and therefore totally incapable of effecting any great purpose. Subsequent events occurred to awaken the chemists and druggists, both those who had and those who had not joined the "United Society," to the advantages to be derived from registration. Registration may be of two kinds. Doubtless the names of all the members of the Society of Freemasons in England are registered, and such registration assures to each member his rights from the Society. But it goes no further; the law does not distinguish a Mason from other men. This we would call *private* registration. The other is *public* registration, where a man, by virtue of some qualification or service, is placed on a register authorized and protected by Parliament. It happened in 1862 that a Bill to amend the law relating to juries was brought into Parliament, and to this Bill—a source of discord, as it proved, between "pharmaceutical chemists" and "chemists and druggists" at the time—we attribute the great virtue of having, by showing the value of registration, advanced the objects of the founders of the Pharmaceutical Society very materially.

To sit on a jury was probably deemed a privilege in the early days of our national liberties, but, as society advanced, that which had been a *right* became a *duty;* and we are inclined to think that what we now regard as an *exemption* was at one time a *privation.* Persons are omitted from the jury lists from various causes, one being the fact of holding service under the Crown. This may have arisen from a fear that the influence of the Crown might be carried into the jury-box. Another, the circumstance of a man's peculiar professional service to the public being of so much importance as to outweigh the service he would render as a citizen, as in the case of medical men. But, call them exemptions or call them disqualifications, none can exist for persons whose names are not enrolled on some public register. To suppose that men are exempted from serving on juries as a reward for superior learning or position, is to suppose that the Legislature would try to make bad rather than good juries.

Now it cannot be denied that the presence of a chemist in his dispensary is very similar in importance to the immediate attendance of a physician in urgent cases; and on that ground a great effort was made to obtain the insertion of a clause in the new Jury Bill, to exempt chemists from the service. The justice of the thing was acknowledged by Parliament, but the question arose, "*How are we to know who is a chemist? Is every grocer who chooses to sell salts and senna to be struck off the jury-list?*" And to this the reply was ready, which, after a sharp battle between Lords and Commons, settled the matter, "*Pharmaceutical Chemists are a class registered, after due examination, under the provisions of the* 15 *&* 16 *Vict. cap.* 56." On this qualification, and this only, could exemption be granted; and the charge that the Society had secured a special privilege for its members, although really true, should have been no cause of reproach.

Thus much for the benefit of registration; and now for the means by which registration was obtained.

When, in 1841, the druggists were threatened with interference by Mr. Hawes's bill, a few far-seeing and public-spirited members of the trade saw the opportunity of forming themselves into a society capable of protecting their own interests. Such associations had been formed before; they had perhaps served the purpose of the hour, and then collapsed. To give this new union stability, these enlightened men saw that besides a vitality from within, it needed support from without, and to obtain that support must minister to the public good. Education was the one great thing needed, and to education they at once turned their attention. This was the secret of success: by its development the science of Pharmacy has been advanced, the whole body of Pharmaceutists elevated. The higher medical authorities have gladly recognized the fact, and thankfully acknowledged their obligation to the Pharmaceutical Society, which has scattered throughout the country dispensers able to carry out the wishes of those who prescribe. Can it be wondered at that this confidence should extend from the physician to the public, from the public to the Governmental departments where medicines are in question, and from all these to the House of Commons, which sooner or later embodies the public will in its acts? The fact that there is already a corporate body working under Act of Parliament, and working to the satisfaction of all who understand the matter, must bring conviction to the minds of those who would in 1865 have established a second Board to regulate the qualifications of chemists and druggists, that such a proceeding, being unnecessary, could never be effected; and we think it only required such a conference as that which took place at Bloomsbury Square on the 19th ultimo, to dispel the false impressions which had been so industriously conveyed to them of the illiberality of the "Suggestions" put forth by the Pharmaceutical Society for the extension of the Pharmacy Act.

As our readers will find a record of that meeting in this Journal, we need not describe it here. The only real point at issue was the constitution of the Society and the Council. As to the former, it was clearly proved, and acknowledged, that the mode of electing members hitherto in use was the most simple; that there was no reason to apprehend any opposition to their admission; but that, on the contrary, it must be the interest of the Society to enlarge its borders to the fullest extent, and embrace if possible the whole trade; that a man being "eligible" had a positive right to admission, presuming always that there was no disqualifying circumstance attaching to him which the Court of Queen's Bench, as well as the Council of the Pharmaceutical Society, would recognize.

For the constitution of the Council, we think the concession that chemists placed on the register and admitted to membership of the Society, by virtue of being in business at the time of the passing of the proposed Bill, should, in a certain proportion, be entitled to sit thereon, a wise one. The object in barring that privilege, in order to induce all men to come up for the higher examination, was justifiable; but as the limitation of the Council to Pharmaceutical Chemists will be effected after the present generation of chemists and druggists have passed away, we are reconciled to the now proposed arrangement by the great good which we anticipate from the completion of the original plan proposed by Jacob Bell.

THE BENEVOLENT FUND DINNER.

We congratulate our members, and all concerned, on the *fact* of the gathering of the clans. There is too little of the social element amongst those engaged in the pursuit of pharmacy. Half our misunderstandings arise because we do not know each other, and so seldom meet face to face. There is an illustration which would have been worn threadbare, had it not been so good. Two brothers climbed up the same mountain steep, but by different routes. As they advanced, the deep, white mist rolled over and around them; and a grim, portentous figure seemed menacing attack. But being bold, and true-hearted men, they continued to ascend, until they gained the summit; and no sooner did they stand together in the sunshine than each recognized his own brother. How many of us during the past few months have done precisely the same thing! What a dowry of lasting friendship, and still better what broader and more intelligent thought, have not at least a hundred of us brought home from Nottingham! Nor need we go further back than mention some recent deputations, when two sides drawn up in apparently hostile array were mutually surprised to find how little real difference lay between them. Still less can we forget another meeting, when the dread Salic law of our Society was set at naught, and when for once pharmacy was *fairly* and properly represented by the gentler sex. Let us hope for some moral progress in our next conversazione.

But, pleasantry apart—what a splendid thing it is when a man's life, that is the habitual current of his actions, says Yes to the question, "Am I my brother's keeper?" Certainly in no case is this fraternal guardianship more requisite than in the class of chemists and druggists. Suppose, for an instant, a man engaged in large commercial transactions. Everything he does succeeds, and he seems to possess that trade alchemy which turns everything he touches into gold. All at once, while you are looking at him—without a note of previous warning—the morrow after the banquet, while the carriage is at the door to take him to the city—crash—all goes, and he is left penniless in the world. We are not speaking either of those dreamy or nefarious speculations of which we may predict the ruin, but of those accidents of fortune which occur in the order of the good providence of God; for has not the highest authority assured us, riches *make to themselves* wings, and fly away? Such a reverse is thought the culminating point of misery—something worthy of enlisting our very deepest sympathy. Yet (without sinking its sorrowful character) it is not the overwhelming catastrophe supposed. First of all, the man has had his day:

he has enjoyed all that wealth and honourable character could bestow. Secondly, there is the not doubtful chance of recovery, while there is no reason whatever but that with prudence and determination, his bark once more may crest the waves.

There is a still drearier picture presented by the dull monotony of narrow means. We have often trembled while observing the slender thread on which the commercial life of average pharmacy depends. Speaking within bounds, we may safely say, that in too many instances the occupation of the working chemist is not so much the development of trade, as the struggle against actual want. Nothing is more wearying or more sickening than this misery *guttatim.*

The Executive Committee of the Benevolent Fund has lately strained every effort to grapple with the urgent necessity of the case; and their exertions have been crowned with merited success. The cry for help was responded to by all parties; not to our surprise, for we were as certain that such a cause would be represented by every shade of thought, and feeling, and sectional society division; as we are, that if common sense be allowed to steer the vessel whose sails benevolence has so nobly filled, we may all row together before the advent of another year.

Meanwhile let us unite to the best of our ability in endeavouring to restore hope to many a desponding heart, and joy to many a desolate home.

THE NEW EDITION OF THE BRITISH PHARMACOPŒIA.

Our readers will be glad to learn that a proof copy of the new British Pharmacopœia was sent to each member of the General Medical Council in the early part of February, and that the publication of the work will probably take place in about two or three weeks from the present time. The book remains with the members of the Council for one month, that they may have the opportunity of suggesting any alterations they may think desirable; but it is not likely that any extensive modifications involving delay will be demanded. This preliminary issue really takes place for the purpose of eliciting criticism on the work while there is yet time to correct any obvious error that may be pointed out. The members of the Council have not, therefore, kept the book secret, and already our weekly contemporaries have published detailed notices of its contents. The 'British Medical Journal' was early in the field with an account of all the additions and alterations which are involved, and the 'Lancet' has already given two articles explanatory of the changes effected. Under these circumstances, we are at liberty to make our readers fully acquainted with the distinguishing features of the new Pharmacopœia, although the work is not yet avowedly before the public.

The size of the book is intermediate between that of the large and the small copies of the previous edition. It forms a post-octavo volume of 394 pages, exclusive of the preface and index. In point of bulk, therefore, it is by no means so pretentious as the new French Codex, which is a royal octavo, and includes 711 pages. The feature most noticeable upon first inspection of the new work, is the manner in which the matter has been arranged. Hitherto every pharmacopœia published in Great Britain has been divided into two parts; one including the "Materia Medica," and the other the "Preparations and Compounds." This classification is now abolished, and, in its place, we have simply one category of substances arranged in the alphabetical order of their Latin names. Although this plan is new to this country, it has been adopted in several of the foreign Pharmacopœias, and notably in those of Prussia and

Austria. The principal advantage resulting from its adoption is the facility for reference which it affords. The book becomes a dictionary, and all the information regarding any article is found in one place and under one heading. A great inconvenience, which was observable in the previous edition of the British Pharmacopœia, is thus obviated, namely, the necessity of looking in one place for the process, and in another, and perhaps under a different heading, for the definition, characters, and tests. In the case of Liquor Ammoniæ Acetatis, for instance, whereas in the edition of 1864 the description of the substance was contained in the Materia Medica, under the heading Ammoniæ Acetatis Liquor, and the process for its production was given among the Liquors in the second part of the work; in the new edition the characters and method of preparation are put together under one name and in one place. All that is necessary, therefore, in order to find the entire information given regarding any article, is to look for the Pharmacopœial Latin name of the body in its proper alphabetical position; but as this name may occasionally slip the memory, the book is provided with a copious index, in which are given both the synonyms and the English names. Of course it must be understood that the chemical tests and volumetric solutions are not included in this general arrangement; these are classed separately in an appendix as before.

Appended to each substance in the Pharmacopœia, and following its description, is a list of all the preparations in which it is used. This is also a feature of some novelty, and will probably be of considerable use, more especially to the prescriber. Not only does the list give the preparations in which the substance is contained, but, in the majority of cases, it also indicates the proportion of the substance present in each. Thus, under CANTHARIS, we find the following list of *Preparations*:—

Charta Epispastica.	
Emplastrum Calefaciens . .	1 oz. to 1½ lb. nearly.
„ Cantharidis . .	1 part in 3.
Liquor Cantharidis	8 oz. to 20 fluid ounces.
Tinctura Cantharidis . . .	¼ oz. to 1 pint.
Unguentum Cantharidis . .	1 in 8 nearly.

In the case of the Acids the names are given of those preparations containing the acids in the free state, and also lists of the officinal salts of each acid. Thus, under Citric Acid, there are *Preparations containing free Citric Acid*, two in number, and *Officinal Citrates*, of which seven are named. Again, in the case of such an important substance as Opium, all the preparations obtained from it are enumerated, including those in which its derivatives are present. Following HYDRARGYRUM are the names of all the "Preparations containing Mercury, chiefly uncombined," and of the "Preparations containing combined Mercury." Whenever it is possible, the proportions are indicated in which the substance is used in the preparation, excepting in those cases where it enters into chemical union.

A third feature of the book, which may be thought of minor importance, but which will probably prove convenient to the pharmaceutist, is the employment of figures rather than words to express quantities. This substitution renders it far easier to take in at one glance the proportions of the ingredients to be used in any particular preparation.

In the preface to the new Pharmacopœia there is a list showing that the names of ninety-one substances have undergone alteration. Our readers, however, will be glad to learn that most of these changes relate to the names of drugs. In the case of those substances which are really parts of plants, the names have been so altered as to express more correctly the real nature of the body. Thus Gum is no longer *Acacia*, but *Acaciæ gummi;* Hips are *Rosæ caninæ fructus*, Chamomile flowers are *Anthemidis flores*, Caraway fruit is *Carui fructus*, etc. These alterations are somewhat numerous, but they do not at all affect the preparations, while they increase the general accuracy of the work. The nomenclature of chemical substances has not undergone much change. The Chlorides of Mercury have become *Hydrargyri Perchloridum* and *Hydrargyri Subchloridum* respectively, while the vulgar names Calomel and Corrosive Sublimate are retained among the synonyms. Hydrochlorate of Ammonia is now *Ammonii chloridum* or Chloride of Ammonium, and Hydrosulphate of Ammonia is Sulphide of Ammonium. Modern chemists will be glad to find that the term "Sulphuret" is now expunged: Sulphuret of Iron has become *Sulphide of Iron*, and Sulphuret of Antimony is *Antimonium Nigrum* or Black Antimony. A reversion to vulgar or common names has also taken place in the cases of Ferrocyanide of Potassium and of Potassio-Tartrate of Soda, these salts being now called *Potassæ Prussias Flava* and *Soda Tartarata.* On the other hand Lithargyrum is changed to *Plumbi Oxidum*, and Bismuthum Album to *Bismuthi Subnitras.* The name Plumbi Oxidum is chemically correct, and well known; it cannot lead to any error, while it possesses the advantage of bringing the substance among the other compounds of lead, in alphabetical arrangement. The introduction of Carbonate of Bismuth is a sufficient reason for reverting from the term White Bismuth—a name which has been but little used—to that of Bismuthi Subnitras. The moist Peroxide of Iron is now called *Ferri Peroxidum Humidum*, and Peroxide of Iron is changed to *Ferri Peroxidum Hydratum.* It must be admitted that these names do more correctly describe the real nature of these substances. The solutions of Acetate of Ammonia and of Perchloride of Iron of the first British Pharmacopœia are now named *Liquor Ammoniæ Acetatis Fortior* and *Liquor Ferri Perchloridi Fortior*, because weaker solutions of the same substances are also introduced, and these bear the simpler name, probably for the reason that they are more likely to be ordered in prescriptions. The names of four galenical preparations have been modified so as to avoid any indication of the presence of opium in them. Thus Pilula Opii is changed to *Pilula Saponis Composita*, Pulvis Ipecacuanhæ cum Opio to *Pulvis Ipecacuanhæ Composita*, Pulvis Kino cum Opio to *Pulvis Kino Composita*, and Tinctura Camphoræ cum Opio to *Tinctura Camphoræ Composita.* Changing the name of Calomel has involved an alteration in the names Pilula Calomelanos Composita and Unguentum Calomelanos; these preparations are now called *Pilula Hydrargyri Subchloridi Composita* and *Unguentum Hydrargyri Subchloridi.* For a like reason Emplastrum Lithargyri is altered to *Emplastrum Plumbi.* The Infusum Gentianæ Compositum of 1864 is now named *Mistura Gentianæ Composita;* and the Compound Infusion of Gentian of the London Pharmacopœia is introduced under the name *Infusum Gentianæ Compositum.* Thus both preparations have become officinal. Linimentum Cantharidis has been changed to *Liquor Cantharidis*, principally, we presume, because it would not admit of being rubbed on the skin like other liniments. These are all the changes in nomenclature which the new Pharmacopœia will be found to comprise; it will be seen that they are by no means numerous, and that they have not been made without good warrant.

In the case of definite chemical compounds, the symbolic formulæ representing their composition are given. Chemical formulæ were introduced for the first time into the edition of 1864 for the purpose of defining certain substances, and their use has given rise to considerable discussion. It is well known that at the present time the opinions of chemists regarding the constitution of salts, and the combining proportions of the elements, are undergoing considerable modification, and that two systems of notation and two tables of atomic weights are now very generally in use. In consequence of these facts, it was represented to the Council on high chemical authority, that it would be advisable to avoid the use of any formulæ in the preparation of the present edition. The Council, however, did not entirely adopt this view, but determined to represent chemical compounds of definite constitution, both by the old and also by the new method of notation. In all cases, therefore, where chemical symbols are used, two formulæ are given, one according to the old and the other according to the new system. These are distinguished from each other by the use of different types, the formulæ according to the old system being printed in Roman type, and those according to the new system in the heavy Egyptian or Clarendon type. Thus Sulphate of Magnesia is described by the following formulæ:—

$$MgO.SO_3.7HO \text{ or } \mathbf{MgSO_4.7H_2O}.$$

This distinction of type is carefully observed throughout the work, and enables the reader to recognize at a glance the formulæ of the one system from those of the other, while it gives an equally simple appearance to each. In the employment of these formulæ for defining substances, a certain discrimination has been exercised. In the case of crystalline bodies of a pure and definite nature, the formulæ follow the name, and frequently constitute the sole definition. But in the case of other substances, such as the liquid acids, the Caustic Alkalies, Lime, Sulphurated Antimony, and a few others, the formulæ are inserted in the text of the description. Thus Sulphuric Acid is stated to be:—

"An acid produced by the combustion of sulphur and the oxidation of the resulting sulphurous acid by means of nitrous vapours. It contains 96·8 per cent. by weight of the sulphuric acid, HO,SO_3 or $\mathbf{H_2SO_4}$, and corresponds to 79 per cent. of anhydrous sulphuric acid, SO_3 or $\mathbf{SO_3}$."

The objection which was advanced against the formulæ used in the previous edition,—namely, that in certain cases they expressed a quantitative composition which the body did not really possess,—is thus obviated.

In compliance with a generally expressed wish, the Doses of all the more important medicines are now for the first time introduced into the Pharmacopœia. The quantities stated under this head are intended to represent average doses in ordinary cases for adults. We are expressly told, however, that "they are not authoritatively enjoined by the Council, and that the practitioner must rely on his own judgment, and act on his own responsibility, in graduating the doses of any therapeutic agents he may administer to his patients."

No alteration has been made in the weights and measures which in the edition of 1864 were directed to be used in the preparation of medicines. The volumetric solutions, however, which are used in certain cases for quantitative estimation, are so arranged that they may be prepared and used either with the English grain weights and grain measures, or with the French metrical weights and measures. The figures involved in each case are the same; they may be taken to represent grains and grain-measures, or grammes and cubic centimetres. This arrangement does not at all interfere with the other parts of the work, and it may pave the way for the further introduction of the French system at some future time, should the adoption of such a course be ultimately considered desirable.

Such, then, are the general features of the book. Among the medicines it includes will be found a large number of preparations which are familiar to our readers, but which were excluded from the first edition. There are also some introductions which are novel, and among them two new classes of preparations, namely, the GLYCERINES and the VAPOURS OR INHALATIONS. There are altogether ninety-nine articles included in the present edition which were not in the previous one, while there are only four omissions. The limits of space preclude our doing more on the present occasion than giving a list of these additions, but it will be seen from the names that many of them have been long recognized in our Pharmacopœias, and are frequently employed in medical practice. Several preparations have also undergone an alteration of composition, and among chemical substances many of the processes have been omitted or modified. But the detailed notice of these and some other points we must reserve for another occasion.

Substances included in the Present Edition of the British Pharmacopœia, but not in the Pharmacopœia of 1864.

[Those printed in italics were included in one or more of the Pharmacopœias of London, Edinburgh, and Dublin.]

Acetum Cantharidis. (Lond.)
,, *Scillæ.* (Lond., Ed., Dub.)
Acidum Carbolicum.
Adeps Benzoatus.
Amygdala Amara.
Atropiæ Sulphas.
,, Sulphatis, Liquor.
Bismuthi Carbonas.
Bismuthi et Ammoniæ Citratis, Liquor.
Cadmii Iodidum.
,, Iodidi, Unguentum.
Canellæ Albæ Cortex. (Lond., Edin., Dub.)
Cerii Oxalas.
Charta Epispastica.
Collodium Flexile.
Confectio Opii. (Lond.)
Decoctum Ulmi. (Lond.)
Emplastrum Cerati Saponis.
Essentia Anisi. (Dub.)
Essentia Menthæ Piperitæ. (Dub.)
Extractum Lactucæ. (Lond.)
,, Mezerei Ætherium.
,, *Papaveris.* (Lond., Edin.)
,, *Pareiræ.* (Lond., Edin.)
,, Physostigmatis.
Glycerinum Acidi Carbolici.
,, ,, Gallici.
,, ,, Tannici.
,, Amyli.
,, Boracis.
Infusum Aurantii Compositum. (Lond.)
,, *Gentianæ Compositum.* (Lond.)
Linimentum Potassii Iodidi cum Sapone.
,, Sinapis Compositum.
Liquor Ammoniæ Acetatis. (Lond., Edin.)
,, ,, *Citratis.* (Lond.)
,, Arsenici Hydrochloricus.
,, Bismuthi et Ammoniæ Citratis.
,, Ferri Perchloridi.
,, *Hydrargyri Perchloridi.* (Lond.)
,, Lithiæ Effervescens.
,, Magnesiæ Carbonatis.
Liquor Morphiæ Acetatis. (Lond., Dub.)
,, *Potassæ Effervescens.* (Lond. 1836.)
,, *Sodæ Effervescens.* (Lond. 1836.)
,, *Zinci Chloridi.* (Dub.)
Lotio Hydrargyri Nigra.
Mistura Sennæ Composita.
Mistura Spiritûs Vini Gallici. (Lond.)
Morphiæ Acetas. (Lond. Edin., Dub.)
,, *Acetatis Liquor.* (Lond., Dub.)
Oleum Sinapis.
,, Theobromæ.
Ovi Vitellus. (Lond.)
Oxymel Scillæ. (Lond.)
Physostigmatis Faba.
Pilula Aloes et Ferri. (Edin.)
,, *Conii Composita.* (Lond.)
,, *Ipecacuanhæ cum Scillâ.* (Lond.)
Pulvis Opii Compositus.
Pyrethri Radix. (Lond., Edin.)
,, Tinctura.
Sodæ Citro-tartras Effervescens.
,, *Sulphas.* (Lond., Edin., Dub.)
Spiritus Ammoniæ Fœtidus. (Lond., Edin., Dub.)
Spiritus Vini Gallici. (Lond.)
,, ,, ,, *Mistura.* (Lond.)
Sulphuris Iodidum. (Lon., Dub.)
,, *Iodidi, Unguentum.* (Lond.)
Sumbul Radix.
,, Tinctura.
Suppositoria Hydrargyri.
,, Plumbi Composita.
Syrupus Rhamni. (Lond., Edin.)
Tinctura Chloroformi Composita.
,, *Cubebæ.* (Dub.)
,, *Ferri Acetatis.* (Dub.)
,, *Opii Ammoniata.* (Edin.)
,, Pyrethri.
,, *Quassiæ.* (Edin.)
,, Sumbul.
,, Veratri Viridis.
,, Zingiberis Fortior.
Trochisci Ferri Redacti.

Trochisci Ipecacuanhæ.
,, Potassæ Chloratis.
,, *Sodæ Bicarbonatis.* (Edin.)
Unguentum Cadmii Iodidi.
,, Hydrargyri Compositum.
,, *Picis Liquidæ.* (Edin., Dub.)
,, *Plumbi Iodidi.* (Lond., Dub.)
,, Potassæ Sulphuratæ.
,, *Sulphuris Iodidi.* (Lond.)
Vapor Acidi Hydrocyanici.
Vapor Chlori.
,, Coniæ.
,, Creasoti.
,, Iodi.
Veratri Viridis Radix.
,, ,, Tinctura.
Vinum Aurantii.
,, Ferri Citratis.
,, Quiniæ.
,, *Rhei.* (Dub., Edin.)

Substances included in the British Pharmacopœia of 1864, *but omitted in this Edition.*

Catechu Nigrum.
Cocculus.
Spiritus Pyroxylicus Rectificatus.
Unguentum Cocculi.

Substances the Names of which have been Altered.

Present Names.	Names in the Edition of 1864.
Acaciæ Gummi	Acacia.
Aconiti Folia	Aconitum.
Ammonii Chloridum	Ammoniæ Hydrochloras.
Amygdala dulcis	Amygdala.
Anethi Fructus	Anethum.
Anthemidis Flores	Anthemis.
Antimonium Nigrum	Antimonii Sulphuretum.
Armoraciæ Radix	Armoracia.
Arnicæ Radix	Arnica.
Belæ Fructus	Bela.
Belladonnæ Folia	Belladonna.
Bismuthi Subnitras	Bismuthum Album.
Buchu Folia	Bucco.
Calumbæ Radix	Calumba.
Capsici Fructus	Capsicum.
Carui Fructus	Carui.
Cascarillæ Cortex	Cascarilla.
Cassiæ Pulpa	Cassia.
Cinchonæ Flavæ Cortex	Cinchona Flava.
Cinchonæ Pallidæ Cortex	Cinchona Pallida.
Cinchonæ Rubræ Cortex	Cinchona Rubra.
Cinnamomi Cortex	Cinnamomum.
Colocynthidis Pulpa	Colocynthis.
Conii Folia	Conium.
Coriandri Fructus	Coriandrum.
Cuspariæ Cortex	Cusparia.
Digitalis Folia	Digitalis.
Emplastrum Plumbi	Emplastrum Lithargyri.
Ferri Peroxidum Humidum	Ferri Peroxidum Hydratum.
Ferri Peroxidum Hydratum	Ferri Peroxidum.
Filix Mas	Filix.
Fœniculi Fructus	Fœniculum.
Gentianæ Radix	Gentiana.
Glycyrrhizæ Radix	Glycyrrhiza.
Granati Radicis Cortex	Granati Radix.
Hæmatoxyli Lignum	Hæmatoxylum.
Hemidesmi Radix	Hemidesmus.
Hydrargyri Perchloridum	Hydrargyri Chloridum.
Hydrargyri Subchloridum	Calomelas.
Hyoscyami Folia	Hyoscyamus.
Kamala	Kamela.
Krameriæ Radix	Krameria.

Laurocerasi Folia	Laurocerasus.
Liquor Ammoniæ Acetatis Fortior	Liquor Ammoniæ Acetatis.
Liquor Antimoniæ Chloridi	Liquor Antimonii Terchloridi.
Liquor Cantharidis	Linimentum Cantharidis.
Liquor Ferri Perchloridi Fortior	Liquor Ferri Perchloridi.
Maticæ Folia	Matica.
Mistura Gentianæ Composita	Infusum Gentianæ Compositum.
Nectandræ Cortex	Nectandra.
Oleum Myristicæ Expressum	Myristicæ Adeps.
Papaveris Capsulæ	Papaver.
Parciræ Radix	Pareira.
Pilula Hydrargyri Subchloridi Composita	Pilula Calomelanos Composita.
Pilula Saponis Composita	Pilula Opii.
Piper Nigrum	Piper.
Plumbi Oxidum	Lithargyrum.
Podophylli Radix	Podophyllum.
Potassæ Prussias Flava	Ferrocyanide of Potassium.
Pterocarpi Lignum	Pterocarpus.
Pulvis Ipecacuanhæ Compositus	Pulvis Ipecacuanhæ cum Opio.
Pulvis Kino Compositus	Pulvis Kino cum Opio.
Quassiæ Lignum	Quassia.
Quercus Cortex	Quercus.
Rhei Radix	Rheum.
Rhœados Petala	Rhœas.
Rosæ Caninæ Fructus	Rosa Canina.
Rosæ Centifoliæ Petala	Rosa Centifolia.
Rosæ Gallicæ Petala	Rosa Gallica.
Sabinæ Cacumina	Sabina.
Sambuci Flores	Sambucus.
Sanguisuga Medicinalis	Sanguisuga Officinalis.
Sanguisuga Officinalis	Sanguisuga Medicinalis.
Sarsæ Radix	Sarsa.
Sassafras Radix	Sassafras.
Scoparii Cacumina	Scoparius.
Senegæ Radix	Senega.
Serpentariæ Radix	Serpentaria.
Soda Tartarata	Sodæ et Potassæ Tartras.
Tabaci Folia	Tabacum.
Taraxaci Radix	Taraxacum.
Ulmi Cortex	Ulmus.
Unguentum Zinci	Unguentum Zinci Oxidi.
Uvæ Ursi Folia	Uva Ursi.
Valerianæ Radix	Valeriana.

*Preparations the Composition of which has been Altered.**

Acidum Nitricum.
Alumen.
Alumen Exsiccatum.
Decoctum Aloes compositum.
Infusum Gentianæ compositum.
Linimentum Crotonis
„ Terebinthinæ.
Liquor Ammoniæ Acetatis.
„ Ferri Perchloridi.
Mistura Ferri Composita.

Spiritus Cajuputi.
„ Juniperi.
„ Lavandulæ.
„ Menthæ Piperitæ.
„ Myristicæ.
„ Rosmarini.
Suppositoria Acidi Tannici.
„ Morphiæ.
Trochisci Bismuthi.
„ Catechu.

Substitution.

Pulvis Cinnamomi compositus (Pulvis Aromaticus, *Edin.*) substituted for Pulvis Aromaticus.

* Minor alterations are not included.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *6th February*, 1867,

Present—Messrs. Bird, Bottle, Carteighe, Deane, Edwards, Hanbury, Haselden, Ince, Morson, Orridge, Palmer, Randall, Sandford, Savage, Squire, and Waugh,

The following were elected Members—

Marrack, Philip........................Cowes, Isle of Wight.
Padwick, John ....Brighton.

ELECTION OF COUNCIL FOR THE ENSUING YEAR.

The lot having been taken, the following Members were declared to go out of office, but are eligible for re-election :—*

Bottle, Alexander..................37, Townwall Street, Dover.
Brady, Henry B.....................40, Mosley Street, Newcastle-on-Tyne.
Carteighe, Michael ....172, New Bond Street.
Deane, Henry ....Clapham.
Evans, Henry Sugden ....56, Hanover Street, Liverpool.
Hanbury, Daniel Bell ....Plough Court, Lombard Street.
Haselden, Adolphus F............18, Conduit Street.
Hills, Thomas Hyde...............338, Oxford Street.
Mackay, John ....121, George Street, Edinburgh.
Morson, Thomas N. R. ....38, Queen Square.
Palmer, Robert ....35, Ovington Square.
Randall, William Brodribb ......146, High Street, Southampton.
Squire, Peter ....277, Oxford Street.
Standring, Thomas ....1, Piccadilly, Manchester.

The following Members remain in office for the ensuing year :—

Bird, William Lionel...............42, Castle Street, Oxford Street.
Edwards, George ....Dartford.
Ince, Joseph ....26, St. George's Place, Knightsbridge.
Orridge, Benjamin B................30, Bucklersbury.
Sandford, George Webb............47, Piccadilly.
Savage, William Dawson ....65, Edward Street, Brighton.
Waugh, George ....177, Regent Street.

A letter to the President, from Mr. Henry Matthews, F.C.S., President of the United Society of Chemists and Druggists, was read, asking the appointment of a day for the reception of the deputation from the meeting held at the London Coffee House on January 24th, and the Secretary was requested in reply to name Tuesday, the 19th of February, at noon, for that purpose.

A communication was also presented from Mr. Wade, requesting an interview with the Council for himself and other members of the trade not acting with the United Society, and a later hour of the same day was appointed.

A Memorial from the Chemists and Druggists of Bath and Bristol to the Board of

* Bye-laws, sect. 5, clause 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 of March in each year.

Commissioners of Inland Revenue, praying for a reduction of the Methylated Spirit Licence, was received from Mr. Pooley, of Bath, (Local Secretary,) with a request that the Council would present it, and support its prayer.

SPECIAL MEETING OF COUNCIL, 19*th February*, 1867.

Present—Messrs. Bird, Bottle, Carteighe, Hanbury, Haselden, Hills, Ince, Morson, Orridge, Palmer, Randall, Sandford, Savage, Squire, and Waugh.

To receive the Deputations, as arranged on the 6th inst.

Reports of resolutions in reference to the "Suggestions" of the Council, as published in the January number of the Journal, for an amended Pharmacy Bill, were received and read from—

The York Chemists' Association,
The Bolton Chemists' Association,
The Chemists' Assistants' Association, London,
The Chemists and Druggists of Hanley and district.

CONFERENCES AT THE PHARMACEUTICAL SOCIETY'S ROOMS, BLOOMSBURY SQUARE, FEBRUARY 19, 1867.

A number of chemists and druggists waited upon the Council of the Pharmaceutical Society of Great Britain, at the Institution, Bloomsbury Square, on Tuesday, 19th of February, for the purpose of discussing the suggestions made by the Society for an extension of the Pharmacy Act. They came as a deputation from the Meeting of the Trade which was held at the London Coffee House on the 24th of January.

Mr. Matthews, F.C.S., President of the United Society, introduced the deputation. He said:—Mr. President and Gentlemen, I have the pleasure of introducing to you several gentlemen connected with the United Society of Chemists and Druggists, and several other gentlemen connected with the trade—some being from the country and others carrying on business in town—and I trust that the conference to-day may lead to good results. By way of opening the subject I may mention that we have received some short communications from the country, which Mr. Buott, the Secretary of the United Society of Chemists and Druggists, will be good enough to read. I shall then leave other gentlemen to express their opinions on the subject who are more personally interested in the matter than I profess to be.

Mr. Buott: I may just state, before reading the correspondence, that Manchester, Birmingham, the towns of the Potteries, and other towns, have distinctly placed before the trade their views on the subject which we have to converse upon this morning. But there are two or three communications, which it is the special request of those from whom we have received them should be read to-day. Mr. Buott then read letters from Sunderland, Newcastle, and York.

Mr. Betty then opened the real business of the meeting. He assured the Council that he felt it a great honour and privilege to form one of the deputation on an occasion from which so many good results were likely to follow, and from which might date a new era of advancing prosperity to the trade of chemists and druggists throughout the country. The deputation were the representatives of the present, past, and future. Looking to the past, they asked the Council to consider the objects for which the Society was established; and looking to the future, they asked the Council to consider the status which the rising generation of chemists and druggists would enjoy. He hoped they had met to effect some practical good. He asked the Council to take into consideration the conclusions arrived at by the chemists and druggists at the London Coffee House. Those conclusions were intended to place the trade in the position which they wished to occupy; and he trusted some understanding would be come to by which the trade would attain its proper influence, and keep pace with the increasing educational requirements of the age, and by which chemists and druggists throughout the country would achieve a position of wealth and dignity, which their honour, integrity, and ability as a class justly entitle them to.

Mr. Anderson, in accordance with the programme laid down by the deputation, said he wished to lay before the Council the resolutions carried at the London Tavern by a meeting of the trade, and to place these side by side with the suggestions of the Pharmaceutical Society. He proceeded to read those suggestions, and also the first resolution passed at the London Coffee House.

Mr. SALTER read the third resolution, as follows:—"That as it regards the fourth clause, which runs thus:—

> 'That all persons registered as chemists and druggists should be eligible for election to membership to the Pharmaceutical Society, under the bye-laws thereof; but they should not by virtue of that membership be entitled to registration as 'Pharmaceutical Chemists,' that title being strictly kept for those only who pass the major examination. They should have the right of nominating and voting for members of the Council, but the Council should consist only of members who are Pharmaceutical Chemists.'

This meeting concurs in the desirability of limiting the title of 'Pharmaceutical Chemists' to those who may pass their major examination; but it is decidedly opposed to registered chemists and druggists being subjected to election by the Pharmaceutical Council as a condition for the exercise of their right to vote upon the election of the members of that Council; and it is equally and decidedly opposed to the Council of so large a body as the chemists and druggists will be under an Act of general incorporation being limited to those who are now, or may be hereafter, Pharmaceutical Chemists."

Mr. PASS said he would make only this one remark: he was sorry to call up any unpleasant feelings, but the Council must recollect that there would be a time when the founders of this Society, and the gentlemen who were members of the Pharmaceutical Society by virtue merely of registration or their fees, having died out, the area of selection for the Pharmaceutical Society would be confined entirely to gentlemen who had passed their examination. He was not going to lay down as an axiom that science and business aptitude were not always found together, but he did not think that in conducting a business society they would go to scientific bodies to select their counsellors. Men who had proved themselves business men were, as a rule, far better counsellors than scientific men.

Mr. MERCER, referring to the Bye-laws of the Pharmaceutical Society, objected to the use of the word "eligible," as applied to members of the trade seeking to become members of the Society. Speaking the sentiments of, he believed, every chemist and druggist in the country, he asked that the word should be erased, and in its place there should be substituted these words—"that all registered chemists and druggists should be members of the Pharmaceutical Society."

The PRESIDENT (Mr. Sandford) said that the resolution just read embraced two questions, and it would be more convenient to consider them separately. The first was the election of members of the Society; the second, the constitution of the Council. Proceeding to the first he remarked—When we say a man is eligible under Act of Parliament, we mean that he has a right to become a member, unless we can show very good cause why he should not be one. All registered chemists and druggists would be eligible, and, being so, would have a right to be elected members of this Society. There was nothing objectionable in the word. He remembered when, two years ago, something was said about eligibility, their solicitor said, "Oh, you must consider that word in a very different sense. If a man is eligible under Act of Parliament, you have the privilege of electing him, but not only the privilege, for it is your duty; you are bound to elect him. You are bound to elect all men who so present themselves. You are bound to proceed according to the spirit of the Act." That is what eligible means, and election does not depend upon mere will or caprice. A man in business at the time of the passing of any proposed Bill, or connected afterwards with the trade as an examined man under the second examination, would have a right to admission to membership of this Society. He believed the Council of the Society would only be too glad to receive such a man as a member. They wanted to increase the number of members, not lessen them. It was absurd to suppose they wanted to keep the Society as a sort of club. It never was so. He believed that on one occasion a man previously convicted of felony had been refused admission, but he supposed the deputation did not want such men as that. There must be an election of some kind, and the question was, how was the election to be conducted? A man could not elect himself, and it would be very expensive and troublesome for him to have to go all over England and Scotland to canvass the votes of every member of the Society. Then, it must be remembered that every member had a voice in the election of the Council; therefore the Council might surely be trusted to elect the members on behalf of the Society. He confessed he could see no more ready or even safer way of electing a man, and he did not know what else the deputation could wish. In their suggestions the Council did not compel any man to register as a Chemist and Druggist. They said "there should be a register open," but it was entirely left to the man's own option whether he did register. If he did not do so, he was at liberty still to carry on his business, to go on calling himself a Chemist and Druggist, and conduct his business as heretofore. On the other hand, if he liked to register himself, the door was thrown open to him, and, being so registered, he might, if he liked, become a member of this Society in the ordinary way.

Mr. Betty: Do you object to substitute for the word eligible, "shall have the right"?

The President (Mr. Sandford): Certainly not.

Mr. Pass: In a club a man is obliged to get a proposer and seconder.

The President said the system adopted in the Society was for a man to send in his application to the Secretary, and the proposing and seconding took place as a matter of course in the Council meeting.

Mr. Toogood (of Hull) observed that in that town there were nearly seventy persons in the trade connected with the United Society, and not twenty, he thought, connected with the Pharmaceutical Society. He should very much like, if they could, to shake hands and agree, and become one Society. He formed one of a deputation which waited upon Sir George Grey in reference to two Bills connected with the trade, which were supposed to be in collision with each other. Sir George Grey said, before another year he hoped these two Societies would meet and agree upon a Bill that would suit all parties; and he (Mr. Toogood) hoped, before the deputation left that day, they would make such arrangements that they could join hand in hand with the Pharmaceutical Society, and produce a Bill between them that everybody would be satisfied with.

Mr. Harwood said he was there as the representative of the Bolton chemists and druggists, who, on the 7th of that month, had held a meeting and passed a resolution (which he read) approving of amalgamation.

Another gentleman from Bolton endorsed what Mr. Harwood had said, adducing that it was the unanimous feeling of the thirty-two chemists and druggists in Bolton that an incorporation of the two Societies should take place as soon as possible. The distinction between ordinary chemists and druggists and Pharmaceutical Chemists and Druggists was really so fine that the matters now between them might, in his opinion, be very easily adjusted. He expressed the feelings of the Bolton Association generally when he said, that at this crisis some little sacrifice might be made to bring about that which eventually must be for the good of the trade, inasmuch as it would put the trade in the future upon a proper basis.

Mr. Hughes (of Oxford) stated that the chemists and druggists of that town were unanimously of the opinion that in any alteration of the law they should be not only eligible as members of the Pharmaceutical Society, but qualified for election on the Council.

Mr. Betty asked the nature of a mandamus which he had heard it said might be issued to compel the admission of an eligible person to the Society.

The President: If a man made application to the Council to be elected a member, he having a right by Act of Parliament, and the Council refused to admit him to membership, he might go the Court of Queen's Bench and ask them to issue a mandamus, and the Council would be cited to appear at the Court to show cause why they had not elected him.

Mr. Betty: Has there ever been occasion for putting that in force?

The President: It has never been put in force, because we have never given a man occasion; and It hink it is fair to presume that, having elected equitably and fairly hitherto, we should continue so to elect—not only we, but you would be with us to elect as heretofore those men who are eligible.

Mr. Anderson: I think the deputation are perfectly satisfied with the explanation. Now we should like to hear your views as to the constitution of the Council.

The President: You know our suggestion—that all members should have a voice in the elections, but that the Council itself should be composed of Pharmaceutical Chemists. We have no power whatever to regulate the conduct of the trade. I wish to state that, because by gentlemen, not members of our Society, a misconception appears to be entertained on that point.

Mr. Betty: You have had no power hitherto, but shall you apply for it under the new Act?

The President: Certainly not; and if the Government would grant such power, I should assuredly vote against our taking it. I think it would be only a source of discord in the Society. Parliament would not interfere to give us any Act to protect our trade, but I apprehend it would give us an Act to protect the public against incompetent persons, which would virtually protect our trade. To retain the confidence of the public, it is absolutely necessary that the Society should be kept up to a proper standard; and in framing the suggestions it was proposed to limit the Council to Pharmaceutical Chemists, in order to leave a greater inducement for all men to come up for the higher examination. That was the chief reason for the restriction. There may be other secondary reasons,—the accumulation of a large amount of property, and the expenditure of more than £100,000, collected entirely from members of the Society during a quarter of a century of subscription, and very hard work on the part of the Council. The perfect equality of the non-examined Pharmaceutical Chemists and outsiders of the same date, may be true enough in the main, but some credit should be given to those who, seeing the necessity for a change, have exerted themselves so successfully to promote it. Still, remembering that the Pharmaceutical Society was established to embrace all chemists and druggists in Great Britain, the Council, animated by the desire that it should do so, propose that, in the event of obtaining an Act of Parliament to compel the examination of all men entering the trade in future, those chemists in business at the time of the passing of that Act, who may choose to become members of the Society, shall be eligible for the Council, but that three-fourths or two-thirds of the Council shall always consist of Pharmaceutical Chemists. This would certainly give all men the opportunity for a fair representation, and the votes of the Society would regulate it.

Mr. Toogood said he thought the President had adduced a very good argument against members newly joining becoming members of the Council. He had come to represent a large number, and he felt that he could not enter that room without arguing everything fairly. The Pharmaceutical Society had been accumulating their property for a great number of years; the United Society had not contributed a farthing; and he thought it would be extremely unfair for a man belonging to the latter seeking to be admitted to all the privileges of the former without first paying down a sum equal, he would say, to what had been paid by the several members of the Council during the time they had belonged to it. If he had the ambition to become a member of the Council, he should be very glad to pay, say £50; but they might say £20, or any other sum they could agree upon.

The President: That is bringing the thing to a point. You might say every man on election should pay a couple of guineas, and then he would be eligible to election on the Council. That would be a compromise to some extent. Then, having made all men eligible, he believed a measure might be framed on a basis of that kind.

In reply to Mr. Huddlestone, of Sheffield,

Mr. Waugh said the Examiners were not necessarily on the Council.

Mr. Huddlestone said that many of the Sheffield chemists were in favour of a payment for eligibility to be elected on the Council.

The President: We never proposed to take large fees, nor to limit the number of our members.

After some further discussion,

Mr. Anderson expressed his entire satisfaction with the explanations afforded by the Council, and proposed to take a show of hands from the deputation as to whether they were not likewise satisfied.

The Council retired from the room, and Mr. Matthews put the question to the deputation, whether the trade generally, as represented by them, would not be satisfied; and the response was in the affirmative, *nem. con.*

The Council re-entered the room; this information was conveyed to them.

The President made some observations on the old adage that union was strength, and then closed the interview.

A second deputation, consisting of the chemists and druggists unrepresented by any organized society, was introduced by Mr. Wade, who said: Mr. President and Gentlemen, it will be within your recollection that a meeting of the trade was recently called by the Executive Committee of the United Society, for the purpose of discussing the resolution suggested by your Society, as the basis for an extension of the Pharmacy Act. At that meeting a certain resolution was put, having almost an equal number of supporters and opponents, and, through the irregularity of the proceedings, no accurate decision was arrived at; but it is believed, that had there been a fair counting of voters, that resolution, supported by these gentlemen here present, would have been carried. It is on that account, then, we have requested a separate hearing from those who voted against it. Let it not be supposed that we are opposed to the majority of the United Society; on the contrary, we believe that we better represent the views of the United Society than the officials, who have of late propounded such notions as are irreconcilable to the wish of the outside trade. It is, therefore, to repudiate those sentiments which have tended to sow mistrust and create discord between the several sections of the trade, that we are here to-day. And in order that it may not be said we are figuring as the three tailors of Tooley Street, I hold in my hands correspondence from all parts of England expressive of confidence in the endeavours we have made to reconcile parties. I am prepared to read any and every if desired; but if you will accept my representation without, it will save you a great deal of time. I will, however, read one as a specimen of those I am daily receiving: I select this, as it is the last to hand from one totally unknown to me, and the sentiments therein expressed are those of the greater part of the trade. Apart from the United Society there is a body of real outsiders, and these are the men who ought to have some consideration shown them. They are men, proprietors of old established businesses, who have been from the earliest period, and still remain, totally indifferent to registration or title. These men, who, by their own talents and respectability, have established for themselves a name, an income, and a character,—these men would have things take their own course, and rather express themselves to this effect, "A plague o' both your houses," when appealed to by one Society or the other in reference to incorporation. If, then, this outside body have been indifferent since 1853, to the exertions of your Society; if they have turned a deaf ear to the supplications of the United Society, they have certainly a right to repudiate either the one or the other, acting as representative for them. But if they are indifferent, on their own account, feeling that neither title nor certificate would increase their gains, they are not so absorbed in self-interest as to forget those that follow them, and they would willingly help to advance the education of the trade by example and precept. But if you require this of them, you should be prepared to offer an equivalent for that support which they have the power to throw into either scale. If they move at all, they naturally prefer that action which aspires to elevating the trade, and in the Pharmaceutical Society they see the means for accomplishing as much. Then, Sir, I would suggest that this matter should be met, and practically treated, by the several sections and interests in the trade; that you should invite a certain number of the United Society, and a certain number of outsiders, to frame an Act, and proceed at once to Parliament. In reference to the equivalent referred to, I would suggest the reduction of the 10 guineas examination fee to 5 guineas, for it is not the test of ability so much as the value to the individual of the certificate obtained. This deputation is here, not as antagonistic, but rather with a desire to strengthen the Council to bring the question to a settlement. Having said so much, I now leave the matter for those gentlemen who have accompanied me, to express their opinions. I may add, that this deputation does not represent any organized section, but contains representatives from various parts as volunteers. If I have spoken with confidence, it is because from my knowledge of many in the trade I have learnt and studied their wishes.

The President said he was much pleased at the events of that day. It was a source of much gratification to him to think that the deputation that had just departed had left, he believed, satisfied, as he himself was, with the result of their conference. He was glad to state that nothing had occurred in any way of a disagreeable character. They had had a conversation touching upon the chief points in dispute; but as there was only one real obstacle to get over, he might as well inform those present that the Council had suggested, with a view to meet the outsiders, that those chemists who became duly registered as members of the Society, should be eligible to the Council. It was perhaps difficult to divide 21 by 4, or even by 5, but there was no difficulty in stating that fourteen members of the Council must be elected from

Pharmaceutical Chemists, and seven may be chosen from members of the Society. It was impossible for the Council to forget the struggle and trials of early years,—how only by undaunted perseverance and faith, the founders of the Society had raised themselves to the position they now held. They had nothing to gain by opening the doors. They were satisfied to go on prospering as they had done of late, and the agitation out-of-doors was of more benefit than injury to them. Never had their numbers kept up as during the past few years; at no time were there so many apprentices upon their books, nor were they ever so sanguine as to the future condition of their institution; but yet that was not the only spirit that moved them. When opponents came forward and in reason and confidence met them, they could discuss that which was for the good of all. It was very easy to discuss among themselves what they would like as protection to trade interests, but in Parliament they must not even hint at such things, for with Government it is not what will benefit a class, but the public. In reference to those suggestions relative to the reduction of fees, it was a question of detail; if it was seen a large number were likely to pass, some alteration might be made. It had never before occurred to him, and therefore he was not prepared to enter into that question then, or give an off-hand answer; but he hoped what he had stated would meet with the satisfaction of this deputation. It was not in his power to say that there would be an Act obtained this session: for his own part, he much desired it; but he could not disguise from them that the multfarious duties of Parliament rendered such a result extremely doubtful.

Mr. D'Aubney was very glad to hear such conciliation had been offered to and accepted by the first deputation, and he thought it could not fail to be acceptable to those present. As far as the election of the Council was concerned, he was able to appreciate the concession, but was of opinion that apprentices should be included in any exemption from examination.

Mr. Potter thought it very necessary that this clause should be understood. There were many who took apprentices more for the premium than with any intent to instruct them, and he thought that apprentices had a vested interest after the premium had been paid.

Mr. Squire expressed very strong feeling in respect to the education of apprentices, and thought that after five years there would be no difficulty, if a lad had made good use of his time, passing an examination creditably.

Mr. Cannon said that it was only a matter of a few years, and he did not think it worth while retarding the passing of a Bill on a question like this.

Mr. Savage made a few remarks upon the same subject.

Mr. Carteighe also gave his experience of those who came for their examination often being deficient in the practical knowledge of dispensing, and thought that nothing could compensate a youth for the loss of an apprenticeship.

Mr. Wade wished to refer to the position of Assistants. The application had been made by himself for a deputation of assistants to attend that meeting, in consequence of his having heard expressions of mistrust from their body. He had, by the kind help of Mr. Bremridge, placed their position before the Committee of the Assistants' Association, and was glad to state that they were satisfied. He wished it to be distinctly understood that they had no desire to enter into political action, and he quite agreed with them that such a step might be injurious to the objects of their institution, which is intended for social enjoyment and mutual improvement; but that every interest should be represented, and the moral support and acknowledgment of the assistants' approval should be produced. He had obtained the following resolution, passed at their meeting with perfect unanimity, on Thursday, the 14th inst.:—"That the Society, having regard to its perfectly neutral character, and being desirous to avoid interference in any question involving trade differences, respectfully declines to express any opinion by deputation on the subject of legislation for Assistants and Apprentices engaged in the business of chemists and druggists. The present meeting, however, accord its support to the suggestions of the Pharmaceutical Council, as published in the January number of the 'Pharmaceutical Journal.'"

A few remarks having been made by various gentlemen present,

Mr. Wade begged, on behalf of those present, to thank the Council for their courtesy and for the facilities offered to discuss these matters. It was gratifying that the Council had dropped that course which had guided them, no doubt for various reasons he was not cognizant of, and which his friends had thought too conservative; he was glad to learn they would now ask the Legislature for that which was liberal and likely to be granted; and he again tended the thanks of the deputation to the Council.

BOARD OF EXAMINERS, 13*th February*, 1867.

Present—Messrs. Carteighe, Darby, Davenport, Deane, Gale, Garle, Hanbury, and Squire.

Ten candidates presented themselves for the Major and Minor Examinations, and were duly registered:—

MAJOR (as Pharmaceutical Chemist).

Buckett, Alfred Henry..............................Neath.

MINOR (as Assistants).

Curé, Charles..Mauritius.
Daniel, Silas ....Holsworthy.
Foster, William ....Bridlington.
Poate, Thomas Pratt ....Gosport.
*Severs, Joseph ....Leeds.
*White, James Walter ....Weymouth.
Whitelam, Richard ....Long Sutton.
Wood, Alfred Charles ....Birmingham.
*Woolley, Hermann ....Manchester.

REGISTERED APPRENTICES AND STUDENTS.

NAME.	RESIDING WITH	ADDRESS.
Budden, William	Mr. Huntley	Wimborne.
Collier, Henry	Mr. Bothamley	Chatteris.
Cuffling, Joseph	Mr. Doughty	Knightsbridge.
Earee, Edwin Thomas	Mr. Earee	Staines.
Ellis, Charles Edward	Mr. Ellis	Thornbury.
Gwatkin, James Ross	Mr. Gwatkin	Brighton.
Lincoln, John Thomas	Mr. W. C. Wigg	King's Lynn.
Loggin, Charles Frederick	Mr. Loggin	Stratford-on-Avon.
Peacock, William Spencer	Mr. Thursfield	Kettering.
Pearson, Edward	Mr. Newcome	Grantham.
Reeder, Francis James	Mr. Ward	Sheffield.
Richardson, William Henry	Mr. Procter	Beverley.
Robinson, Joseph	Mr. Robinson	Chester-le-Street.
Round, Frederick	Messrs. Tomlinson and Hayward	Lincoln.
Sandall, William	Mr. Woods	Worcester.
Silvester, Henry Thomas	Mr. Silvester	Knutsford.
Thompson, William	Mr. Chantry	Goole.

ERRATUM.—Page 433, last line, *for* "Gloucester" *read* "London."

BENEVOLENT FUND.

USUAL ANNUAL SUBSCRIPTIONS RECEIVED, 1867.—LONDON.

	£.	*s.*	*d.*
Attwood and Hugill, 147, Cannon Street	2	2	0
Barron, Harveys, and Co., 6, Giltspur Street	2	2	0
Bentley, R., 17, Bloomsbury Square	1	1	0
Bird, Wm. L., 42, Castle St. East	1	1	0
Blake, Charles T., 47, Piccadilly	1	1	0
Borchert, Heinrich T. G., German Hospital, Dalston	0	10	6
Buckle, Christopher F., 77, Gray's Inn Road	0	10	6
Croyden, Charles, 37, Wigmore Street	0	10	6
Cocksedge, Henry B., 20, Bucklersbury	0	5	0
Dinneford and Co., 172, New Bond Street	2	2	0
Davies, Henry E., 43, Wood St.	0	10	6
Darby and Gosden, 140, Leadenhall Street	2	2	0

* Passed in honours; eligible, at the end of the Session, to compete for the prize of books.

	£.	s.	d.
Evans, John H., 60, Bartholomew Close	1	1	0
Francis, George B., 5, Coleman Street	1	1	0
Gristock, Thomas, 42, South Street, Manchester Square	1	1	0
Herrings and Co., 40, Aldersgate Street	2	2	0
Hill and Son, 11, Little Britain	2	2	0
Hodgkinson, Tonge, and Stead, 213, Upper Thames Street	2	2	0
Hodgson, W. H., St. Bartholomew's Hospital	0	10	6
Hopkin and Williams, 5, New Cavendish Street	2	2	0
Humpage, Benj., 51, Judd St.	0	10	6
Kemp, R., 205, Holloway Rd.	0	10	6
Kernot, G. C., 3, Chrisp St., Poplar	0	10	6
Knowles, R. J., 96, Lansdown Road, Notting Hill	2	2	0
Lescher, Joseph S., 60, Bartholomew Close	1	1	0
May, John, Battersea	0	10	6
Matthews, William, 1, Wigmore Street	0	10	6
Maw and Son, 11, Aldersgate St.	2	2	0
Orpe, Thomas M., 329, Old Kent Road	0	10	6
Pollock, Thomas, 129, Fenchurch Street	1	1	0
Roach, Pope, 8, St. James's St.	0	10	6
Sandford, George W., 47, Piccadilly	1	1	0
Strawson, George F., 101, Holborn	0	5	0
Starkie, Richard S., 4, Strand	1	1	0
Salman, Thomas, 87, Cornwall Road, Westbourne Park	0	10	6
Thompson, Henry A., 86, Chiswell Street	1	1	0
Turner, Charles E., 63, Great Russell Street	0	10	6
Wright, W. V. and Co., 11, Old Fish Street	1	1	0
Wyman, John, 122, Fore St.	1	1	0
Waugh, Alex., 177, Regent St.	0	10	6
Whitburn, A. R., 174, Regent St.	0	10	6
Willows, John and Jesse, 101, High Holborn	2	2	0
Young, George, 12, Ebenezer Terrace, Millwall	0	5	0

Subscriptions.—Country.

	£.	s.	d.
Alderley Edge, Hampson, R.	0	10	0
Alfreton, Robinson, Joseph S.	0	10	6
Beverley, Robinson, James M.	0	5	0
Bilston, White, Thomas	1	1	0
Birmingham, Lucas, Joseph	0	10	6
Brighton, Gwatkin, James T.	0	10	6
,, Robson, Thomas	0	10	6
,, Noakes, Richard	0	10	6
Bristol, Butler, Samuel	0	10	6
Broadstairs, Doubell, James	0	5	0
Cheltenham, Fletcher & Palmer	0	10	6
Cheshunt, Butt, Edward N.	0	10	6
Chichester, Long, William E.	0	10	6
Cirencester, Pratt, John	0	10	6
Clapton, Goodwin, John	1	1	0
,, Granger, Edwin J.	1	1	0
Cockermouth, Bowerbank, J.	1	1	0
Colchester, Shenstone, J. B. B.	0	5	0
Coventry, Hinds, James	0	10	6
Dorking, Clift, Joseph	0	10	6
Derby, Goodall, Henry	0	10	6
Fareham, Peat, Walter	0	5	0
Gainsborough, Marshall, J. F.	0	10	6
Gloucester, Hurst, W. F. H.	0	5	0
Grantham, Newcome, John	1	1	0
Gravesend, Beaumont, W. H.	1	1	0
,, Spencer, Charles	1	1	0
Guildford, Martin, Ed. W.	0	10	6
,, Shepherd, Geo. P.	1	1	0
Harrogate, Greenwood, John	0	10	0
Hendon, Goldfinch, George	0	10	6
Hirwain, Sims, Joseph	0	10	6
Kilmarnock, Borland, John	0	10	6
,, Rankin, William	1	1	0
Landport, Tryon, William G.	0	5	0
Lewes, Martin, Thomas	1	1	0
Liverpool, Maskery, Samuel	1	1	0
,, Hunt, Thomas	1	1	0
Looe, Hicks, James S.	0	10	6
Maryport, Cockton, John	0	5	0
Manchester, Brown, W. Scott	1	1	0
,, Halliday, Wm. J.	0	10	6
Market Drayton, King, W. G.	1	1	0
Montreal, Mercer, Nathan	0	10	6
Newcastle-under-Lyne, Cartwright, William	0	10	6
Newton Abbot, Poulton, John.	0	10	6
Northallerton, Warrior, Wm.	0	10	6
Odiham, Hornsby, John H.	0	10	6
Otley, Pratt, Richard M.	0	10	6
Oldham, Hargraves, Henry L.	0	10	6
Oxford, Delves, George	0	5	0
Portsmouth, Parsons, William	0	10	6
Rothbury, Farrage, Robert	0	10	6
Rotherham, Ellinor, George	0	10	6
St. Asaph, Roberts, Peter	0	10	6
Shefford, Baigent, William H.	0	10	6
Spalding, Swift, Francis	0	10	6

	£.	s.	d.		£.	s.	d.
Sutton Coldfield, Smith, Wm.	0	10	6	*Tunbridge Wells*, Sells, R. J.	0	5	0
Stockton, Hodgson, E. & Son	0	10	6	*Uttoxeter*, Johnson, John B...	0	10	6
Thornton-in-Craven, Wilson, T.	2	2	0	*Wath-upon-Dearne*, Hick, A..	0	5	0
Tickhill, Yorks., Crowther, T.	0	10	6	*Weymouth*, Groves, Thomas B.	0	10	6
Torpoint, Down, Richard H...	0	10	6	*Windsor*, Russell, Charles J. L.	0	10	6

PHARMACEUTICAL MEETING.

Wednesday, December 5th, 1866.

MR. T. H. HILLS, VICE-PRESIDENT, IN THE CHAIR.

ON THE PREPARATION OF SPIRIT OF NITROUS ETHER.

BY THEOPHILUS REDWOOD, PH.D.,

PROFESSOR OF CHEMISTRY AND PHARMACY TO THE PHARMACEUTICAL SOCIETY.

An impure spirituous solution of nitrous ether has been long and extensively used in medicine, under the several names of *Dulcified Acid of Nitre*, *Sweet Spirit of Nitre*, *Spirit of Nitric Ether*, and *Spirit of Nitrous Ether*. It appears to have been first vaguely described as far back as the thirteenth century, by Raymond Lully, but it was more prominently brought into notice by the great champion of chemical medicines, Basil Valentine, about two hundred years later. The process generally adopted for its preparation has consisted in distilling a mixture of nitric acid and spirit; but several modifications of the process have from time to time been made, the proportion of acid in relation to the spirit having been frequently varied, and other alterations effected, with the view of meeting difficulties that have presented themselves, or of obviating objections that have been found to apply to the products obtained.

In 1746 this preparation was first introduced in the London Pharmacopœia under the name of *Spiritus nitri dulcis*, which was changed in 1788 to *Spiritus ætheris nitrosi*, and again in 1809 to *Spiritus ætheris nitrici*.

The process given in the London Pharmacopœia of 1746 consisted in submitting to distillation a mixture of six troy ounces of strong nitric acid, of about 1·5 specific gravity, with thirty-two fluid ounces of rectified spirit. This process remained unaltered until 1809, when the proportion of nitric acid was reduced to one-half. In 1824 a slight change was made in the quantity of spirit directed to be distilled from the mixture, which was equivalent to reducing the proportion of acid. The next change was made in 1851, when the proportion of acid was still further diminished, and a weaker acid, of specific gravity 1·42, was directed to be used. The process now consisted in mixing $3\frac{1}{2}$ fluid ounces of nitric acid (sp. gr. 1·42) with 2 pints (40 fluid ounces) of rectified spirit, and distilling 28 fluid ounces of product from the mixture.

It will thus be seen that the changes which have been made in the process of the London Pharmacopœia have all been in one direction, and have consisted in a succession of reductions in the proportion of nitric acid employed. The object appears to have been to avoid the violent reaction which occurs when strong nitric acid and rectified spirit, in certain proportions, are submitted to distillation. When nitric acid of specific gravity 1·42 is employed, little or no chemical action occurs unless the proportion of acid to spirit be at least one to four by volume. If the proportion be one to three, the action is violent and uncontrollable; in fact, in operating on more than small quantities of material, the process under these circumstances is not unattended with danger.

As the chemical action becomes more intense it assumes a more complex character, large quantities of uncondensable vapours are given off, and much waste of spirit and of acid necessarily ensues.

The following experiments were made to determine the limits in the ratio of acid and spirit, within which mixtures of nitric acid (sp. gr. 1·42) and rectified spirit, when submitted to distillation in the usual way, yield nitrous ether suitable for use in medicine:—

1. A mixture of 1 fluid ounce of nitric acid and 3 fluid ounces of spirit was put into a retort, furnished with a thermometer, and to which an efficient condenser was attached. The heat of a lamp was applied until the temperature rose to 185°, when, chemical action having commenced, the lamp was extinguished and the process allowed to proceed spontaneously. The temperature of the liquid quickly rose to 205°; a violent reaction occurred, and much of the vapour which passed over escaped in the uncondensed state. After a short time the temperature fell to 175°, but again rose spontaneously to 190°. When the action finally subsided, there were two fluid ounces of condensed liquid in the receiver, and nine fluid drachms of a strongly acid liquor left in the retort.

2. A mixture of 1 fluid ounce of nitric acid and 4 fluid ounces of spirit was submitted to distillation with an arrangement such as was adopted in the previous experiment. A little pure spirit came over in the early part of the experiment, but this was soon followed by the production of ether, which commenced when the temperature had reached 195°. The action was not so intense as in the previous experiment, and therefore the heat of the lamp was not withdrawn, but the flame was lowered. The temperature of the liquid in the retort rose to 200°, but afterwards fell to 185°, without any alteration in the source of heat; at this temperature ether came over freely, but without altering the flame of the lamp the heat of the liquid in the retort rose to 195° before the action ceased. The distilled product amounted to two and a half fluid ounces, and the residue in the retort to seven fluid drachms.

3. A mixture of 1 fluid ounce of nitric acid and 5 fluid ounces of spirit was submitted to distillation as in the previous experiments. When the temperature had risen to 185°, spirit began to pass over without any ether. The temperature gradually increased to 205°, with irregular ebullition, but still nothing but spirit passed over. The irregularity of the ebullition caused the temperature to vary between 200° and 205°, and this continued until six fluid drachms of spirit had distilled, when chemical action commenced, and ether began to appear in the distilled product. The temperature now rose to 208°, and the action became so violent that much of the vapour escaped uncondensed. As the process proceeded, however, the temperature fell, and the action then became more regular and satisfactory. The result was that the total distilled product amounted to three and a half fluid ounces, while seven fluid drachms of liquid were left in the retort.

These experiments show that when a mixture of nitric acid and spirit is submitted to distillation, as it usually is in the preparation of sweet spirit of nitre, the proportion of spirit greatly exceeding that at which chemical action occurs and ether is produced, the first part of the process consists in the simple distillation of alcohol; and when this has been carried so far that the spirit which remains in the retort is about four times the volume of the acid, ether begins to be formed. The exact proportion of acid and spirit required for the production of ether depends upon the temperature at which they are brought into contact with each other, as will be seen from a comparison of experiments 2 and 3. The higher the temperature to which the mixture is subjected, the larger is the proportion of spirit that may be present when the ether-producing action occurs; but if the temperature be above 200°, the action is liable to become so violent that much loss of product occurs, from the difficulty of condensing the vapours, and from the more complex nature of the reaction.

It has long been observed, in making spirit of nitric ether by the London process, that the nature of the product depends, to some extent, upon the quantity of ingredients operated upon, and the manner in which the heat is applied. If a small quantity of the mixture be submitted to distillation in a retort at as low a temperature as is sufficient for effecting slow distillation, the quantity of distilled product indicated in the Pharmacopœia may be drawn over without any appreciable amount of nitrous ether being formed, so that the product in such case would be little else than pure spirit. In operating on larger quantities, however, and especially in conducting the process with a steam-jacketed still, a better result is obtained, the distilled product being richer in ether, in consequence of the higher temperature attained in the process. But even in this case the result is unsatisfactory, for not only is the amount of ether produced small in relation to the nitric acid employed, but most of the acid and much of the spirit, mixed in the proper proportions for producing ether, would be left in the still as a waste residue, if the process be stopped at the point indicated. Practically manufacturers do not stop at this point, but continue the distillation, and thus greatly increase the strength of the product. There is, nevertheless, a limit beyond which the distillation cannot be carried without great detriment to the product, as the reaction becomes more and more complex as the process proceeds, and finally nitrous fumes are abundantly formed.

The nature of the reaction which occurs in this process has been investigated by many able chemists, who have shown that it varies greatly according to the conditions present, and that it is very complex, especially when the action is intense. Dr. Golding Bird, many years ago, and more recently Dr. Debus, have contributed to this investigation. Among the products of the reaction, in addition to nitrous ether and aldehyd, chemists have enumerated carbonic, formic, acetic, oxalic, lactic, saccharic and glyoxalic acids. Hydrocyanic acid is also said to have been produced in some instances. I do not propose to enter, on the present occasion, into this part of the subject, beyond alluding to the fact, that, as these bodies are produced, there must be loss of alcohol and nitric acid, and there may be a material alteration effected in the composition of the distilled product. Intense action is therefore to be avoided, both on the ground of economy, and also with a view to the quality of the product.

I believe that the sweet spirit of nitre of commerce is always obtained by the distillation of a mixture of nitric acid and spirit, but manufacturers no doubt vary their methods of operating according to their knowledge and experience. The objects they have especially in view are, the means of satisfying the requirements of their customers, and of competing with each other in regard to quality and price. The article is manufactured upon so large a scale, and its market value is defined within such narrow limits, that any proposed alteration in the long established process for its production, that would materially alter its character or enhance its price, would be very unlikely to be generally adopted.

It is not in the dispensing of medical prescriptions that the great bulk of the sweet spirit of nitre of commerce is used, but as a popular remedy which the public are accustomed to prescribe on their own responsibility. As originally prepared, and as met with in commerce, it is an impure solution of nitrous ether in strong spirit. All the samples that I have ever examined, containing any appreciable quantity of nitrous ether, have also contained aldehyd, and I therefore consider commercial sweet spirit of nitre to be essentially a solution of nitrous ether and aldehyd. All the attempts that have hitherto been made to exclude aldehyd have practically proved failures, either by excluding at the same time the nitrous ether, or by unduly increasing the cost of the process, or by too greatly altering the character of the product. The London process failed from the first of these causes. The Edinburgh and Dublin processes have also equally failed from the latter causes, for as these processes consisted in the production of pure nitrous ether as a preliminary operation, by a somewhat wasteful method more applicable to operations on the small than on the large scale, and the subsequent solution of the ether thus produced in spirit, in the one case in the proportion of one to four, and in the other, of one to ten, they have proved unsuited for the purpose of the manufacturer.

In the British Pharmacopœia of 1864 a new process was given for this preparation, under the name of *spirit of nitrous ether*, and great expectations were at first formed with respect to it. I need hardly say that these expectations have been disappointed. So much has been published by myself and others with reference to nitrite of soda, and its proposed use in the manufacture of spirit of nitrous ether, that it will be sufficient for me to state here, that this process has brought us no nearer than we were before to a satisfactory and available method of accomplishing what is required.

I have been engaged for a considerable time in submitting the various published processes for nitrous ether and sweet spirit of nitre to practical trial with the view of ascertaining which is the best, and have made a great number of experiments for the purpose of discovering a more satisfactory method of obtaining these products, and especially the latter one, than any of those hitherto adopted. I was anxious to find a process that would be suitable for the Pharmacopœia, and which, at the same time, would commend itself to the manufacturer, so as to induce its general adoption. To fulfil this object it was essential that the process should admit of application without difficulty on a large or small scale, with similar and uniform results, yielding a product resembling the best sweet spirit of nitre of commerce, at a cost not exceeding that at which it could be produced by any other known process. In the different attempts which have been made in this direction, both by myself and others, the object aimed at has been to set up a chemical action that can be regulated and controlled, so that while nitrous ether is produced in sufficient quantity there shall not be an undue formation of secondary products or an excessive destruction and waste of alcohol and nitric acid, as frequently occurs in the ordinary processes.

It has been proposed to effect the required object, (1) by adding the nitric acid to the spirit in successive quantities as the process proceeds; or (2) by altering the strength of the acid; or (3) by interposing an inert medium between the acid and alcohol, through which they shall mutually pass by diffusion; or (4) by causing the nitric acid to be gradually produced in the retort by the decomposition of a nitrate; or (5) by substituting a nitrite for a nitrate; or (6) by substituting nitrous acid for nitric acid in the free state; or (7) by using some ingredient which, in the presence of the spirit, will convert the nitric into nitrous acid, without involving the destruction of alcohol and consequent formation of aldehyd and other secondary products.

The processes of the Edinburgh and Dublin Pharmacopœias belong to methods (1) and (2); they can only be practically applied on the small scale, and they are not economical. The process referred to under (3) is that of Dr. Black, which Berzelius preferred to all the others; but this, again, is not a manufacturer's process, and cannot be made such. It consists in putting into a long narrow cylindrical vessel, 9 parts of rectified spirit, then introducing beneath this, by means of a funnel-tube reaching to the bottom of the vessel, 4 parts of water, so that it shall form a distinct stratum beneath the spirit, and afterwards introducing in the same way, beneath the water, 8 parts of strong nitric acid. These are allowed to stand undisturbed, for two or three days, in a room at a uniform temperature, not exceeding 53°. At the end of the process, when carefully conducted, a stratum of nitrous ether is found floating over an acid liquor. The method referred to under (4) presents no advantage over (1) and (2); (5) is the process of the British Pharmacopœia of 1864; and (6) is Liebig's process, which, although presenting some advantages, is liable to become unmanageable when anything more than small quantities are operated upon, and is, in other respects, unsuited for operations on a large scale. The last of the methods referred to (7), appeared to me to present the greatest probability that a process might be founded upon it capable of accomplishing what is required.

Kopp's process for the production of nitrous ether, consists in heating a mixture of equal volumes of rectified spirit and nitric acid, sp. gr. 1·36, in contact with copper filings, and, when chemical action has commenced, withdrawing the heat and allowing the distillation to go on spontaneously. This process answers well for the purpose for which it was intended, and it was in working with this process and making some modifications in it, that I discovered one which appears to present advantages over any other process I know for the preparation of spirit of nitrous ether. There appeared to be some difficulty in adopting even a modification of Kopp's process on account of the increased consumption of nitric acid which it involved and the cost of the copper consumed in the process, for the nitrate of copper that would be formed, if the process were generally used in a manufacture of this extent, would not be likely to find a market. Other substances, acting in the same direction as the copper, for deoxidizing the nitric acid, were tried, but without much success. I am informed that manufacturers sometimes use iron as well as copper stills in making sweet spirit of nitre, and thus get better results than are obtained when the distillation is effected in glass or stoneware; but in my experiments I have not obtained any satisfactory results by the use of iron. Several experiments were made with starch, and also with sugar and glycerine. Many years ago, in 1850, Mr. Grant, of Bristol, suggested the use of starch instead of copper in Kopp's process; but in attempting to apply it in the preparation of spirit of nitrous ether, with an increased quantity of spirit in contact with the nitric acid, I have found that the starch remains undissolved and unaltered in the mixture of spirit and acid until so much spirit has been distilled off as to leave the nitric acid with about four times its volume of spirit, when nitrous ether begins to be formed. This, however, is just the point at which the ether would be formed if there was no starch present. The starch certainly acts beneficially in one respect,—its particles diffused through the mixture of acid and spirit cause the liquid to boil more freely and regularly than it otherwise would, and the temperature is therefore less subject to variation than it is in the distillation of the acid and spirit alone. When the formation of ether has commenced the process proceeds satisfactorily for some time, but at last a very violent reaction takes place, and nitrous fumes are copiously evolved, which, if allowed to pass into the distillate, would render the product unfit for use.

As the starch remains in an insoluble state in the mixture until it is acted upon at the end of the process, I thought there might be an advantage in substituting some other organic body of a similar description that would be soluble in the spirit. Grape sugar and glycerine were thus tried, but with no better success than was obtained with starch. In using glycerine, however, a practical difficulty was experienced; it was found almost impossible to distil a mixture of nitric acid, spirit, and glycerine in a glass vessel, on account of the violent bumping which takes place, and which endangers the safety of the apparatus. In this respect, therefore, glycerine produces an effect the reverse of that produced by starch.

Finding that of all the reducing agents tried, copper was that which acted in the most satisfactory manner, I returned to it, and endeavoured to overcome the objections that had presented themselves to its use. My object was not to produce pure nitrous ether, but good sweet spirit of nitre, and therefore the quantity of spirit required for this purpose was used. I found that in distilling a mixture of nitric acid and spirit in contact with copper, if the proportion of spirit to the acid was more than one to five by volume, the copper was but slightly acted upon; and here, as in the other cases noticed, the formation of nitrous ether did not take place to any appreciable extent until the proportion of acid to spirit was reduced to about one volume to four. The process then proceeded with great regularity, the proportion of ether in the distillate increasing as the liquid in the retort became more highly charged with nitric acid; but it was only during one short period of the process that the best result occurred, and with this exception the distillation yielded little else than pure spirit. In endeavouring to equalize the action and diffuse it through the entire process I tried the effect of adding a portion of sulphuric acid to the other ingredients, and in this way I completely accomplished the object.

After a great many trials, in which the ingredients were used in different proportions, I adopted the following process as one in every way suited for the production of spirit of nitrous ether, equal in strength and similar in composition to that described in the British Pharmacopœia:—

Take of Nitric Acid, sp. gr. 1·42 . . . . 3 fluid ounces.
Sulphuric Acid, sp. gr. 1·843 . . 2 fluid ounces.
Copper, in fine wire (about No. 25) 2 ounces.
Rectified Spirit . . . . 3 pints.

To one pint of the spirit add gradually the sulphuric acid, stirring them together; then add, in the same way, 2½ fluid ounces of the nitric acid. Put the mixture into a retort or other suitable apparatus, in which the copper has been introduced, and to which a thermometer is fitted. Attach now an efficient condenser, and applying a gentle heat, let the spirit distil at a temperature commencing at 170° Fahr., and rising to 175°, but not exceeding 180°, until 12 fluid ounces have passed over and been collected in a bottle kept cool, if necessary with ice-cold water; then withdraw the heat, and having allowed the contents of the retort to cool, introduce the remaining half-ounce of nitric acid, and resume the distillation as before, until the distilled product has been increased to 15 fluid ounces. Finally, mix this with the remaining two pints of spirit.

In this process, when the heat has been applied, and the temperature of the liquid has reached about 150°, numerous minute bubbles of gas are observed to issue from the surface of the copper, and these increase until the temperature has reached 170°, when nitrous ether begins to be formed, and the liquid, at the same time, becomes coloured with a salt of copper. The temperature now quickly rises to 175°, at which, if the heat applied to the retort be properly adjusted, it will remain with scarcely any variation throughout the process. At the temperature of 175° the distillation proceeds rapidly and steadily, the surface of the liquid in the retort being covered with a froth of about half an inch in thickness, and the space above it being filled with a transparent vapour of a yellowish colour. This colour is not due to the presence of nitrous fumes, but appears to be that of the ethereal vapour. The effervescence in the liquid is evidently not that of ebullition, but of chemical action, and this does not alter either in its nature or intensity, the distilled product continuing unchanged from first to last. I have never found it necessary to alter the source of heat while the distillation is proceeding if it be properly adjusted at the commencement, and the process will often go on to the end without a variation of more than one or two degrees of temperature. When about twelve fluid ounces of liquid have been distilled the action will slacken, in consequence of the exhaustion of the nitric acid, and this will be immediately indicated by the disappearance of the froth on the surface of the liquid. The suddenness with which this usually takes place is remarkable. It is followed by a rise of temperature in the liquid, if the applied heat remain unaltered, but when the temperature reaches 180° the heat should be withdrawn, and the contents of the retort allowed to cool. There will still be a portion of the spirit left in the retort, together with sulphuric acid, sulphate of copper, and undissolved copper, and it is for the purpose of converting this spirit into nitrous ether that the remaining half-ounce of nitric acid is directed to be added. When this addition has been made the distillation is to be resumed as before, until the distilled product amounts to 15 fluid ounces. This product consists of a strong spirituous solution of nitrous ether containing thirty-five per cent. of the crude ether. On mixing it with the remaining two pints of spirit, it will have the strength indicated in the British Pharmacopœia of 1864, and will nearly answer to the other tests and characters there given. The specific gravity will be 0·845. If it be mixed with twice its volume of a concentrated solution of chloride of calcium, from two to three per cent. of nitrous ether will separate and rise to the surface of the liquid. This indicates the presence of ten per cent. of ether, as eight per cent. remains unseparated.

Spirit of nitrous ether made in this way, is, I believe, equal in every respect to that produced by any of the previously adopted processes, and it is better and stronger than most of what is met with in commerce. It is much stronger than that made by the London process, although the quantity of nitric acid employed in its production is less than one-half, and the loss of spirit is less than one-third, what they are in that process. It is therefore a very economical method of preparing the product; in fact it surpasses all the other processes in this respect, as there is no avoidable loss of nitric acid or alcohol, and the copper which is dissolved is recovered as sulphate of copper. Only about half the quantity of copper used, however, is thus dissolved; that which remains may be employed in a subsequent operation. But the principal recommendation to the process is that it affords the means of obtaining spirit of nitrous ether, on the large or small scale, of definite and uniform strength and composition, and of perfectly good quality. As these objects can be thus attained with ease and certainty, without any increase, but rather at a reduction, of cost, there will be no excuse for any other variation in the product than such as may arise from the change which necessarily takes place to some extent when it has been long kept in contact with the air.

Having now explained the practical details of this process, I shall not pursue the subject further on the present occasion, but reserve for a subsequent communication the notice of some points in connection with it, the investigation of which I have not yet completed.

The Chairman, in expressing the thanks of the meeting for this communication, remarked that it related to a preparation extensively used in medicine, but which had always been very uncertain in its strength and composition, and had frequently been the cause of complaint against those who supplied it in what was considered to be an improper state. The process, which they had all had an opportunity of witnessing,* appeared to be a very good and a

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* During the reading of the paper the process was put into operation before the meeting.

very easy one. The meeting would be glad to hear whether this was the process that it was proposed to introduce in the new edition of the Pharmacopœia.

Professor REDWOOD answered in the affirmative.

A CRITICAL EXAMINATION OF THE VARIOUS PUBLISHED PROCESSES FOR THE ESTIMATION OF TANNIN.

BY MR. JOHN WATTS.

There is, perhaps, scarcely any substance in the whole range of organic chemistry, of really more practical importance to chemists than the old and familiar body known as tannic acid, and yet on account of the difficulty of preparing it in a state of purity, on account of its proneness to pass to other states of oxidation, and from its want of crystallizability, the chemistry of this body still remains in an imperfect state, and one even now hesitates what formula to adopt, when it becomes necessary to assign some composition to it.

Moreover, from the frequency with which tannic acid occurs in the vegetable world, it often becomes necessary to ascertain the percentage amount, and having had occasion very frequently of late to do this myself, and, at the same time, knowing that it is by no means an easy matter to obtain satisfactory results, I thought that an examination of the various processes which have, from time to time, come before our notice, by publication in the various journals, would tend not only to assist others who may be engaged in the same pursuit, but also to throw some additional light upon the various reactions and combinations of this substance. Although the tanning of hides, by means of astringent vegetable infusions, is of very great antiquity, it is only within recent years that Seguin first showed that it was owing to the combination of the tannin with the gelatine of the skin, and upon this knowledge founded a process for estimating the strength of tanning materials, which I think may be considered as the earliest known; as however this is an important method, I will first notice some others, which, in my hands, have proved less satisfactory, and revert to it again subsequently.

*Monier's process.**—In the 'Comptes Rendus' for 1858, a method is introduced by M. Monier, which depends upon the well-known reaction of permanganate of potash with organic bodies, oxygen being given up, while carbonic acid is evolved—

$$\dagger\ \underbrace{C_7H_6O_5}_{\text{Gallic acid.}} + O_{12} = 3\,H_2O + 7\,CO_2.$$

The reaction for tannic acid being nearly the same, save that some other body hitherto undetermined, is simultaneously produced.

To apply the permanganate, it is necessary to prepare first a solution of tannin of known strength, say 1 per cent., which serves subsequently to indicate the proportion of tannin present in the sample operated on by means of comparison. Taking oak bark as an example, exhaust 10 grammes by boiling with water, acidulate the decoction with hydrochloric acid, and after repose or filtration to separate any coagulated albumen, take 50 c. c. by means of a pipette, of course having previously made the solution up to a known volume. Into a beaker of the same size, measure 50 c. c. of the standard tannin solution, acidulate it with dilute sulphuric acid, and add from a burette, solution of perman-

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* 'Comptes Rendus,' 1858, p. 577. † C=12, O=16.

ganate of potash to both beakers, till precisely the same rose-tinted colour is produced in each. The volumes V and V_1 of permanganate consumed, are, of course, proportional to the quantity of tannin contained in the liquors, and the amount of one being known, the other can be calculated without any difficulty. He then proceeds to enumerate certain bodies, which in dilute solutions appear to have no action upon permanganate, but which in the concentrated state act slowly; such are citric and tartaric acids, sugar, gum, fats, theine, caffeine, quinine, etc., and to eliminate the action of such substances, states that it is only necessary to have the solution sufficiently dilute, so that they may be present in ess than one-half per cent.

Now all this reads very well, and if we were operating on pure tannic acid, nothing could be more simple; but unfortunately for it this is never the case, and to attempt to use permanganate with deeply coloured infusions is absolutely impossible, while to dilute the liquor to such an extent as to nullify the effect of the colour, is only practicable in a very few cases; imagine the rose tint visible in infusion of catechu! But this is not all, other organic matter than that operated upon is present in the solution, and to say that it has no action because it is at first imperceptible, is not chemical analysis, nor could any such results be accepted as accurate.

*Commaile's process.**—The next process I would mention, is that of Commaile, published a short time since. It is based upon facts noticed by M. Millon in the 12th vol. 3rd series of the 'Annales de Chimie,' that many organic substances comport themselves in various manners, when their solution is heated with iodic acid, in presence of a small quantity of hydrocyanic acid. Some are not affected, whether H Cy be absent or present, others only when absent, while the class of astringent matters are acted on only when a small proportion of hydrocyanic acid is present with them.

To operate, take a known weight of substance, boil with water and filter, add a few drops of H Cy, and boil again gently for a quarter of an hour with a slight excess of I_2O_5; all the iodine set at liberty disappears. Cool, decolorize with animal charcoal, and estimate the iodic acid remaining in the liquor.

This latter may be done in several ways;—1, as argentic iodide by reducing the iodate with sulphurous gas; 2, as argentic iodate; 3, by means of a standard solution of indigo in sulphuric acid; 4, by a standard solution of iodide of potassium; and by these methods he has proved that 1 gramme of tannic acid = 2·32 grms. of iodic acid, and 1 grm. of gallic acid = 2·366 of the same.

Great credit is due to M. Commaile, for the manner in which these results are worked out, and the original paper well repays perusal, it appears to answer in practice pretty well, several results being fairly coincident, but the whole is too bulky, and the necessary decolorization with charcoal almost fatal, for unless it be removed it is impossible to work, and to get rid of it entirely is a very difficult job.

Handtke's process† is a volumetric one, depending on the precipitation of the tannin by solution of peracetate of iron, some acetate of soda being added to cause the separation of the precipitate. Prepare a solution of peracetate of density 1·14, and to 16 grms. of this liquid add 8 grms. of acetic acid and 16 grms. of acetate of soda, with sufficient water to fill a litre measure; this is used as a volumetric solution, the termination of the operation being known by the liquid ceasing to form a precipitate. M. Handtke, however, practically condemns this himself, by stating that the solution of peracetate will not keep, and further, that it is only available for substances such as are used in tanning, for the astringent matters of coffee, tea, and other leaves and flowers, do not form a permanent precipitate.

* 'Comptes Rendus,' tome lix. p. 398.

† Journ. für Prak. Chem. b. 82, p. 3465.

*Marriage's method** advances us no further in this direction; it consists in precipitating the tannin by means of solution of ammonio-sulphate of copper; but this salt of copper precipitates many vegetable infusions containing no tannin, and further, I could never succeed in ascertaining the end of the operation; although Mr. Marriage states that the colour towards the termination of the reaction almost vanishes, certainly I never found it to do so, for if there was any alteration it appeared to be in the opposite direction.

Pelouze and Stephens simultaneously proposed to estimate tannic acid by combining it directly with cortical tissue, as in tanning. For this purpose small strips of the best ox-hides, shaved thin, are washed in water, thoroughly dried and weighed, they are then soaked in water till they become soft and porous, when they are transferred to the solution to be analysed; the increase in weight, caused by absorption of the tannin, after having been brought to the same state of dryness as before, gives the proportion of tannin present.

This, though apparently an unexceptionable method, fails to give satisfactory results, for in the first place the operation has to extend over a lengthened period, as the acid is very slowly absorbed; and, secondly, owing to that length of time, the infusion is apt to become partially converted into gallic acid; moreover the skin takes up small quantities of other bodies, such as colouring matter, etc., which tend more or less to affect its weight.

Hammer's process.†—The foregoing method has been modified by M. Hammer, who estimates the strength of a solution by ascertaining the specific gravity before and after the removing the tannin. Having first noticed the density, precipitate the tannin by agitation with rasped animal hide, filter, and take its density again; the difference between these two specific gravities shows how much is due to the tannin present. By means, then, of a table which he has prepared, an approximation to the percentage may be obtained.

These six preceding processes, from the various objections stated, I have found not to work well; that is, they do not possess that accuracy which, combined with a certain amount of simplicity, is necessary to the success of the analysis. We now come to three other methods, which I believe, as far as our knowledge at present carries us, are the only processes by which astringent bodies can be practically analysed.

The Gelatine process.—This well-known method may be very properly divided into two parts, viz. the old, and, I may say, the now obsolete mode, and its more recent modification by Mulder. The whole consists in precipitating the tannin solution by means of a volumetric solution of gelatine.

Sir Humphry Davy used to analyse with gelatine gravimetrically, filtering off the precipitate, drying it, and reckoning $\frac{2}{5}$ of the whole as pure tannin; this has, however, been shown to be both tedious and incorrect, as the solution refuses to filter, and the first portions precipitated contain by far a larger proportion of tannin than do those which fall towards the end.

As it is also perfectly impossible to work by the old volumetric method, we will at once proceed to Mulder's excellent improvement upon it; he says, "after many trials, I found that the addition of a small quantity of alum to the solution of gelatine, furnished a suitable means to enable tannin to be precipitated without any difficulty from any fluids containing it, so that it may be determined with the greatest exactitude. The separation of the precipitate takes place so readily and completely that in the course of a few minutes the fluid over the precipitate becomes quite limpid, and consequently may be immediately tested for any possible residue of tannin."

To prepare the gelatine solution, dissolve in a litre of water 3 grammes of

* Pharm. Journ. 1862, Vol. III. p. 509.

† Journ. de Chimie Méd., and Pharm. Journ. 1862, Vol. III. p. 433.

isinglass, and add to it about 1 grm. of powdered alum. To ascertain the quantity of tannin which 1 c. c. of this solution represents, dissolve 2 grms. of tannic acid accurately in 1 litre of water for a standard solution, of which every 10 c. c. will therefore contain ·02 grm. of tannic acid. Measure now 50 c. c. of this latter solution, containing ·1 grm. of acid, into a beaker, dilute it somewhat with water, and drop in from a burette the aluminous solution until the falling of a drop on the surface no longer produces the characteristic ring of tannate of gelatine, then allow the precipitate to settle; next take a drop out carefully by the end of a glass rod, drop it on to the surface of a black glass plate, and there test it for excess of either tannin or gelatine, by bringing in contact with it a drop of either solution, and observing whether any cloudiness occur at the junction of the two drops; when the exact point has been ascertained at which the gelatine no longer produces a precipitate, which requires some practice to hit exactly, the number of cubic centimetres of gelatine solution consumed correspond to ·1 grm. of tannic acid.

Mulder does not appear to have tried this process with such substances as catechu and kino, at least I can find no notice of it anywhere, and this is its weak point, for with this class of bodies, the precipitate, even with the addition of alum, certainly will not settle, and I failed to obtain by it even an approximative analysis,—with such the antimony process to be next noticed will be found to answer much better; but with everything of the nature of wood, barks, roots, leaves, etc., the exact point of precipitation may be ascertained within half a c. c., and the percentage calculated without the slightest difficulty.

In operating, I prefer to extract the soluble portions with hot water, and to pour off the clear liquor without filtering, as the small particles thus remaining in the solution appear to assist considerably in accelerating the subsidence of the precipitate.

*The Antimony process.**—About four years ago, Dr. B. W. Gerland published a process in the 'Chemical News' for the estimation of tannin, which he considered as an improvement upon all others up to that date, and it certainly upon trial appears to answer remarkably well; he effects the precipitation of the tannin by means of a volumetric solution of tartar emetic, in presence of some ammoniacal salt, such as the chloride. Now although tartar-emetic will give a precipitate of tannate of antimony, even in pure solutions of tannin, a considerable time must elapse before the precipitate manifests at all, and it never subsides, let the solution stand ever so long; but the addition of chloride of ammonium acts even more remarkably than does alum with solution of gelatine, for the tannate of antimony instantly forms, and subsides as a dense white curdy precipitate, leaving the supernatant liquor quite clear, and ready to be tested for excess of either tannin or antimony.

In preparing the volumetric solution, Dr. Gerland calculates the proportion of oxide of antimony necessary to combine with 1 gramme of tannic acid, taking $3(C_{18}H_8O_{12}) = 636$ as the formula for the latter, and the composition of the precipitated tannate of antimony $SbO_3, 3(C_{18}H_8O_{12}) = 789$, consequently by dissolving 2·611 grms. of emetic tartar, dried at 100° C. in a litre of water, a solution is obtained, 1 c. c. of which (containing ·002611 grm.) will exactly precipitate ·005 grm. of tannic acid.

Now, for my own part, I prefer to standardize the antimony solution in the same manner as with gelatine, by dissolving a known weight of tannin in a litre of water, ascertaining the number of c. c. required to exactly precipitate 100 c. c. of the tannin solution, and by this means arriving at the precipitating power of the tartar-emetic in hand; for according to Strecker's more recent analyses $C_{27}H_{22}O_{17} = 618$ is the correct equivalent to be given to tannin, and

* 'Chemica News,' vol. viii. p. 54.

consequently to calculate with 636 must involve an error, more or less, in one direction; but by putting aside all calculations depending upon formulæ when possible, as in this instance, and preparing the volumetric solution as before noticed, we have a very excellent method before us, and capable too of easy application.

The operation is conducted in precisely the same manner as with gelatine: a certain quantity having been run into the beaker, it is allowed to settle, and a drop taken out on to a piece of black glass; by letting fall carefully another drop of emetic solution on to it, it will be immediately seen whether the precipitation be complete or no, and so on till the exact point has been obtained.

To ascertain the approximate amount of antimony solution required by a certain quantity of material, I have been in the habit of employing a modification which will be found to answer very satisfactorily, viz. by taking six beakers, and having exhausted, say 60 grms. of astringent substance, I make the decoction up to 600 c. c. I then measure 100 c. c. of it into each beaker, in order that the soluble portions of 10 grms. of substance may be contained in each. 10 c. c. of antimony solution are then run into the first, 15 into the second, 20 into the third, and so on; by testing then each beaker as before explained, it is very easy to see in which there is an excess of tannin and in which an excess of antimony. Thus, if the beaker into which we ran 15 c. c. of antimony, should, on testing, indicate the presence of tannic acid, while that which has had 20 c. c. of antimony shows an excess of the latter, it is obvious that 10 grms. of the substance used will require for the precipitation of its tannin a quantity of tartar-emetic solution lying between 15 and 20 c. c.; by exhausting some fresh material, and operating over again, the exact point of precipitation will be very readily obtained.

The analysis of catechus and kinos, by this method, still presents some difficulty, and to coax the precipitate into subsiding will tax the patience of most operators; sometimes the addition of a little alum or a few cubic centimetres of alcohol will effect it, and I have found that merely warming the solution gently for a few minutes will sometimes cause the precipitate to settle sufficiently, so as to enable it to be tested as above; but in all cases it will be found rather more tedious than when working upon such bodies as oak bark, or its analogues.

This process possesses the same advantage as the gelatine, in not precipitating gallic acid, and excels it in the fact that the precipitate is denser, and more readily subsides. Brande says that "gallic acid and the alkaline gallates throw down a precipitate from solutions of emetic tartar, containing about 43 per cent. of oxide of antimony." This, however, as regards gallic acid is not a fact, for I have specially examined it on this point, and find that no reaction takes place between them, when the acid is in the free state; but to effect the combination of it with antimony the freshly precipitated Sb_2O_3 must be employed.

Mittenzwey's process,* which is the last that I have to notice, is in substance a new application of a well-known fact, namely, that an alkaline solution of tannin will rapidly absorb oxygen whenever that element is allowed access to it; and it is by means of the volume so absorbed, which is of course proportional to the quantity of tannin present, that M. Mittenzwey proposes to calculate the percentage of the latter.

The process is conducted in the following manner:—A bottle capable of holding about a litre and a half is fitted with a good cork, perforated to admit the passage of a length of glass tubing, which projects above the cork about 50 mm., and on entering the bottle is slightly bent towards the side. This is connected to a second similar piece by a moderately long piece of india-rubber tubing provided with a pinchcock to close it. Having arranged the bottle as above,

* Journ. für Prakt. Chem. no. 2, 1864, p. 81.

introduce into it 150 to 200 c. c. of a 2 or 3 per cent. caustic soda, or 3 to 5 per cent. potash solution, and then drop in about 1 gramme of tannin, loosely wrapped in paper, close the bottle instantly, and open the pinchcock just for a moment to equalize the pressure between the external and internal air. The absorption of oxygen commences immediately, and is hastened by strongly shaking the bottle, which must be wrapped in a cloth, to avoid raising the temperature by the warmth of the hand.

To ascertain the quantity of oxygen absorbed, weigh about 250 c. c. of distilled water into a beaker, and dip the end of the exterior glass tube into it; on opening the pinchcock, the water, owing to the vacuum in the interior, will flow into the bottle, at the same time taking care that the fluid in the two vessels is kept at the same level, so as to avoid unequal pressure. The experiment is ended, when, after repeated shakings, no more water runs from the beaker into the bottle, and the difference in weight of the water in the beaker, in grammes, gives the amount of oxygen absorbed in cubic centimetres, which can be corrected for the standard temperature and pressure.

The next thing to find out is, how many c. c. of oxygen are equivalent to a definite quantity of tannic acid: now Mittenzwey says that 1 grm. of tannin will absorb the amount of oxygen as ·7 grm. of gallic acid, viz. 175 c. c. at 20° C., and in twelve experiments the greatest variation observed was 2 c. c. with tannic, and 1·2 c. c. with gallic acid. Of course the whole value of the process depends upon the accuracy of these determinations, and with the hope of verifying them, if possible, I instituted a series of experiments having that end in view, and the result of those experiments is, that I am quite assured that 175 c. c. is not the correct volume absorbed by 1 grm. of tannin at 20° C.

After repeated trials, I found that 1 grm. of commercial tannin absorbs, with considerable uniformity, 225 c. c. of oxygen at the above temperature, and the following are the numbers upon which this assertion is based:—

							Calculated for 1 grm. at 20° C.
·783	grm.	at 10° C.	absorbed	169·2	c. c.	=	224·1.
·671	,,	,,	,,	145·8	,,	=	225·4.
·694	,,	13·85° C.	,,	152·8	,,	=	224·0
·801	,,	,,	,,	175·9	,,	=	224·61.
·821	,,	14° C.	,,	181·4	,,	=	225·9.
·732	,,	13·5° C.	,,	161·6	,,	=	226·1.

The greatest variation being 2·1 c. c.

Several points must be particularly attended to in order to ensure a correct analysis, which, though simple in themseves, if neglected are certain to vitiate the result.

1. Ensure that the bottle is accurately closed, else as soon as a slight vacuum is produced inside, the pressure of the external air forces some through the pores of the cork; to obviate it, brush the upper half of the cork over with sealing-wax, and before shaking lute it round with linseed-meal.

2. The temperature of the air with which the bottle is filled must be carefully noted, and when finished must be brought to the same temperature, before calculating the volume.

3. Sufficient length of time must be allowed for the tannin to absorb as much oxygen as it will; and if five or six operations be conducted at once, this may be readily done without inconvenience.

4. The bottle must be large enough to hold more oxygen than will be required; 1 grm. of tannin may be used in a litre and a half bottle, but not more.

5. The volume must be reduced to some standard temperature.

Although I have given 225 as the number of c. c. obtained in these experiments, there is no doubt that the theoretical volume is 231 c. c. at 20° C.; commercial tannin never contains more than 96 to 97 per cent., and that is the reason why the numbers do not approach with greater exactitude, but could we in any way procure chemically pure tannin to work upon, we should doubtless find that it would absorb exactly 231·1 c. c.

These results are remarkably corroborated by the labours of Büchner,* who some time since investigated the whole series of tannates and gallates, and amongst them specially examined the bodies produced, by the oxidation of tannin in alkaline solutions. By direct separation and analysis of the body so produced, he found that 3 equivalents of tannic anhydride, $C_{18}H_{10}O_9$, absorbed 24 equivalents of oxygen, carbonic anhydride being simultaneously produced, the composition of the resulting product being $C_{15}H_{10}O_{11}$:—

$$3\,(C_{18}H_{10}O_9) + O_{24} = 3\,\underbrace{(C_{15}H_{10}O_{11})}_{\text{Tannoxylic anhydride.}} + 9\,CO_2.$$

Now if in Büchner's hands 3 at. of tannin consumed 24 at. of O, by free exposure to the air, there is no reason why it should not do the same under the present circumstances, and if so 1 grm. of the above composition would absorb 225·5 c. c. at 20° C. But the now universally received formula for tannin is $C_{27}H_{22}O_{17}$, and, therefore, from its somewhat lower atomic weight 1 grm. would absorb 231·1 c. c., at the same temperature and pressure. We see at once the similarity existing between these numbers and those obtained in the foregoing experiments.

I think this is sufficient to prove that 175, the volume given by Mittenzwey, should be superseded by 231; at the same time bearing in mind to whom the credit for the introduction of the process is due. There is one slight drawback in the fact that it reckons everything that will absorb oxygen as tannic acid, so that if gallic acid be present the tannin in a fresh sample must be precipitated by albumen or gelatine, the gallic acid separately determined, and then deducted from the total amount; in all other respects the process answers well, and in accuracy of result, in giving a minimum of trouble, and in rapidity of execution is excelled by none, and it may, without hesitation be adopted by any one who may have occasion to make an analysis of an astringent substance.

Such are the various processes which have, from time to time, been published for the estimation of tannin; and although I am of opinion that its analysis may be effected in other ways, such perhaps as a tannate of an alkaloid, or by oxidation with plumbic peroxide, I have forborne to bring them forward on the present occasion, because as yet they are not found to possess any decided advantages over the processes already known, and further, because I am aware that in practice as well as in theory it is useless to supplant one process or hypothesis by the substitution of another, without affording a more satisfactory explanation of questions at issue.

Baker Street, Portman Square, W.

The Chairman thanked Mr. Watts for his paper, but said, at that late hour it would be impossible to enter upon a discussion of it.

Mr. Hemingway laid two bottles on the table, containing tincture of hemlock, to which reference had been made by Dr. Harley in a communication on that subject. He said he was authorized by Dr. Harley to state that he hoped at the next meeting of the Society to make a further communication on the preparations of hemlock, relating to those of the fresh plant.

* Annalen der Chem. und Pharm. b. 53, p. 175–369.

THE DINNER FOR THE BENEFIT OF THE BENEVOLENT FUND OF THE PHARMACEUTICAL SOCIETY.

MR. GEORGE WEBB SANDFORD, PRESIDENT, IN THE CHAIR.

This festival took place at Willis's Rooms, on Wednesday, the 20th of February, a day which will be long remembered by the Founders of the Pharmaceutical Society of Great Britain; a day worthy of "red letters" in their calendar, and perhaps a day to which many a future widow or orphan may recur with gratitude and thankfulness. The musical arrangements were under the direction of Mr. Young, assisted by Messrs. Wilbye Cooper, Farquharson, and King. Mr. Harker, jun., acted as toastmaster.

This was the largest gathering of pharmaceutists which ever occurred, and they brought with them friends ready to promote one great object of the Institution—the relief of distress,—friends to whom the Society owes a deep obligation for the hearty and liberal manner in which they came forward to augment a Benevolent Fund, special in its character. Among the visitors we noticed Mr. Vanderbyl, M.P., the Rev. Walter Mitchell, Drs. Quain, Saunders, Langdon Down, Silver, Tilbury Fox, Leared, Simms, Buchanan, Musgrave, and Frankland; Messrs. Ernest Hart, Flux, Ellis, Quincey, Forster, Lansdown, A. and L. Newbery, Barclay, Nicholson, W. P. Brook, Alfred Penny, and many other gentlemen. We saw also Messrs. Frederick Barron (one of the most active promoters of the dinner), Becket, J. Herring, M'Culloch, Watts, Horner, Hill, Evans, Hopkin, Williams, Westwood, Savory, Messer, Daniel Bell, Hanbury, and many representatives of the wholesale houses, with a very large sprinkling of Chemists and Druggists unconnected with the Pharmaceutical Society. In all, 264 sat down to dinner.

It was required to raise the amount of invested capital from seven to ten thousand pounds, and the dinner has accomplished half that work, a sum exceeding fifteen hundred pounds having been collected. For the present, at least, the Council need not scruple, if there be need (and the President said there was need), to add to the number of annuitants.

Those who worked in the beginning with Jacob Bell and the more forward men of that day must have been reminded of their early exertions, and gladdened by the evidences of success which surrounded them; they must have felt almost that the spirit of Jacob Bell had descended on the meeting, once more bringing all chemists and druggists into union for one common object. Not only members of the Pharmaceutical Society, who have a vested interest in this fund somewhat of the nature of a contingent assurance company, but the trade generally seemed moved by a desire to come together in harmony, acknowledging that the Society had faithfully carried out the objects of its founders, had elevated their body to the rank of a profession, lessening, or indeed obliterating altogether, the feeling of jealousy and distrust which formerly existed between "doctors and druggists," and obtaining in its stead such hearty goodwill and just appreciation as were so generously expressed by Dr. Quain and Mr. Ernest Hart.

We augur much good from this meeting, and we cannot help associating it with others which have recently occurred. That at Bloomsbury Square, on the previous day, proved the desire of chemists already established, and familiarly spoken of for the last few years as "outsiders," to come into the Society. The more brilliant assembly of the 30th ultimo, at Willis's Rooms, where the happy union of Chemists and their Assistants at a Ball entirely inaugurated by the latter, made us hopeful as to the future; to the assistants and apprentices of this day we look for the life-blood of the Society in time to come, and it was no small pleasure to hear the "Surplus of the Chemists' Ball Fund" enumerated among the contributions when the Secretary announced them after the dinner.

At the conclusion of dinner, "Deum Laudate" having been sung by the vocalists present,

The PRESIDENT said, the honour of occupying the chair on that occasion was to be attributed to the office he had held for some years past, that of President of the Pharmaceutical Society. He could dispense with the honour, but he was afraid that in so doing it might be considered that he would shirk his duty, and he hoped he should never be found to do that. He would ask them to perform their duty by drinking the health of the Queen. It would be an insult to say anything in commendation of the toast, for her Majesty lived in the hearts of her people, and he knew they would feel much pleasure in drinking long life and happiness to the Queen.

The toast was followed by the National Anthem.

The PRESIDENT said they followed naturally from the Queen to the heir apparent, and long might it be before he was anything else. This toast would include her Royal Highness the Princess of Wales, and the rest of the Royal Family; and when he informed them that the Royal Family had recently been increased by the birth of a princess, he hoped it would be a matter of congratulation. They had been saddened from day to day by hearing that the Princess of Wales was suffering from rheumatism, and they were gladdened that morning to hear that she had given birth to a princess. He would therefore give them the healths of the Prince and Princess of Wales and the rest of the Royal Family, not forgetting the new arrival.

Song—"Nina," by Mr. Wilbye Cooper.

The PRESIDENT then proposed the Army and Navy, and the Volunteers. They respected these services, and desired to keep them in full efficiency, believing that by so doing they were not likely to require them. The Volunteers were a very popular body. Their establishment was a great and glorious ebullition of feeling on the part of Englishmen, and their true character was shown by the inscription on one of their banners—"Defence, not defiance." That was the true spirit of Volunteers. The three services were represented on that occasion; the army by Dr. Saunders, the navy by Dr. Musgrave, and the volunteers he did not know by how many, but he believed Mr. Williams would respond.

Dr. SAUNDERS, in returning thanks for the Army, said he felt it a high honour to have his name associated with that distinguished service. He had had the privilege of serving for many years in the army in various portions of the world, and he could assure them that officers, when serving abroad, felt great gratification in knowing that on every festive occasion when Englishmen met, they would never be forgotten, and that the service would be held in the highest estimation. It was some consolation to those who left wife, family, and friends, and it compensated somewhat for those privations and risks they ran, not only before the enemy, but in the deadly climates they had to contend with. They looked also to their fellow-countrymen for something more, viz. to that generous forbearance which they were entitled to when they were placed in circumstances of great exigency and political excitement, and were called upon to act. They invariably did the best they could in their judgment, knowing the circumstances by which they were surrounded, and the particular exigencies of the time. They might sometimes go beyond the spirit of the law in order to save a colony, in which case they might well ask those at home to extend to them a generous forbearance. He should blush for his countrymen if he felt that they accorded less, and he should tremble for his country's welfare if he thought that those high-minded and highly distinguished men—many of them the scions of the noblest families in the land—wanted that forbearance and support from the country which was expected, and have to follow the pseudo-religious enthusiasm of Exeter Hall and such-like places. If they were to keep their colonies,—those colonies which had been the means of making England a great, glorious, and free country,—they must give a generous support to those who were placed under great difficulties and in trying positions.

Dr. MUSGRAVE returned thanks for the Navy. He regretted, however, that some one more worthy than himself had not been called to discharge that duty. The navy, he was happy to say, was as popular now as it had ever been; and he felt certain that whichever party might be in power, the navy would be kept up in a most efficient manner, and that if actually required they would be found to fight their country's battles with the same courage and bravery as had distinguished the service in bygone years.

Mr. WILLIAMS briefly returned thanks for the Volunteers.

Song—"Oh, firm as Oak," by Mr. Farquharson.

The PRESIDENT said he had now to propose a toast in which the public were greatly interested, viz. the Colleges of Physicians and Surgeons, and with which the Pharmaceutical Chemists were in intimate relation. It was the way of the world to feel proud in speaking of rich relations, if they had any, but on that occasion their rich relations had not been backward in recognizing them. They were happy in having excellent testimony borne towards them by the physicians and surgeons as a body as well as individually. The relationship existing between prescribers and dispensers, thanks to the Pharmaceutical Society, had been greatly improved, and the more they were educated in their profession, the less likely were Pharmaceutical Chemists to trespass on the province of the surgeon or physician. He should connect with the toast the names of Dr. Quain and Mr. Ernest Hart.

Dr. QUAIN thanked them most sincerely, on behalf of the College of Physicians, for the warm and enthusiastic manner in which the toast had been received. He rejoiced most sincerely at the close relationship that existed between physicians and Pharmaceutical Chemists, for without them the physician would be helpless. He recognized most sincerely the expression used by the President, that by increased education Pharmaceutical Chemists would be the better able to discharge their important functions, and be the less likely to trespass on the profession of the physician. There was in educated pharmacy abundant employment for talent, and he hoped abundant materials for reward and success in life. He recognized with sincere satisfaction the efforts that were being made by the Pharmaceutical Society to advance the education of pharmaceutists, and he sincerely trusted that their efforts would be successful, and that they would be supported by the Government and Parliament. If any evidence were required of the intimate relationship which existed between the physician and the Pharmaceutical Chemist, it would be found in the fact that when the Medical Council required assistance to frame a new Pharmacopœia they sought and obtained it from the Pharmaceutical body, in the great knowledge possessed by Professor Redwood and Mr. Warington. In a few days that book would be before them, and he hoped it would be the means of saving the body considerable trouble. The book would be found to contain much that was new, and he hoped it would bring back many of their old familiar friends, whilst the arrangement would greatly facilitate their labour.

Mr. ERNEST HART acknowledged the honour that had been done him, in associating his name with the toast of the College of Surgeons. He had been called on rather unexpectedly to do so, but he must say that he highly appreciated both the honour and the manner in which the toast had been received by so numerous and highly respectable an assemblage. Every branch of the medical profession must sympathize with the efforts which the Pharmaceutical Society had made, and acknowledge the great success the Society had achieved in improving the pharmacy of the country, and no one was more sensible of it than the members of the Royal Colleges of Physicians and Surgeons.

Round—"Yes, Brothers, yes!"

The PRESIDENT said he had now to propose to them what in such meetings was commonly called the toast of the evening, and in so doing said that he felt perfectly certain that any deficiency on his part in proposing would be more than compensated by their heartiness in responding. In proposing the toast of the Benevolent Fund of the Pharmaceutical Society, he need not remind them that the establishment of such a fund was one of the first objects named in their Charter, and that it was to be devoted to the relief of distressed members and associates, their widows and orphans. The same charter also provided that the Pharmaceutical Society might from time to time set apart a portion of their general fund for benevolent purposes; in the early days of the Society that was done to the extent of £1500, but of late years they had not been able to do so in consequence of having lowered the annual subscriptions, and of the great demands upon the Society for the very high objects for which it was originally formed. The fund had therefore to rely entirely on the benevolent feeling of the members, and the result had been to a certain extent satisfactory, a large amount having been raised from that source. They had now, he was happy to say, an invested capital of £7000, which amount was yearly increasing. As was to be expected, the claims on the fund were more numerous than at first, and, as the Society got older the age of members increased, they must expect the claims to increase in proportion. During the past month the applicants for casual relief were so great, that they gave away as much as £90. When the fund was established, it was contemplated that annuities should be granted as well as casual and ordinary relief, so soon as they had an invested sum of £10,000. The fund, however, had not, unfortunately, reached that amount. The fund had gone on very slowly at first, but in 1865, although they had only between £6000 and £7000, the Society, instigated by some of its more active members, and among them he could not help specially naming Mr. Orridge, granted two annuities of £30 each; it was his privilege, as President of the Society, to hand it to the recipients, and he should always remember it with great pleasure. Since then they had granted two others, and were now paying £120 per annum in annuities, with an income only of £200 from the invested sum, leaving a balance in favour of the Society to the extent of about £80. He was of opinion that it was prudent, and he hoped he should not be considered uncharitable in saying so, that they ought to be exceedingly cautious, and not grant annuities up to or beyond the amount of their invested capital, because if they were to make grants beyond the positive means of the Society to pay, they would be defaulters, morally speaking, to the annuitants whose trustees they were. He thought therefore that it was their bounden duty to raise the fund to £10.000 at once,—no great sum considering they had at present about £7000 invested. They had now many applications for relief,—one, the widow of a man who under peculiar circumstances fell into difficulties, and since his death his wife had had to support herself by her needle. She had in consequence of her sad reverse of fortune been obliged to apply to the Society for casual relief,—and from the circumstances connected with the case, the Society would only be too happy could they grant the poor widow an annuity. He therefore hoped that when they considered the amount of distress that unhappily prevailed, and how small a sum was required of each person to afford relief, that they would liberally respond to the appeal that was now made to them, and would not only make up the fund to £10,000, but go forward in the same course. It had been suggested that other benefits might be conferred on the trade by this Society, such for instance as endowed schools, but that was a very large question, at present quite beyond their means of accomplishing; and another suggestion was the establishment of residences for the pensioners; some member had gone so far as to send them in an estimate for the building. There was also a matter which they could entertain, and at that time,—a proposition that £2000 should be raised by a certain number of gentlemen by instalments. He considered it a very good suggestion, and he had thrown it out for their consideration. It should be borne in mind that great advantages might and must result to members by aiding this fund, for it very often happened unfortunately that prosperity in youth did not continue in old age. The fund as at present established was only applicable to Pharmaceutical Chemists, and in distributing the fund the Council had occasionally felt great difficulty, and had wished that they could have applied some to members of the general body of chemists and druggists, but he hoped the time would shortly come when they would all be of one body, and when all their unfortunate brethren would have a claim on this fund. He regretted to find that one of their old familiar friends, and a staunch supporter of the Society, was absent on that occasion, viz. Mr. Waugh. He had been one of the warmest supporters of the Society, he was a large-hearted, liberal man; and he was sure he need not inform them that it was domestic affliction, and not any want of interest in the fund, that kept Mr. Waugh away. That could not be better shown than in stating that Mr. Waugh had sent a check for twenty guineas, and his son one for five. He proposed the toast of the evening—The Benevolent Fund of the Pharmaceutical Society, with three times three.

Song—"And doth not a meeting like this make amends?" by W. Young.

Mr. Vanderbyl, M.P., in proposing the toast of the Pharmaceutical Society of Great Britain, said it was a society which, though only twenty-six years old, had assumed a position and had acquired for its members a station of which they might well be proud. When he was invited to partake of their hospitality he visited their house in Bloomsbury Square, and he had the pleasure of meeting there Professor Bentley, who was indeed an ornament to the Society. He had had the pleasure of knowing that gentleman many years. He was formerly a colleague of his, and he could fully appreciate and testify to the well-deserved merits he possessed and which were so highly appreciated by all students of medicine as well as the students of the Pharmaceutical Society. He had had an opportunity of visiting the museum belonging to the Society and their lecture hall, and of examining their library and collection of drugs and chemicals; and certainly, from what he saw on that occasion and from what he had heard that evening, he thought the advantage of becoming a member of the Pharmaceutical Society could scarcely be over-estimated. These were not advantages merely for the members, but they were advantages which were of immense benefit to the medical and surgical profession, and greater even than that were the benefits which they conferred on the community at large, in the satisfaction they must feel in having their medicines which were prescribed by physicians dispensed by men of education. A matter of great importance, not only to the members of the profession but also to the public, was the exemption of Pharmaceutical Chemists from serving on juries, and that was an advantage that could scarcely be over-estimated by the public. And in referring to it he could not help recalling to his mind the eventful trial in 'Pickwick,' which no doubt they all remembered, where the chemist who refused to be sworn on the jury, tried to excuse himself by stating that he had only a boy in his shop—a very nice boy,—and that his prevailing apprehension was, that in the boy's mind Epsom salts meant oxalic acid, and that somebody might be murdered before the trial was over. The question was, how were the advantages which were possessed by the Pharmaceutical Chemists of Great Britain to be secured to them? In his humble opinion he thought that was to be done in two ways; firstly, by unity of action, and secondly, by the establishment of an *esprit de corps* amongst them. By unity of action, he meant the co-operation of all those respectable chemists and druggists who were not members of the Society. He had been informed that at present there were 2500 members,—a number which the most sanguine supporters of the Society when it was first established twenty-five years ago could scarcely have anticipated, it being in the proportion of one-third of the whole trade of England and Wales. Unity of action (speaking for himself, and without authority) he thought might be obtained by the admission of the remainder of the chemists and druggists as members of the Pharmaceutical Society, and that, he thought, might be obtained by following the example of the Colleges of Physicians and Surgeons, by having Members and Fellows. He was desirous that there should only be one Society, because however desirable competition might be in trade, it did not answer in the case of societies like the present, where it had naturally the effect of lowering the status of the profession, by one society giving degrees on a lower standard than the other. In conclusion, the honourable gentleman, in reference to his second proposition—the proper *esprit de corps* of the profession,—urged upon them to follow the example of Jacob Bell, and found scholarships for those who were unable to meet the expenses necessary on a proper course of study; and again submitting the toast, he coupled with it the name of Mr. Morson.

Mr. MORSON said that as an old member of the Council of the Pharmaceutical Society, he felt much pleasure in responding to the toast that had been proposed by the honourable gentleman, the Member for Bridgewater. It was highly gratifying to them to find that after twenty-five years' expenditure of much time and labour they had been so successful; and all, no doubt, would concur with him when he said how much they should have been pleased if Providence had so ordained it, as to have permitted Jacob Bell to witness the fruits of his labour. He was happy to say that they had not worked in vain. They had accomplished much good. When he commenced life they were a reproach to their Continental neighbours, but now, he was happy to say, they could take their place in Europe with the best body of chemists and druggists, and they would not fail to improve on it, and henceforth take their proper position.

Mr. EDWARDS said he knew he might claim the indulgence of the company in proposing the next toast, which was one of considerable importance, as it had only been confided to him since he had entered the room,—because if he had known it before, he would have striven with better words and more suitable address to recommend it, viz. the health of the President. He could assure them that it was not an honorary post, but one which made every demand on the time and attention of the gentleman who filled it. And he could assure them that of the many valuable Presidents they had had, none of them had filled the office with greater honour and usefulness than the gentleman whose health he asked them to drink. Any one could sit at the helm when it was fine weather, but when it was otherwise it required a man of courage and ability, and tasked his energy and skill. Their President, in his term of office, had had to devote his time and attention to a Bill which was promoted in Parliament, and involved waiting on Cabinet Ministers, and an attention to those who opposed it, besides other claims upon his time and patience; to all of which he had given a constant and sedulous attention. Whoever might hereafter fill the office, he felt satisfied they would never have a more worthy representative than Mr. Sandford. He could name many circumstances, if necessary, to commend the toast to their notice, but of all of them none would be greater than the announcement of the fact that yesterday all opposition to the proposed legislation ceased. He called upon them to drink with all their hearts the health of the worthy President.

The PRESIDENT, in returning thanks, said, that however much he might have been prepared for their reception of the toast, he was altogether unprepared to respond to the manner in which Mr. Edwards had proposed it, and had alluded to his past services. He must confess that he accepted the office with many misgivings, and a feeling that there were many others better able to fill it than he was. All he could say was, that whatever he had done for the Society had been done in the hope that the Society would fulfil the object for which it was established, viz. the advancement of pharmacy, which was only to be accomplished by bringing all its followers into union, and by their all working for one object. Allusion had been made to what had been done in Parliament, and also to what took place yesterday, and it afforded him great pleasure to be able to state that from it they might look forward to success, and that all who practised pharmacy would be united in one society, and do their best to maintain the dignity of the profession. It would have been a great reward to him if he could have seen a Pharmacy Bill passed this session, but he feared they must not expect that, under the present state of things in the political world.

Mr. HILLS proposed the health of the visitors, and begged to thank them for their support that evening. They were honoured with the presence of a member of the House of Commons, and also members of the medical profession. He also thanked the country members, who had come from all parts of the country, and some from great distances, to be present and to help the important object of that day's festival. Whenever the members of the Pharmaceutical Society were required, they were always ready in furthering the objects of the Society. There were also present gentlemen of the same trade, who although not members of the Pharmaceutical Society at present, yet he hoped, from what had taken place at the interview between the deputation of the "United Society" and members of the trade with the Council of the Pharmaceutical Society, that the next time they met in that room all would be members of the Pharmaceutical Society, and he welcomed them that evening. Then there was a gentleman representing a great institution of the State—he meant the Church. He was delighted to see him there, for he was not only a great ornament to the profession to which he belonged, but he was also a great crystallographer, and consequently he might be claimed as one of the Pharmaceutical body. He had great pleasure in proposing the health of the visitors, and thanking them for their presence and support on that occasion, and in coupling that toast with the name of the Rev. Mr. Mitchell, of St. Bartholomew's Hospital.

The Rev. Mr. MITCHELL acknowledged the compliment, and adverted to the great advantages which such a Society conferred upon the public generally as well as upon its members.

Dr. LANGDON DOWN proposed the School of Pharmacy. Allusions had been made to various departments of the institution—such as the Benevolent Fund, and the advantages to be gained by more specific Parliamentary enactment, but the most glorious thing in connection with the Society was its school of pharmacy. He was happy in being able to say that he had been a working pupil in that school, and he could bear his testimony to its great value. The Society did not seek to make itself a close corporation, but to educate the rising members of the profession. He would connect with the toast the name of Professor Redwood, who appeared to have been created for the benefit of the Society. That gentleman combined the practical knowledge of pharmacy with the highest attainments in chemistry.

PROFESSOR REDWOOD, in returning thanks, said he thought credit was mostly due for what had been accomplished to the promoters and patrons of the school, who had maintained it for a quarter of a century, through good and through evil report. Not only was there great credit due to those who founded and maintained the school, but also to those men who, in its early days, were its greatest ornament, and who, as teachers in the school, had contributed to its elevation,—men who had passed from this world, but whose names shed a halo around those who followed them, and who thereby could not fail to derive some amount of credit and of lustre in being connected with the school. But there was still another class by whom the usefulness of the school was demonstrated, namely, those who, having been successful students in it, had since become distinguished pharmaceutists. He was proud to recognize around him a host of accomplished chemists who were outstripping their former teachers, and thus contributing, in the most efficient and creditable manner, to do honour to the toast which had just been drunk.

Mr. MATTHEWS, President of the United Society of Chemists and Druggists, in complimentary terms, proposed the health of the Stewards, coupling with it the name of Mr. Orridge.

Mr. ORRIDGE said that at that advanced period of the evening he felt sure he should have the concurrence of his brother Stewards in merely saying, heartily and most sincerely, that their exertions had been a labour of love, amply repaid by having the presence of so many friends, and the substantial assistance afforded to the treasury of the Benevolent Fund. He begged, on behalf of the Stewards, to thank those who had so liberally responded to their appeal.

Mr. MORSON proposed the health of the Secretary, Mr. Bremridge. Their success was to be attributed to that gentleman, and he called upon them to drink his health, and long life to him.

Mr. BREMRIDGE, in acknowledging the compliment, thanked them for the cordial manner in which they had been pleased to receive his name. He was, however, afraid that Mr. Morson had rather overstated his usefulness, but he did take credit to himself for possessing a deep interest in the Society and its operations, and he could not look back on the time he had had the privilege and the honour of filling his official position but with pleasure and gratification. He assured them, however, that the success of the Society was due to the attention and time devoted to it by the Council, by the several Committees, and especially to the abilities and attention given to it by their worthy President. The present financial position of the Society and the estimation in which it was held by the medical profession and the public, was the best evidence of the necessity for such an institution and of the soundness of its constitution, and as long as the Society continued to be governed and conducted as it had been, it must go on and prosper. He believed the trade was generally interested in the Society, and he looked forward with pleasure to the time when he should have the honour to be their Registrar-General.

Some other toasts followed, after which the company separated.

Several lists of subscriptions and donations were read over, amounting in the aggregate to about £1450.

DONATIONS AND SUBSCRIPTIONS.*

	£	s.	d.
Adams, George, Hertford	2	2	0
Alexander, Austin, & Poole, Earl St.	1	1	0
Allen, A. U., Lymington	0	5	0
Anderson, Thomas S., 30, Duke St., W.	0	10	0
Andrews, George, 18, Holborn Hill *An.* £1. 1*s.*			
Ansar, Harford, and Co., 77, Strand *An.* £2. 2*s.*	21	0	0
Arnold, Edward, Norwich	1	0	0
Ashton, William, 154, Sloane Street	0	10	6
Atkins, Samuel R., Salisbury	1	11	0
Atkins, W. S., Birmingham	0	7	6
Atkinson, George, Aldersgate Street	10	10	0
Attfield, Dr. J., 17, Bloomsbury Sq.	5	5	0
Averill, H. A., Stafford . *An.* £1. 1s.			
Averill, John ,, . *An.* £1. 1*s.*			
Baigent, William H., Shefford	1	1	0
Bailey, Delamore J., 30, Conduit St.	5	5	0
Baiss, Brothers & Co., Leadenhall St.	10	10	0
Ball in aid of the Benevolent Fund, held at Willis's Rooms on January 30 (surplus)	29	10	6
Barber, George H., Esq., 10½, Ironmonger Lane	1	1	0
Barclay and Sons, Farringdon Street	10	10	0
Barclay, Robert ,,	10	10	0
Barnes, James B., Knightsbridge	1	0	0
Barnes, W. C., Hackney Wick	1	1	0
Barret, E. L. & Co., Thrawl St., N.E.	5	5	0
Barret, E. L. ,, *An.* £1. 1*s.*			
Barron, Harveys, Becket, and Simpson, Giltspur Street	10	10	0

* As several members and friends have expressed their regret at having been unable to attend and their willingness to contribute to the result of the Dinner, a supplementary list of contributions will be published in a future number of this Journal.

	£	s.	d.
Barron, Frederick (Drew, Barron, and Co.), Bush Lane	10	10	0
Squire, Alfred ,,	5	5	0
Squire, Alfred R. ,,	2	2	0
Edden, John ,,	1	1	0
Sheppard, Robert ,,	1	1	0
Bruce, A. ,,	0	10	6
Swales, Thomas ,,	0	5	0
Nichols, J. R. ,,	0	5	0
Payne, George ,,	0	5	0
Sherwood, N. ,,	0	5	0
Rose, John ,,	0	5	0
Depree, S. B. ,,	0	5	0
Duerdin, J. R. ,,	0	5	0
Lasham, J. W. ,,	0	2	6
Gubbins, D. H. ,,	0	2	6
Callaway, G. ,,	0	2	6
Kiloh, E. P. ,,	0	2	6
Foster, John ,,	0	2	6
A Friend, per F. Barron, Esq.	0	6	0
Bartlett, William, Chelsea *An.* 10*s.* 6*d.*	1	1	0
Barton, Brothers, Brighton *An.* £1. 1*s.*	1	1	0
Bass and Sons, Hatton Garden	5	5	0
Batchelor, C., Fareham	0	10	6
Battley and Watts, Lower Whitecross Street	10	10	0
Baxter, W. W., Bromley	2	2	0
Bayley, Edmund, Walworth	1	1	0
Beard, James, Manchester	0	10	0
Beaton, W. J., Edgware Rd. *An.* £1. 1*s.*			
Beaumont, William H., Gravesend	1	1	0
Bell, John, and Co., 338, Oxford Street	21	0	0
Hills, Thos. Hyde ,, *An.* £10. 10*s.*			
Barnard, John ,, *An.* £1. 1*s.*			
Gale, Samuel ,, *An.* £1. 1*s.*			
Middleton, F. ,, *An.* £1. 1*s.*			
Dunkley, Edward ,,	0	5	0
Ellis, Charles B. ,,	0	5	0
Goulden, Ed. B. ,,	0	5	0
Haddock, Geo. J. ,,	0	5	0
Hardy, Samuel C. ,,	0	5	0
Johnson, Edwin E. ,,	0	5	0
Kinch, Charles J. ,,	0	5	0
Machray, William ,,	0	5	0
Paffard, Walter H. ,,	0	5	0
Smith, J. ,,	0	5	0
Tanner, Benjamin ,,	0	5	0
Wearing, Rich. H. ,,	0	5	0
Wigg, Henry John ,,	0	5	0
Bell, W. H., 96, Albany Street	1	1	0
Bemrose, J., Long Bennington	0	10	0
Bentley, Professor, 17, Bloomsbury Sq.	5	5	0
Betty, S. C., 1, Park St., Camden Town	0	10	0
Bevan, Charles F., Harwich	1	1	0
Billing, Thomas, 143, New Bond Street *An.* 10*s.* 6*d.*			
Binge, Thomas, Pimlico	1	1	0
Bird, Augustus, Shepherd's Bush	5	5	0
J. C., per A. Bird, Esq.	0	10	0
Bird, Wm. Lionel, 42, Castle St. East *An.* £1. 1*s.*	3	3	0
Bishop, Alfred, Speck's Fields, N.E.	5	5	0
Bishop, Thomas, Woolwich	0	10	0
Blackburn, Francis, King's Coll. Hosp. *An.* 10*s.* 6*d.*			
Blain, William, Bolton, per Mr. Charity	1	1	0
Blake, Charles T., 47, Piccadilly	5	5	0
Bland, John H., Stourbridge	2	2	0
Bluhm, —	1	1	0
Boor, George, Artillery Lane	1	1	0
Botham, W., Sheffield *An.* 10*s.* 6*d.*			
Bottle, Alexander, Dover	2	2	0
Bourdas, Isaiah, 7, Pont Street	10	10	0
Bourdas, Isaiah, jun., 48, Belgrave Rd.	5	5	0
Bowerbank and Son, Sun Street	3	3	0
Bowman, J. R., Douglas	1	1	0

	£	s.	d.
Boyce, J. P. & Son, Chertsey *An.* 10*s.*	1	0	0
Boyce, John P., Windsor *An.* 10*s.* 6*d.*			
Bradley, John, Kilburn	5	5	0
Brain, G. J., Bury St. Edmunds	0	5	0
Brayshay, W. B., Stockton *An.* £1. 1*s.*			
Bremridge, Elias, 17, Bloomsbury Sq.	5	5	0
Brierley, W., Walton	0	5	0
Brook, William P., Esq., 1, Poultry	5	5	0
Brown, George, and Sons, Smithfield	0	10	0
Brown, James, Aldgate	1	1	0
Brown, William S., Manchester	3	3	0
Brown, William, Holborn Bars	0	10	6
Brumleu, Charles, 9, Mincing Lane	1	1	0
Bryant, William, Huntingdon	1	0	0
Buchanan, Dr., 53, Harley Street	2	2	0
Buck, Thomas, Kingsland	1	1	0
Buckle, Christopher F., Gray's Inn Rd.	1	11	6
Bullock & Reynolds, 3, Hanover St., W.	5	5	0
Butcher, T., Cheltenham *An.* £1. 1*s.*			
Butler, Samuel, Bristol	1	0	0
Butt, Edward N., Cheshunt	1	11	6
Caley, Albert J., Norwich	1	1	0
Cannon, C., 85, Upper St., N. *An.* £1. 1*s.*	1	1	0
Carteighe, Michael, 172, New Bond St.	5	5	0
Carter, Henry, 14, Bath Street, E.C. *An.* £1. 1*s.*			
Cartwright, W., Newcastle-under-Lyne	1	1	0
Chapman, John, Tring *An.* £1. 1*s.*	0	10	6
Chapman, R. J., Chipping Ongar	0	10	0
Charity, William, Swan Lane	1	1	0
Cherry, E., Newport	0	10	0
Childs, Philip, Speenhamland, Berks	5	5	0
Chipperfield, Robert, Southampton *An.* £1. 1*s.*	1	1	0
Chubb, James C., St. John Street	1	1	0
Churchill, John, and Sons, New Burlington Street *An.* £1. 1*s.*	5	5	0
Churchyard, Robert L., Camden Road. *An.* 10*s.* 6*d.*			
Clarke, B. J., Cheltenham *An.* 10*s.* 6*d.*			
Clay and Abraham, Liverpool	5	5	0
Clements, R. G., Mincing Lane	1	1	0
Cocksedge, Henry B., 20, Bucklersbury	1	1	0
Cockton, John, Maryport	1	1	0
Coleman, Mr., Cardiff	0	2	6
Coles, Charles, Adelaide Road	1	1	0
Coles, J., Camberwell New Road *An.* 10*s.* 6*d.*	1	1	0
Collins, H. G., Windsor *An.* 5*s.*			
Commans, R. D., Bath	1	1	0
Constance, E., 37, Leadenhall Street	5	5	0
Cooper, Albert, Kensington	1	1	0
Cooper, George, Exeter	1	0	0
Cooper, Thomas, Leicester *An.* £1. 1*s.*			
Copney, Wm., Roy. Coll. Physicians, Pall Mall East	1	1	0
Corbyn & Co., 300, Holborn *An.* £3. 3*s.*	10	10	0
Cotterell, Wm. H., Dover	0	10	0
Cox and Gould, Chicksand St., N.E.	10	10	0
Crispe, James, 4, Cheapside	5	5	0
Crook, E., Windsor *An.* 10*s.* 6*d.*			
Crook, George, Farnham *An.* 10*s.* 6*d.*	0	10	6
Croyden, Charles, 37, Wigmore Street	5	5	0
Curtis, R., 86, New Bond Street	1	1	0
Curtis, W., Barnstaple *An.* 10*s.* 6*d.*			
Curtis and Co., Baker St. *An.* £2. 2*s.*			
Cuthbertson and Co., King's Cross	1	1	0
Dale, G., Chichester	0	10	6
Darby and Gosden, Leadenhall Street	5	5	0
D'Aubney, Thomas, Shepherdess Walk	1	1	0
Davenport, John T., Great Russell St.	5	5	0
Davy, Yates, and Routledge, Upper Thames Street	10	10	0
Deane, Henry, Clapham	5	5	0

	£	s.	d.
A thankoffering, from a Lady, per Mr. Deane	1	1	0
Dinneford and Co., 172, New Bond St.	10	10	0
Down, Dr., Earlswood	2	2	0
Dowsett, William, King's College Hospital . . . *An.* 2*s.* 6*d.*			
Dring, William, St. Neots	0	10	0
Dunn and Company, Princes Square	5	5	0
Dyer, H., Trowbridge	0	10	0
Dyer, William, Halifax . . *An.* 5*s.*			
Dyson, John, Andover . *An.* 10*s.* 6*d.*			
Dyson, W. B., South Kensington	1	1	0
Earle, Francis, Hull	5	5	0
Edwards, George, Dartford *An.* £1. 1*s.*			
Edwards, William, 38, Old Change	21	0	0
Ellis and Hale, Lime Street	5	5	0
Ellis, B., Banff	0	10	0
Ellis, Richard, Thornbury . *An.* £1. 1*s.*	0	5	0
Ellis, William, 8, John St., Minories	1	1	0
Elvey, Thomas, 8, Halkin Street West	2	2	0
Ereaut, John, Jersey	1	1	0
Evans, Lescher, and Evans, Bartholomew Close	10	10	0
Evans, Son, and Co., Liverpool	10	10	0
Evans, Evan, Aberavon . *An.* 10*s.* 6*d.*			
Evans, J. D., Trelech	0	2	6
Ewen, James, Garlick Hill	1	1	0
Eyre, Thomas S., Launceston *An.* 10*s.* 6*d.*			
Falkner, H., Pillgwenlly	0	3	0
Farnell, W. T., Esq., Isleworth	5	5	0
Farnsworth, Thomas, Codnor	0	10	6
Farre, Dr., St. George's Rd. *An.* £1. 1*s.*			
Fergusson and Forster, 23, Eastcheap	2	2	0
Field, James J., Upper Gifford Street *An.* £1. 1*s.*			
Fleeming, William, Wolverhampton	1	1	0
Fletcher and Palmer, Cheltenham	2	2	0
Fletcher, J. T., Esq., 44, Hamilton Ter.	1	1	0
Flower, Thomas S., Kingston-on-Th.	0	10	6
Flux and Argles, 1, East India Avenue	5	5	0
Forbes, William, Reigate	1	1	0
Ford, Charles, Blackheath Road	0	10	0
Forrest, Richard, 20, Cork Street, W.	1	1	0
Forster, Robert, Dover . *An.* 10*s.* 6*d.*			
Foulger and Son, 153, St.George's St.E.	3	3	0
Fowler, Edward, Bedale . *An.* £1. 1*s.*			
Fowler, Stanley, 36 Elgin Crescent, W.	1	1	0
Fox, W., and Son, 49, Church St., N.E.	10	10	0
Frankland, Dr., F.R.S., 42, Park Rd., Haverstock Hill	2	2	0
Freeman, Richard, Kennington Pk. Rd.	5	5	0
Frost, George, Derby	1	1	0
Furze, Henry, Forest Hill *An.* 10*s.* 6*d.*	0	10	6
Gardner and Co., Edinburgh	1	1	0
Garle, John, Bromley	10	10	0
Garrod, Dr., 11, Harley Street	1	1	0
Gedge, Wm. S., 65, St. John Street	1	1	0
Gibbons, Thomas G., Manchester	10	10	0
Giguer, John, Chelsea . . *An.* 10*s.* 6*d.*	0	10	6
Gilbertson, H., and Sons, 72, Ludgate Hill	3	3	0
Gilkes, William, Leominster	0	5	0
Gissing, T. W., Wakefield *An.* 10*s.* 6*d.*			
Goddard, Joseph, Leicester	5	5	0
Godfrey and Cooke, Conduit Street and Knightsbridge	10	10	0
Godfrey, T., Newton Abbot	0	5	0
Good, Thomas, Minories	5	5	0
Goodwin, John, Lower Clapton	1	1	0
Gordelier, Paul W. G., Sittingbourne *An.* £1. 1*s.*			
Goss, Samuel, Barnstaple	0	10	6
Goulden, W., Upwell	0	5	0

	£	s.	d.
Granger, Edwin J., Upper Clapton	1	1	0
Graham, Thos., F.R.S., Master of the Mint	2	5	0
Greenish, Thomas, 20, New Street, Dorset Square . . . *An.* 10*s.* 6*d.*			
Griffiths, R., Slough	0	10	6
Grisbrook, E., Windsor . *An.* 10*s.* 6*d.*			
Groves, Henry, Florence	5	5	0
Groves, Thomas B., Weymouth	5	5	0
Groves, W., Blandford	2	2	0
Gummery, J., Kidderminster	0	2	6
Guy, Edwin, Hereford	0	5	0
Gwatkin, James T., Brighton	2	2	0
Hall, T. Howard, 1, West Smithfield	1	1	0
Hallam, E., Uxbridge	0	10	6
Ham, John, Netherstowey *An.* £1 1*s.*			
Hamand, S., Davenport	0	10	0
Hanbury, Daniel Bell, Plough Court	21	0	0
Hanbury, Daniel, ,,	21	0	0
Hanbury, Cornelius, jun., ,,	10	10	0
Handford, E., Torrington	0	5	0
Harman, Richard, Folkestone	0	10	0
Harrington, A., Rochford *An.* 10*s.* 6*d.*	0	10	6
Hart, Ernest, Esq., 69, Wimpole St.	5	5	0
Haselden, Adolphus F., 18, Conduit St.	2	2	0
Havill, P., Tiverton	0	5	0
Hawke and Son, Wild Court, W.C.	5	5	0
Hayter, H., Wimborne	1	1	0
Hearon, M'Culloch and Co., 5, Coleman Street	10	10	0
Henly, John Creed, 213, Upper Thames Street . . . *An.* £1 1*s.*			
Henry, A., Macduff	0	5	0
Herapath, Wm., senr., F.C.S., Bristol	2	0	0
Herrings and Co., 40, Aldersgate St.	10	10	0
Hewlett and Son, Creechurch Lane	10	10	0
Hick, Allan, Wath-upon-Dearne	0	5	0
Hick, Joseph, Bradford . . *An.* 10*s.*			
Hickey, Evan L., Chelsea	1	1	0
Hickley, G., Brighton	0	10	6
Hickman, William, Newbury	1	1	0
Hill, A. S. and Son, Little Britain	10	10	0
Hill, John, Sheffield . *An.* 10*s.* 6*d.*	1	1	0
Hill, Richard, Bruton	0	5	0
Hills, T. C., Deptford	5	5	0
Hitchcock, Ch. E., Oxford *An.* £1. 1*s.*			
Hodgkinson, Tonge and Stead, 213, Upper Thames Street	10	10	0
Hodgkinson, Charles ,, *An.* 10*s.* 6*d.*			
Hodgkinson, T. and Co, 86, Snow Hill	10	10	0
Hogg, Thomas, Bideford . *An.* 10*s.*	0	10	0
Holder & Son, Walworth Rd., *An* £1. 1*s.*			
Holland, Wm., Market Deeping	5	5	0
Hooper, Bartlett, King William St.	5	5	0
Hooper, Wm., Russell St., W.C.	5	5	0
Hopwood & Son, Richmond *An.* £1. 1*s.*			
Horncastle, J., 12, Stanhope Terrace	2	2	0
Horner and Sons, Bucklersbury	10	10	0
Howard and Sons, Stratford *An.* £2.2*s.*	10	10	0
Howden, Robert, 78, Gracechurch St.	2	2	0
Howman, Philip, Winchcombe *An.* 5*s.*			
Hubbuck and Son, Lime Street	2	2	0
Hudson, William B., 27, Haymarket	5	5	0
Hughlings, H., Halifax	0	10	6
Humpage, Benjamin, 51, Judd Street	2	2	0
Huskisson, Henry O., Gray's Inn Rd.	2	2	0
Huskisson, William, sen., Swinton St.	2	2	0
Huxtable, John, St. John Street Road	3	3	0
Ince, Joseph, 26, St. George's Place	5	5	0
Ince, The Rev. Wm., Exeter Coll., Oxford (in memory of his Father)	5	5	0
Jacobson, Nath., Walbrook *An.* £1. 1*s.*			
Jarvis, Wm., New Brighton *An.* 10*s.* 6*d.*			

	£	s.	d.
Jennings, John E. H., Sheffield	0	10	6
Jessop, Jonathan, Halifax . *An.* 5*s.*			
Joce, J., Bideford	0	5	0
Johnson, Matthey and Co., Hatton Gar.	10	10	0
Johnson, John B., Uttoxeter	1	1	0
Johnson, Robert N.	0	10	6
Jones, A. M., Brynmawr	0	5	0
Jones, D., Narbeth Road	0	5	0
Jones, E. B., Carmarthen	0	10	0
Jones, John, Aberdare	1	1	0
Jones, J. P., Aberayron	0	5	0
Jones, P., Norton Folgate, *An.* £1. 1*s.*			
Jones, Thomas, Putney . . *An.* 5*s.*			
Joy, Francis W., Cardiff *An.* 10*s.* 6*d.*			
Jull, Thomas, Horsham . *An.* £1. 1*s.*			
Keating, Thos., St. Paul's Churchyard	2	2	0
Kent, T., Blackfriars Rd. . *An.* £1. 1*s.*			
Kernick and Bowring, Cardiff	1	1	0
Kettle, Joseph, 42, Castle St. East, W.	1	1	0
King, E., Southend	0	5	0
Kingdon, Wm. Y., Notting Hill, W. *An.* 10 .6*d.*			
Kinninmont, A., Glasgow *An.* 10*s.* 6*d.*			
Kirkham, Thomas, Bury St. Edmunds	2	2	0
Kirkman, C. J., Brighton . . *An.* 5*s.*			
Langtons, Scott, and Edden, Upper Thames Street	10	10	0
Lansdown, George, 2, Warwick Street, Charing Cross	2	2	0
Leared, Dr., 12, Old Burlington Street	1	1	0
Lees, J., 2, Upper St., N. *An.* 10*s.* 6*d.*			
Leigh, John, Windsor . *An.* 10*s.* 6*d.*			
Levick, G. A., Caistor	0	2	0
Lindars, W., 32, Lower Whitecross St.	1	1	0
Lister and Biggs, Laurence Pountney Hill, E.C.	1	1	0
Loader, R. A. C., per Mr. Bottle, Dover	0	10	6
Lockyer, George, Deptford	0	10	6
Loggin, Charles F., Stratford-on-Avon	0	10	6
Long, Alfred T., Bognor . *An.* 10*s.* 6*d.*			
Long, William E., Chichester	0	5	0
Macdonald, Mr., Fraserburgh	0	10	0
Macfarlane and Co., Edinburgh	10	10	0
Macintosh, A., Rothesay . . *An.* 5*s.*			
Mackay, John, Edinburgh	5	5	0
Mackey, John B., 15, Bouverie Street	10	10	0
Malden, W. W., 199, Brompton Road	2	2	0
Maleham, H., Sheffield . *An.* 10*s.* 6*d.*			
Marks, George, Bradford-on-Avon	1	1	0
Marlor, Jabez, Lees . . . *An.* 10*s.*			
Mason, Wm. W., Shortwood, Glo'ster.	0	10	0
Mather, Wm., Manchester *An.* £2. 2*s.*	10	10	0
Matthews, H., F.C.S., 60, Gower St.	2	2	0
Maw, Charles, Aldersgate Street	10	10	0
May, John, Battersea	5	5	0
May, W. H., Guilford Street, W.C. *An.* £1. 1*s.*			
Meadows, H., 124, Southampton Row	0	10	6
Meatyard, Robert, Basingstoke	1	1	0
Medcalf, Ebene er, Tooting	2	2	0
Meggeson, George . . *An.* £1. 1*s.*	5	5	0
Merrell, J., Camden Rd. . *An.* £1. 1*s.*	2	2	0
Messer, Wilson, Esq., 24, Carlton Hill	1	1	0
Metcalfe, Christopher L., Hull	10	10	0
Millais, Thomas, Jersey	1	1	0
Miller, Dr. Wm. Allen, F.R.S., King's College	5	5	0
Morley, Geo., Donington *An.* 10*s.* 6*d.*			
Morris, Henry, St. John's Wood	1	1	0
Morson, T. & Son, Southampton Row *An.* £1. 1*s.*	5	5	0
Morton, Jamieson, Ramsbottom	1	1	0
Mould, Samuel, Moorgate Street	2	2	0

	£	s.	d.
Mousley, William, Redditch	0	10	6
Mundy, A., 40, Aldersgate Street	0	10	0
Musgrave, J. T., Esq., Finchley Road	2	2	0
Muskett, J., Harleston . *An.* 10*s.* 6*d.*			
Nelson, Dale, and Co., Little Britain	1	1	0
Newbery, Francis, and Sons, St. Paul's Churchyard	26	5	0
Newton, F., Salisbury	10	0	0
Nichols, H., Petersfield	1	1	0
Nicholson, E. C., 8, Fenchurch Street	10	10	0
Nicholson, S., Hampstead	1	1	0
Oakley, John J., Esq., 183, Piccadilly	10	10	0
Odling, Dr., St. Bartholomew's Hosp.	1	1	0
Oldfield, Henry, Eltham *An.* 10*s.* 6*d.*			
Orridge, Benjamin B., 30, Bucklersbury	5	5	0
Orridge, Mrs. B. B., per Mr. Orridge	2	2	0
Paas, W., 66, St. James's St.	1	1	0
Padwick, John, Brighton *An.* 10*s.* 6*d.*			
Palmer, C. F., Birmingham *An.* £1. 1*s.*			
Palmer, R., 35, Ovington Square	2	2	0
Parnell, George W., Pimlico	1	1	0
Parnell, John, Peterborough	5	5	0
Parsons, Frederick, St. Mary Axe	1	1	0
Parsons, W., Portsmouth	0	10	0
Patterson, G., Stamford . *An.* £1. 1*s.*	2	2	0
Peake, Henry, Dover	1	0	0
Peake, James, Walmer . *An.* 10*s.* 6*d.*			
Peat, Walter, Fareham	0	4	0
Pedler, G. S., 199, Fleet Street	3	3	0
Peevor, G., Clapham	1	1	0
Pegg, H., Birmingham . *An.* £1. 1*s.*			
Penny, Alfred, Esq., Wharf Road, City Road	5	5	0
Petty, T., Deddington	0	10	0
Pike, C., Bovey Tracey	0	5	0
Pilley, Samuel, Boston	1	1	0
Player, E., Bristol	1	1	0
Plummer, G., Peckham . *An.* £1. 1*s.*			
Pollock, Thomas, Fenchurch Street	5	5	0
Pountney, William, Burton-on-Trent	1	1	0
Powell, E., Winchester . *An.* £1. 1*s.*			
Pratt, Richard M., Otley . *An.* 10*s.*			
Preston and Sons, Leadenhall Street	10	10	0
Prichard, H., Taibach	0	10	6
Proceeds of a half-crown subscription among the Students in the Laboratory of the Pharmaceutical Society (20th February)	2	12	6
Prockter and Forth, Cheltenham	0	10	6
Prott, William, Huntley *An.* 10*s.* 6*d.*			
Pullin, W. H., Leamington *An.* 10*s.* 6*d.*			
Quain, Dr., 67, Harley Street, W.	5	5	0
Quiller, C. R., Sloane Sq. *An.* 10*s.* 6*d.*	2	2	0
Quincey, Roger, Fenchurch Street	5	5	0
Radermacher, C. J., 173, Sloane St.	1	1	0
Radley, Wm. V., Sheffield	1	1	0
Ramsden, A., Esq., Halifax	0	10	6
Randall and Son, Southampton	5	5	0
Ransom, William, Hitchin	5	5	0
Rastrick, James L., Southsea	1	1	0
Rastrick, J. A., Woolwich *An.* 10*s.* 6*d.*			
Read and Company, Salisbury	2	2	0
Redwood, Prof., 17, Bloomsbury Sq.	5	5	0
Reece, John, Birkenhead . . *An.* 5*s.*			
Rees, Dr., F.R.S., 26, Albemarle St.	2	2	0
Renshaw, A., Cowgill	0	5	0
Richardson, J., Bishopsgate Street	1	1	0
Richardson, J. G. F., Leicester *An.* £1. 1*s.*			
Rickwood, H., Bath	0	5	0
Rimmel, Eugene, 96, Strand	5	5	0

	£	s.	d.
Robbins, John, and Co., 372, Oxford Street	5	5	0
Roberts, Albinus J., Walworth Road	2	10	0
Roberts, Thomas, Manchester	1	0	0
Robinson, Levi, Alford	0	5	0
Rogers, Arnold, 16, Hanover Square	10	10	0
Rogerson, William, 5, Coleman Street	0	10	6
Rohrweger, Julius C., 7, Fen Court	1	1	0
Rossiter, F., Hastings	0	5	0
Rowden, J., Calne	0	5	0
Rowe, Robert, Exeter *An.* 10s. 6d.			
Rowntree, Thomas, Islington	1	1	0
Sadler, W., Norton Folgate *An.* 10s. 6d.			
Salter, T. K., Mount Street *An.* £1. 1s.			
Sanders, Henry W., Bristol	2	2	0
Sandford, George Webb, 47, Piccadilly	10	10	0
Sanger, John, and Sons, 150, Oxford St.	10	10	0
Saunders, Dr., 13, Queen Street, E.C.	1	1	0
Savory and Moore, 143, New Bond St.	10	10	0
Schneidt, Henry C., 12, Mark Lane	2	2	0
Schweppe and Co., 51, Berners Street	5	5	0
Sedcole, James W., 11, New Burlington Street	1	1	0
Shaw, Alex. H., Stockport	5	5	0
Shaw, John, Liverpool *An.* £1. 1s.			
Shenstone, James B. B., Colchester	1	1	0
Shepheard, Thomas, Chester	5	5	0
Shillcock, J. B., Bromley	0	5	0
Silvester, Joseph, Knutsford	3	0	0
Simms, Dr. F., 46, Wimpole Street, W.	2	0	0
Simpson, Thomas, Forest Hill *An.* 5s.			
Sirett, George, Buckingham *An.* £1. 1s.	1	1	0
Skinner, Thos., Cirencester *An.* £1. 1s.			
Smart, N., Littlehampton	0	10	0
Smith, Nath., Cheltenham *An.* £1. 1s.			
Smith, William F., Walworth Road *An.* £1. 1s.	2	2	0
Smith, W., and Co., Borough, S.E.	0	10	6
Snell, Glanville A., Chalk Farm Road	0	10	6
Southall, Son, & Dymond, Birmingham	5	5	0
Spencer, T., Wokingham	0	10	0
Spiller, William	1	1	0
Squire, Peter, 277, Oxford Street	10	10	0
Standring, Thomas, Manchester	10	10	0
Stanswood, Mr., Landport	0	5	0
Steedman and Faulconer, Walworth Rd.	26	5	0
Stenhouse, Dr., 17, Rodney Street, N.	1	1	0
Stevens, John, Broseley *An.* 10s. 6d.			
Stevenson, Richard, Derby	5	5	0
Steward, William, Bridgnorth	1	1	0
Stickland, W. H., South Kensington *An.* £1. 1s.			
Stocken, James, Euston Square	2	2	0
Stoneham, Philip, Craven Place, W. *An.* 10s. 6d.			
Stott, W., Sowerby Bridge *An.* 10s. 6d.			
Strawson, Henry, Crewkerne	1	1	0
Street, E., Cheltenham	0	5	0
Suart, Benjamin, 14, Bath St., E.C. *An.* £1. 1s.			
Sutton, Francis, Norwich	1	1	0
Tanner, H. A., Bristol	0	10	0
Tatham, J. W., Barnstaple	0	5	0
Taubman, R., 124, Southampton Row	0	10	6
Taylor, J. E., and Co., 10, Little Queen Street, W.C.	5	5	0
Taylor, Richard, Ryde *An.* £1. 1s.			
Telfer, Fred., Leytonstone *An.* 10s. 6d.			
Tennant, Charles, Son, and Co., 9, Mincing Lane	5	5	0
Thomas, J., Bridge	0	2	6
Thomas, John A., Boston	1	1	0
Thomas, John H., ,,	1	1	0
Thomson, F. O., 73, Hatton Garden	2	2	0
Thomson, Henry, 11, Little Britain	1	1	0
Thomson, Henry, Norwich	0	10	0
Thompson, Henry A., 86, Chiswell St. *An.* £2. 2s.	5	5	0
Thompson, John, 11, Aldersgate Street *An.* £1. 1s.	5	5	0
Thorne, John, Wellingborough *An.* 10s. 6d.			
Tibbs, Frederick, 47, Blackfriars Road	2	2	0
Trotman, A. C., 29, Chapel St., S.W. *An.* 10s. 6d.			
Tuff, John, Enfield	0	10	6
Tugwell, W. H., Greenwich *An.* 10s. 6d.			
Tunley, John, West Bromwich	0	10	0
Tupholme, J. T., Lamb's Conduit St.	10	10	0
Turner, Charles E., Great Russell St.	1	1	0
Turner, George, Honiton *An.* 10s. 6d.			
Twinberrow & Son, 2, Edwards St., W.	5	5	0
Twinberrow, Wm. ,, *An.* 10s. 6d.	5	5	0
Umney, Charles, 40, Aldersgate Street *An.* 10s. 6d.			
Vanderbyl, Philip, Esq., M.P., 51, Porchester Terrace	5	5	0
Vincent, Philip, Walham Green	1	1	0
Vizer, Edwin B., Pimlico	5	5	0
Wade, John, 100, York Street, Westminster	1	1	0
Walker, John, Bradford *An.* 10s.			
Wall, William J., Tottenham	3	3	0
Walpole, William, Yarmouth	0	5	0
Warner, Richard, 20, Charterhouse Sq.	5	5	0
Waugh, George, Regent Street	21	0	0
Waugh, Alexander ,,	5	5	0
Welch, J Kemp, 15, College St., E.C.	5	5	0
Weller, George, Windsor *An.* 10s. 6d.			
Wellington, F. G., South Petherton	1	0	0
Wellington, James M., Oakham	0	10	6
Wells, W. E., Budge Row	0	10	0
Westwood and Hopkins, Newgate St.	10	10	0
White A. (T. R. & A White, Castle St.)	1	1	0
Whitfield, Henry, Worcester	1	1	0
Wilkes, Doctor Tyers, Upton-on-Severn	0	10	6
Williams, E., St. Clears	0	10	6
Williams and Co., White's Row	1	1	0
Williams, John, 5, New Cavendish St.	10	10	0
Williams, Joel D. Bodmin *An.* £1. 1s.			
Williams, Joseph J., Harrow Road	0	10	6
Williams, W. Pyatt, Nottingham	0	10	6
Wilson, Edward, Sheffield	1	1	0
Wilson, R , Clay Cross	0	10	6
Wood, Benjamin, Halifax	0	10	6
Wood, W. Pontypool	0	5	0
Wright, George H., 7, Poultry	1	1	0
Wright, Herbert M., 4, Addison Gardens South, W. *An.* £1. 1s.			
Wright, W. and Co., 11, Old Fish St.	10	10	0
Wyman, John, 122, Fore St.	5	5	0
Yarde, Giles, 28, Lamb's Conduit St.	5	5	0
Yardley, C., Vine St., Bloomsbury	2	2	0
Yearsley, E., Ross	0	5	0
York Glass Company, Finsbury	10	10	0
Young, George, Millwall	0	10	6
Young, R. F., New Barnet *An.* 10s. 6d.			
Young, W., Balls Pond Rd. *An.* 10s. 6d.	0	10	6

*** *The Secretary would be glad to receive notice of any omissions, corrections, or other inaccuracies in reference to the foregoing list.*

THE CHEMISTS' BALL.

This Ball which took place at Willis's Rooms, on Wednesday, 30th January last, proved a great success, and reflects much credit on the Committee of Management.

From a statement furnished to us it appears that 247 ladies and gentlemen were present at the Ball, and that the total amount of receipts was £193. 5*s*. 0*d*., and of the expenditure £163. 14*s*. 6*d*., thus leaving a surplus of £29. 10*s*. 6*d*., which was given to the Benevolent Fund of the Pharmaceutical Society.

We are especially glad to be thus able to announce the success of the Ball from the fact of its having originated in a praiseworthy desire on the part of a number of the younger followers of Pharmacy, most of whom were unconnected with our Society, to do something which should show their sympathy in the objects of the Benevolent Fund of the Pharmaceutical Society.

It was announced during the evening of the Ball that the gathering would probably be annual, a statement which was received with unanimous expressions of satisfaction, and most of the members of the Committee undertook the work of organization for the next year.

BRITISH PHARMACEUTICAL CONFERENCE.—THE DUNDEE MEETING.

A large meeting of the Chemists and Druggists of Dundee was held on the 25th of January, to consider what steps should be taken for the reception of the members of the Conference in the autumn of the present year. It was resolved that arrangements should be at once adopted to give the Conference a hearty welcome, and to secure the co-operation of the chemists and druggists generally throughout the several districts of Scotland.

A second meeting was held on the 1st of February, when a resolution was passed to the following effect:—"That an association be formed, to be called the Dundee Chemists' Association, the first chief object of which should be the reception of the Conference." A committee was formed, with Mr. James Hardie as President, Messrs. Hodge and Levie Secretaries, and with power to add other names as members. Sub-committees have since been formed, and necessary details arranged.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Fifth General Meeting, held January 3rd, 1867, at the Royal Institution; the President in the chair.

The PRESIDENT announced that he had received a communication from the Secretary, which stated that owing to a severe illness he was unable to be present to read the paper announced for that evening. The President expressed his regret and that of the meeting for this occurrence, and hoped that the Secretary would soon be restored to health.

Mr. MURPHY (acting for the Secretary) read the minutes of the previous meeting, which, after a few emendations, were passed.

Donations to the Library of—'The Pharmaceutical Journal' for January, 1867; 'The Proceedings of the Architectural Society;' 'The Proceedings of the Polytechnic Society,' were announced and the thanks of the meeting passed to the donors.

Mr. H. S. Evans brought forward the subject of the Benevolent Fund of the Pharmaceutical Society, stating in the course of his remarks the object of the originators of the Fund, and the benefit arising from it. He strongly urged that the Liverpool section of the trade should contribute to the Fund, and thus increase the means of the Committee for extending the charity to a wider circle.

Mr. Evans then drew attention to the use of methylated spirit for the preparation of medicinal tinctures, etc., and that its use was prohibited for the manufacture of nitric ether, etc. In consequence of this prohibition, tinctures and nitric ether were found in the market of very low strength. Mr. Evans put the question whether the introduction of weak medicines of this kind was justifiable. The feeling of the meeting was strongly against the use of ether and tinctures of a lower standard than that indicated in the British Pharmacopœia.

Mr. Chas. Symes moved and Mr. John Shaw seconded the following resolution on this subject:—

"That this Association deprecates the sale of tinctures or spirits weaker than specified in the Pharmacopœia, seeing that it would lead to want of uniformity, would be likely to produce dangerous results in the case of laudanum, and would be the source of low competition, to the injury of those who wished to conduct a respectable and conscientious business." Carried unanimously.

Mr. Evans referred to the progress that had been made by the Pharmaceutical Society in regulating the basis of determinate legislative measures respecting the qualifications of chemists and druggists.

The President offered a few remarks on the subject, and the meeting closed.

Sixth General Meeting, held January 17th, 1867; the President in the chair.

The minutes of the previous meeting were read and passed.

The President stated, in impressing the value of the Benevolent Fund of the Pharmaceutical Society, that a late member of the Association had been relieved by it.

The following donations were acknowleeged:—'The Proceedings of the Liverpool Architectural Society,' 'The Proceedings of the Liverpool Polytechnic Society.'

The President then called upon Mr. E. Davies, F.C.S., to read the paper for the evening—Chemical and Pharmaceutical Gleanings from 1866.

The lecturer, after alluding to the fact that no very remarkable discoveries had been made during the past year, divided the various subjects to be described under the heads of pharmacy, analysis, manufacturing, and scientific chemistry.

The pharmaceutical discoveries described were—gelatine capsules, new methods of preparing iodide of potassium and citrate of magnesia, investigations on senna leaves and Rhus toxicodendron. In analysis a new test was given for grape sugar, the use of magnesium in toxicology was explained, and a density test for ung. hyd. described.

In manufacturing chemistry, the novelties alluded to were a process for making soda ash by means of carbonate of magnesia, a method of covering iron with copper, a process for making sulphide of ammonium, etc.

In scientific research, among other subjects, Dr. Bence Jones's discovery of a substance similar to quinine in the animal kingdom, Fleetmann's method of making oxygen, and Berthelot's researches on acetylene were alluded to. The lecture was illustrated by specimens and experiments. In the discussion which followed, the President expressed a hope that the gelatine capsules would be found so successful as to supersede metallic capsules.

A vote of thanks was passed to Mr. Davies, and the meeting closed.

LEEDS CHEMISTS' ASSOCIATION.

The fifth meeting of the Session was held in the Library of the Philosophical Hall, on Wednesday, the 20th inst.; the President, Mr. E. Thompson, in the chair. Mr. Mayfield was admitted a member, and the President then proceeded to deliver the following address:—

Gentlemen,—The two papers of Mr. Orridge, read at our last and previous meetings, in which he comments upon some parts of the Inaugural Address which I had the honour of delivering to you, appear to require from me a few remarks, partly explanatory and partly defensive. In presenting them to you, I hope to avoid taxing your patience too much, by compressing what I have to say within a moderate compass.

I think it will be found, on analysing the papers alluded to, that they consist of four component parts:—

1st. Matter which may possibly have some bearing on compulsory examinations in general, yet is totally irrelevant as regards the questions in dispute between the author and myself.

2nd. Misstatements of what I said, of course unintentional.

3rd. A comparatively small amount of real argument; and,

4th. A concession, which almost renders argument unnecessary.

That Mr. Orridge holds his opinions in very good company is what I never was disposed to deny. I stated before that many—perhaps nearly all—of our body throughout the kingdom held similar views. Presidents of colleges, and medical officers of hospitals, whose names and titles are given at length by my censor, may of course be added to the number of the supporters of compulsory examinations. But to a "meeting of shrewd Yorkshiremen" (to use Mr. Orridge's words), what does all this prove? Surely it has no relation whatever to the soundness of the analogical reasoning adopted by him, and he can scarcely imagine that the parade of authorities, however numerous and influential, will serve as a substitute for argument.

The very satisfactory account which our author gives of his own consistent conduct in reference to this question is, if possible, still more irrelevant. It is very pleasing to hear that he has laboured perseveringly in the good cause from the very beginning, and that his knowledge of the subject, derived from his "hourly communication with medical men and pharmaceutists for a long series of years" should have led to his having been called upon to address the Council of the Pharmaceutical Society and to move resolutions at its meetings. I could not wish in the least to detract from Mr. Orridge's merits in these respects, but I cannot see how a portion of his autobiography, however edifying it might be in another connection, can prove anything in the question before us. If the authority of all the presidents of colleges, and of the physicians and surgeons of all the hospitals in London has no logical force, Mr. Orridge can hardly expect his own authority to be esteemed of greater weight.

Matter of this kind occupies more than half of Mr. Orridge's space, and, I beg to submit, is only of small moment in reference to any subject, but proves no more to the purpose in hand than does a chapter in Herschel's Astronomy.

As I wished to be brief, perhaps it was to be expected that some things that I said should have been misunderstood. For instance, I used the words "compulsory examination" in a sense in which I supposed they were employed by Mr. Ince; and, as I imagined, generally received amongst us. An Act of Parliament which imposes penalties upon all engaged in a business or profession who have not passed an examination, I called a "Compulsory Act," and an Act which allows men to practise who have never been examined, without imposing penalties for so doing, I called a "Non-compulsory Act," or rather, "non-compulsory as far as the analogy before us is concerned." I was aware that the Medical Act was compulsory as regards *titles*, but not so as respects *practice*, and it was the latter about which I was speaking; and therefore, without using more words than were necessary for my purpose, I think I could hardly have been more explicit. I cannot imagine what a non-compulsory law is, in the absolute sense of the words, unless it be a contradiction in terms. A law which compelled no one to do anything in particular, would be a "dead letter" indeed. "The law," says Paley, "never speaks but to command, nor commands but where it can compel."

My critic is severely humorous on my allusion to the trebled exports of the country. I may not have expressed myself very clearly on this subject; but I could scarcely have supposed that any one could have thought that I spoke of the fact of increased exports as a cause of the improved education of medical men. This would indeed have been a very absurd *non sequitur*, which could only have been arrived at by roughly tearing away essential parts of the paragraph, and joining together what was evidently intended to be kept asunder. Trebled exports proved increased wealth, and wealth demanded more medical skill, which was supplied by superior education in obedience to the demand, and so one cause of the improved state of the medical profession, besides the operation of the Apothecaries Act, was brought forward. Thus, I flatter myself, a reader of less penetration than Mr. Orridge might have understood the argument, and then, instead of proving nothing, I think it would have proved much against the assertion that the Apothecaries Act, of itself, or mainly, raised the profession to its present condition.

Notwithstanding Mr. Orridge's allusion to Homœopathy, I still assert, as a general rule, that the "more intelligent a man is, the more he will seek after real skill on the part of his medical attendant." The exceptions brought forward do but prove the rule.

We now come to the *arguments* employed in combating my positions, and you will remember that I did not so set myself up as a champion on one side that I could not afford to appreciate sound reasoning on the other. Let us see how the case stands. The proposition asserted on the other side is twofold.

1st. That the present prosperous condition of the medical profession is mainly due to the Act of 1815 compelling every medical practitioner to be examined; and

2nd. By analogy, an Act compelling every chemist to be examined, would lead to a like state of prosperity.

It will be recollected that against the first part of this proposition I brought forward other causes which had been at work to produce the result besides the Act of 1815, and concluded that these other causes operated so powerfully that the advances made by the medical profession were not mainly in consequence of the Act of Parliament referred to, just as though the Goodwin Sands began to be dangerous immediately after the building of Tenterden Church steeple; it is not usually reckoned that the one is the main cause of the other. But I never expressed any doubt of the Apothecaries Act having produced *some* good effect. It was not always quite a "dead-letter." But I will avoid on this occasion trusting to my memory alone, lest, as Mr. Orridge fears, it should lead me "into a false position," over which he might have again to rub his eyes with astonishment. A long array of cases cited, with chapter and verse produced, always looks much better than a mere hap-hazard statement made from "recollection." Let us therefore give Mr. Orridge the full benefit of his most precise references. And, when looked into, to what do they amount? Nine cases are given in which the Apothecaries' Company prosecuted individuals for violating the Act of 1815, and in two of these cases the Company did not succeed. This leaves seven successful cases occurring in fifteen years. One or two of the references are rather curious, if intended to impugn the views I before advanced. For example, vol. vi. p. 342, the Apothecaries' Company confess that "their means are inadequate to the institution of frequent prosecutions;" and in the same volume, p. 347, the 'Lancet' is quoted as saying, "men of rank and medical education were prosecuted by the Company, while the uneducated pretender revelled in success and luxury."

I grant that the effect of a law is not always to be measured by the prosecutions based upon it. But the Act of 1815 was all along notoriously violated, and confessedly failed to put an end to quackery, as Mr. Orridge must know.

I think, therefore, that after all, my memory has not led me on this occasion far wrong, and that as regards the hosts of law-breakers the Apothecaries Act was practically a "dead letter."

From these and other considerations brought forward in my former Address, and remaining intact after the onslaught that has been made upon them, I conclude that as the present prosperous state of the medical profession is *not* mainly due to the operation of the Act of 1815, so a similar Act in favour of chemists would not alone have any considerable effect in raising their condition.

Whether limitations to freedom are the characteristics of modern legislation in this country, as my critic seems to think, or whether what are called free-trade principles have been prevalent of late years, as I ventured to assert, is a question which I think it would be out of place to discuss at length on the present occasion.

I hasten to consider what I rejoice to look upon as a concession on the part of Mr. Orridge; and if I can consistently meet it with a little concession on my part also, I hope we shall end our little controversy, not only in an amicable, but in a useful manner.

After enumerating the contents of the Medical Act now in force, and especially the penal clause providing that none but registered persons shall use a title implying that he is a legal practitioner, Mr. Orridge admits that "an amended Pharmacy Act, couched in similar terms, and providing that no one, after a certain day, (vested interests being reserved,) should, unless examined by the Pharmaceutical Board, take the name of Pharmaceutical chemist and druggist, or any title to imply that he is a compounder of medicines, and on the register, would wellnigh satisfy the wishes of those who advocate compulsory examination in the science and art of pharmacy."

Now, in the Address, to which so much exception is taken, I spoke rather approvingly of the Government as stepping in to "force some men to be honest against their will, so that the public might be able clearly to distinguish the learned from the unlearned." A very little extension of the Pharmacy Act, as here suggested by Mr. Orridge, would put pharmacy in the exact legal position of medicine, and, if such extension could be shown to be useful, I, for one, am quite ready to promote it, assured that it would not be at all inconsistent with anything I have brought before you. I think we might even go a step further in the same direction. On the Act respecting titles might be engrafted some regulations providing that none but registered persons should sell poisons, and that they should keep a written account of all such sales.

An amended Pharmacy Act, extending to the assumption of titles and the sale of poisons, would be quite in accordance with the "course of modern legislation" (see J. S. Mill on 'Liberty,' ed. 1867, p. 56), and would answer most of the purposes for which any further enactments are required; and especially would prevent any apparent necessity for a new Poison Bill, which might, like its unfortunate predecessors, be devised in utter ignorance alike of the requirements or conveniences of the trade, and the necessities of the public. I might comment upon other passages, but I forbear.

I think I need scarcely add that my objection to Mr. Orridge is purely logical, and not at all personal. I have no love for controversy for its own sake, and shall be satisfied if I have made any suggestion which may lead to a measure calculated to benefit ourselves as a class, whilst, at the same time, it does no violence to those economical principles that lie at the basis of every enactment which really conduces to the public weal.

Some discussion took place respecting a Poison Bill, after which Mr. Yewdall, Honorary Secretary, read a communication on the propriety of forming a museum of Materia Medica in connection with the Association. The proposal was generally approved of, and as the museum was intended chiefly for the benefit of the Associates, it was resolved that they should be invited to solicit subscriptions, and assist in making arrangements for carrying out the plan.

MEETING OF CHEMISTS AND DRUGGISTS.

On Thursday, the 24th of January, a public meeting of the trade was held at the London Coffee-house, Ludgate Hill, to consider and adopt certain resolutions which the Executive Committee of the United Society had agreed to at a meeting held by them on the 17th January last. The President, Mr. H. Matthews, in the chair. The meeting was attended by about sixty persons. The first two resolutions might be said to have been agreed to without any discussion; Mr. C. F. Buott, jun., however, taking occasion, in moving the second resolution, to refer at some length to the third resolution as to the right of nominating and voting for members of the Council.

The Secretary (Mr. Cyrus Buott) having read the circular convening the meeting, stated that he had received between forty and fifty letters upon the subject of the meeting. As the correspondence was somewhat of a personal character, he should abstain from reading it at the meeting. He had however received an official document from Sheffield, which could not be overlooked on that occasion. It was signed by the Chemists and Druggists of Sheffield, and stated, with reference to the 4th clause suggested by the Pharmaceutical Society, they could not agree to it, and that they also objected to any Bill that did not give equal rights and privileges with the unexamined members of the Pharmaceutical Society. They agreed that those members who had passed the Major examination of the Pharmaceutical Society should have the distinctive appellation to which they were justly entitled, and further, that any Bill which did not give to the Chemists and Druggists an equal voice with the members of the Pharmaceutical Society in the election of members of the Council, should have their decided opposition. Unless the Pharmaceutical Council conceded the principle embodied in these resolutions, they hoped and trusted that the Executive Committee of the United Society would take independent action for obtaining an incorporation of the trade during the ensuing session of Parliament. Then followed the signatures of thirty-four or thirty-five members of the trade, who were brought together within two or three hours' notice.

The CHAIRMAN said that in bringing forward these resolutions it had been decided that as the third resolution was the only one upon which any discussion was likely to arise, that gentlemen, in moving and seconding other resolutions, would not be necessarily confined in their remarks to them, but be at liberty to refer also to the subject of the third resolution.

Mr. ANDERSON moved the first resolution:—

> "That in relation to the first clause of the Suggestions of the Pharmaceutical Council for the incorporation of the trade, viz.:—
>
> 'That in future all persons, before assuming the name or title of Chemist and Druggist, or keeping open shop for the compounding of medicines under physicians' and surgeons' prescriptions, or for vending, dispensing, or compounding certain dangerous drugs, chemicals, and other poisonous substances to be enumerated in a schedule, should undergo an examination and be registered as Pharmaceutical Chemists, or Chemists and Druggists.'
>
> This meeting has much pleasure in recording its concurrence therewith, and hopes that the compulsory examination it sets forth—desired as it is by the entire body of Chemists and Druggists, sanctioned by the Medical Profession, and recommended by the Select Committee of the House of Commons—will effectually secure the public against the practice of incompetent druggists, and greatly elevate and benefit the trade."

He considered they could adopt the suggestions of the Pharmaceutical Society, as they were based upon the most liberal principle so far as the trade was concerned. The proposal was a most important one, and he was sure this Society would concur in it, because in doing so they would do an immense good to themselves personally as chemists and druggists; because on the day when an act of incorporation received the Royal assent, all their businesses would be increased in value from 20 to 25 per cent. A butcher, baker, or draper, might set up in a new neighbourhood after such a bill was passed, but no chemist would be able to do so unless he was an examined and properly qualified person. The Pharmaceutical Society, instead of being called illiberal, should be considered the most liberal, and he had therefore much pleasure in proposing this resolution, which he had no doubt would meet with universal approval.

Mr. SALTER seconded the resolution. He considered that all persons should pass an examination before commencing business as chemists and druggists, and that if they wished to call themselves Pharmaceutical Chemists they should pass the Major examination, but if not, then they should pass the Minor examination. The trade stood numerically as follows:—Pharmaceutical Chemists, 2500; members of the United Society, 2500; and outsiders (including all Chemists and Druggists) 10,000 (a voice, 14,000). A chemist and druggist before commencing business should be compelled to pass an examination similar to members of the medical profession. The resolution was carried unanimously.

Mr. YEATES moved the following resolution:—

"That as to the system of examination specified in the 2nd and 3rd Clauses to the effect—

'That the examination for 'Pharmaceutical Chemists' should be, as heretofore, that which is known as the Major Examination of the Pharmaceutical Society.

'The examination for 'Chemists and Druggists' should be that which is known as the 'Minor Examination,' and to which persons hitherto registered as 'Assistants' have been subjected,'—

This meeting takes no exception to it."

He attended the meeting as a delegate representing the Hull chemists and druggists, although he was a London chemist and druggist. They required to be placed on the same equality as unexamined members of the Pharmaceutical Society.

Mr. Buott, jun., in seconding the resolution, said he was not a chemist and druggist, but he stood before them as a friend of the trade, from his past associations, and also as a delegate representing seventy members of the trade, carrying on business at Hull. They were the representatives of a large district association, and they had deputed him and Mr. Yeates to represent, on that occasion, their unanimous views on this question. If there was a division of opinion here, there was none at Birmingham, Manchester, Liverpool, Sheffield, and Hull. There had been meetings of the trade in those great centres of industry, and they were unanimously of opinion that there should be equality of government and representation. They had to consider what the Pharmaceutical Society offered to the trade, and what the latter required. The members of the United Society had no desire to enter into personalities, and there was an abnegation, on their part, of any ulterior views. They took no exception to what was suggested by the Pharmaceutical Society in the first two resolutions, the only difference being on the third. By that resolution they said that the government, which consisted of the Council under the present charter, should be continued and confined entirely to Pharmaceutical Chemists. He felt he was treading on tender ground in referring to certain transactions, but the emergency of the question must be his excuse. They knew that the majority of the members of the Pharmaceutical Society were unexamined chemists standing in no social position superior to those outside. Yet the Pharmaceutical Society wished to put chemists and druggists in an inferior position to the unexamined members of that Society,—in other words, that the government of the Society should be nominated and elected by their own class. Had they shown themselves such a liberal class as to be able to place implicit confidence in them? He thought not, for the history of the Society showed that they had made a scramble for special privileges as was shown in the Jury Bill, thereby throwing away a splendid opportunity of conciliating the outsiders, and putting the trade on an equal footing. The Pharmaceutical Society were not to blame so long as they kept to their stand-point of view, and did not go beyond it. They were a highly respectable body of men, and the outside feeling was right in viewing that Society as a select club; but when they proposed to go to Parliament and claim to be the representatives of the whole trade, could it be said they fairly represented the wants of the outsiders? Were they showing it by stipulating as a condition for amalgamation that no member of the Council should be chosen from the outsiders, but that it should always be confined to members of the Pharmaceutical Society? He appealed to every one of the trade whether that was right. It was true the Pharmaceutical Society, as they said, had borne the heat and battle of the day; they had accumulated funds, spent money, and been in the van, but latterly only in their own interest, and not for the objects laid down by their founder. His object was to elevate the commercial and scientific status of the whole body without reference to special privileges. There was no objection to the distinctive title of Pharmaceutical Chemist for the examined members of the trade, but the United Society, which was the exponent of the whole trade, said it should go no further, and that there should be no invidious distinction set up hereafter between them. There were men of as high standing and with as great prestige attached to their names, who were not members of the Society, as were attached to any member of the Pharmaceutical Society. Were such, and all those whose interests were identical, to be reduced to the invidious distinction of not being able to nominate a member of their future government? There was another point of objection in the third resolution; it stated "that all persons registered as chemists and druggists should be eligible for election to membership." He might be called ingenious in raising an objection to this, and it might be said by others that he had discovered a mare's nest, but he begged to disclaim having made a discovery beyond another; but it struck him that the Pharmaceutical Society not only reserved to themselves the power of self-nominating the Council, but also to say whether an outsider should or should not become a member of the Society. He hoped the trade would never consent to such vast power being given to the Pharmaceutical Society. He had much pleasure in seconding the motion.

The motion was carried unanimously.

Mr. Pass moved the third resolution :—

"That as regards the 4th Clause, which runs thus :—

'That all persons registered as chemists and druggists should be eligible for election to membership of the Pharmaceutical Society under the bye-laws thereof; but they should not by virtue of that membership be entitled to registration as 'Pharmaceutical Chemists,' that title being strictly kept for those only who pass the Major examination. They should have the right of nominating and voting for members of Council, but the Council should consist only of members who are Pharmaceutical Chemists.'

This meeting concurs in the desirability of limiting the title of 'Pharmaceutical Chemist' to those who may pass their Major examination; but it is decidedly opposed to registered chemists and druggists being subjected to election by the Pharmaceutical Council as a condition for the exercise of their right to vote upon the election of the members of that Council; and it is equally and decidedly opposed to the Council of so large a body as the chemists and druggists will be under an Act of General Incorporation, being limited to those who are now, or may be hereafter, Pharmaceutical Chemists."

After what had been said by Mr. Buott, jun., upon this clause, he should not occupy the time of the meeting by offering further observations on it. The object in calling the meeting was to obtain the opinion of the trade on the resolution, and not for them to hear the opinion of the Executive Committee. It was for them to act as they thought best upon it.

Mr. Warden, one of the Executive Committee, seconded the resolution, but in so rambling a manner that it was impossible to ascertain with any degree of accuracy what he meant. He travelled off on points having no connection with the subject of the resolution; for instance, remarking on what he considered to be the right pronunciation of the word "pharmaceutical." He completely tired out his audience before he sat down, and he was perfectly oblivious to the manifestations of impatience expressed in the usual cries of 'order' and 'question.' The speaker's line of argument appeared to be against what he considered the unjust and arbitrary power which the Council of the Pharmaceutical Society wished to reserve to itself. In the course of his remarks, when called to order, he said he was offering a few remarks in the presence he presumed of the trade at large, and not in the presence of persons as members of the Pharmaceutical Society, the Drug Society, or any other society. This observation was met with loud cries of 'order,' and a call for the retraction of the words "Drug Society." He declined to do so or to sit down until he had made his statement. He stood on his privilege to speak, and in the confusion that existed he appeared to urge that no good could result from an amalgamation with the *clique* which he designated the Pharmaceutical Society. He urged that a national school of pharmacy should be established under the ægis of Government, which was received with much laughter. At last he gave way to the repeated demands of the meeting, and sat down.

Messrs. Hudson, Hornby, and Huddleston attended as a deputation from Sheffield, and addressed the meeting, urging similar reasons to those expressed by Mr. Buott against the third resolution, and stating the determination of the Sheffield chemists and druggists never to assent to it.

Mr. Heppell said he had received a communication from a member of the Pharmaceutical Council, from which it would appear that the Council had no power to reject any one applying to be a member. The only rejection that had taken place, the communication stated, was in the case of a person who had been mixed up in a charge of felony. That, Mr. Heppell said, would show that the power of rejection existed in the Council.

Mr. Buott, jun., said there was no doubt the Council had the power of rejection, but they had no doubt thought it good policy not to enforce it except in the one case alluded to. They had the power, and they proposed to retain it. The question was whether the Pharmaceutical Society should retain such a dangerous principle.

The President said he should be happy to hear any remarks from a Pharmaceutical Chemist if there was one present. The meeting was convened for the whole body of chemists and druggists.

Mr. Wade said he had hoped some member of the Pharmaceutical Society would have been present and have offered to the meeting some remarks in support of the proposed Bill. The meeting ought not to separate without expressing their opinion of the feeling of the outsiders in relation to this matter. He believed they were present not for the purpose of contesting the point as to which was the best Society, or which was right or which was wrong, but which was the best way to frame an Act of Incorporation so as to form them all into one body, and so bring the trade into unity. Up to that time they had not accomplished that desirable object, but it was hoped that might be done by the passing of this and the other resolutions. The trade itself, if not the United Society, was determined that an Act of Incorporation should be obtained this year, and the trade united into one body. Now, with regard to the power of rejection, he was of opinion that every respectable society should have the power of refusing to admit to membership a man of known bad character; but in the case of a respectable registered chemist and druggist, he felt sure the Pharmaceutical Society would not attempt it, because their determination in such a case could be put aside by *mandamus*. Now with regard to the question in dispute he thought they would never arrive at a satisfactory solution of the difficulty by meeting in public only and discussing it, and therefore he was glad to find there was a resolution to be proposed for the appointment of a deputation to wait on the Pharmaceutical Society in respect to this question. He hailed that motion with pleasure, because he thought more good would result from a dozen men sitting round a table and quietly discussing the points in dispute than could be done in a public meeting. No doubt there were many who concurred in opinion with the Sheffield and other northern chemists; but then there were others of a different opinion, and who, no doubt, would support the Pharmaceutical Society; and he held in his hand a resolution passed by the Bath Chemists and Druggists, approving of the Suggestions which had emanated from the Pharmaceutical Society. By continuing public discussion they were only enlarging the division of feeling, but by coming together they would be likely to come to a sensible solution of their differences.

The resolution was carried unanimously.

The following resolutions were also carried unanimously and without any discussion requiring notice:—

"That this meeting cordially adopts the 5th Clause, which provides for—

'All persons registered under the Bill as chemists and druggists, to be exempted from serving on juries.'

"That in relation to the 6th Clause—

'That nothing in the Bill is to interfere with, or curtail the rights of chemists already in business, or of persons of the full age of twenty-one years, who should, at a given date, be assistants to chemists and druggists. Other necessary exemptions to be made for apothecaries, veterinary surgeons, wholesale dealers,' etc.

This meeting considers that all assistants, and the parents and guardians of all apprentices now connected with the trade, purchased a vested interest in it as it existed at the time of their contract, and therefore it requires, in adopting this clause, that the words 'persons of the full age of twenty-one years, who shall at a given date be assistants to chemists and druggists,' be omitted, and the words 'assistants and apprentices now engaged in it,' be substituted."

"That as to the 7th Clause thus expressed—

'That chemists and druggists already in business may, if they choose, be placed on the register of chemists and druggists, if within a certain time after the passing of the Bill they make application, and produce to the Registrar satisfactory evidence that they were actually in business on their own account, and engaged in the compounding and dispensing of medicines under physicians' and surgeons' prescriptions, and vending, compounding, and dispensing the dangerous poisons, as per schedule, prior to that date,'—

This meeting is of opinion that it might stand as it is, with such addition as will recognize the exemption of all existing assistants and apprentices from examination as required by the Act, in accordance with the proposed alteration of the 6th Clause."

Mr. Betty then moved the following resolution:—

"That, as among the interests influencing the entire trade of chemists and druggists, two elements, the educational and the commercial, are inseparably connected, and as it is of vital importance in maturing any form of government for the whole trade, that these two interests should, so far as practicable, be blended, this meeting cherishes the hope that from the resolutions it has adopted, the advantages of a mutual understanding and combined action may be brought into operation, and authorizes a deputation of the trade to wait in this spirit upon the Pharmaceutical Council."

This, he said, was the practical point upon which the meeting turned, and he was glad to find from the tone of the meeting that it would meet with their views. The movement had passed through three stages; first, in the glorious conception of Jacob Bell, to consolidate the trade and put them on a level in one respect; secondly, in bringing forth the question for discussion with a view of ascertaining their weak points; and thirdly, that the question was ripe for legislation. To carry out the latter, they wished to enlist the best ability of the trade, in order to bring about the best form of government for the whole trade. The Council of the Pharmaceutical Society not only revered the memory of Jacob Bell, but his spirit still pervaded it.

Mr. Anderson seconded the resolution.

Mr. Heppell asked why the last words of the resolution as printed, "*to ask their concurrence with the resolutions of this meeting*," had been struck out.

Mr. Betty said, because he wished to submit it to the meeting as he had drawn it.

The Secretary explained that *he* made the addition to it before sending it to the printers.

The resolution, as amended, was unanimously agreed to.

At this period the proceedings became of a very stormy character,—so much so, that all that can be done is to endeavour to give some outline of what occurred.

Mr. WADE proposed the following resolution :—

"That the deputation or committee consist of *twenty-one* unincorporated chemists and druggists, comprising *ten* members of the United Society and the President, and *ten* unconnected with either society; and that they be empowered to confer with the Council of the Pharmaceutical Society for the purpose of framing an Act of Incorporation, based upon the foregoing resolutions."

Mr. CANNON seconded it, and expressed a hope that they would all be chemists and druggists.

This remark raised a complete storm, and he was asked to withdraw his expression of opinion. Great indignation was expressed at the proposal to take it out of the hands of the Executive Committee, which it was said had been in existence for more than seven years, and had worked hard for the good of the trade. Numbers were speaking at the same time, and the Secretary, who was communicating with the Sheffield deputation, was several times called to order, and requested to keep his place at the table by the side of the President. He accordingly did so, but at the same time audibly expressed his opinion of the ingratitude of those present, after the manner the Executive Committee had worked for the benefit of the trade generally. Mr. Buott, jun., said there could be no doubt as to the object and intention of the resolution. He thought it was open to a practical objection. The deputation should be as open as possible, and so far from wishing to limit the number, the Executive Committee would be happy to have the concurrence of the whole body of the trade. If the meeting was sincere, it ought not to bind the deputation to a particular number from each body. There was a little underground work in thus trying to throw into the shade the exertions of the United Society; that the representatives of the meeting should be in sufficient numbers to put aside the expressions of the United Society as the exponents of the trade. Mr. Wade, however, refused to alter the terms of his motion, and the meeting was a great representation of a "Disunited society." Two amendments were proposed: one by Mr. Heppell, which was altered three times; first, that the deputation should consist of twenty-one members, the gentlemen to be nominated and elected by this meeting; then "members" was altered to "chemists," and afterwards "gentlemen," so as to admit those who were not chemists. Neither change appeared to give satisfaction, and Mr. Hornby moved, as another amendment, "That the deputation should consist of the Executive Committee of the United Society of Chemists and Druggists, and any other gentlemen willing to join them." Amongst the confusion that prevailed, the Chairman said he should put the last amendment, and, on calling for a division, the Secretary held up his hand, which was objected to by some of the members of the Society. He, however, claimed his right as a member to vote, but at the request of the Chairman he desisted. The hands were counted. At first they were stated to be twenty-two for, and afterwards twenty; and nineteen against. It was then arranged that the supporters and objectors should separate and be again counted, and when that was done the numbers were announced as twenty-six for the amendment, and seventeen against it. Dissatisfaction was then expressed, that persons had voted who were not chemists and druggists, and it was proposed that the names should be written down on paper. It was accordingly proceeded with; but as many had left, the Chairman, with a loud blow of his hammer on the table, finding it impossible to properly conduct the business, declared the meeting closed, and left the chair.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE ANATOMY OF DRUGS.

BY HENRY B. BRADY, F.L.S., ETC.

(*Concluded from p. 463.*)

Dicotyledons.—Exogenous or Dicotyledonous plants form the chief portion of the vegetation of every latitude, and as they yield by far the largest number of the elements of our vegetable Materia Medica, anything like a general sketch of the structure of their various medicinal products, even in outline, would far exceed the limits assigned to us. Neither is there much necessity for an elaborate or extended survey of them. With a higher organization we have, it is true, a larger margin for variation in minute particulars; but the existence of slight peculiarities can scarcely be said to increase the difficulties of the student, inasmuch as there is generally an obvious and easily-read relation of all the parts to a common typical plan of structure.

Thus, when the characters of any common Exogenous stem are understood, a section of quassia, sassafras, guaiacum, or logwood will need no explanation, for though each will be found to differ from the others in certain respects, it will be readily seen that the differences are dependent on the degree of development of the parts, and not on the presence of any superadded structure nor even on any alteration in the general arrangement of the organs forming the stem. The transverse section of these or any similar stem shows the wood, arranged in rings, each of which corresponds to a year's growth—a central pith or an indication of the position the pith had occupied in the earlier stages—and an external bark. Radiating lines ("medullary rays") traverse the wood connecting the central cellular tissue (pith) with the external cellular portion (bark). A longitudinal section through the centre of the stem is but a profile view of the organs just enumerated, but as the medullary rays are never quite straight or uniform in their growth, only patches of them are seen here and there, taking the appearance of a flat, regular, network of elongated cells. A third section cut longitudinally, but not through the centre of the stem (tangential), will *cross* the medullary rays, showing their thickness and further indicating their cellular nature. Of course in the chips of any of these woods as found in commerce only portions of these structures are to be found, as both bark and pith are usually rejected. In many woods, guaiacum for example, the inner layers become much hardened by secondary deposit, acquiring thereby a darker colour. The general appearance of the wood under the microscope is not altered thereby, except when viewed with high magnifying powers, which show, especially in transverse sections, the filling of the cells in the manner alluded to.

From woods, we may pass to the consideration of the cellular tissues which envelop them and in no section of the vegetable Materia Medica has the use of the microscope been more extensive than in the examination of the various products of Cinchona and allied genera known under the general name of "Peruvian barks," and few subjects are so beset with sources of error and confusion. To obtain authentic specimens of many varieties is a matter of extreme difficulty, and, until recently, that of ascertaining their precise botanical and geographical origin was scarcely less. The works of Weddell, Delondre, Phœbus, and others, and the beautiful monograph of Mr. J. E. Howard, have of late years cleared up many botanical doubts, and the explorations of Mr. Spruce in the cinchona countries, have, in like manner, thrown much light on the distribution of the various species. Hence, any writer in the present day who cannot command the opportunities enjoyed by these authors, acts most wisely when he is content to be a compiler only.

As Dr. Berg devotes no less than seven of his quarto plates to the illustration of these products, and gives descriptions of the structure of at least fifty varieties of bark, it becomes necessary that a somewhat detailed notice should be awarded to them. This we should not have been in position to attempt but for the kindness of Mr. Howard, who not only allowed opportunity of reference to the specimens in his unique collection, but lent his assistance also in the solution of many difficulties.

Firstly, let us award what praise we may to the drawings, as they constitute what is in reality the most valuable feature. They are excellent examples of the hard, ideal, diagrammatic sort of work before alluded to; too geometrical to be entirely natural, but giving, with none the less emphasis on that account, the peculiarities of the various sections.

A transverse section of Cinchona bark shows, at the outer edge, a thin, dark, external layer of cork cells, and immediately within it the wider zone of oblong, thick-walled cellular tissue, which constitutes the chief portion of its substance. This is traversed to a varying extent by long, fibrous liber-cells, partially or entirely filled with secondary deposit. In the outer half of the zone, these liber-cells are usually absent, whilst in the inner, or part nearest the wood, they are often present to such an extent as to form a striking feature. It is impossible to define any exact limit between the portion composed entirely of cellular tissue, and that constituting the liber region, but in some species an irregular line of laticiferous vessels seems to indicate a sort of boundary. The continuation of the medullary rays may often be traced through the liber-region till they lose themselves in the outer cellular tissue. A superficial observer might, at first sight, remark a strong resemblance amongst the microscopic preparations of the various species, but certain differences depending on the distribution and arrangement of the structures enumerated, would become apparent after a little examination. Whilst some allowance is necessary for variations depending on circumstances of growth, we may yet find characters of sufficient uniformity for purposes of identification. For instance, in the bark of some species of Cinchona, the bast or liber-cells appear in groups; in others they occur singly distributed through the parenchyma, or even in radial lines. The position and frequency or entire absence of milk-vessels (laticiferous ducts) are indications of a certain value. Exceptional characters, such as the presence of dark-coloured resin-cells or of crystalline bodies, also yield to the experienced observer useful data. It is, however, necessary to guard against the employment of evidence founded on *comparative* characters, as though it afforded means of *absolute* diagnosis, and it is here that Dr. Berg has lost his way. The table of cinchona barks, classified according to their microscopical appearances, which is given as an epitome of the subject, would leave nothing to be desired if it were only reliable. We should then be able, from the mere transverse section of any bark, to assign it to its proper species on a moment's examination. But, alas, our faith evaporates when we find closely allied species, such as *C. ovata* and *C. cordifolia*, or as *C. micrantha* and *C. nitida*, at opposite ends of the series, or when we find species so different in all botanical characters as *C. hirsuta* and *C. nitida*, or as *C. glandulifera*, *C. Calisaya*, and *C. succirubra*, placed in juxtaposition, and we are forced into the belief that the table is only the climax of hair-splitting. Surely a classification, however artificial, should have some of the elements of a natural arrangement.

Mr. Howard pointed out, some years ago, in his 'Nueva Quinologia,' the existence in certain barks (that of *C. succirubra* in particular) of stellate groups of crystals, consisting of kinovate of quinine, and reverted to the subject at greater length in the 'Pharmaceutical Journal' for May, 1865. These observations were repeated and confirmed by others in this country; indeed, speaking from our own experience, there was so little beyond the most ordinary care required in manipulation in order to obtain the most satisfactory evidence of the correctness of the views laid down, that we should not have supposed it possible that a doubt could have arisen in the matter. Notwithstanding, we find as follows, at page 60 of the 'Atlas:'—"The crystals which Howard figures are not found in that condition in the bark, but are first produced through chemical treatment of the preparation;" and it is even more surprising to find that another German writer, Dr. Phœbus, seems to have only partially succeeded in his search for them. Failure can only be attributed to one of two causes,—either the directions for preparing the sections have not been attended to, or else the bark operated upon has not been a good specimen.* The crystals are hard tufts of considerable size, enclosed in intercellular cavities proper to them, and may be observed by any one who will take the trouble to select a good rich sample of Red Bark. It is necessary to dissolve out some of the colouring matter which obscures them, by boiling for a few moments in weak potash, but the theory that this process should produce the crystals in question is manifestly absurd. Although these appearances are, so far as at present known, confined to the bark of three or four species, we have in others a somewhat analogous deposit in an amorphous form sufficiently marked to afford confirmatory evidence.

We cannot leave the subject without lamenting the unaccountable confusion which exists in Dr. Berg's separation of the species yielding the various commercial Peruvian barks, and pointing out a few of the errors into which he has fallen. It would be an easier task if any authority were given for many of the statements, which are set down as though they were acknowledged facts, without evidence and without argument. For example, we are told that the produce of *C. scrobiculata* is known in commerce (amongst many other names) as "Huamalies Bark," and as "Uritusinga suberosa" Bark. Now the Uritusinga tree, if we may judge from plants which have been raised from the seeds collected in the mountain of Uritusinga, is the true *C. officinalis*, Linn., which yields the Pale Bark of commerce. What "China Uritusinga suberosa" is we cannot pretend to say, and there is certainly no such thing now known in commerce as "Huamalies Bark." Again (p. 64), "Cinchona rubra dura" is stated to belong to a distinct species from "Cinchona rubra suberosa," in spite of the evidence of Spruce, who states that the difference depends on meteorological causes,—that the one is obtained from the tree in sheltered, shaded localities, the other from the same, grown in situations where it is exposed to sunshine, wind, and showers. "Quina fina de Loxa" is stated to be derived from *C. glandulifera*, but no authority is given for the assertion. The bark of *C. Uritusinga* is said to be known in commerce, when old, amongst other names as "Calisaya empeder*m*ida," which, apart from the fact that old Loxa bark is not known in commerce at all, is incorrect. In addition to which, the significance of the Spanish word *empedernida* (hardened and wrinkled like an old man's hand) is entirely lost by the bad spelling. Some varieties of Pitaya bark are said to come from Chiquinquera; as the two localities are about six hundred miles apart, one might as well talk of digging Newcastle coals in Cornwall. Anomalies such as these might be quoted at much greater length, and they detract seriously from the value of the letterpress portion of the book; but enough has been said to put students, using the work, on their guard respecting this sort of information.

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* Is it possible that the optical defects and general inferiority of the German microscopes has something to do with statements like the one quoted? The query has presented itself to us a dozen times whilst engaged on these papers. If the reader doubts the importance of the most accurate adjustment of object-glasses, let him examine the drawings made by the late Richard Beck, of the appearance of the Podura-scale as observed with the same objective, with varying amount of correction for the thin glass cover.

The number of plants whose roots are esteemed their most serviceable part is very large, indeed the list of those recognized as officinal is even longer than that of barks. It would be almost impossible to define what is understood as a "root" in any positive characters not equally applicable to the stem, but for pharmaceutical purposes the term may be taken to imply the *descending axis* of a plant. Many Exogenous plants have roots with a distinct separable bark, indeed, in at least two familiar instances, those of mezereon and pomegranate, this is the active medicinal portion. Many likewise, such as *Pareira brava*, have the woody portions arranged in the most marked, annual, concentric rings, traversed by medullary rays. Probably the only well-defined distinction a physiologist could lay down between the ascending and descending axis of a plant, apart from the direction of growth, would be, that the former does and the latter does not produce leaf-buds; characters affecting the external relations rather than the minute anatomy of either. Let us take two or three dissimilar examples and note their peculiarities.

The structure of rhubarb-root has occupied the attention of many authors seeking to obtain histological characters by which the origin and value of commercial samples might be estimated. The results, however, are only of botanical interest and have but little value in a commercial sense, for there is scarcely a single peculiarity of minute structure in the finest specimens of the "Russian" variety not shared, to a greater or less degree, by the comparatively worthless product of our own gardens. We do not wish to imply that the roots are alike, but that the differences are rather in their sensible physical properties than in their microscopic features.

The general characters of Russian rhubarb are well described by Pereira. The external surface of the trimmed root is not uniform, but shows, when the yellow dust is removed, a dark reddish-white ground with lighter coloured lines or veins crossing each other diagonally and with considerable regularity in their arrangement. The reticulated appearance thus produced may be seen in any good specimen. The mass of the root is composed of ordinary cellular tissue (parenchyma) with woody bundles distributed unevenly through it, and here and there confused groups of annular and spiral vessels. On the surface of the root and also at irregular intervals in the transverse section, but chiefly near the periphery, may be observed little, darker-coloured, circular spots, which when magnified are seen to consist of sinuous lines radiating from a centre. Crystalline tufts of oxalate of lime, common in every portion of the root, are particularly abundant in cellular tissue of the radii. The raphides occur in cells proper to them, and may be studied in English rhubarb as well as in Russian, but in some samples of the latter they amount to from thirty to forty per cent. of the whole weight of the root.

It is therefore chiefly in such peculiarities as weight, colour, fracture and taste that means of diagnosis of the quality of the root must be sought.

Of very different nature is the common licorice-root (*Glycyrrhiza glabra*). In the transverse section we have a type of structure very frequent amongst exogenous herbaceous plants. There is no true bark, but instead, a somewhat closer packing of the thin-walled cells in the epidermal region, which might, under favourable circumstances, be developed into a corky layer. A wider cellular zone traversed by bast fibres follows, and then a narrow well-defined ring of cellular tissue, answering to the cambium layer. Between this and the small central circle of pith lies the woody zone, consisting of irregularly grouped wedges of fibro-vascular tissue, separated by medullary rays. The medullary rays are unusually broad, and are conspicuous almost to the circumference of the section. But the most remarkable fact is one first pointed out, we believe, by our friend Mr. Schacht, in a very careful and accurate paper read before the Bristol Microscopical Society (March, 1857) and confirmed by Dr. Berg's independent observations, viz. the presence of a line of minute raphidian cells on the margin of each woody bundle. These cells are regular in shape, constant in their position, and usually each contain a single crystal. The chemical reactions of the crystals are those of oxalate of lime, as indeed might have been expected. It should be noted that these peculiar cells and their contents can only be seen to advantage in a longitudinal section of the root. In addition to the figures of *Glycyrrhiza glabra*, Dr. Berg gives small sections of *G. echinata*, the species yielding "Italian juice," which are not deficient in interest.

Rhatany root also forms an interesting study to the microscopist. Until within about a dozen years but one sort was known in commerce—the Peruvian or Payta Rhatany, the product of *Krameria triandra;* but since that time a second sort derived from *Kr. Ixina* has been imported from New Granada, under the name of Savanilla Rhatany. Dr. Berg, in addition to these, figures a third kind as Texan Rhatany, and differing considerably in structure from either of the other sorts. Elaborate details of the anatomy of the Peruvian and Savanilla varieties may be found in a paper by Dr. Schuckhardt,* and it is therefore unnecessary to do more than describe them in general terms.†

The figures in the 'Atlas' are scarcely sufficient for the proper elucidation of the structural differences they are intended to explain; indeed, it would be impossible by their means to refer a specimen to its proper species. The rude woodcuts accompanying Dr. Schuckhardt's paper are of even less value, and neither author gives any drawing of the appearance of the longitudinal section.

Peruvian Rhatany has a ligneous centre and thin, separable bark. The woody portion is composed chiefly of elongated fusiform cells (prosenchyma), with but few pitted ducts interspersed. The medullary rays are numerous, narrow, and rendered conspicuous by the dark-coloured resinous contents of many of the constituent cells. There are also cells filled with the same red resin, arranged in indefinite concentric lines at intervals through the wood. The three regions of the bark are easily distinguishable, the outer and middle layers being thin, the inner one equal in extent to the two others combined. The outermost is of a deep-red colour, that within it much lighter. The inner bark is traversed by horizontal cells arranged as irregular lines in the direction of radii, and filled up with minute crystals aggregated in masses.

Savanilla Rhatany has the woody portion thinner than the foregoing, and its structure somewhat differs, in the increased number of large pitted ducts which form the bulk of the tissue, true wood-cells being comparatively scarce. The bark, of which the middle layer is especially developed, is thicker, and is not readily separable from the wood. Resin-cells are scanty, and almost confined to the outer layer of the bark. The raphidian cells are present as in the Payta sort, but not in nearly the same numbers.

Texan Rhatany has a still smaller woody core, consisting of similar elements to the Savanilla sort, and relatively a much larger bark. The outer layer of the bark is thin and very dark coloured, that in the middle is very wide, and composed chiefly of thin walled, oval, brownish cells containing starch, whilst the innermost portion is traversed by the lines of crystal-bearing cells before described. The longitudinal section presents one marked peculiarity, that is, an extensive system of laticiferous ducts (milk-vessels) in the soft tissue of the bark immediately surrounding the wood. This is a distinctive character not observable in the other varieties of Rhatany.

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* *Botanische Zeitung*, Aug. 3 and 10. 1865. Translated, Pharm. Journ. vol. xvi. pp. 29, 132.

† We are indebted to Mr. Hanbury for authentic specimens, communicated to him by the late Dr. Berg, of the Savanilla and Texan roots, and also for opportunity of perusing a manuscript account of the observations of Dr. Radlkofer on this subject. Our own investigations have yielded results almost entirely in accordance with those of Dr. Radlkofer, though frequently at variance with the other two authors named in the text.

It is difficult to explain the omission both by Dr. Berg and Dr. Schuckhardt, of any notice of the crystal-bearing cells. Dr. Radlkofer very properl yattaches much importance to them.

We need not dilate further on the roots of Dicotyledonous plants. The absence of any notice, in Dr. Berg's work, of many in common use with us, and the presence, on the other hand, of several such as those of *Levisticum officinale*, *Ononis spinosa*, *Pimpinella saxifraga*, *Lappa* sp. ("*Radix Bardanæ*") and *Artemisia vulgaris*, all of which are carefully figured, may be attributed to the difference between medical practice (or fashion?) in this country and Germany.

The diagrammatic figures of sections of the various fruits used in medicine or for economic purposes, derived from the Natural Order *Umbelliferæ*, deserve remark as a most instructive series. It is not that the observer could expect to identify every fruit so figured, without previous study, by the mere outline of its transverse section, but that the drawings form an admirable key to the modifications of form in the various species. It would be interesting to see figures from actual sections placed alongside those in the 'Atlas,' which as a rule are too geometric in their drawing to be regarded otherwise than as ideal sketches.

Dicotyledonous seeds would of themselves afford material for a long paper, for in additition to the embryo, there is the testa or seed coat, and frequently an oily, starchy or horny albumen, causing by their modifications an endless variety of structure. There are few portions of vegetable histology in which so much interesting work remains to be done, as in the anatomy of the seed-coverings. Almost the whole of the seeds used in medicine may be studied with advantage, but in some few, such as Star-anise, Stramonium, Nux Vomica, Linseed, White Poppy and Hyoscyamus, the testa presents structural peculiarities which can scarcely be so well observed in any other vegetable tissues.

But there are still certain vegetable substances, used in medicine in the condition in which they occur in nature, which would not be included in any of groups of Exogenous products we have spoken of. Such are the external glands which constitute Lupuline and Kamela, and more strikingly still anomalous growths like the Nut-gall, which might with almost equal justice be regarded as derivatives of the animal kingdom.

The little bodies found around the seed-vessels amongst the scaly bracts of the Hop, and known as Lupuline, are a good example of the organs known to botanists as "compound external glands." They are often mounted as microscopical objects, and their appearance is therefore familiar to many. They are small urn-shaped cellular masses, of yellow colour (owing to the oil or oleo-resin they contain), and with a beautifully reticulated surface. It is necessary in mounting them to observe that, as heat bursts the capsule, glycerine rather than Canada balsam should be used as a medium, but it is still better to mount them dry, and examine as opaque objects.

Kamela consists of minute particles brushed from the seed capsules of *Rottlera tinctoria*, and to the naked eye it has the appearance of a dull red powder. The microscope shows that the constituent particles are not alike, but of two sorts, the lighter being colourless stellate hairs, the dark coloured portion being composed of brown or red compound glands. The glands are of themselves too dark and opaque to admit of their structure being observed, but after treatment with caustic alkali or mounting in Canada balsam they may be rendered transparent. In this condition they are seen to be minute vesicles containing within them a number of oval, elongated bodies grouped into a mulberry-shaped mass. It is these very minute cells which contain the dark red colouring matter so highly esteemed as a dye for silk, and it is probably to the same that Kamela owes its anthelmintic virtues.

The origin of the officinal nut-gall is well known. A peculiar insect (*Diplolepis Gallæ tinctoriæ*) infests a single species of oak (*Quercus infectoria*); the female punctures the epidermis of the young soft shoots and deposits an egg in the cavity; an excrescence is rapidly formed and increases in size until it becomes the fully-formed gall, the egg meanwhile having passed into the pupa stage. If the galls are gathered and dried before the insect has made its escape they have a bluish exterior, and the cocoon may be found filling the central cavity, but if they have been left on the tree too long a neat round perforation may be noticed marking the spot where the insect, arrived at maturity, has eaten its way out, and the galls then have a yellowish-brown colour. A section of a nut-gall examined by means of a pretty high magnifying power shows how completely vegetable is its structure. Nearest the central cavity a series of cells are observed (first pointed out by Guibourt) containing starch. An inner wall composed of a number of irregular layers of hard cells nearly filled with secondary deposit occupies the space surrounding the cavity, and the remainder of the gall is made up of a regular tissue composed of angular cells, large near the centre, small and compact towards the periphery. Here and there may be observed fragments of fibro-vascular bundles, traversing the tissue in a sinuous course.

In bringing these remarks to a conclusion, it is needless to frame excuses for the incompleteness of what has only been intended as a rough sketch, and treated in a suggestive rather than detailed fashion. It would have been easy to have written a simple criticism on Professor Berg's 'Atlas,' but we have indulged a hope that by a few broad indications of the scope of microscopical study in connection with organic medicines, some interest in it might be awakened amongst those who are still young, and, in the common sense of the term, still students. There can be no better wish for them than that they may ever remain students. A microscope, thanks to the popularity of the instrument, is no longer an expensive luxury, and for a few shillings the accessories required for the preparation and mounting of specimens may be purchased. Let it ever be borne in mind that good work does not depend on costly, still less on showy apparatus, but on perseverance and accurate observation. To observe well is a faculty that must be learnt. Schleiden has said that "*seeing* is a difficult art;"—if difficult under ordinary circumstances, how much more so, when deprived of the assistance in reading appearances yielded by comparison with surrounding objects. There is no aid to accuracy so serviceable as drawing,* especially drawing in outline with the camera lucida. The limited amount of mechanical skill required for its practice in ordinary cases, may be attained by almost any one who will devote a little time and pains to its acquirement. Sketches thus made are of far greater value than any written notes, both in the stronger impression they produce upon the mind at the time, and in the facilities they offer for future reference.

We may now leave the subject in the hands of our readers.

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* *Apropos* of "seeing and drawing" the following has the seal of much experience:—"For I am nearly convinced that when once we see keenly enough there is very little difficulty in drawing what we see; but, even supposing that this difficulty be still great, I believe that the sight is a more important thing than the drawing; and I would rather teach drawing that my pupils may learn to love Nature, than teach the looking at Nature that they may learn to draw."—*Ruskin, 'Elements of Drawing,' Preface, p.* xi.

NOTES ON PRESCRIBING.

BY DANIEL HANBURY.

Although more than fifty years have elapsed since the learned Dr. Paris placed before the medical profession his observations on the theory and art of medicinal combination, it may safely be asserted that nothing has been since written on the same subject more replete with sound and accurate information.

Yet every year adds to our experience: not only are new drugs introduced, but new combinations and new forms of administration are also adopted; and the prescriptions of the present day differ as much in character from those that found their way to the druggist's counter half a century ago, as do the medicines then in vogue from those which are now in use.

The art of prescribing, it must be admitted, is not a subject coming precisely within the province of the pharmaceutist, yet the pharmaceutist is necessarily acquainted with the methods of prescribing which are prevalent and is more capable than any other person of judging of the merits of formulæ under pharmaceutical and chemical aspects.

It has long appeared to me that some of these methods or modern phases of prescribing call for notice in the pages of the *Pharmaceutical Journal*, and in the hope that the subject may be further handled, I have thrown together the observations here presented. Some of the formulæ that I shall quote will afford evidence that the precepts of the author of the *Pharmacologia* and the rules of chemistry are too little observed, and that the duties of the private dispensary performed by many of the older physicians while practising as apothecaries, enabled them to avoid the errors and eccentricities into which some of their successors occasionally fall. The result of mixing the ingredients ordered in a prescription is sometimes very unexpected, so that even the most practised dispenser is often unable to predict whether certain given ingredients can be united into a compound that shall be suitable for administration:—and if the pharmaceutist whose time and skill are chiefly devoted to the mixing of drugs is thus at fault, it is hardly surprising that the physician whose mind is mainly directed to other subjects, should sometimes prescribe ingredients that it is impossible to combine, or that if combined, cannot be taken, or are devoid of the required efficacy.

For convenience I shall place my remarks under different heads and shall notice firstly

Unchemical Formulæ.

As an example let us take the following:

℞ Barii chloridi gr. iss
Ferri sulphatis gr. ij
Extracti gentianæ q. s.
Ut fiat pilula.

The writer of this formulæ was a frequent prescriber of chloride of barium which he generally ordered in combination with sulphate of quinine or sulphate of iron, or with both, thereby probably rendering the chloride inert. No reliance could of course be placed on the uniform effects of baryta, prescribed sometimes in a state of activity and sometimes in an inert form.

As another example of this character, take the following prescription which was brought to be dispensed a few weeks ago:

℞ Potassii iodidi ℈i
Potassæ bicarbonatis ʒiss
Ferri et quinæ citratis ℈iv
Tinct. valerianæ ammoniatæ ℥j
Aquæ ad ℥iv
Misce. Sumat cochleare medium ex aquâ ter die.

In preparing this medicine, the iodide and bicarbonate were dissolved in a portion of the water, to which the tincture was then added. The citrate was dissolved in the remainder of the water and the two solutions were mixed. The result as might be expected, was that a frothy white precipitate of quina was instantly formed which in a few minutes collected into a coherent mass, sufficiently hard and tough to be rolled into pills.

It may be observed that in compounds such as this, the quina is not subject to the remarkable influence which citric or tartaric acid exerts on peroxide of iron,—that of allowing it to be combined with an alkaline bicarbonate or with ammonia, but that it is more or less separated when such alkalies are mixed with it, a fact very often overlooked.

A third instance of extremely unsuitable combination occurs to me, which from its frequency a few years ago was impressed on my memory, although I have no copy of a prescription in which it was ordered. It was the prescribing of *glacial* phosphoric acid *in pills*, and that in combination with valerianate of zinc!

Formulæ that give rise to unexpected combinations. A very interesting fact bearing on this point has been stated in a recent number of the *Journal de Pharmacie et de Chimie.** M. Melsens has proved by experiment that pure iodide of potassium may be administered to dogs in considerable doses without occasioning any ill effects; and that chlorate of potash in somewhat strong doses is also tolerated when administered continuously for at least a month. Treated with iodate of potash however, dogs die rapidly. If iodide of potassium and chlorate of potash in equivalent proportions are given to dogs, such mixture speedily proves fatal;—and yet, as is well known, these salts do not under ordinary circumstances decompose one another. These experiments have an important practical bearing on the art of prescribing, showing that medicines, harmless when administered separately, may become highly deleterious when given in combination.

The following case of unexpected change in the composition of a medicine was of actual occurrence. A prescription was written for a mixture of which the more essential ingredients were Rochelle Salt and Calcined Magnesia, the one dissolved, the other diffused in peppermint water. The mixture was prescribed and taken without particular remark, until upon one occasion, recourse was had to a bottle which had been prepared some weeks before. The dose was found extremely different from any that had been taken previously: in fact it had so caustic a taste as to excite the alarm of the patient who suspected a serious error on the part of the druggist. The physician was consulted, and finally an analytical chemist was requested to examine and report on the medicine. This resulted in an explanation:—the Calcined Magnesia by prolonged contact with the alkaline tartrates had gradually abstracted their tartaric acid leaving their alkalies in a free and caustic state.

The dispenser of prescriptions is sometimes puzzled to know what *colour* to make a medicine, the colour being dependent *on the order* in which the ingredients are mixed. For instance, a lotion was prescribed composed of calomel, lime water, and chloride of zinc. If the calomel were decomposed first, the lotion was *black:* if the chloride of zinc first, it was *white.*

Lotions in which both chloride and bichloride of mercury are ordered with lime water, are easily made to vary from yellow to brown or black, according to the order in which the two mercurials are decomposed. A lotion made according to the following formula is either transparent and colourless, or opaque and of a brick red, according to the order in which the ingredients are mixed:

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* November, 1863, page 338.

℞ Potassæ chloratis
Boracis āā ʒss
Hydrargyri bichloridi gr. iv
Glycerinæ ℥ss
Aquæ ad ℥viij
Misce.

Although hardly coming under this section, and rather deserving to be ranged under the head of *ill-contrived formulæ*, may be instanced the following:

℞ Unguenti hydrarg. nitratis ʒiij
——— cetacei ℥j
Liquoris potassæ ʒij
Linimenti saponis ad ℥vi
Misce. Sit linimentum capiti omni nocte infricandum.

℞ Confectionis opii ʒij
Olei terebinthinæ ʒiss
Sp. ammoniæ aromat. ʒiij
— camphoræ ℥iij
Fiat linimentum.

℞ Potassii iodidi ʒi
Morphiæ acetatis gr. x
Aceti colchici ʒiv
Olei sulphurati ℥i
Misce. Fiat linimentum.

The next subject on which I must beg leave to offer a few remarks is the *Undue concentration of Medicines*. There is no practice in the modern method of prescribing more fraught with inconvenience to the pharmaceutist, and risk to the patient, than that of ordering medicines in an excessively concentrated form. The object for doing so is in most cases that the patient may obtain a large supply of medicine at a small outlay;—in others, because medicine in a concentrated form is more convenient for being carried from place to place. That the prescriber should have a due regard for the pocket of his patient and wish to diminish as much as possible the expenses attendant on sickness, is doubtless commendable. But when this is done at the expense of safety and of efficacy, it becomes an abuse which demands rectification.

All druggists know that forty or fifty years ago, liquid medicines for internal use were very commonly prescribed in the form of *draughts*, or doses each contained in a single bottle;—that these have gradually been superseded by *mixtures*, containing usually 6, 8 or 12 doses, and that these last are now often replaced by highly concentrated and smaller mixtures technically called *drops*, each bottle of which contains a large number of doses. Most will admit that the dispensing of medicines in the form of *draughts* except in rare cases, involves more labour and expense than are necessary for any purposes of accuracy or convenience. But in resorting to the compounds which are now prescribed as *drops*, we are going to the other extreme. It is a practice of recent introduction and finds no place in the *Pharmacologia* of Dr. Paris, who does not give a single specimen of such a manner of prescribing.

As evidence of the objectionable character of prescribing medicine in a very concentrated shape, I shall quote a few prescriptions, all of which I have myself lately observed.

℞ Liquoris strychniæ ʒij
Tincturæ valerianæ ℥iij
Spiritûs chloroformi ℥j
——— camphoræ ʒiij
Magnesiæ sulphatis ℥j
Misturæ camphoræ ad ℥viij
Misce. Sumat cochleare unum magnum pro dosi.

This mixture is too alcoholic to retain in solution the sulphate of magnesia, which, although first dissolved in the camphor julep, subsequently concretes into a crystalline mass.

℞ Liquoris Donovani ʒviss
Potassæ bicarbonatis ʒv
Tincturæ calumbæ ad ℥iij
Misce. Signa—Forty minims (by measure) in water twice a day after meals.

Here again the liquids are insufficient to dissolve the alkaline salt, which remains at the bottom of the bottle as a dense white powder, not to be shaken up and poured into a minim measure.

℞ Chlorodyne ʒiss
Sodæ biboratis ʒj
Sp. camphoræ
— ammoniæ comp.
— ætheris sulph, āā ℥ss
Misce. Take a small teaspoonful in a wineglassful of water when required, and repeat the dose every two hours until the pain is relieved.

The addition of the borax to the other ingredients occasions the separation of a sticky mass which adheres to the sides and bottom of the bottle in such a manner that the intended dose cannot possibly be administered, a difficulty which would be entirely obviated had the mixture been ordered in a dilute form.

℞ Hydrargyri bichloridi gr. vj
Liquoris arsenicalis ʒijss
Tinct. cardamomi comp. ʒiij
Aquæ ℥vj
Misce. Sumat cochleare unum minimum bis die.

℞ Quinæ disulphatis ʒss
Acidi phosphorici diluti ʒx
Liquoris arsenici chloridi ℥j
Tincturæ ferri muriatis ʒxj
——— aconiti ʒiij
——— calumbæ ℥iss
Glycerinæ ad ℥vj
Sumat cochleare unum minimum pro dosi

Medicines prescribed according to such formulæ as this and the preceding, are dangerous from their extreme concentration, and from the large quantity ordered rendering them liable to be mistaken for comparatively dilute mixtures taken in the dose of two or three tablespoonfuls.

℞ Tinct. aconiti (Flemming) ʒij
Sumat gutt. j tertiis horis ex aquæ ʒij

℞ Strychniæ gr. j
Acidi phosphorici diluti ℥j
Sumat ♏ v ex aquæ cyatho vinario ter die

℞ Strychniæ gr. ij
Aquæ destillatæ ʒv
Solve ope
Acidi hydrochlorici diluti ♏iv
et adde
Vini ferri ad ʒx
Misce. Signa—Take ten minims by measure in water every morning before breakfast, and increase the dose every other morning by one minim up to 18 or 20 minims.

℞ Ext. cinchonæ liquidi
Liquoris calcii chloridi āā ℥ss
Fiant guttæ.

℞ Acidi arseniosi gr. ij
Syrupi zingiberis ℥ij
Fiat mistura.

In the five formulæ above-quoted, the medicines are ordered to be furnished to the patient in (as it seems to me) a form far too concentrated. By the first of them a bottle containing about 150 doses of the strongest Tincture of Aconite is supplied with directions that a dose is to be taken every three hours. In the second nearly a hundred doses of Strychnine are ordered to be placed at once in the hands of the patient. The third prescribes five weeks' supply of strychnine in a ten-dram mixture, and is also deserving notice for the complicated directions to the patient for calculating his dose. The fourth is objectionable from the fact that the ingredients are decomposed for want of a suitable excipient, the resin of the bark being precipitated on the bottom and sides of the bottle, so that it is impossible for the patient to obtain the intended dose. No such difficulty would arise if each ingredient were reasonably diluted previous to mixing, and the dose apportioned accordingly. The fifth formula is dangerous from ordering the arsenic to be treacherously disguised in the form of a very palatable syrup, which might in ignorance be taken far too freely.

The experience of any dispensing pharmaceutist will readily testify that prescriptions such as those here quoted are now-a-days by no means unfrequent. That they are highly objectionable all will allow, inasmuch as in many cases they do justice neither to the patient, the physician nor the pharmaceutist. Those of the last category are reprehensible for the sake of the patient who is furnished with a large supply of potent, or it may be even dangerous medicine which is to be taken for a lengthened period, almost according to his own pleasure and judgment; for the sake of the physician who by such prescriptions must often deprive himself of the opportunity of watching the effect of the remedies he orders; and lastly for the sake of the pharmaceutist on whom is thrown a heavy risk of error and accident, counterbalanced by no proportionate increase of profit, but actually accompanied by a much diminished scale of remuneration.

Obituary.

DR. SCORESBY-JACKSON.

We have to record the death of this lamented gentleman, who so recently as last January was a contributor to these pages. His career, brilliant as it was of short duration, was suddenly arrested just when his future seemed to offer abundant promise of honourable distinction. By his unexpected removal Edinburgh has been deprived of a good physician, a man of genius, and an amiable Christian scholar. Born at Whitby, Dr. Jackson prosecuted his medical studies in London, chiefly at St. George's Hospital. He became a member of the Royal College of Surgeons of England, licentiate in midwifery, and a licentiate of the Apothecaries' Company in 1855. He also studied in Paris. He afterwards came to Edinburgh, and took the degree of M.D. in 1857, his thesis being on Climate, Health, and Disease. The subject which he thus chose for his inaugural dissertation was that to which he subsequently devoted great attention. He visited the Continent, and then settled in Edinburgh, being first a Fellow of the Royal College of Surgeons in 1859, and then a Fellow of the Royal College of Physicians in 1862. In 1861 he wrote a life of his uncle, the Rev. Dr. William Scoresby, well known for his Arctic travelling. It was after the death of his uncle that he assumed the name of Scoresby—having graduated as Robert Edmond Jackson. He devoted his attention specially to medical climatology, and in 1862 he wrote a work on the subject, in which he gave a topographical and meteorological description of the localities resorted to in winter and summer by invalids of various classes both at home and abroad. On the 2nd of February, 1863, he read a paper to the Royal Society of Edinburgh (of which he became a Fellow in 1861) on the influence of weather upon disease and mortality. This paper was published in the Transactions of the society, and was illustrated by five coloured plates, beautifully executed by the Messrs. Johnston, showing in a graphic manner the range of temperature, the winds, humidity, deaths by diseases at different ages, etc. It excited much notice, and deservedly placed its author in a high position as a scientific observer. Having become a member of the Meteorological Society, he contributed several valuable communications, some of which were published in its Proceedings, and he also conducted some important inquiries respecting climate under its auspices. Materia Medica was a subject to which Dr. Jackson also devoted his attention, and when his friend Dr. Douglas Maclagan became Professor of Medical Jurisprudence in the University, he succeeded him as extra Academical Lecturer on Materia Medica and Therapeutics in the College of Surgeons. The last work which he published was 'A Notebook on Materia Medica, Pharmacology, and Therapeutics,' in which he gives an excellent condensed view of the subject, and supplies a manual well adapted for students of medicine. Dr. Jackson acted for some time as one of the medical officers of the New Town Dispensary, and about two years ago was elected Physician of the Royal Infirmary, and in that capacity he lectured on clinical medicine. During the active discharge of his duties in that institution he was seized with the disease of which he died. He contributed several medical papers to the 'Edinburgh Medical Journal,' particularly an interesting one on aphasia; and the number of the Journal for February, just published, contains the last of his contributions, in which he displays great medical acumen, and a thorough knowledge of the phenomena of disease. To ourselves he will be best known by his excellent analytical review of the Paris Codex, and we can only express our regret that the literature of French pharmacy has lost so admirable an exponent. We learn from a correspondent that Dr. Jackson was prepared to give Pharmaceutical students the advantage of attending his lectures on Materia Medica, on terms of a most liberal and advantageous kind; and that he only waited for some Legislative enactment to bring this matter generally before chemists and druggists. Such a man we can ill afford to lose, and we desire by even this brief notice to do honour to his memory.

MISCELLANEA.

Poisoning of Horses by Strychnine.—During the month of January a number of domestic animals were wilfully poisoned in Cambridgeshire. Mr. G. S. Hall, solicitor, of Ely, lost within a few days a valuable dog, a sow pig, and finally two horses of great value, the cause of death in each case being proved to be the administration of strychnine. The services of Sergeant Clarke, an officer of the Metropolitan detective force, were secured, and on Thursday, February 14th, as the result of his investigations, Dr. Henry Pearson, a physician of about twenty years' standing at Ely, was arrested on a warrant and charged before the Isle of Ely magistrates with poisoning two horses, the property of Mr. Hall, on January 21st. The examination lasted nearly five hours. The evidence went to show that on the 21st of January last Mr. Hall left home at about half-past eleven, to attend the skating match at Littleport. Before starting, he went into his stables and saw the horses in question in excellent health, and on his return home he found them both dead and rigid, their jaws so closely locked that they would break rather than open. On the same afternoon, after ascertaining that Mr. Hall, his chief clerk, and his groom were out of the way, Dr. Pearson was seen coming away from the stable, and he evinced a good deal of confusion at this discovery. It was proved that a day or two previously he was seen with strychnine in his possession, and he asked a veterinary surgeon how much was necessary to kill a horse. Before going to Mr. Hall's stable he was proved to have provided himself with about a handful of wet bran, and on the discovery of the death of the animals, though they were left at noontime without the slightest particle of food in their manger, a small quantity of bran was observed, which Mr. Hall gathered together and showed Dr. Pearson, who was present, and he at once stated that it contained crystals of strychnine, which he alleged he could see with his naked eye. Mr. Wontner, solicitor, of London, for the prosecution, applied for a remand to Saturday, which was granted, bail being refused. At the adjourned inquiry, Professor Tuson, of the Royal Veterinary College, having proved that crystals of strychnine had been found in the bran, and also in the stomachs of the horses in quantity sufficient to cause their death, and other witnesses having been examined, the magistrates committed the prisoner for trial, accepting bail, the prisoner's own recognizance of £500, and two sureties of £250 each. Bail had not been procured up to the rising of the Court.

Koorchee, a New Remedy for Acute Dysentery.—A. C. Castogree, sub-assistant-surgeon, Burrisaul, describes an acute case of dysentery in a child fifteen months old, in which ipecacuanha failed. He endeavoured to get a drug which, without irritating the stomach, would specifically act on the diseased intestine, and fortunately he pitched upon koorchee. This is the bark of the *Wrightia antidysenterica*, growing in jungles as large trees, indigenous in most parts of Bengal. Its seed is the famous *indro-job*, used as a vermifuge by the natives, and in the last cattle-plague of Backergunge extensively used as possessing certain specific virtues. A fresh decoction of the bark of this plant, in the proportion of two ounces of the bark to two pints of water, boiled down to half, was given to the child in four-drachm doses four times a day, with a drop of laudanum in each dose. The effect of this was plainly marked, after seven or eight doses had been taken ; in two days the number and quality of the stools became changed ; in place of blood and slime, fæcal matter was discharged, and from that time the patient gradually recovered. The child subsequently suffered with bilious diarrhœa, which also defied all astringents, but was finally removed by extract of logwood in four-grain doses, three times a day. In acute dysentery, with great irritability of the stomach, where the use of ipecacuanha is worse than useless, the native koorchee is its appropriate substitute.—*British Medical Journal.*

Poisoning by Camphor.—A boy, twenty months old, well grown, and strong, got hold, during the absence of his mother, of a glass containing a solution of camphorated oil, and swallowed a small quantity. Two hours and a half after swallowing it, the child fell down in a state of insensibility. Dr. Leinchen was called, and found the child perfectly stiff, and in an early stage of opisthotonos. The smell of camphor in his throat was distinctly perceptible. The tetanic stiffness was followed by convulsive agitation in the limbs. Dr. Leinchen administered an emetic of ipecacuanha ; this gave relief, and following up the treatment by cold applications to the head, etc., he succeeded in restoring the child.—*Journal für Kinderkrank* and *British Medical Journal.*

Spontaneous Ignition.—"The spontaneous ignition of pyrotechnical compositions made with chlorate of potash is indeed a very serious subject as regards the safety of both life and property. I know not if any reliable observations have been made in the matter, but the following facts were noted by myself some years ago, and may throw some light upon the probable origin of various terrible fires which have occurred on the premises of firework-makers in London. Mixtures of the three ingredients—nitrate of strontia (or barytes), sulphur, and chlorate of potash—if made up at once from *freshly* and strongly desiccated materials, are certain to take fire spontaneously within a few hours, especially if placed in a rather damp situation. The action, which I twice had the patience to watch for and witness, begins with the evolution of an orange-coloured gas; afterwards a liquefaction is set up at several points in the mass; a hissing noise and a more rapid disengagement of the gaseous matter comes on, and the composition takes fire. It is a curious thing that the addition of a small proportion of sulphuret of antimony at once prevents the occurrence of these phenomena; whether charcoal has the same effect I am not quite sure. Moreover, if such compositions, being damp, are, in order to dry them, placed too near the source of heat, the same phenomena will take place even when antimony is used in their composition. Also, compositions to produce a purple flame, if made with black oxide of copper, are almost sure, sooner or later, to take fire of themselves at uncertain periods, whether kept in a damp or dry place. The carbonate should always be usedin preference.—R. TREVOR CLARKE."—*Chemical News.*

Suicide by Cyanide of Potassium.—On Friday, November 23, an inquest was held at the Royal Free Hospital, upon the body of Maria Elizabeth Millidge, aged twenty, of 32, Tysoe Street. It appeared from the evidence that her husband had deserted her, which caused her great distress of mind. She had induced her younger sister to fetch some cyanide of potassium, with the properties of which she was acquainted, her father being a photographer. Shortly after having obtained possession of the poison, she was found insensible on the floor of the apartment where she lived, and was taken to the hospital, where every means were used to restore the deceased, but without effect. The *post-mortem* examination clearly showed that death had been caused by a large dose of cyanide of potassium. It was evident that the poor young woman had been left by her husband without any means of subsistence. The verdict returned was, "That deceased poisoned herself while in a distressed state of mind producing temporary insanity.—*Chemical News.*

Accidental Death from Burning by Phosphorus.—An inquest has been held at the Infirmary, Bristol, on the body of Robert Ellis, who died from the effects of severe burns. From the evidence it appeared that deceased, in walking over the Down, had picked up what he considered to be a stick of sugar-candy, which he put into his trousers pocket. Shortly afterwards the substance ignited, causing the injuries from which he died. Mr. Board, the house-surgeon at the Infirmary, had little doubt, from the description given by deceased, that the burn was caused by phosphorus. It was proved in evidence that a gentleman, on the day before the accident, had purchased of Mr. Hatch, chemist, Redland, some phosphorus for chemical experiments, and had taken it to the house of a friend for that purpose, and having no further use for it, had placed the bottle containing it behind the leg of a seat in the garden for safety. The next morning it was missing, and it was supposed that it had been taken from the garden and thrown on the path, where the deceased picked it up; but there was no evidence to connect the phosphorus picked up with that purchased of Mr. Hatch. The coroner, therefore, recommended the jury to return an open verdict.

Accidental Poisoning by Laudanum.—Mr. Emsley, the borough coroner, held an inquest yesterday on the body of a child, named Frederick Hobson, son of Mr. J. W. Hobson, Ellerby Lane. On Sunday last, Mr. Hobson, with his wife and child, went to dine at his father's, a provision dealer, in Accommodation Road, along with a large party of friends. Towards evening the child screamed very much, and its grandmother recommended a second dose of Godfrey's cordial, one dose having been given during the afternoon. This was assented to, and Mrs. Hobson, sen., who is rather short-sighted, went into the shop to fetch the bottle, but it would appear that she got hold of a bottle containing laudanum instead. The mistake was not discovered until about a quarter of an hour afterwards three-quarters of a spoonful of the poison had been administered. Antidotes were then immediately applied, and surgical assistance obtained, but the child died on Monday morning. In returning a verdict of "Homicidal misadventure," the jury recommended that in future the drugs be kept apart from other goods in the shop.—*Leeds Mercury, December* 27, 1866.

The Danger of using Chemical Powders in Cooking.—A very narrow escape from poisoning a whole family occured at Wilmington, on Saturday. As Mrs. J. Davis was making a hard pudding for dinner, she went to a shelf to get a pinch of "baking powder," as she thought, to mix with it, but in mixing, she fancied it did not feel just like baking-powder, and in taking up the packet and looking at it, she saw poison labelled on the packet, and which was found to contain oxalic acid, which had been left there unknown to her, for cleaning boot-tops; she was much frightened, and at once threw it all away.—*Brighton Paper, December 25th.*

Chloroform as a Remedy in Hydrophobia.—The following case by Mr. R. Delafosse Shield, M.R C.S., of Silverstone, is recorded in the 'Standard' of January 9th:—John Harris, a servant man in a farmhouse in this village, was bitten in the hand by a young foxhound some seven weeks previous to the attack. It is not quite clear that the dog was at that time suffering from rabies, but he was then sickening for what was considered an attack of distemper, and of which he shortly afterwards died in great suffering, especially from spasmodic closure of the jaws.

I was called to Harris late on Sunday evening, the 16th ult. The attack had been ushered in with sickness, and he had now fallen on the floor, suffering from great mental excitement, and was with difficulty restrained by several men. Each paroxysm came on with a wild, sharp cry of "Hi! hi!" when he forcibly raised himself up, and then immediately threw himself backwards convulsed in all the muscles of the neck and jaws, with foaming at the mouth. Each paroxysm lasted a few minutes only. In the intervals, which were also of a few minutes only, he appeared conscious, and would utter "Oh dear!" in a subdued voice, as though he were greatly exhausted. At the onset of the attack he was quite unable to take any fluid, but after some hours, and by giving it him drop by drop only at first, he swallowed a small quantity of warm broth. Cold fluids, a cold vessel, or even the bowl of a spoon, placed to his lips, instantly produced the most frightful convulsions. Having, during several hours, exhausted other means of relieving him, at 9.30 A.M., 17th ult., I gave him a draught of chloroform with laudanum, and on visiting him two hours afterwards with a medical friend (Mr. Watkin, of Towcester), we agreed to continue that treatment. Repeated doses of laudanum and chloroform, the latter in doses of twenty drops, during the day, rendered the paroxysms less severe, but did not entirely remove them; and about eight P.M. on Monday he inhaled two drachms of chloroform, which produced its full effect; he fell into a quiet sleep, from which he was only disturbed at intervals during the night to give him warm broth. On visiting him the following morning we found he had had a quiet night, no paroxysm since he inhaled; since then his recovery has gone on satisfactorily. I ought to add that each draught placed in a bottle was made warm and administered very gently.

I can attribute success in this case not to any novelty in the way of treatment, but to the one fortunate circumstance that he could, although with some difficulty, swallow warm fluids.

Poisoned Thread.—The 'Moniteur de l'Hygiène' states that a number of sempstresses have suffered from violent colic in consequence of putting into their mouths the silk they use in sewing. This affection is attributed to the practice of mixing the silk with sulphate of lead, so as to increase its weight. Mr. Jones, of the Chemical Laboratory, Leadenhall Street, whose attention was attracted by the above statement, has made a chemical analysis of the silk thread used in this country. He operated upon many different samples of thread purchased in and about London, and found in almost every case large quantities of acetate or sugar of lead. He characterizes that admixture as even a more dangerous impurity than the sulphate, on account of its greater degree of solubility in the fluids of the stomach.—*British Medical Journal.*

New Chemical Toy.—"Pharaoh's serpents" and "Vesuvian tea" have paved the way for the reception of a new Chinese wonder in the shape of "ferns growing out of burning paper." This is a neat little experiment, free from many of the disadvantages appertaining both to the "Devil's tears" and the lozenge-shaped crystals of bichromate of ammonia, which may chance to prove too inviting to children's tastes. The instructions direct us to crimp or fold the yellow papers backwards and forwards, so that when opened out they may be supported upright in a zigzag form. One of these slips is then placed upright on a plate, and ignited in two or three places along the upper edge, but without being allowed to blaze. It will burn slowly down with a red glow, diffusing an agreeable perfume, whilst the ash of the paper assumes the most fantastic arborescent shapes, together with a green colour, which, to a lively imagination, may be suggestive of the growth of ferns or lichens. We had no difficulty in imitating this effect by saturating thin cartridge paper, in the first instance, with an alcoholic solution of gum benzoin, and, when dry, applying an aqueous solution of the bichromate of ammonia. The decomposition of the latter substance by heat in contact with burning paper affords an explanation of the phenomena observed.—*Chemical News.*

TO CORRESPONDENTS.

Our readers must excuse the unavoidable delay of the Journal this month; the late arrival of the reports of the Dinner and other meetings, added to the shortness of February, have rendered it impossible to complete it at the usual time.

Several articles that were intended for insertion this month have been unavoidably postponed, including papers by Dr. Harley and Mr. Brown, and reports of meetings at Glasgow, Bolton, Hanley, etc.

Persons having seceded from the Sociecy 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.

T. P. B.—Solution of Tannin in Glycerine.—Tannin, 1 part; Glycerine, 4 parts.

A Commercial Traveller (Bristol) should communicate the particulars of the case to the Secretary, 17, Bloomsbury Square.

S. D. T.—Depilatory.—Sulphuret of barium (recently prepared) and starch, of each equal parts.

M. L. Clift (Derby).—(1) No candidate can compete unless he be an Associate, Registered Apprentice, or Student of the Society. (2) The specimens must have been collected by the candidate between the first day of May in the one year and the first day of June in the following year.

A Registered Apprentice (Brighton).—Fownes's 'Manual of Chemistry' and Bentley's 'Manual of Botany.'

S. (Kilmarnock) should apply, by letter, to the Secretary of the Veterinary College, who will give the information.

M. P. S.—Pepsine Wine.—Vol. XVIII. page 197.

X. Y. Z. (Newcastle).—Apply, by letter, to Mr. R. J. Fowler, 11, Rue d'Enghien, Paris, who, no doubt, will give the necessary information.

"*Alpha*" (Stoke-on-Trent).—Lard, when properly prepared, is perfectly white, and requires no artificial bleaching. See Vol. I. (2nd Series), page 398.

J. H. K. (Leeds).—The ether used in preparing *Ext. Ergotæ Liquidum* may be recovered by distillation.

J. W. (Haddington) wishes for a formula for the so-called "Glycerine and Lime Cream."

Fucus Wine.—J. W. wishes for a formula for Fucus Wine.

Wanted, the January number of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. X.—APRIL, 1867.

PHARMACEUTICAL LEGISLATION.

The proposed additions to, and amendments of the Pharmacy Act have been so widely circulated and so frequently commented on, that it is unnecessary to occupy the space of our Journal this month by inserting "*in extenso*" the draft of the Bill which has been agreed on. It is indeed preferable rather to give a summary of its provisions only, inasmuch as the Bill itself is now in the process of transformation into legal phraseology, and will not issue from the transmuter's crucible in time for publication in our present number.

Our readers are aware that in the two interviews held on the 19th ult. between the Council of the Pharmaceutical Society and deputations from two sections of the trade, the differences which prevented success in 1865 were removed. Since that day the Council has authorized the Parliamentary Committee to proceed with the Bill, and, having submitted it to the trade through the deputations above named, to put it in the hands of the Solicitor. All this has proceeded satisfactorily, and we hope, but cannot feel the confidence we desire, owing to the state of business in the House of Commons, that the Bill will shortly be introduced into Parliament.

The provisions are :—

That from and after a certain day to be named it shall not be lawful for any person to use the title of Chemist and Druggist, or keep open shop for the compounding of prescriptions, or for retailing, dispensing, or compounding certain poisons (to be enumerated in a schedule)* unless he shall have previously carried on such business, or shall have been examined and certified as to his fitness.

* SCHEDULE.

Arsenic, and its preparations.
Prussic Acid.
Cyanides of Potassium and Mercury.
Strychnine, and all poisonous vegetable alkaloids and their salts.
Aconite, and its Tincture.
Opium, its Extract, and Laudanum.
Emetic Tartar.
Corrosive Sublimate.
Nitrates of Mercury.
Extract of Belladonna.
Essential Oil of Almonds, unless deprived of its Prussic Acid.
Cantharides.

That the schedule of poisons may be amended from time to time by the addition of such articles as the Council of the Pharmaceutical Society and the General Medical Council may deem it right, and obtain the consent of a Secretary of State to add thereto.

Exemptions as to the sale of poisons are provided for wholesale dealers and others, but all persons shall be liable to penalty who send out poisons without proper labels.

All persons passing the Minor Examination of the Pharmaceutical Society shall be registered as Chemists and Druggists; all persons already in business, all assistants of full age, and apprentices under articles of indenture, *may*, on application within a given time, be registered as Chemists and Druggists. The registration of the three latter classes, who have already a vested interest in the trade, will be entirely optional, and their declining it will in no way prevent their carrying on business as heretofore.

All persons on the register of Chemists and Druggists, being in business on their own account, will be eligible for election to membership of the Pharmaceutical Society, subject to the Bye-laws thereof.

Chemists and Druggists already in business, who choose to register and become members of the Society by virtue of that registration, may be elected members of Council, but the Council shall never at any one time contain more than seven members who are not on the register of Pharmaceutical Chemists.

The title of Pharmaceutical Chemist is to be held only by those already in possession thereof, and those who may hereafter pass the Major Examination.

All registered Chemists and Druggists are to be exempt from serving on juries.

The Registrar is to keep a correct register and publish it annually.

At all elections of the Society (*i. e.* elections of Council) members may vote either personally or by transmitting their voting papers to the Secretary one clear day prior to the election.

Lastly, it is provided, that instead of confining relief from the Benevolent Fund to Members and Associates of the Society or their widows and orphans, as heretofore, it shall be lawful to extend it to any person who is, or ever has been, on the register of Pharmaceutical Chemists or Chemists and Druggists.

Such then are the provisions agreed to. There may still be diversity of opinion as to the wisdom of the concessions made by the Council, and indeed some of our correspondents seem to feel that the interests of examined men and founders of the Pharmaceutical Society have been sacrificed, and their titles not properly protected; but we think these gentlemen forget how often in public meeting assembled, once in a meeting called expressly to consider the special subject, the Council were empowered—nay even instructed—by the members generally to act liberally to the outsiders, if by so doing one great object of the Society, namely, the compulsory examination of future Chemists and Druggists, could be attained. We think too they overlook the fact that the one title protected by law at present, and becoming understood by the public, is the title of Pharmaceutical Chemist. "Pharmaceutical Chemist" and "Chemist and Druggist" will, we hope, hereafter be the two titles in use among us. It is by those we shall be empowered to perform certain acts, and exempted from certain annoyances. It may not be in our time, but we believe it will hereafter happen that nine-tenths of those who practise Pharmacy in Great Britain will deem it a point of honour to attain the higher appellation.

THE METROPOLITAN POOR BILL.

This Bill, which has passed its third reading in the House of Commons, and is now before the Lords, contains, among other excellent provisions, regulations for "Medical Out-door Relief," which will be interesting to all persons in any way interested in the medical profession. Its primary object is, of course, to benefit those unfortunate members of the community who are thrown on public resources for assistance in time of need. Whether justly or unjustly, complaints have long been made of the inefficiency of the means provided for relief of the sick poor. Those complaints seem to have culminated in the reports published last year in the 'Lancet,' and perhaps to the exertion made by that journal the public may be in no small degree indebted for Mr. Gathorne Hardy's amendments of the Poor Law Act.

An important step in the right direction is now taken by dividing medical advice from the supply of medicines. Everybody knows how inadequate the pay of many "parish doctors" has been to the time and attention even required for the patients, let alone the drugs. Mr. Hardy has wisely relieved these gentlemen both from the cost of medicines and the trouble of dispensing, thereby acknowledging and promoting the fast-growing opinion that, wherever practicable, the prescriber and dispenser should not be one and the same person.

Each "union" or "parish" within the Metropolitan district (the present Bill goes no further than the Metropolis) will have to appoint a dispensary committee, part of whose duties it will be to supply medicines and appoint dispensers. This last appointment has given rise to some discussion in the House of Commons, and a very important addition was made to the clause in committee on the suggestion of Mr. Vanderbyl. The original clause stated that *proper persons* should be appointed, but Boards of Guardians are not always able to judge of a man's fitness for professional duties, with the nature of which they are unacquainted, and it was consequently proposed that while the committee should decide on a candidate's *general* fitness, it should be compulsory on all applicants for the appointments to give evidence of *professional* qualification, that they should be either "persons on the general medical register, or duly qualified as competent under the Pharmacy Act, 1852, or the Apothecaries Act, 1815."

In the discussion which followed Mr. Vanderbyl's proposition of this amendment, its principle was fully confirmed, but the committee ultimately decided that the qualification should be kept in the hands of the Poor Law Board, and consequently added the word "qualifications" in the proper part of the clause, as indication that some should be required.

SUBSCRIPTIONS TO THE BENEVOLENT FUND.

Every one who shared in the late Festival for the Benevolent Fund must have been highly delighted at the result, and not a little credit must be given to the originators and those who took a most lively interest in it. It would be invidious to mention names, as every one must have been interested in so good an object; at the same time there were some half-dozen or more who were most conspicuous and active in their exertions, and to whom we are sure the great success obtained is more than sufficient recompense.

The sum obtained by *donations* was most satisfactory, but the number of annual subscriptions was not much augmented; and, with the view of increasing these subscriptions, while the list is still open, we call the attention of our Members and Associates to the subject.

We have now a very fair nucleus of a fund; and if we get a large accession of *annual* subscribers, we may possibly be able to establish residences for the aged and unfortunate, and schools for orphans and children of Members, somewhat similar to the Medical Benevolent College at Epsom.

We all are but human, and may some day come on the Benevolent Fund, therefore let us all lend a helping hand while we can; "let us be up and doing" while we have the power. "One cannot help many, but many can help one," as the phrase goes:

> "All should unite and guard what all may share;
> A general good *should* be a general care."

We will not say what each should give—that we leave to the individual mind—but *every one* should give a little. "The poor widow who threw two mites into the treasury gave more than they all." The steady advance of the Society, the unanimity which exists among its members, and the late social gathering around the festive board, as well as the much-to-be-wished amalgamation of the whole trade, which seems to be progressing so well, will be the consummation of the late founder's wishes, and the object he had in view when the Society was formed. Therefore, before the list closes, let us hope that many more may be added to the list of annual subscribers, so that when any Member or Associate, their widows or children, from misfortune or other unforeseen circumstance, apply for aid, there will be a fund to relieve them.

USE AND ABUSE OF METHYLATED SPIRIT.

The Methylated Spirit Act of 1855 has proved a decided success. After being in existence for twelve years there has been ample time to test its mode of working, and experience only tends to increase the respect that must be felt for the bold originators of the plan for allowing spirits duty-free, and in a no less degree for those whose skill and sagacity found out the method by which such a boon could be conferred on the public without injury to the revenue. It was a subject for legislation surrounded with difficulties. To be successful, it was essential that the material to be employed in defiling the alcohol should be of such a nature that the mixture "should be so pure as to be generally available for the purposes to which it was to be applied in the arts or manufactures," and also "that it should not be capable of purification by any simple process of rectification or otherwise, so as to be made palatable." Mr. Phillips, the principal of the Inland Revenue Laboratory, was happy in his selection of wood spirit as the contaminating agent, because it exactly fulfilled these conditions; and the experiments of Messrs. Graham, Hofmann, and Redwood left nothing to be desired in the way of proof that, with certain simple precautions, ethylic alcohol, when mixed with wood spirit, might be allowed duty-free. The Act 18 & 19 Vict. c. 38, embodies the conclusions arrived at by these gentlemen, and we require no further proof of their correctness than that up to the present time there has arisen no necessity for making a change in the law. To us there appear to be no weak points in the Act;

whatever mistakes have subsequently been made respecting the uses of methylated spirit, can easily be traced to a desire on the part of the Board of Inland Revenue to give every possible facility to trade. In some instances they have found the concessions have been prejudicial to the interests of the revenue. In 1856 the representatives of almost every branch of trade in which alcohol was used were unanimous in praising the measure; but then it might have been said, with some degree of truth, that those who so vehemently praised, did so from selfish motives only, and entirely overlooked the fact that the amount of duty remitted on methylated spirit must be made up to the national exchequer from other sources. Ten years later we are still able to praise, and to say that although the quantity of spirit manufactured in the United Kingdom in 1866 is less by more than three million gallons than it was in 1857, and the quantity methylated has increased from 210,000 to 1,000,000 gallons, yet the income derived from spirits has increased more than a million and a half sterling in the same period, by raising the duty on this article of luxury to ten shillings a gallon. The rapid increase in the consumption of methylated spirit for the purposes for which it was originally intended, is a sure proof of the benefit its use has conferred upon the public; and perhaps no class of the community has derived greater advantages from its employment than the manufacturing chemist; but at the same time we are grieved to admit, no class has so much abused the privilege. In the face of the opposition of the Colleges of Physicians of London, Edinburgh, and Dublin, pharmaceutical preparations both for external and internal use were prepared from methylated instead of from pure alcohol. Serious doubts were entertained of the efficacy of such medicines, but their cheapness appeared to overrule other considerations; and we know they have been extensively used, not only by chemists and druggists, but also by members of the medical profession, especially in infirmaries and similar institutions. From medical preparations of methylated spirit there was soon a descent to the manufacture of other compounds which partook more of the nature of beverages than medicines. Such were Indian Brandee, Indian Tincture, Gindee, Whiskee, and the like,—names which have been described as "more suggestive of the gin palace than of the druggist's shop." We are aware that only a few chemists resorted to these latter practices, but many used methylated tinctures, etc., in dispensing. We have every reason to believe that the alteration which has now been made in the law, restricting the use of methylated spirit to the purposes originally contemplated by the Act of 1855, will completely put a stop to the improper uses which have recently been made of duty-free spirit, and that the members of the drug trade as a body will assist to the utmost of their power in carrying into effect the regulations which have been found necessary, alike for the credit of pharmacy and the protection of the revenue.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *6th March*, 1867,

Present—Messrs. Bird, Carteighe, Deane, Hanbury, Haselden, Hills, Morson, Palmer, Randall, Sandford, Savage, Squire, and Waugh,

The following were elected Members—

Brown, Edward	Leeds.
Dawson, Oliver Robert	Southampton.
Fletcher, John	Cheltenham.
Marston, John Thomas	London.
Mayfield, John Thomas	Leeds.
Paget, John	Loughborough.
Quinlan, Joseph	London.
Vincent, John Beckley	London.

Josiah Messer, of London, having paid his arrears and his subscription for the current year, was restored to Membership.

United Society of Chemists and Druggists,
Office, 18, *New Ormond Street, W.C., London, March* 5, 1867.

To the President and Council of the Pharmaceutical Society of Great Britain.

Gentlemen,—The Executive Committee of the United Society of Chemists and Druggists, as the exponents of the unincorporated trade, hereby express their great satisfaction at the conciliation which has been accomplished by mutual concession and forbearance.

In the same spirit they are desirous to consummate the question of incorporation and amalgamation so auspiciously commenced, and they therefore earnestly invite the immediate attention of your Council to the drafting of a Bill for the concurrence and unanimous support of both Societies, embracing the modifications to the "Suggestions" which have been deposited by your Council with Government, and which modifications were agreed upon in conference on the 19th ultimo.

Signed on behalf of the Executive Committee of the
United Society of Chemists and Druggists,
JAMES CROTCH, *Chairman.*

Resolved, That the Parliamentary Committee, with the assistance of the Solicitors, if necessary, and of any Members of the Trade they may think well to consult, be instructed to prepare a draft Bill, in accordance with the "Suggestions" sent to the Government and as modified in conference with the two deputations on the 19th February.

That the said draft be presented, on an early day, to a special meeting of this Counci

The Secretary was requested to acquaint Mr. Crotch of the steps taken by the Council

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The President laid before the Council the following letter from the Board of Inland Revenue, Somerset House:—

4th March, 1867.

Sir,—I am directed by the Commissioners of Inland Revenue to acknowledge the receipt of an application from the Chemists and Druggists of the cities of Bath and Bristol, forwarded through you, suggesting the reduction, to the sum of 10*s*., of the present duty chargeable on a licence for the sale of methylated spirit, and to acquaint you that the suggestion shall have their careful consideration.

I am, Sir, your obedient servant,

G. W. Sandford, Esq. WILLIAM CORBETT, *Secretary.*

Resolved,—That a memorial be presented to the Board of Inland Revenue, praying that Chemists and Druggists may be empowered, under a certain Licence, to sell Rectified Spirits of Wine in small quantities, and that, if possible, the Licences for the sale of Rectified and Methylated Spirits be combined in one.

BENEVOLENT FUND.

A second grant of twenty pounds was made to a distressed widow and family of a London member.

BOARD OF EXAMINERS, *27th February*, 1867.

Present—Messrs. Darby, Davenport, Deane, Gale, Garle, Hanbury, and Haselden.

Seven candidates presented themselves for examination; the following passed, and were duly registered as—

PHARMACEUTICAL CHEMISTS.

Brown, Edward	Leeds.
Barlow, John	Wem, Salop.
Marston, John Thomas	London.
Paget, John	Loughborough.
Quinlan, Joseph	London.
Vincent, John Beckley	London.

BOARD OF EXAMINERS, *March 20th*, 1867.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Davenport, Deane, Edwards, Gale, Garle, Hanbury, and Haselden.

Fourteen candidates presented themselves for the Major and Minor Examinations; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

*Hebron, Richard	Stokesley.
*Rew, Walter	London.

MINOR (as Assistants).

Collier, Henry	Chatteris.
Fincham, Newton Thornton	London.
Gittoes, Samuel James	West Bromwich.
Ireland, Edward Jackson	Egremont, Cumberland.
Kitchin, Archibald	Whitehaven.
Mortiboy, John	Stafford.
Parker, Henry Walter	London.
†Poingdestre, Charles Richardson	Jersey.
Sleggs, George Richardson	Market-Weighton.
White, William Edwin	Dover.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Coles, George Alfred	Mr. Orchard	Salisbury.
Davenport, Horace	Mr. Davenport	London.
Holton, John Henry	Mr. Spencer	Lincoln.
Jones, Frank Derry	Mr. Gibbon	Cheltenham.
Lake, Richard	Messrs. Smith and Shenstone	Colchester.
Smith, Samuel Henley	Mr. Biggs	Hampstead.
Spong, Douglas Morton	Messrs. Taylor and Cuthbert	Bedford.

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* 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.

BENEVOLENT FUND.

Annual Subscriptions received during March.—London.

	£	s.	d.
Allchin, A., Richmond Road, N.	0	10	6
Allen, Warner, and Co., Charterhouse Square	2	2	0
Anderson, C., Lower Belgrave St.	1	1	0
Ashton, Wm., 154, Sloane Street	0	10	6
Barnes, Jas. B., Knightsbridge	0	10	6
Barron, F., Bush Lane	2	2	0
Best, James, Harrow Road	0	10	6
Binge, T., 23, Stockbridge Ter.	0	10	6
Bourdas, Isaiah, 7, Pont Street	1	1	0
Burgoyne, Burbidges, and Squire, 16, Coleman Street	2	2	0
Chubb, James C., St. John St.	1	1	0
Coles, Charles, 1, King's College Road	0	10	6
Croucher, J. T., Shadwell High Street	0	10	6
Davies, Wm., 292, Gray's Inn Road	0	10	6
Dyson, W. B., South Kensington	0	10	6
Ellis, George H., Finsbury Pavement	0	10	6
Fincham, Robert, 57, Baker St.	2	2	0
Fisher and Haselden, Conduit Street	1	1	0
Foott, R. R., 8, Stockbridge Ter.	0	10	6
Gedge, William S., St. John St.	0	10	6
Glover, Geo., 19, Goodge Street	1	1	0
Goodger, David, 31, Regent St.	0	10	6
Griffiths, J., Clerkenwell Green	0	10	6
Hanbury, D. B., Plough Court	1	1	0
Hickley, Thomas P., 15, St. Alban's Place	0	10	6
Hickman, Wm., Archer St., W.	0	10	6
Hooper, B., 43, King William St.	1	1	0
Hora, H. Whinfield, Minories	1	1	0
Horncastle, J., 12, Stanhope Ter.	0	10	6
Horton, A. T., 18, Conduit St.	0	5	0
Howden, R., 78, Gracechurch St.	1	1	0
Ince, J., St. George's Place, S.W.	1	1	0
Jeynes, George W., 42, Princess Street	0	5	0
Johnson, Benj. M., Tottenham Court Road	0	10	6
Jolley, G., 13, Curzon St., W.	1	1	0
Jones, Wm., Allason Terrace	0	5	0
Lidwell, Josh. E., Notting Hill	0	10	6
Long, Henry, Notting Hill	1	1	0
Mitchell, J., 254, Upper St., N.	0	10	6
Morris, Henry, St. John's Wood	1	1	0
Mould, Sam., 21, Moorgate St.	0	10	6
Bacon, John Turner, Esq., per Mr. Samuel Mould	1	1	0
Nicholson, F., St. Paul's Rd., N.	1	1	0
Northway, J., 27, Gt. Tower St.	1	1	0
Palmer, R., Ovington Square	1	1	0
Penrose, A. W., 5, Amwell St.	0	10	6
Peppin, S. H., 25, Princes Street	0	10	6
Preston and Sons, 88, Leadenhall Street	2	2	0
Quiller, Charles R., Sloane Sq.	0	10	6
Quinlan, Joseph, Barnsbury Rd.	0	10	6
Richardson, Geo., Notting Hill	0	10	6
Rowson, H., Chichester St.	0	10	6
Saunders, T. H., Queenhithe	2	2	0
Shirley, J. G., 1, Westbourne Grove	1	1	0
Sims, John F., Hemingford Rd.	0	10	6
Sleggs, G. R., 220, Regent Street	0	5	0
Snelling, F., 23, Farringdon St.	1	1	0
Taylor, J. E., and Co., Little Queen Street	1	1	0
Thomas, H., 7, Upper St. Martin's Lane	1	1	0
Tippett, Benj. M., 3, Sloane St.	0	10	6
Warner, Charles H., Fore Street	1	1	0
Weston, Sam. J., Westbourne Terrace	1	1	0
White, D., and Son, Park Terrace	1	1	0
Whysall, W., 199, Fleet Street	0	5	0
Williams, Joseph J., Harrow Rd.	0	10	6
Windle, William, 48, Portman Place	0	10	6
Wooldridge, J., 290, Euston Rd.	0	10	6

Country.

	£	s.	d.
Ashby-de-la-Zouch, Redfern, J.	1	1	0
Banbury, Ball, George V.	0	10	6
Bedford, Anthony and Son	0	10	6
„ Taylor and Cuthbert	0	10	6
Berwick, Carr, W. Graham	0	10	6
„ Davidson, John	0	10	6
Birmingham, Pegg, Herbert	0	10	6
Bridge, Kent, Thomas, James	0	5	0
Carlisle, Hallaway, John	0	5	0
Darlington, Abbott, John T.	0	5	0
Deal, Green, John	0	10	6
Diss, Cupiss, Francis	0	10	6
Goole, Hasselby, Thomas J.	0	5	0
Harrogate, Coupland, Joseph	0	10	6
Heywood, Beckett, William	0	10	6
Howden, Saville, John	0	10	6
Huddersfield, Higgins, Tom S.	0	10	6
Duffin, Thomas	0	5	0

	£	s.	d.
Huddersfield, Fryer and King...	1	1	0
Kidderminster, Bond, Charles...	0	10	6
Leicester, Salisbury, William B.	0	10	6
Lewisham, Clift, Edward.........	1	1	0
Louth, Hurst, John...............	1	1	0
Lower Norwood, Rose, Alfred...	0	10	6
Lowestoft, Edmonds, Benj. M.	0	5	0
Lyme Regis, Henley, Henry ...	0	10	0
Manchester, Mitchell, John ...	0	10	6
Merthyr Tydfil, Thomas, R. ...	0	5	0
Middlesborough, Taylor, W. J.	0	10	6
Norwich, Arnold, Edward	0	5	0
Petherton, South, Wellington, Frederick G. N.	0	5	0
Plymouth, Burdwood, James...	0	5	0
Rochdale, Lord, Ellis	0	5	0
Rochester, King, Thomas S. ...	0	10	6
Rock Ferry, Dutton, John......	1	1	0
Seacombe, Holt, Richard W. ...	0	5	0
Shildon, Veitch, William	1	1	0
Southampton, Palk, Edward ...	1	1	0
„ Randall and Son .	1	1	0
Southport, Walker, W. H.......	0	10	6
Stowmarket, Simpson and Son	1	1	0
„ Sutton, Charles W.	0	5	0
Tiverton, Bond, Lawrence V....	0	10	0
Watford, Chater, J., and Son...	1	11	6
Wymondham, Skoulding, Wm.	0	5	0

BENEVOLENT FUND DINNER.

FIRST SUPPLEMENTARY LIST OF DONATIONS AND SUBSCRIPTIONS.

	£	s.	d.
Chard, F. J., 39, Warwick St. Pimlico	1	1	0
Chard, O. E. P., Esq., per Mr. F. J. Chard	1	1	0
Evans, Mercer, and Co., Montreal	3	3	0
Hogarth, William, Preston...	2	2	0
*Hopkin, Wm. King, 5, New Cavendish Street	10	10	0
Huggin, W. H., Wainfleet...	0	5	0
Marrack, Geo. M., Penzance	0	5	0
Phytological Society, balance in hand, per Mr. J. T. Tupholme	2	14	5
Roller and Widenmann, Love Lane, Eastcheap	2	2	0
Silverlock, H., Doctors' Commons	5	5	0
Smith, James, 69, Coleman St.	1	1	0
Tippett, Benj. M., 3, Sloane Street	1	1	0
*Walsh, Edward, Oxford. *An.* £1. 1*s*.			
Warrick Brothers, Garlick Hill, E.C.	1	1	0
Willis, F. and C., King Street, St. James's	5	17	6

ERRATA.

Page 507, Rothbury, Farrage, Robert, *for* 10*s*. 6*d*., *read* £1. 1*s*.
„ 508, line 7, *for* December 5th, 1866, *read* February 6th, 1867.
„ 529, Bird, William Lionel, 42, Castle Street East, *for* An. £1. 1*s*., £3. 3*s*. donation, *read* donation £5. 5*s*.
„ 530, *for* Harman, Richard, *read* Hammon, Richard.
„ 531, *for* Mason, Wm. W., Shortwood, Gloucester, *read* Mason, Wm. W., Nailsworth, Gloucester.
„ 532, Thompson, Henry A., 86, Chiswell St., *omit* An. £2. 2*s*.
„ „ Twinberrow, Wm., *omit* £5. 5*s*. donation.
„ „ *for* Wright, W., and Co., *read* Wright, W. V., and Co.

BOTANICAL PRIZE FOR 1868.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1867, and the first day of June, 1868; 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

* These amounts were accidentally omitted in the March number of the Journal.

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 Phanerogamous 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 Hooker and Arnott), 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, 1867, and the first day of June, 1868, 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, 1868, 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. John Scoley Battle.
,, Joseph Bemrose.
,, John Butterworth.
,, P. Kossuth Fripp.
,, William Foster.
,, George Harrison.
,, Henry Thomas Harwood.
Mr. Archibald Kitchin.
,, Alexander Pedler.
,, John Tom Porter.
,, Lewis Buttle Ross.
,, Joseph Severs.
,, Frank William Steel.
,, William Pyatt Williams.
Mr. Hermann Woolley.

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, 1866.*

Receipts.	£	s.	d.	£	s.	d.
Balance in Treasurer's hands				527	13	1
Life Members' Fund:						
Fees	42	0	0			
Interest	76	6	10			
				118	6	10
Government Securities:						
Interest				84	2	2
Rent				100	0	0
Arrears of Subscription				74	0	6
Donation to the Society				1	1	0
Subscriptions:						
360 London Members	378	0	0			
1426 Country Members	1,497	6	0			
124 Associates	65	2	0			
198 Apprentices	103	19	0			
				2,044	7	0
Fees:						
66 Pharmaceutical Chemists	435	15	0			
86 Assistants	348	12	0			
113 Apprentices	237	6	0			
36 Registration Certificates	1	16	0			
				1,023	9	0
Fees:						
Lecture				165	7	6
Laboratory				481	17	5
Journals:						
Balance of Account				218	5	5
				£4,838	9	11

Expenditure.	£	s.	d.	£	s.	d.
Life Members' Fund:						
Investment				34	14	1
Government Securities' Investment				1,154	13	11
Conversazione	86	7	5			
Pharmaceutical Meetings	5	2	6			
Repayments	6	16	6			
British Pharmaceutical Conference, donation to	10	0	0			
Sundries	12	0	0			
				120	6	5
House Expenses				33	5	5½
Rent, Rates, Taxes, and Insurance				434	13	0
Repairs and Alterations				36	8	6
Apparatus				18	10	9
Library				68	8	0
Museum				33	6	7½
Furniture				5	18	0
Stationery				20	12	5
Postage				48	19	0
Printing and Engraving				34	13	1
Advertisements				34	7	5
Law Costs (1863, 1864, 1865)				394	8	10
Carriage				2	7	10
Collector's Commission				32	13	8
Travelling Expenses				129	7	4
Gratuity to Mr. Sharp, late Librarian				21	0	0
Secretary and Registrar				337	10	0
Wages				157	7	6
Expenses of Society in Scotland				70	16	11
Board of Examiners				151	4	0
Professor of Chemistry and Pharmacy, etc.				300	0	0
Professor of Botany and Materia Medica, etc.				250	0	0
Subscription to Royal Botanic Gardens				21	0	0
Prize Medals, etc.				15	2	4
Laboratory:						
Director's Salary and Percentage on Fees	302	15	3			
Demonstrator	100	0	0			
Porter's Wages, etc.	66	0	8			
Chemicals, etc.	92	9	11			
				561	5	10
Balance in Treasurer's hands				315	0	6
Balance in Secretary's hands				0	8	6
				£4,838	9	11

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 in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1866:—

On account of the General Fund, New 3 per Cents	£4000
Life Members' Fund, 3 per Cent. Consols	2650
Benevolent Fund, 3 per Cent. Consols	7250
Bell Memorial Fund, 3 per Cent. Consols	2050

WILLIAM MCCULLOCH,
JOHN B. MACKEY,
FREDERICK BARRON,
ROBERT WESTWOOD,
WALTER BRETON,
Auditors.

14th March, 1867.

PHARMACEUTICAL MEETING.

Wednesday, March 6th, 1867.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

Mr. Morson asked permission of the President to contradict a statement which had been circulated and communicated to him, with reference to the new British Pharmacopœia, to the effect that he had used the knowledge he was supposed to have obtained relating to that work, by preparing in advance some of the newly introduced preparations. He begged to assure the meeting that such was not the fact, and that he had not manufactured any of the preparations that were proposed to be adopted in the forthcoming work. His position in relation to Dr. Redwood, who had been engaged in preparing the new Pharmacopœia, had probably given rise to the report, but this very circumstance, if no other, would have prevented his using any opportunity occurring in that way; in addition to which, he thought such a proceeding would have operated to his loss rather than gain, as the work was not yet published, and the processes might still be modified.

The following papers were read:—

GENERAL OBSERVATIONS ON THE PREPARATIONS OF CONIUM, AND THE EXTRACTION OF CONIA.

BY JOHN HARLEY, M.D., F.L.S.

So much uncertainty attends the use of a particular class of old-established vegetable preparations, that few, doubtless, of those practitioners who frequently prescribe them, would be able to state accurately what effects would follow the exhibition of a given dose of them. I allude particularly to the preparations of the succulent vegetables, digitalis, henbane, and conium. Indeed, we cannot but feel convinced that, in respect of these, we are at present in almost total ignorance as to the relative medicinal value of the recent and dried plant. Nay, I believe I may go still further, and assert that we have, without sufficient experimental proof, attributed to the dried plant the virtues which cases of accidental poisoning, or more rarely direct experiment, have proved that the recent plant possesses.

These remarks apply very forcibly to Hemlock, and I shall avail myself of this opportunity, so courteously afforded to me by the Council, of calling the attention of the Society to a few practical points respecting the preparations of hemlock, which bear out the foregoing general assertions.

In some communications, lately made in the 'Pharmaceutical Journal,' I have shown that the tincture of the fruit of conium and the tincture of the dried leaf may be taken in such doses as to induce inconvenient effects from the alcohol contained in them; that, in fact, they are practically useless. In investigating a number of preparations prescribed for our use, it would be sufficient, as far as these are concerned, to show what are useless and what useful; but it is, at the same time, desirable to go a step further, and determine why a given preparation is useless.

Take, for example, the tincture of the dried leaf. It is inert; why? It may be that the dried herb contains none of the active principle of the recent plant. It may be that the alkaloid exists in undiminished quantity, but that its effects are destroyed by the action of the alcohol. To prove the point, I have carefully examined the sample of dried leaves used in the preparation of the tincture employed in my experiments. As I have, in a paper which has not yet appeared in the 'Pharmaceutical Journal,' described in detail the processes adopted, I will only mention here that I operated upon equal quantities of the dried leaf separated from the leafstalks, and of the leafstalks themselves; that both furnished an equal quantity of conia, and that this in each case did not amount to half a grain of impure conia from ℥ij of the dried plant. In order to separate so small a quantity of the active principle, I was led to adopt a process which I believe will be found to yield a larger quantity of conia than any other. Having prepared an aqueous or spirituous extract of the plant with as little heat as possible, and of a syrupy consistence, I mix it, while warm, with an equal bulk of strong solution of caustic potash (1 pint to 3 of water), and then transfer it to a long tube, and agitate the mixture with its bulk of æther several times during twenty-four hours. The æther is then decanted, and the alkaline mixture washed again and again with fresh portions of æther, until the conia is completely removed. Two, or at most three washings are sufficient for this purpose. On distillation of the æthereal solution the conia, more or less pure, according as spirit or water has been used for exhausting the herb, remains. The impure conia is next treated with diluted sulphuric acid, which separates the alkaloid from oily or resinous impurities. From this solution of sulphate of conia, the base is separated in the usual way, viz. evaporation to a syrupy consistence, mixture with caustic potash, washing the mixture with ether, evaporation of the ether, and distillation of the conia in a current of hydrogen. In the preparation of the extract, a small quantity of dilute sulphuric acid should be added to the tincture or infusion, in order to fix the conia before heat is applied.

I satisfied myself that æther will entirely remove the conia from an alkalized extract, by the following experiment:—I took f ℥iij of a dark brown mixture of extract and caustic potash, from which the conia had been completely removed by æther, and added to it a drop of conia dissolved in an excess of a dilute solution of sulphuric acid. After thorough admixture, it was set by for a few hours, and then, finding that it still contained an excess of caustic potash, it was mixed with one-third its bulk of æther, and agitated for two minutes. The æther was removed as soon as it was separated, and the mixture washed again with the same volume of æther, and decanted without delay. On evaporating the æthereal solutions, nearly the whole of the original drop of conia was recovered. In this case the process was hastily performed, and no pains taken to thoroughly wash the exhausted extract.

After making a number of comparative experiments of the above described method, and the usual mode of distillation with caustic potash, I find, as I have stated above, that the former is the most productive process when operating on small quantities. When strongly heated with caustic potash in the presence of organic matters, conia appears to undergo considerable decomposition. On examination of the retort remainder, after the distillation of the alkaline fluid containing the conia, I have separated by means of æther, a definite crystalline compound which, as it possesses a strong odour and taste of tobacco, is probably a derivative of conia. It appears distinct, both in physical and chemical characters, from conhydrin. As I have not yet completed my examination of it, I shall hope to say more about it in a future communication to the Journal. I call attention to it in this place, in order to elicit information respecting its relationship. A specimen lies upon the table.

Having thus, satisfactorily I hope, explained why the particular tinctures employed in my experiments were inert, I hope we shall all be led to the conclusion that the dried plant is wanting in the powers attributed to it, and that it should therefore be excluded from the Materia Medica. I would even apply this exclusion to the dried fruit, and would do so without hesitation, since, as I now proceed to show, we have in the *Succus conii* a most worthy representative of hemlock, and therefore a most valuable medicine.

I have now made numerous experiments with this drug, supplied to me by Messrs. J. Bell and Co., Mr. Buckle, Mr. Hanbury, and Mr. Hemingway, but I need not do more than quote a passage from a communication which will, I hope, be published in the next number of the Journal. The *succus* is in every respect so unobjectionable a preparation, and so long as it is carefully prepared, I venture to say we shall want no other, not even an extract.

In conclusion, I would say a few words by way of introducing to the notice of the Society a succus and an extract prepared by Mr. Hemingway from the fresh root. I am extremely sorry that severe indisposition prevents Mr. Hemingway from fulfilling his desire of being here to-night. He should properly have introduced these preparations to the Society, for their existence is entirely due to his interest in the question. Finding the spirituous preparations of the dried plant useless, we naturally directed our attention to the recent herb, and as the roots at this season of the year were alone to be obtained, Mr. Hemingway procured ten pounds, and Mr. Buckle most kindly gave us his valuable time and the use of his powerful hydraulic press, whereby the juice upon the table was obtained. The extract was prepared from a portion of the expressed juice the same day.

I find that these preparations contain a considerable amount of conia, but as I have not yet had time to complete my examination of them, nor opportunity of ascertaining their physiological effects, I must leave this matter also for subsequent consideration.

Dr. Harley, in reply to a question of a member as to the dose of Succus Conii given by him, said that he found $1\frac{1}{2}$ fluid drachms to be not too large a dose; in fact, he had administered as much as 2 drachms. He stated that different individuals were very differently affected by the preparations of conium. He had especially noticed that great smokers would bear large doses of conium. Dr. Harley added, that he had tried the effects of a specimen of Succus Conii made as far back as 1863, and found it equally efficacious as that recently prepared.

The President remarked, that the experiments of Dr. Harley were most important, especially as the new British Pharmacopœia was about to appear. He believed that conium fruit would be retained in that volume, as in the present Pharmacopœia.

Professor Redwood said that he had lately received a letter from Dr. Christison, in which he had referred to the length of time during which extract of conium would retain its activity. Dr. Christison stated that twenty years ago he had received from the late Jacob Bell a specimen of the extract, which, upon being lately administered by him, was found to have maintained its original strength.

Dr. Attfield remarked that the thanks of the meeting were especially due to Dr. Harley for his present communication, as papers which combined physiological with chemical research were particularly interesting at their meetings, as the members themselves had no opportunities of testing the value of remedies.

REMARKS ON THE NECESSITY FOR A FURTHER CULTIVATION OF MEDICINAL PLANTS.

BY DANIEL HANBURY.

All who are engaged in the buying and selling of drugs are well aware of the remarkable fluctuations to which such commodities are liable; all know that a drug which at one time is scarce and high-priced may suddenly become so plentiful as to be nearly unsaleable. This is especially the case with drugs recently introduced and for reasons which it is not difficult to explain. A drug, the production of a foreign country, introduced as a novelty, is at the commencement commonly in few hands, and hence a monopoly existing, a high price is obtained. If the sale prove considerable and the drug bid fair to have important uses, this high price leads to enquiry abroad and usually to the shipment of large supplies,—often so much too large as to involve the holders of the commodity in great loss. A reaction ensues: no one will import what has been unremunerative, and consequently after the lapse of time the drug grows scarce, until the price mounts to a figure high enough to tempt a fresh importation. The scarcity of old established drugs is dependent on a variety of circumstances some of which are curious from the remoteness of their effects. Thus the demand for cotton consequent on the war in the United States, stimulated the culture of that crop in Asia Minor; and as the growing and picking of cotton required many hands, the wages of the peasantry so greatly advanced that it was less profitable than usual to collect Scammony, and hence a reduced supply and enhanced price of that drug.

Political convulsions impeding the freedom of commerce, also operate extensively in diminishing the exports of a country,—and to such cause may be attributed the late high price of Snake-root, Senega and other drugs of the United States. The increased value of Jalap is probably due to the unsettled state of Mexico.

East Indian Kino of the best kind is a drug which during the past few years has become exceedingly scarce or I might say has ceased to be imported. Now this sort of Kino which was produced near Tellicherry, was a few years ago brought into competition with Kino from another district of India, which though considered inferior in quality, was freely sold and at a much lower rate than the old drug. The price of Tellicherry Kino consequently fell enormously, and it would seem that the drug has ceased to be brought into the market.

Ipecacuanha again has doubled in value since 1850 owing partly, it is said, to the extirpation of the plant from old habitats and the consequent necessity of collecting it from new and more distant localities; and partly to the circumstance that the stock of the drug is in the hands of but few persons, who are thus able to restrict the export and in consequence to raise the price.

The rarity of a drug or its total disappearance is due in some cases to an improvident and ruinous method of collection. Thus, a century ago there was still found in commerce Loxa Bark that had been stripped from tree-trunks of no mean dimensions, and some such bark which I have seen has a thickness of a quarter of an inch and is rich in alkaloids. At the present day, old trees yielding this species of bark are unknown, all the Loxa Bark of modern commerce being derived from shrubs, which are stripped even to their smallest twigs.* The same fate seems likely to fall (if it has not already done so) on the Red

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* Cross, *Report on Expedition to procure seeds of* Cinchona condaminea *in the forests of Loxa,* Nov. 1861.

Bark of Ecuador, the thick or *tabla* form of which, derived from the trunks of old trees, is becoming more and more rare.

Mr. Spruce who in 1859 visited the forests of Azuáy in the Quitenian Andes in order to examine the species of Cinchona which occur there, found that the Red Bark was in process of rapid extermination, prostrate naked trunks in some places surrounded by saplings being the only remnants which he met with of this valuable species. The slopes of Chimborazo, which the same traveller visited in the succeeding year, offered similar evidence of an improvident and destructive method of bark-collecting, the very roots of the trees having been in many cases dug out and stripped of their bark. This valuable Cinchona is however now so well established in India (the number of trees on the Neilgherry Hills alone, amounting in May 1866 to 297,465),* that there is no danger of an utter failure of red bark, at all events of such as may be obtained from young wood.

The advanced price of Scammony already mentioned, presents an instance in which the supply of a drug is diminished by the introduction of a more profitable object of commerce. This cause combined with the clearing of forests, has operated still more strongly in the case of some drugs the demand for which has been small and uncertain. Thus it has been more advantageous to grow sugar, coffee, cotton and cacao than to collect the forest-products which in earlier times formed articles of trade. To this cause, I think we must attribute the disappearance from commerce of such drugs as South American Elemi, Liquidambar Resin, the fragrant Tacamahaca, Caranna, Winter's Bark and Contrayerva Root, all of which were furnished by the Spanish colonies a century ago.

Turning to the Old World, we may note the disappearance of the sweet-scented Rhodium Wood once found in our shops. This substance is derived from two remarkable shrubby species of *Convolvulus* occurring in the Canaries, in which islands, however, as I have been informed by Dr. Bolle who at my request made special enquiries on the subject, no shrubs are now to be found having woody stems thick enough to be worth collecting. The Oil of Rhodium sold in the shops is well known to be an artificial compound.

Sagapenum may also be mentioned as a drug that has almost ceased to be imported; and it is one of which we know neither the botanical source nor exact place of production, a remark that applies to another gum-resin of the same class, namely Opopanax.

From considerations such as the foregoing, it becomes evident that the supply of many drugs which are obtained without culture, is of necessity fluctuating and precarious; and most persons will be disposed to acquiesce in the remark of an accomplished modern traveller and naturalist, that "whatever vegetable substance is needful to man, he must ultimately cultivate the plant producing it." This indeed is a truth exemplified in many ways. In the animal kingdom we find it needful to cultivate, so to speak, both oysters and salmon, while partridges, pheasants, grouse, hares and foxes all receive in our island protection sufficient to save them from extermination. In the vegetable kingdom, and in that branch of it with which we have to do, there are several medicinal plants once easily procured in a wild state which it has now become necessary to cultivate. Henbane, belladonna, foxglove, hemlock, pennyroyal and valerian have all to be cultivated, in order that they may be obtained abundantly and regularly; and it seems probable that even the common dandelion may soon be honoured with the cultivator's care. These however are examples of the cultivation of plants in the country in which they are indigenous.

The introduction of the cinchona into the Dutch and British East Indies

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* Parliamentary Return, ordered by the House of Commons to be printed, 18 June 1866.

presents an instance, and a very remarkable one, of the culture of an exotic plant hitherto only known in a wild state. I do not intend here to survey the progress of Cinchona Plantations. Their success however is so promising that it should stimulate further enterprise of the same kind, and especially the introduction to India of *Ipecacuanha*.

The Ipecacuanha plant, *Cephælis Ipecacuanha* A. Rich., which belongs to the same order as the cinchona, is a native of Brazil, where it occurs in shady humid forests, lying between the 8th and 20th parallels of south latitude. The plant is also found in New Granada, in which country, however, its root is not collected to any large extent. The supply of the drug is therefore drawn from Brazil, whence in 1862 it was exported to the value of £11,225.

The consumption of ipecacuanha in India is large, as may be judged from the fact that the India Government purchased 3571 lbs. of the drug in the year 1860, 4011 lbs. in 1859, 2636 lbs. in 1858 and 1386 in 1857. We know but little as to the susceptibility of the Ipecacuanha plant for cultivation. In the hothouses of our botanical gardens, where it is by no means common, it appears as a humble plant of slow growth and tender appearance. In attempting its culture in India, the first object should be to procure from Brazil a supply of recent mature seeds, which should be transmitted to Europe in the most rapid manner for distribution, it may be suggested, among the cinchona cultivators in our own possessions, as well as those in the Dutch East Indies and in Algeria.

One special advantage that accrues from the cultivation and preparation of medicinal plants by civilized and intelligent persons, is the much better condition in which they are presented to commerce. As an instance of this I may cite *Tinnevelly Senna*, which is but a cultivated form of the senna produced on the shores of the Red Sea, and known from its port of shipment to Europe as *Bombay Senna*. How remarkable the contrast between these two drugs! Would not similar advantage be derived from the cultivation in India of *Calumba Root?* This drug as imported is invariably found to be more or less worm-eaten and is often in other respects ill-conditioned,—defects attributable, as I believe, to the slovenly manner in which it is dried, stored and packed. The plant, which is indigenous to Mozambique, flourishes perfectly in Mauritius, and would probably thrive with equal luxuriance in Ceylon and continental India.

There are two other drugs which I have often thought it would be advantageous to procure in a better condition than we now usually find them; and these are Hemidesmus Root and Chiretta, both of which are often imported in an unsound state. Some of the former kindly collected for me in Madras by Dr. Lestock Stewart contrasted most favourably with the Hemidesmus ordinarily imported.

Another drug which it appears to me might be obtained in far better condition by the exercise of more intelligent skill, is Jalap, but as I have prepared some remarks in a separate form upon this drug I will not in this place say more.

Let me in conclusion commend attention to the words with which I commenced this paper,—the necessity for a further cultivation of medicinal plants.

THE CODEX AND THE BRITISH PHARMACOPŒIA, 1864, COMPARED.

BY A. F. HASELDEN.

It is with no small degree of diffidence that I commence my observations upon the Codex, because it has already been noticed, and, in all probability, will be still further commented upon by those more calculated to do it justice. Nevertheless, some simple and homely thoughts may suggest themselves to the less qualified and scientific writer, which might be passed over by the more highly gifted, and yet which may be equally acceptable to a large number of pharmaceutists; and, apart from this, the Codex is a large work, there are many fields in it, and abundant room for many and varied workmen. Under this conviction I began the task of looking through the Codex and comparing it with our own Pharmacopœia of 1864; and here let me observe, that I come before you not as a professor, but simply as one of yourselves—a working pharmaceutist, one of the numerous bees pertaining to a large hive, and I ask you to extend to me now, as upon former occasions, your patience and indulgence.

I feel that I have undertaken a work of no small labour and magnitude, and in one communication know it to be impossible to go fully into the subject. It is true, I might tell you that the Codex proper, after the Preface, is divided into Preliminary Remarks, Materia Medica, and the Pharmacopœia, or Preparations and Compounds; that the Materia Medica contains upwards of six hundred substances, derived from the vegetable and animal kingdoms, besides those from the mineral. I might tell you the chemistry of the work is excellent; that the ordinary name is given in French, and to us at least a new name in Latin, —for example, Bicarbonate de Soude, Bicarbonate of Soda, is Bicarbonas Sodicus, Sodic Bicarbonate; that the preparations of every kind are abundant, not only in number, but in the multiplicity of ingredients which enter into the composition of some of them; that the whole is wound up with a copy of the laws regulating the practice of pharmacy, and the education of pharmaceutists; and that there is an excellent index in Latin, also one in French; but this would give you a very imperfect idea of the work, not a single thought of my own, nor would it be calculated to elicit any from others. What I desire to do is this, having touched lightly upon the Report and Preface, to take each part separately, point out any difference I may think worthy of notice between the Codex and the P. B., make my own remarks, and leave you to fill up the interstices. And now to the work.

The first few pages contain a report to his Majesty the Emperor, setting forth that, by the wisdom of the law which regulates the practice of pharmacy in France, an official formulary published with the sanction and by the orders of the Government, contains all the medicinal and pharmaceutical preparations which ought and should be kept by pharmaceutists. This formulary is a code for the guidance of medical practitioners and pharmaceutists, while protecting the public health from the dangers of empiricism, and the treacherous seductions of charlatanism (in no country, perhaps, is there more quackery than in France); it is, at the same time, a safe guide for the practitioner, and an assured means of order and supervision for the Government. But in order to accomplish this, it should, in truth, be upon a level, or keep pace with science; it should present at all times a faithful *résumé;* it should verify and record all progress; it should, in fact, express the last teaching of the lecturer and the schools. It is then essentially a progressive work, and one that is called upon, at certain intervals of time, to submit to complete revision or reconstruction; with the P. B. it was reconstruction, which has already, and I trust with advantage, been submitted to revision, and again reconstruction. The progress of science which necessitated a revision of the Codex in 1835, did, in 1861, produce a similar result; and thus in July 1866, rather more than four years after the commencement of the labours of the Commission, composed of men eminent for their learning and skill, was produced the present Codex, in which there is much to admire and from which all pharmaceutists may gather instruction; at any rate, only to take it up at leisure moments and read it, will not fail to expand the mind. This brings me to the Preface. It, like our own, expresses the opinions of the Commissioners, and in a masterly style: this is as might have been expected with Professor Dumas as president. It is not necessary, neither do I intend, to produce a translation of the entire Preface, but there are certain passages which seem to me to have a particular interest for the pharmaceutist, and, to a degree, a bearing upon the present condition of pharmacy in this country; the following paragraph will strike the pharmaceutist as in some sort setting forth the duty expected from him. It is the province of the medical man, according to his experience and regulated by his conscience, to prescribe all such medicaments as he may judge necessary, suitable, or convenient. The pharmaceutist should prepare these forms with fidelity, so far as they are explicit or clear, or so that the Pharmacopœia to which they belong is plainly indicated; always excepting circumstances under which prudence being more than usually called for warns him to protect his own responsibility by precautions, for which every prescriber would thank him; the pharmaceutist has only to secure the exact and honest preparation of the prescriptions entrusted to him. But, say the Commissioners, it becomes evident every day, that inasmuch as energetic medicines increase in number, purity, concentration, and power, it is more necessary that the pharmaceutist, trusted with the preparation of them, their preservation, their manipulation, and their doses, should be well instructed, careful, and faithful. Here let me observe that the Commissioners, neglecting to take advantage of the discussions on the P. B. in the matter of doses, have also neglected to supply a posological table.

To what dangers, continue the Commissioners, would not families be exposed if the dispenser did not know that chloride of mercury might indicate either a violent poison or an innocent purgative, and that there is nothing in common between chloride and cyanide of potassium, so easily confounded by the ignorant.

The pharmaceutist requires a larger and better kind of instruction or education, since the progress of therapeutics places in his hands a greater number of remedies or medicaments more powerful, more susceptible of change, and more open to adulteration, in the use of which the slightest mistake endangers the life of the sufferer, and from which the smallest deviation betrays the hopes of the prescriber. When this conviction touches even England, enlightened by accidents multiplying before her eyes, and by the numberless miseries which follow in their train, it is assuredly not the time for France, where it has always been upheld, to select for abandoning it.

Thus far are these paragraphs of the Preface plain and outspoken, as regards the responsibility of, and the necessity for a fixed standard of education for the dispenser and pharmaceutist; how sincerely and frequently have I wished that, on writing the preface to the P. B. of 1864, the Medical Council had been equally impressed with its importance, and solicitous for its accomplishment, and as plainly and boldly have set it forth, and thus have given a most important assistance towards the attainment of the much desired extended Pharmacy Act. Is the preface to the revised edition written, or is it too late to urge this point? I hope not.

I pass now to that portion of the Preface which treats of the divisions of the Codex, which are three in number, to wit—Preliminary observations or remarks, Materia Medica, and the Pharmacopœia or preparations and compounds, or, in other words, chemicals and galenicals.

Under preliminary remarks, weights and measures are noticed first. It being compulsory now in France to use, in weighing or measuring, the decimal-metric system, substances employed by weight are expressed in grammes or multiples thereof, measures of capacity in litres or multiples thereof, in the work. There are now four tables relating to weights, the principal one of which compares the value of medicinal weights used in other countries by the French gramme, which it is not necessary to read here or write out. The only measures of capacity employed in the work are the litre, and the decimal divisions thereof; but as the quantities are mostly given by weight, the measure has rarely been called into use; it is always easy to get at the volume of a given weight of liquid when its density is known.

There are many substances ordered by spoonfuls, drops, etc., and these expressions, referring to no accurately determined quantity, leave always an amount of uncertainty about the dose of a medicine. Medical men should bear this in mind when they make use of this mode of prescribing; but it must also be remembered that the spoonful and the glassful are often the only practicable means of portioning the liquids, the administration of which is entrusted to the care of those who are about the invalid, and so a table showing the value by weight of spoonful, etc. is given, and, as it is an unusual one with us, I transcribe it in full, thus,—

A coffee- or tea-spoonful of water		5 grammes.
An ordinary or tablespoonful = 4 teaspoonfuls or		20
A glassful = 8 tablespoonfuls or		160
A handful of barley	=	80
" linseed	=	50
" " meal	=	100
" dried mallow leaves	=	40
" " succory "	=	30
A pinch of chamomile flowers	=	2
" arnica "	=	1
" marsh-mallow "	=	2
" coltsfoot "	=	2
" mallow "	=	1
" lime "	=	2
" aniseed	=	2
" fennel seed	=	2
A fowl's egg fresh-laid, about	=	64
" the white alone	=	40
" the yolk "	=	20
Blanched almonds, each about	=	1

The British Pharmacopœia bestows no such table as this, and it would with us be a retrograde movement, as handfuls and pinches are now only employed in the kitchen; divided bottles and graduated glasses being in common use in England for portioning the doses of liquid medicines.

For certain liquids, I quote from the Preface. The dose is frequently by drops, numerous circumstances influence the size of the drops which flow from bottles employed in pharmacies, and lead to notable differences in their weights. Moreover, it frequently happens that the intermittent flowing of liquids is transformed into a continued thread stream during the act of measuring; to avoid this species of inaccuracy, and to arrive at more regular results than can be obtained from bottles of variable dimensions, many instruments or contrivances have been proposed: the preference is here given to a very simple *compte-gouttes* or drop-reckoner, by the use of which, if not absolute precision, still a sufficient degree of accuracy is obtained. It consists of a little flask or globular glass bottle, furnished with a small lateral tube, the interior diameter of which is adjusted so as to allow, by means of a slight inclination, a liquid to flow, drop by drop, and with great regularity. This instrument is considered in good order when, at a temperature of 15° C., twenty drops of distilled water weigh one gramme within about five centigrammes; as may be supposed, twenty drops of any other liquid than water would weigh differently: for instance, twenty drops of chloroform weigh only five grains, about one-third of a gramme; but whatever the weight may be, with this little *compte-gouttes* it is always the same at the same temperature. Many suggestions have, from time to time, been made with a view to improve upon the ordinary minim measure, as you may see by several instruments which I have brought, for instance, Allsop's graduated drop syringe, Gilbertson's graduated tube with india rubber-top, simple graduated tubes which may be used by plunging into the liquid, and placing the finger upon the opening of that end of the tube not in the liquid. But as far as my experience goes, I can measure as accurately and as quickly with an ordinary minim measure as can be required, and which can be more easily cleansed than any tube. The *compte-gouttes* might be useful to patients taking any particular medicine by drops; but the system of drops, either in prescribing or administering medicines, should be eradicated from all well-regulated minds. Prescribers should at all times write minims when desirable, and not drops; and for administration, all medicines should be at least diluted, so that nothing less than a teaspoonful should be given even to a child.

I come now to the part relating to densities and areometers or hydrometers. It is often necessary—I quote the Codex—in pharmaceutic operations to bring a solution to a density determined upon, whether it be in the operations of crystallography or to obtain a constant or uniform state of concentration,—a knowledge of the density of a liquid being useful, within certain limits, to judge of the purity of the composition of some liquids.

Baumé's areometer or hydrometer, which has been in use many years, is the one directed to be used. An account of it is given, but it is not necessary to reproduce it here, as it may be found in many works, especially Mohr and Redwood's 'Practical Pharmacy;' there are many density-tables in this part, and for reference undoubtedly frequently used,—the thermometers of Réaumur, Fahrenheit, and the Centigrade are those in general use, the Centigrade being exclusively adopted in this work; there is a table of comparison, showing the relative value of the three, then follow tables setting forth the fusing-point of different solid substances, the boiling-point of certain liquids, and the solubility in water of many substances used in pharmacy—winding up this part with a table of equivalents of elementary or simple bodies very similar to that of the P.B. There are two or three little discrepancies in the numbers, and the Codex enumerates amongst these substances, cadmium, cobalt, fluorine, nickel, silicon, and strontium, not contained in the P.B. table, omitting lithium, which is in it.

This brings me to the Materia Medica, which treats of those substances which are employed, either in the natural state or which take part in the formulæ of the Codex. The first section or series comprises those substances which are obtained either from the vegetable or animal kingdom. Certain directions are given respecting the choice of these substances, to wit, the animals; the parts or products thereof are very few, and are obtained in commerce. The best quality should always be selected of each kind. The so-called animals or their parts may at once be dismissed by simply naming them:—ambergris, lard, butter, bile or gall, spermaceti, cantharides, castor, wax, civet, cellar-woodlouse, cochineal, isinglass, hartshorn shavings, vine-snail, animal gelatine, frogs, cod-liver-oil, musk, oysters, cow's milk, honey, eggs, and, lastly, the viper; a strange collection, very useful and very good in their way.

Vegetables, their parts or products, furnish, on the contrary, nearly all the materials of organic nature which are used in the preparation of medicines; those which are obtained in the ordinary way of commerce, should be carefully selected, and indigenous plants should be gathered, as regards age, season, and development, at the time when each part possesses in the highest degree the qualities which are sought for in them. *Vide* Codex.

Before I make any remarks upon the different substances which constitute the vegetable portion of the Materia Medica, I may point out that in both books the arrangement is alphabetical. The Codex contains nearly double the number of substances that the P.B. does, and does not include among the vegetables any preparations derived from the mineral kingdom, for which a separate section is given, and in this particular differs from the P.B., in which all the substances forming the Materia Medica followed indiscriminately in alphabetical order. In the forthcoming revised edition of the P.B. there will be a different arrangement. In the Codex the ordinary name is given in French, then the botanical in Latin, then the natural or suborder to which it belongs, and the part to be used, in French; in the matter of Orders the Codex has stolen a march upon the P.B. In the P.B. the name stands first in Latin, then Anglicized, with the botanical in Latin. The part employed, source whence obtained, and sundry remarks as to characters, etc., follow in English, and in this particular has the advantage over the Codex. Whether the information as to orders or characters is the more important to the student or advanced pharmaceutist, I cannot decide; but I say, pick up both, and what you cannot find in one book seek in another. In the Codex remarks are occasionally added which, when interesting, I shall give *in extenso*, and shall only touch those most likely to engage attention. It is not expected that all the substances mentioned as officinal should be actually in stock, but only those bearing the mark of an asterisk.

*Two kinds of wormwood, namely, *Artemisia Absinthium* and *Artemisia maritima*, have the asterisk, the distinguishing mark, which might be expected, seeing the French have a predilection for absinthe, although it has been for some time banished our Pharmacopœia. The leaves and flowering tops are the parts to be used.

**Aconit Napel*, *Aconitum Napellus*. The root and leaf are employed. The following observations are attached:—The root of aconite is more active than the leaf; until now, however, the leaves alone have formed the basis of the officinal preparations; therefore, should the physician not order especially the alcoholic tincture or extract of the root of aconite, the pharmaceutist should use the preparations from the leaves. Many persons have thought that the irregularity in action, for which the preparations of aconite have been blamed, has arisen from the employment sometimes of the wild plant (which, according to them, is more active), and sometimes the cultivated plant; this irregularity of action is occasioned either from the age of the leaves, which are not always collected at the best time, or from a defective mode of preparation. The attention is next attracted towards the different species of aloes, and naturally so, for aloes enter into the composition of almost every aperient pill in use in this country. The kinds mentioned are, Socotrine, Barbadoes or Jamaica and Cape aloes; and it will be a matter of some surprise when I state, that the Cape aloes is preferred and is honoured with the asterisk, and that there may be no mistake, the following note is added: This aloes—meaning Cape—is less active than the former, *i.e.*, Socotrine and Barbadoes, and it is that which should be used, unless otherwise ordered; as, for instance, in Anderson's pills, compound colocynth pill, and some others extracted from English pharmacy. There are remarks attached to each variety of the aloes, somewhat similar to the P.B., but no mention is made of the appearance of crystals from a solution in spirit under the microscope.

Angusture vraie, Angustura or Cusparia, has some good remarks attached, from the circumstance of its having been confounded at one time with a false angustura of the nature of Nux Vomica; then follows a description of the true and false barks and the nitric acid test. The remarks are fuller than those of the P.B., but perhaps not more to the purpose.

**Anis étoilé*, *Illicium anisatum*, star aniseed, and ordinary aniseed, *Pimpinella Anisum*, are both distinguished by the customary mark. The fruit is to be used. Star aniseed is rarely met with now in England as an article of commerce, and still more rarely used.

**Bardane.* Three kinds of burdock are in use of which the root is employed. Years ago they were in repute here as antiscrophulous remedies, and I have seen them ordered, though but rarely.

**Baume de Tolu*—Balsam of Tolu. It is observed in a note, that whereas formerly it was firm and dry, breaking into pieces in the cold, it is always now found in a soft condition, and a doubt is expressed as to its being from the same tree, as it is often sophisticated.

(*To be continued.*)

Mr. HILLS observed that as some allusion had been made to the present practice of ordering *concentrated* medicines, and as Dr. Harley was present, he appealed to him to use his influence with the profession to discourage a practice so dangerous to the patient as well as inconvenient to the dispenser. He thought that potent remedies should not be prescribed in less than one, two, or three tablespoonful doses.

CONVERSAZIONE IN EDINBURGH.

On the evening of Thursday, 8th March, the Pharmaceutical Society gave a conversazione in the Industrial Museum of Science and Art. Notwithstanding the very inclement state of the weather, the galleries were crowded with a numerous and brilliant assemblage of ladies and gentlemen. Mr. Kemp, of Portobello, President of the North British section of the Society, along with other members of Council, received the visitors. The reception commenced at eight o'clock, and before the hour of lecture about nine hundred were promenading the various departments of the Museum. The bright and beautiful manner in which the interior of the building was lighted up, and the admirable and interesting mode in which the various articles were exposed, gave the greatest pleasure and gratification to those, who had responded to the invitation of the President and Council. Those present were of course in evening dress, and all felt how much enhanced the comfort and the pleasure of the evening was, by the presence of so many of the fair sex, at least one-half of the company being ladies. A little before nine o'clock the large Lecture Hall attached to the Museum was thrown open, and as there was accommodation for about a thousand individuals, every one had an opportunity of being present at a lecture given by Dr. Stevenson Macadam on Spectrum Analysis. In the room, among those present were—Dr. John Smith, President of the College of Physicians, Professor Balfour, Professor Archer, Dr. Bell, Dr. Bedford, Dr. Fowler of Corstorphine, Dr. Nasmyth, Dr. Craig of Ratho, Dr. A. Gamgee, Dr. Young, Dr. Burns Thomson, Dr. Davidson of Madagascar, Dr. Myrtle, Dr. James Young, Dr. Miller, Dr. Andrew Wood, Dr. Robertson, Councillor Cousin, Councillor Callender, Bailie Falshaw, the Master of the Merchant Company, Rev. Messrs. Guthrie, Deans, R. Macpherson, Mackenzie, Bruce, Bartholomew, Horn of Corstorphine, Bruce, and Renwick; Scott Moncrieff, Esq., Mr. Macnab of the Royal Botanic Gardens, C. Pearson, Esq., C.A., David Page, Esq., F.G.S., J. Phipps, Esq., F. Pilkington, Esq., W. Reid, Esq. of Drem, Colonel Ryley, Robert Tod, Esq. of Clerwood, Gourlay Steele, Esq., Messrs. Kinninmont, Moffat, and Black from Glasgow, etc. etc.

The President, in a few complimentary remarks, introduced the lecturer, after which Dr. S. Macadam gave a very interesting lecture on Spectrum Analysis. Commencing with Newton's discovery of the decomposition of light through the glass prism in 1701, he proceeded to refer to the labours of Wollaston and Sir David Brewster in connection with the solar spectrum. Having glanced at the investigations of Kirchhoff, Huggins, and W. A. Miller, Dr. M. proceeded to illustrate his subject by means of a very powerful battery, composed of about 80 cells. The prisms used were those of bisulphide of carbon, and having, by means of the electric light, produced the various prismatic colours, he proceeded to burn different metallic substances, such as sodium, barium, potassium, lithium, thallium, and several other kindred substances, producing in every case, most successfully, the striking, remarkable, and beautiful coloured bands by which they are individually recognized. The lecturer was much applauded, and concluded by remarking, that, spectrum analysis performed for the chemist the function at once of the microscope and the telescope—determining the composition not only of the minutest substances on our own planet, but also the materials to be found in the most distant of the visible orbs.

At the close of the lecture, a cordial vote of thanks was, on the motion of Dr. Smith, President of the College of Physicians, awarded to Dr. Stevenson Macadam for his very interesting and successful communication, which was carried amid much applause. Professor Balfour also moved a vote of thanks to the Department of Science and Art, and to Professor Archer, for kindly allowing the Pharmaceutical Society the use of the Museum, which was seconded by the Master of the Merchant Company, and carried with acclamation.

By the kind permission of Colonel Payn and the officers of the 72nd Highlanders, the Regimental Band was in attendance, and played in the course of the evening, with great skill and taste, selections from operas and other favourite music, which added much to the pleasure of the whole proceedings.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Eighth General Meeting, held at the Royal Institution, on February 14th, 1867; the PRESIDENT in the chair.

The minutes of the previous meeting were read and passed.

The SECRETARY announced the following donations to the Library:—The Pharmaceutical Journal for February. The Proceedings of the Liverpool Architectural Society. The Proceedings of the Liverpool Polytechnic Society. The New York Druggists' Circular, from Mr. Mercer.

The PRESIDENT read a letter from Mr. Mercer, in which he expressed his gratification on being elected an Honorary Member, and promised to send the New York Circular every month. The thanks of the meeting were voted to Mr. Mercer and the other donors.

Mr. ROBINSON presented a sample of "Rena Bark," which had lately arrived in this country.

Mr. REDFORD informed the members that the new edition of the British Pharmacopœia would be issued shortly, and mentioned a number of alterations in the contents and arrangement which he considered improvements.

Mr. R. EVANS exhibited a water barometer, and offered to furnish members with them.

A paper on the "Chemical and Physiological Structure of the Teeth" was then read by Mr. H. Waite, Doctor of Dental Surgery, Liverpool.

The rapid extension of diseases of the teeth has furnished an incentive to a minute study of their structure, on the principle that the foundation of all curative treatment of disease must be laid in an intelligent acquaintance with the condition of the parts when in health. The comparative anatomy of the teeth of man and animals discovers to the student many beautiful and wonderful provisions. Some of these, illustrated in the Radiata, Mollusca, Articulata, and Vertebrata, were described, and the suitability of the various dental contrivances to the peculiar habits of the creature pointed out. Among the Vertebrata, the jaws form part of the bony skeleton, and are sometimes furnished with solid teeth, while in others, as birds and tortoises, they are enveloped in a horny covering, the beak. Of those which are armed with solid teeth, there are varieties according to the habits and food of the animals. Carnivora, for example, are chiefly supplied with pointed teeth, suitable for seizing and holding their prey; while Herbivora are devoid of this class of teeth, but have instead cutting and grinding teeth. The mouth of man offers to us a type of both of these classes, containing as it does three classes of teeth,—incisors, or cutting teeth; cuspid, or pointed teeth; and molars, or grinding teeth. The numbers, the names, the forms, the position, and the functions of the several kinds of human teeth were enumerated.

The microscopical structure of the teeth was then entered upon, and the chemical characteristics of the various tissues discussed, viz. the enamel, dentine, and cementum. The physiological relations of the dental organs to the nervous and sanguiniferous systems, together with a lucid description of the trifacial or fifth pair of nerves, were given; and the paper concluded with a notice of the alveolar processes, in which the teeth are situated, with their investing membranes of gum externally, and periosteum within. Numerous diagrams were employed to illustrate the paper, which was listened to with marked attention.

Mr. SHAW, Mr. ROBINSON, Mr. REDFORD, and others, expressed the gratification which they had derived from the clear and interesting paper of Dr. Waite; and a vote of thanks was passed by acclamation.

Ninth General Meeting, held February 28th; Mr. REDFORD in the chair, the President being unwell.

The minutes of the previous meeting were read and confirmed.

The following donations to the Library were announced:—Dr. Horace Dobell on Tuberculosis, by Mr. Charles Higgins. The Proceedings of the Liverpool Architectural Society. The Proceedings of the Liverpool Polytechnic Society. Mr. A. N. TATE presented to the Museum a series of raw materials and products illustrating the manufacture of coal oil. Thanks were voted to the donors.

Mr. REDFORD asked the members for suggestions as to the best method of preventing steel apparatus from rusting during a sea voyage.

Mr. MURPHY proposed the use of chloride of antimony, as in browning gun-barrels. Mr. ROBINSON suggested packing in magnesia; and Mr. JONES, coating with collodion.

The PRESIDENT then called upon Mr. A. N. Tate, F.A.S.L., etc., of Mold, to read the paper for the evening, on "The Products of the Distillation of Cannel."

After giving a brief account of the processes by which the various products are obtained, Mr. Tate proceeded to describe the composition and properties of these products, and, in the course of his remarks upon the refined burning oil, said that the properties by which a mineral lamp oil are tested in the market are colour, smell, specific gravity, and point of ignition. Much importance is attached to colour, and the colour of an oil is certainly to some extent a test as to whether the oil has been properly refined or not; but a really good burning oil need not necessarily be colourless, as many persons suppose. The aim to make a perfectly colourless oil is a mistake in a manufacturing point of view, as it either necessitates too frequent distillation of the oil, or the rejection of a somewhat coloured but useful portion, which cannot be well used up as part of the other refined products. In order to obtain colourless oils, other more important properties are overlooked or purposely neglected. The smell of an oil is a matter upon which few persons agree, but, of course, the less smell an oil possesses the less likely it is to prove objectionable in use. Burning oil, when newly made, has always a somewhat sharp pungent odour, but this becomes less as the oil grows older, so that the smell of an oil that has been kept some time is scarcely perceptible. The specific gravity has considerable effect upon the burning property. If too heavy, there is difficulty in getting the oil to rise properly through the wick; the wick becomes charred, the lamp smokes, and an inferior light is produced. If, on the hand, the specific gravity is too light, the oil is consumed too rapidly; but this, perhaps, is a point more for the consideration of the consumer than the producer. But there is also a certain relation between the specific gravity and the igniting point of an oil, and, as a rule, a low specific gravity indicates a low igniting point. The point of ignition is a point of very considerable importance, but the persons who use mineral lamp oil know but little about it. The point of ignition is that temperature at which an oil throws off an inflammable vapour; but perhaps this is not a sufficiently clear definition. Refined oils, like other liquids, throw off vapour even at a very cold temperature, but in such extremely small quantity as to be insufficient to form with the air in its vicinity an explosive mixture. But, as the temperature is gradually raised, a point is at last reached at which the oil gives off vapour at such a rate that, before it can be diffused away, it forms with the air in its immediate neighbourhood an explosive mixture, which will take fire immediately a flame is brought in contact with it. The temperature at which an oil commences to thus give off vapour is termed the igniting point. Neither crude cannel oil nor crude petroleum have a certain definite chemical composition, but consist of a number of hydrocarbons, possessing, amongst other properties, different specific gravity, igniting point, and boiling point. The same remarks apply to the refined commercial products; they have not one definite composition, but are made up of hydrocarbons, varying in specific gravity and igniting and boiling points. To separate these commercial products one from the other, advantage is taken of the difference in boiling point, which runs through a range of several hundred degrees, and the process of fractional distillation is resorted to. The actual point of separation of these products one from another is, however, probably not the same in any two works, yet it is of great importance that products sold under the same name, and for the same purpose, by different makers, should approximate as closely as possible in quality. The spirit consists of those portions of the crude oil possessing the lightest specific gravity and lowest igniting point, and, boiling at comparatively low temperature, passes over from the still first, and is collected separately. Those portions forming the burning oil, having a higher boiling point, distil over at a higher temperature, they have a heavier specific gravity and a higher igniting point; whilst the lubricating oil, again, is composed of those portions possessing still heavier specific gravity, and higher igniting and boiling point. During the process of distillation the rise in specific gravity, etc., is so gradual, and the different products merge so one into the other, that it depends much upon the whim of the manufacturer as to the exact point of separation; but, unless this is fixed at the proper point, the products cannot be satisfactory. Now, bearing these matters in mind, it will be easy to follow a few further remarks upon the igniting point of the lamp oil. If the collection of burning oil commences at too early a stage, it follows that portions of the spirit are mixed with it, and an oil of low igniting-point produced. On the other hand, if the collection of the burning oil is carried too far, portions of the lubricating oil are mixed with it; a higher igniting point will be the result, but the specific gravity will be so increased that the oil will not rise properly in the wick. Now, there is seldom much chance of the latter taking place, for, if the collection of burning oil is continued beyond the proper limit, the resulting product is of a deeper colour, and this is objectionable to the buyer; and as it is a fault readily detected by the eye, it is at once noticed. But in the former case the fault, although far greater, is not so readily detected, and the appearance of the oil is probably improved instead of being deteriorated; but here "appearances are deceitful." The point of ignition being low, the oil is not so safe to use in a lamp. I do not consider that any oil should be sold as a lamp oil unless it has an igniting point not under 110° F., for the simple reason that a temperature closely approaching 110° F. is obtained in an ordinary mineral oil lamp. Experiments made by Dr. Attfield, of London, and which I have carefully repeated with similar results, show conclusively that this is the case. Although the oil in the reservoir of the lamp may not, under ordinary circumstances, become warmer than 80° F., yet, in its passage up the wick, it has to pass through the heated brass-work, the temperature of which, at that part presented to the interior of the reservoir, ranges, according to careful experiments, from 100° to 110° F.; and during the passage of the oil through the brass-work, if it has a lower igniting point than the temperatures just mentioned, it will evolve vapour into the upper part of the reservoir, and, if any air is also present, an explosive mixture will be produced. It is by no means the case that an accident must necessarily occur under such circumstances, but it is possible, and such a possibility ought not to exist. As long as the inflammable mixture does not come in contact with the flame, no accident will occur; but so long as vapour is produced, and exists in the lamp, so long is it possible that it may come into contact with the flame and an accident occur, especially as lamps are now constructed. The air-hole which allows of air entering the lamp to take the place of oil which rises through the wick, is usually placed close to the flame. There is no reason why this should be so, and it is very desirable that such an aperture should be placed at some other part of the lamp, or it should, as Dr. Attfield suggests, be packed with wires after the principle of the oxy-hydrogen jet. The portion of this brass-work facing the interior of the lamp should also be covered with bone, glass, or some other material possessing bad conducting power of heat, so that the passage through which all the oil has to pass to get to the flame shall be kept as cool as possible. As a rule, there is always a strong current of air passing upwards from the lamp, preventing the passage of the flame down into the reservoir; but if this current is reversed, an explosion may occur, or, if not an actual explosion sufficient to shatter the lamp to pieces, the vapour may take fire, and dangerous consequences ensue. For this reason,—and it cannot too strongly impressed upon persons who use mineral oil lamps,—it is not safe to blow out the flame of a lamp; yet it is a common practice to do so. The wick should be moved down gently until the flame is extinguished. There are several means of ascertaining the igniting point of a lamp oil, and various apparatus have been designed for this purpose. (These were all mentioned and described.) A very ready means of ascertaining whether or not an oil has too low an igniting point is to extinguish the lamp in which it is used some time after it has been burning, unscrew the top, and apply to a light the mouth of the reservoir, when, if a vapour has been produced, it will inflame, probably with a slight explosion. This experiment is perfectly safe. I have been led to make these remarks upon the igniting point, from the fact that at the present time a large quantity of lamp oil is sold which possesses a very low igniting point—much below 100° F.; but this is principally American petroleum. The very low price obtained for burning oils during the last twelve months has probably not proved remunerative to the American refiners, and, as burning oil is the most saleable and highest-priced product they make, it has been to their interest to make as much of it as possible. Spirit has been extremely low in price, and, consequently, the less made of it the better, in a pecuniary sense, for the producer. Consequently, more spirit than is proper has been collected with the burning oil, and the result is that the market swarms with petroleum lamp oil of a much lower igniting point than formerly; and I believe I am quite right in saying that the ignition point of petroleum burning oil is now more frequently below 100° F. than above it. This is not the case with the lamp oils prepared in this country. As a rule, so far as my experience goes, they have an igniting point not below 100° F., and most of them above 100° F. Some few specimens are to be found which ignite below 100° F., and the fact that such oil is generally better in appearance, and that petroleum of such character sells readily, may operate to induce our own manufacturers to make such oil. But this practice cannot be too strongly condemned, and in the cannel oils there is not so much pecuniary inducement, from the fact that crude cannel oils yield but little spirit. It is to be regretted that the Petroleum Act of 1862 does not include a clause to make the selling of lamp oil below 100° F. (110° F. would be better) punishable. As the Act now stands, it only prevents the storage of such oil in quantities over forty gallons in close proximity to a dwelling-house. Mr. Tate then went on to describe other products of the distillation of cannel, some of which, he said, although not of commercial importance as yet, were extremely interesting in a scientific point of view, and afforded matter for research, which would well occupy an ordinary lifetime. He thought many of them would before long be brought into profitable use. The employment of oil as a steam fuel was also mentioned, as also the utilization of the waste gases produced in oil-works; but Mr. Tate was of opinion that this gas could be used with more advantage in the oil works than by endeavouring to light towns with it, as proposed by the Flintshire Oil Company in the case of Chester. The production of gas in the course of oil-making would, he thought, be eventually much reduced, as the process became better known and worked.

The lecture was illustrated by a large number of specimens, showing the raw material, viz. the cannel and shale, the various oils, etc., produced during the manufacture, and the chemicals employed in refining.

A discussion ensued, in which Mr. Robinson stated that he had examined a large number of oils by Attfield's process, and had found that the majority had too low an igniting point.

Mr. Murphy said that in his opinion Attfield's process gave inaccurate results, and thought that the danger of oils having a low igniting point had been exaggerated. Other members joined in the discussion, and the thanks of the meeting were then warmly expressed to Mr. Tate for his valuable paper.

YORK CHEMISTS' ASSOCIATION.—ANNUAL MEETING.

The annual meeting of the York Chemists' Association was held on Friday evening, the 8th inst., at Beale's 'King's Arms Hotel'—the President, Mr. George Dennis, being in the chair.

Mr. J. Brown, the Honorary Secretary, read the annual report, which was approved and adopted, and ordered to be entered upon the Society's minutes.

The balance sheet and accounts, which were produced by the Treasurer, Mr. Thomas Cooper, were audited and found correct, showing a balance of £6. 8*s.* 11*d.* in his hands, to be carried over to the account of the current year.

Votes of thanks to the Chairman, Treasurer, Secretary, Auditors, and Committee, were passed unanimously, and duly acknowledged; and the committee and officials for the ensuing year were re-appointed, and the annual dinner agreed to be held at the King's Arms Hotel on Tuesday, the 26th inst.

The ordinary routine business being concluded, Mr. J. Brown said that the members of the Society were doubtless aware that the Pharmaceutical Council had made certain propositions for an amended Pharmacy Bill, which were of a more liberal nature than the Bill they had before Parliament two years ago, and which, he thought, might be made acceptable to the United Society and outsiders by a little more timely concession. The rejected Bill of two years ago contained a clause for the compulsory registration of chemists in business, and charged a guinea for such registration; the present propositions made registration optional, and did not name any fee. The most important provisions, however, were those contained in number 4, and which admitted all existing chemists to the right of membership of the Pharmaceutical Society as chemists and druggists, on being elected by the Council, and paying the same annual subscription as Pharmaceutical Chemists, giving them the right of voting on the election of the Council, but excluding them from the right of being nominated on the Council themselves. He cared nothing for the name of Pharmaceutical Chemist, as a distinction of that kind in York carried no weight with it whatever; but he maintuined it was the interest of the Pharmaceutical Society to give equal rights to all existing chemists, and offer such inducements as would combine them together for the procurement of a Bill of Incorporation, and so do away with the jealousy and dissension that has so long existed. It also appeared that the Council of the Pharmaceutical Society a short time ago had an interview with Mr. Walpole, the Home Secretary, doubtless with the view of inducing him to bring in a Bill founded on those propositions, or at all events to persuade him to support one introduced by themselves. Since then there had been a meeting of chemists in London, not connected with the Pharmaceutical Society, and the result had been the appointment of a deputation to meet the Council of that Society to confer and agree if possible upon the provisions of the proposed Bill, and which conference would take place on the 19th instant, when it was to be hoped a satisfactory settlement might be come to. In order, however, to induce the Pharmaceutical Council to meet the views of the York Association in the spirit of justice and conciliation, he had drawn up a resolution, which embodied those views, and which he had no doubt would meet with the approbation of those present, both pharmaceutists and chemists and druggists; but, before reading the resolution, he might say that the action of the York and kindred societies must have had considerable influence on intended legislation, as the Pharmaceutical and United Societies had gradually come round to adopt many of the views that were originally adopted and advocated by the York Association. Mr. Brown then proposed the following resolution:—

"That the York Chemists' Association hails with the greatest satisfaction the new proposals of the Pharmaceutical Council for an amended Pharmacy Bill for the Incorporation of the Trade, and would support such a measure in Parliament, providing greater liberality is shown to non-pharmaceutists, by the admission of chemists and druggists at present in business to equal rights and privileges with the unexamined members of the Pharmaceutical Society."

Mr. Cooper said that he entirely coincided with the views then expressed by Mr. Brown; and as a member of the Pharmaceutical Society he had long been of opinion that the only way to procure an amended Bill was by opening the Society freely to chemists and druggists already in business; and he felt convinced the resolution now proposed was one in the right direction, and he had great pleasure in most cordially seconding it.

Messrs. Bulmer, Bowman, Wilson, and the Chairman expressed themselves in the same favourable terms, and the resolution was unanimously agreed to; and it was ordered to be forwarded immediately to the Pharmaceutical Council and the Committee of the United Society of Chemists and Druggists for their consideration.

ANNUAL REPORT.—1866.

The Committee of the York Chemists' Association, in presenting to the members their second annual report, offer their congratulations on the continued prosperity and success that has attended their efforts for the promotion of unity and harmony, and for the furtherance of the interests of the trade in the city of York.

During the past year your Committee has held several meetings for the transaction of business, and for the discussion of subjects interesting to the members generally; and at the annual dinner, held on the 27th February last, a most successful and pleasant gathering of the trade took place, and the utmost cordiality and good feeling prevailed.

Your Committee would draw the attention of the members to the provisions of the Petroleum Act, passed by the Legislature two or three years ago, wherein powers are granted to Local Boards of Health, and other authorities, to grant permission for the storing of petroleum in certified places, and which imposes penalties on those storing petroleum in quantities exceeding 40 gallons, without a proper licence. Prosecutions have taken place in some towns, and penalties inflicted on chemists for non-compliance with the provisions of the Act.

In York, your Committee are grieved to say that the Excise authorities proceeded against several of your members for selling methylated spirits of wine without a licence; and, though legally liable to the penalties inflicted, they are bound to add that in every case there was no intentional wish to evade the Act or defraud the Revenue.

The new regulations regarding methylated spirits of wine having caused some difference of opinion in the trade as to their operation, your Committee instructed the Secretary to write to the Board of Inland Revenue in London for an explanation, and the reply received may be deemed satisfactory. It is hoped that the trade will observe the provisions of the Act in the use of methylated spirits of wine for external use only, as the penalties imposed under its authority are very heavy, either for making methylated medicines for internal use, or for in any way altering 'finish,' except by adding gums thereto.

During the past year, the progress of kindred societies for the improvement of the trade, and the advancement of pharmacy, has been greatly developed; and a most successful meeting of the British Pharmaceutical Conference took place at Nottingham on the 4th August and following days, calculated to stimulate the exertions of all those who are interested in the education of the future race of chemists.

Those of our members who belong to the United Society of Chemists and Druggists would be grieved at the want of unity exhibited at their annual meeting in July last, and which was likely to produce division and discord in that useful body; but there is one cause of congratulation to counterbalance this apparent mischief, in the fact of the Pharmaceutical Society having forwarded propositions for an amendment of the Pharmacy Act, and which seem calculated in some degree to bridge over the gulf that has so long divided pharmaceutists and chemists and druggists. Should there be some further necessary concessions, it is the opinion of your Committee that the present session of Parliament may witness the united trade intent upon the procuring of a Bill giving equal rights to all, and placing it in the position of honourable usefulness so long desired, and thereby advancing the moral and material interests of our successors, to the great benefit of the public welfare.

Your Committee append a statement of accounts for the past year, showing a balance in hand of £6. 8*s*. 11*d*., and would recommend the annual dinner to be held on Tuesday the 26th inst., at the King's Arms Hotel.

RECEIPTS.

To Balance in hand, 1865	£4	3	6
Subscriptions, 1866	12	16	0
	£16	19	6

EXPENDITURE.

To Postages, Stationery, Sundries, Annual Dinner, etc.	£10	10	7
Balance in hand	6	8	11
	£16	19	6

(Signed) GEORGE DENNIS, *Chairman*.
THOMAS COOPER, *Treasurer*.
York, Feb. 8th, 1867. JNO. BROWN, *Secretary*.

GLASGOW CHEMISTS AND DRUGGISTS' ANNUAL SOIRÉE.

The Seventh Annual Soirée of the Glasgow Chemists and Druggists' Association was held in the Merchants' Hall, on Thursday evening, January 31st; Mr. Alexander Kinninmont, President, in the chair. The Hall was completely filled, upwards of 400 being present. The Chairman was accompanied to the platform by Drs. J. G. Wilson, R. Wood Smith, Otho Wyer, Howatt Tannahill, Buchanan, and Newman; Messrs. Ainslie (Edinburgh), Mitchell, Stanford, Rait, Currie, Moffat, Taite, Black, Jardine, Brodie, etc.

After tea, the Chairman, in giving a slight sketch of the history and objects of the Association, said that many years ago the young men belonging to the trade in Glasgow, seeing the advancement of education on all sides, and stimulated by the establishment of the Pharmaceutical Society, resolved to form an association for the purpose of mutual improvement. At the first outset, however, they met with an almost insuperable obstacle, namely, the late hours then universal in the trade. Before improving time, it was necessary to have some time to improve, and the Association, therefore, was first originated as an Early Closing Association, and, as such, existed for several years.

After many ineffectual struggles, its efforts were at last crowned with success, and the time of labour shortened by one hour. The Chairman wished he could convey to the mind of those who have entered the trade since that time, and who have grown up under the new *régime*, some idea of the cost at which this victory was obtained; the frequent canvassing, the angry rebuffs, the never-ending discussions as to the "night bells," which always brought with it a dilemma, threatening to prove fatal to the very existence of the Association: all these things are to them matters only of tradition. First among those who contributed to this result was Mr. John Campbell, our deceased President, who, by his unwearying energy, never-failing tact, and steady enthusiasm, aided us in overcoming obstacles which it long seemed almost hopeless to encounter.

This victory won, it was necessary to redeem the pledge given as to the use made of it. The Association then assumed the name of the Glasgow Druggists' Association, and as such has earned and deserved the respect of the public. The Chairman then pointed out the great difference which existed between mutual improvement associations of other trades, compared with that of the chemists; the improvement sought in the other cases being more of a literary nature, and entirely personal to the individual, whilst every step forward made by the chemist acted directly for the benefit of the public.

Much had been said about adulterations, and he was not inclined to dispute the existence of such abuses, he might say crimes; he believed, however, that such things were rare, and would become still more rare; but of one thing he was certain, that to the man who understood and knew the characteristics and properties of the articles in which he dealt, who felt that his preparations partook something of himself, the offspring of his hand and head as it were, the temptation to adulteration was very much weakened—it was felt to be a crime and a paltry wickedness. "*Noblesse oblige*,"—nobility compels, was the maxim of the French aristocracy; "Science compels" was really the maxim of the educated druggist, who felt that it would be unworthy of him to tamper with the dishonouring treason of adulteration. That sentiment was indeed the greatest safeguard to the public, second only to a high degree of conscientiousness in the discharge of duty.

This Association, originated for the purpose of advancing the cause of pharmacy, has been productive of great benefit. Courses of lectures have been delivered, and prizes have been awarded for essays, and those essays have shown an amount of research and careful experiment highly creditable to their authors.

In concluding, the Chairman remarked that whilst the Society was in a prosperous condition, numbering seventy members, yet that was far short of the entire number connected with the trade in the city, and he would call upon all those who had not yet joined to come forward and enrol themselves. They might, perhaps, be studying at home, but they would certainly find more benefit was derived from intercourse with others having a similar aim, than by any private efforts.

Mr. Ainslie, of Edinburgh, then addressed the meeting, dwelling more particularly on the duties and responsibilities of assistants and apprentices. In the course of his remarks, after addressing the apprentices, he said:—Allow me now to make a few remarks to the assistants. As they occupy a higher position in the establishment, they ought to exercise that authority with kind forbearance to their juniors, not forgetting their own apprentice days, but of course insisting upon implicit obedience from all under them, as they are responsible to their employers, that all goes on with the same correctness in their absence as when they are present; and my experience as an assistant was, that all under me generally acted harmoniously because they were not tyrannized over,—a practice sometimes indulged in by ignorant young men, who imagine that such a course adds to their importance. After some remarks on the importance to assistants choosing proper companions, and attending to their moral and religious improvement, and congratulating the Association on its prosperous condition, and the large turn-out at their annual *réunion*, Mr. Ainslie concluded a long and instructive address amidst great applause.

A vote of thanks, proposed by Mr. Moffat, to the Chairman, was cordially awarded, after which the Hall was cleared for the assembly which then took place.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

At the usual fortnightly meeting of this Association, held on the evening of the 28th of February, Alexander Kinninmont, Esq., President, in the chair, the following paper on Singleton's Golden Eye Ointment was read by Mr. William Jardine:—

"During the discussion on Citrine Ointment at our last meeting, the Chairman remarked that according to Christison the colleges intended, in preparing the formula for that ointment, that it should, as nearly as possible, resemble Singleton's Golden Ointment. He also expressed his surprise that the various dispensatories should differ so much on the composition of this ointment, when a few simple experiments would suffice to settle the matter, and offered to present me with a pot of it that I might endeavour to discover what it really contained.

"Christison, as we have seen, considers it to be citrine ointment. Another authority represents it to be red precipitate ointment, containing a drachm to the ounce, while another asserts that it is an ointment of orpiment.

"In colour it resembles citrate of red precipitate ointment, and its smell is that of a cooked fat of some description or other. It has been suggested that the fat which forms the basis of this ointment might be boiled butter, but it is not that. Boiled butter has a peculiar smell altogether different from the fat in question. This fat is very soluble in ether, indicating that it contains little or no stearine, so that it cannot be either lard or tallow. It may be either dripping or marrow, or it may be, as the Chairman has suggested, goose grease. It is most probably the latter.

"Having weighed it carefully, I digested the ointment in ether. Allowing it to stand for some time, a powder fell to the bottom of the tube, forming two distinctly marked layers, both of an orange-red colour, the upper one, however, being of a lighter shade than the lower. They were ultimately found to be the same substance, the upper layer being more finely divided than the lower. Pouring off the ethereal solution of the fat, and washing the powder well with ether, I then digested it in dilute hydrochloric acid. I might have treated the powder with nitric acid, which would have dissolved the oxide of mercury, and oxidized the sulphuret of arsenic, if present, into arsenic and sulphuric acids, retaining it in solution also. The presence of mercury and arsenic could then have been determined by the proper reagents. This would have been the better way to proceed had I been sure of the presence of arsenic. By using hydrochloric acid, its absence was determined at once, as the powder was immediately and completely dissolved. It now only remained for me to determine that it was really red oxide of mercury. By adding a few drops of solution of iodide of potassium to a small portion of the liquid the characteristic scarlet precipitate of red iodide of mercury was produced. Ammonia added to another portion produced a white precipitate of amido-chloride of mercury; and the salt obtained by evaporating another portion of the liquid to dryness, on being heated in a test tube with carbonate of potash, produced decided globules of mercury, which condensed on the sides of the tube: of course this was decisive. I also tested for lead, but found none. I did not attempt a quantitative analysis, nor, as the result proved, was it at all necessary. The ointment contained in the pot weighed exactly a drachm; the fat recovered from the ethereal solution and the washing weighed 56 grains; so that it is simply red precipitate ointment of the strength of 30 grains to the ounce, prepared with a peculiar fat, say goose fat. It is exceedingly well made, the powder being very finely divided."

ORIGINAL AND EXTRACTED ARTICLES.

REPORT OF AN ANALYSIS OF THE FIFTH REMITTANCE OF BARK FROM INDIA.

BY J. E. HOWARD, ESQ., F.L.S.

To the Under Secretary of State for India.

February 4th, 1867.

Sir,—I have to report that the specimens of bark removed from trees in September and October, 1866, reached me in good condition. The No. 1 specimen shows at once its superiority, and approaches nearly in appearance to the fine red bark grown in South America. No. 2 does not differ much at first sight, except in the absence of lichens, from No. 3. Amongst the barks of this parcel suited for sale at public auction, the broker at once selected the specimen of *C. Pahudiana*, as the most likely to give satisfaction, and as likely to realize at the present time from 1*s.* 6*d.* to 1*s.* 8*d.* per pound. Next to this, and at about the same value, comes No. 6, which is very much like the original specimen of this bark, as gathered by Mr. Cross, and now in my possession, together with a very well preserved specimen of a flowering branch of this sort, the *Colorada del Rey* of Pavon, and now named *C. officinalis*, var. *Bonplandiana*. (See Mr. Markham's Memorandum, at p. 5 of the Parliamentary Return (Cinchona) of June 18th, 1866.) I make this correction on the strength of the corresponding appearance with the specimen brought by Mr. Cross, and beg to direct particular attention to the discrimination of the varieties of *C. officinalis*, which, though classed together in some returns, and in others declared to be "not distinguishable," will be seen to be of totally different value for cultivation. Of this, the *C. officinalis*, var. *crispa*, is a remarkable illustration. I pointed out in 1852 the great inferiority of produce in alkaloids of this, the "fine Loja bark" of modern commerce, to the original Loja barks. This characteristic is not altered by the new place of growth, and this sort also preserves its peculiarly black appearance, and its very crisp fracture, from which peculiarities it was called *Cascarilla crespilla negra* by the Spanish dealers. It is, however, no longer noted in its new place of growth for the aroma (compared by Professor Guibourt to that of tobacco), nor has it the same pleasing appearance as when grown on the mountains of Loja. It would fetch probably 1*s.* 4*d.* to 1*s.* 5*d.* per pound in the market. The remaining parcels would not at first command a ready sale, as they differ so widely in appearance from any now in the market.

The quantity sent this time, especially of the earlier numbers, was more favourable for examination, affording the opportunity of correction by a second or third analysis of any point left obscure, an opportunity which I should desire for a future re-examination of No. 6, though I do not suppose that the result would be more favourable than it is this time.

No. 1. *C. succirubra.*—3rd crop of bark, renewed under moss.

Crystallized sulphates, per 100 parts		8·45
Alkaloids soluble in ether, viz. cinchonidine and quinine		1·14
Insoluble in ether (cinchonidine)		0·20
		9·79

Memo.—The sulphates (of mixed quinine and cinchonidine) refine well, but do not stand the ether test.

*No. 2. *C. succirubra.*—Original bark, six months under moss.

Crystallized sulphates		4·57
Alkaloids soluble in ether, cinchonidine and quinine		3·78
Insol. in ether, cinchonine	0·80	
Cinchonicine	0·11	
		0·91
		9 26

Memo.—The sulphates as No. 1, but less easily refined.

*No. 3. *C. succirubra.*—Original bark, unmossed.

Crystallized sulphates		4·50
Alkaloids soluble in ether		1·71
Insol. in ether, cinchonine cryst.	0·40	
Cinchonicine	0·34	
		0·74
		6·95

Memo.—The sulphates as under No. 2.

No. 4. *C. officinalis*, var. *β. Condaminea* (*Bonplandiana?*).—Second crop of bark, renewed under moss.

Crystallized sulphates	6·52
Alkaloids soluble in ether, quinine and cinchonidine	1·35
Insol. in ether, cinchonicine	0·15
	8·02

Memo.—The sulphate refines well, and stands the ether test.

No. 5. *C. officinalis*, var. *β. Condaminea* (*Bonplandiana?*).—Original bark, nine months under moss.

Crystallized sulphates	6·66
Alkaloids soluble in ether, quinine and cinchonidine	0·56
Insol. in ether, cinchonicine	0·15
	7·37

Memo.—As No. 4.

No. 6. *C. officinalis*, var. *β. Condaminea* (*Bonplandiana?*).—Original quill bark under moss.

Crystallized sulphates	2·58
Alkaloids soluble in ether, quinine and cinchonidine	2·10
Insol. in ether, cinchonicine	0·05
	4·73

Memo.—As No. 5.

No. 7. *C. Pahudiana.*—Original bark, nine months under moss.

Crystallized sulphates	0·581
Alkaloids soluble in ether, quinine chiefly	0·180
Insol. in ether, cinchonicine, a trace	—
	0·761

Memo.—The quinine, refined (with some loss) and separated from a very little cinchonidine, (apparently) gave 0·580 per cent.

No. 8. *C. officinalis*, var. *crispa.*—Original bark, unmossed.

Crystallized sulphates	0·259
Alkaloids soluble in ether, chiefly quinine	0·370
Insol. in ether, cinchonicine, a trace	—
	0·629

Memo.—The quinine refined as above, still retaining a characteristic tinge of green, gave 0·590 per cent. Two specimens of this fine Loja in 1851 and 1854 gave me,—

1854. A particularly fine and unmixed parcel—

* With reference to the above specimens marked Nos. 2 and 3, Dr. Flückiger makes the following observations in a letter to Mr. Daniel Hanbury :—"As to the mossed Cinchona Bark, I was astonished not to find any considerable difference in it to the natural bark, with the exception of a richer development of the corky layer, but not an increase at all of the liber fibres. This, I think is also in favour of Mr. Howard's opinion that the parenchyma, rather than the liber fibres, is the very seat of alkaloids, and a corroboration of my statements in my paper on the anatomy of Cinchona Barks."

Quinidine and uncrystallizable quinine	0·40
Cinchonine	0·03
	0·43

1851. Another parcel, slightly mixed with "rusty crown"—

Quinidine	0·57
Cinchonine	0·67
	0·63

(See Pereira's Mat. Med. vol. ii. part ii. p. 1639, and 'Pharmaceutical Journal,' August, 1854.)

I trust that these trials will be useful in the guidance of the cultivation in India. It is evident that the plan adopted in No. 1 is the best. This was practised to some extent in the old times of collection of the Loja barks (as described by Ruiz in a MS. in the British Museum, under the name of *Cascarillas resacadas**), but unless the bark is covered with moss immediately, as discovered by Mr. M'Ivor, the subjacent woody portion suffers serious injury. On the other hand, if this is attended to, the operation may be repeated with advantage, increasing, as it would seem, for every time of renewal. Not only is the gross percentage of alkaloids larger in the last decortication, but of this a more considerable percentage consists of quinine, and that less intimately combined with the yellow colouring matter, so as to be more easily purified. The structure reminds of the granulated formation of flesh over a wound, and does not exhibit the customary liber fibres, or at least in a very much smaller proportion to the mass of the bark. This great richness in alkaloids does not seem to consist, therefore, with the views entertained by Wigand and others, that these liber fibres are the seat of the alkaloids. The improvement is less apparent in the present sample of the *C. officinalis* (No. 4), but it is probable that some slight alteration might add a large portion of the at present uncrystallized 1·35 per cent. of alkaloid soluble in ether to the previous amount of crystallized sulphates. In the meantime, the examination of No. 4 and No. 5 discloses a most gratifying success, in the excellence of what I conclude to be the predominant variety cultivated in India.† It is only in a very few instances that the best Bolivian bark approaches the good quality which this *Colorada del Rey* has already attained in India.

I have not yet had specimens for examination of the East Indian *C. officinalis*, var. *Uritusinga*, but have reason to suppose this must also be a valuable species, whilst it must be evident that the var. *crispa* should not be propagated, as it will not repay the expense of cultivation. The same remark, in my opinion, applies to the *C. Calisaya*, var. *Frutex* (as the sort hitherto chiefly cultivated is very properly named by Mr. M'Ivor‡); also to the *C. Pahudiana*, which yields me much the same amount of alkaloid soluble in ether that it has done to Dr. De Vry. It is a pity to plant this sort; but where, as in Java, it is so extensively grown, it were equally a pity, as I think, not to turn the bark to some useful purpose in the way of decoctions.

I think the variety of *C. officinalis*, which bore the name of *Cascarilla amarilla del Rey*, and which would now be *C. officinalis*, var. *Bonplandiana lutea*, should also be introduced into the Indian cultivation. The bark of this sort fetches a high price in the market, as it is excellent for pharmaceutical preparations, and contains quinine in a very pure state.

It seems to me that none of the small quill barks, intended for sale to the druggists, should be mossed, as the natural appearance of the bark would be more acceptable to the general dealer.

The effect of the application of moss for a few months to No. 2 does not show, as compared with the original unmossed bark of No. 3, so much real advantage as might have been expected. There is an increase in alkaloid, but this bears more upon the uncrystallizable portion of the quinine (as I ascertained by repeated experiment), and also upon the cinchonine, which was apparently doubled in the mossed bark at the expense

* See my Illus. Nueva Quinologia, sub voce *C. Uritusinga*.
† 753,272 plants out of 1,123,645 in May, 1866. See 'Report,' p. 253.
‡ 'Return,' p. 203, etc.

of the cinchonicine. I cannot account for this fact, but perhaps Mr. M'Ivor may gain some light upon it.

The cinchonine in these two samples was obtained in a beautifully crystalline form as alkaloid, and afterwards in its characteristic crystallization as sulphate. Cinchonicine, the residuary product, is insoluble in ether and of rather uncertain composition.

On the whole, the present remittance of barks is unquestionably the most instructive and the most encouraging that I have had the opportunity of examining from India.

CRYPTOPIA, A NEW ALKALOID DISCOVERED IN OPIUM.

BY T. AND H. SMITH.

There are now known to exist in opium nine undoubted principles with markedly distinguishing characters:—morphia, codeia, papaverine, narcotine, thebaia, narceine, meconine, meconic acid, and thebolactic acid.

In the multiplicity of its constituents and in its wonderful action, as well salutary as deleterious, upon the living animal system, opium takes, *par excellence*, the highest place amongst all the products of the vegetable kingdom of nature. If it should be objected that the greater part of the principles yielded by it may really be the result of the varied manipulations necessary for obtaining them, the wonder is not in the least diminished, unless, which is very far from being the case, anything like an equal number of principles of equally marked characters may have been found in any other production of vegetable nature.*

It is long since it became a conviction in our minds that the long and wonderful list of opium products does not exhaust the number which this drug might still conceal, but which may be ready to be revealed by some happy chance to the chemist possessed of sufficient opportunity for the research. In proof that our preconception was not erroneous, we are now able to add another well-marked body to the list already admitted. The new substance is an organic alkaloid; its alkaline character is strong and decided, perfectly neutralizing the strongest acids, and forming salts. The sulphate, muriate, nitrate, thebolactate, and acetate have been produced by us,—these all crystallize in beautiful and distinct forms.

The salts of cryptopia,—a name which we have given to the subject of this paper,—especially the muriate, have a remarkable tendency to form a jelly. In this tendency they are distinguished from all the other salts of the opium alkalis, and, so far as we are aware, from most of the other organic salts. The salts of aricina form, as far as we remember, the only example of the existence of such a character. If the muriate of cryptopia be dissolved in from ten to twenty parts of hot water, the solution sets into a crystalline mass on cooling; but if the quantity of water should amount to about thirty parts, the liquid, on being set aside, instead of crystallizing, forms a jelly, which differs in appearance from pure gelatine only by being somewhat less transparent. If the jelly be now evaporated in a shallow vessel at a smart heat, it dries up into transparent

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* It must not, in this connection, be overlooked that in none of the processes for obtaining the different principles of opium are the chemical actions of a very powerful nature. They consist in a few precipitations, solutions in acids, not generally more than neutral, and, in addition, the use of various solvents, such as water, alcohol, and ether, and a moderate heat. When the principles, pure and in a separate state, (the remarkably ready change of meconic acid into comenic acid forming an exception) are subjected to such operations and conditions, the only result is a more or less great degeneration or destruction of the body. When more powerful agents, such as strong acids, alkalis, chlorine, or a strong heat, are used, the principles of opium, like all other organic bodies, are changed into other substances almost endless in number.

horny shavings, which by continued heat become short and brittle; but if the heat of evaporation be only about 100° F., it crystallizes in flattened, striated tufts, radiating very prettily from a centre or taking fringe-like forms, and gives about $\frac{1}{32}$ of its previous weight.

In the gelatinous state the muriate of cryptopia behaves somewhat eccentrically, sometimes retaining this condition for an indefinite period, and at other times running into crystalline knots, which are then seen floating in a clear watery liquid. The muriate of cryptopia, and also, we have reason to believe, its other salts, has a character which peculiarly distinguishes it from the muriates of the other opium alkalies: for instance, if the muriate of morphia or codeia be dissolved in a quantity of hot water, such as to give a crystallization of the salt on cooling, if the resulting salt be dried by the use of bibulous paper and exposure to a gentle heat, the bulk of the salt hardly changes, and remains in a state loose and easily broken up; with muriate of cryptopia the result is very different, the crystalline mass gradually shrinks, and by the time of complete desiccation it is found to be quite tough, and diminished in bulk to an extraordinary degree; if, on the contrary, the liquid be removed by means of a strong press, the resulting cake is tough like parchment, so as to be powdered with very great difficulty. We have not observed this character in any other salt of the opium alkalis. The crystallization of muriate of cryptopia, while lying in the liquid from which it had crystallized, is sometimes exceedingly beautiful, but on being slowly dried up, its crystalline appearance almost ceases to be seen by the naked eye; but may be again easily brought out by moistening the mass for a short time with hot water; the effect is very striking.

Under various circumstances this salt yields very fine crystals, but very different both in form and appearance from those produced in the last mother-liquids of the muriate of thebaia, in which it was first observed by the manager of our chemical works, Mr. J. Smiles, who drew our attention to the beautifully light, delicate, floating, leaf-like, and silky crystallization which it presented. This was so different in appearance from that of any other opium products with which we had hitherto been acquainted, that we felt assured of the novelty of the substance. It may not be uninteresting to remark, that in addition to its beautiful appearance, the new substance presented a feature which has been a characteristic of narceine alone of all the other principles of opium, that, namely, of crystallizing nearly colourless out of an almost black liquid. The muriate of cryptopia is much less soluble in water than the muriate of morphia. A saturated solution of the former gives only nine grains on the evaporation of a fluid ounce, while the same quantity of a like solution of the latter gives three times as much. The solubility of the two salts is reversed when spirit is used as the solvent, showing that muriate of cryptopia is more soluble in spirit of wine than muriate of morphia.

Cryptopia is colourless and odourless; its salts have a taste at first bitter, but the bitterness is soon followed by a peculiar coolness, which spreads over the tongue and palate, as if there had been an addition of some peppermint. It leaves no ash when burnt. Heated in a glass tube it remains without apparent change till the heat rises to about 400° F.; it then melts into a liquid which, on raising the heat, assumes a dark colour; on cooling it becomes solid at about 340° F., and, according to the quicker or slower cooling forms a splintered resinous-like layer, or draws into lichen-like tufts, which show a radiated crystalline structure when examined by means of a lens. When cryptopia is gradually heated to redness in a closed glass tube, it melts, blackens, gives off a watery vapour, which condenses on the cold sides of the tube; whitish-yellow vapours make their appearance, but quickly disappear; and, although there is a creeping up in the tube of an oily liquid, there is nothing to indicate sublimation. The liquid condensed in the tube at once turns reddened litmus-paper blue; the fumes from the tube have an ammoniacal smell, and a glass rod moistened with weak hydrochloric acid, when passed into the tube is immediately surrounded with a white cloud. The alkaloid appears to be soluble neither in oil of turpentine nor in benzole, but is nearly as soluble in chloroform as narcotine.

PREPARATION.—Cryptopia is contained in the weak spirituous washings of crude precipitated morphia, the liquid designated by the French, "eaux mères alcooliques."

The first step to be taken is to neutralize the liquid with diluted sulphuric acid, keeping it rather below than above the neutral point; the spirit is then to be recovered by distillation, and the contents of the still washed out with abundance of hot water; the washings and liquid are to be mixed together and filtered, the hot liquid is now to be thrown down with a large excess of caustic lime in the form of a milk; the liquid is next to be filtered away, and the precipitate thoroughly washed,—the washed matter, more or less loose or pitchy, is the source of cryptopia. The very compound matter thus obtained is to be boiled up with rectified spirit in large quantity, and the spirituous solution filtered, the filtered solution is then distilled to recover the spirit. After the spirit has been removed, the contents of the still are found to be a watery liquid, and a solid matter of a pitchy consistence. The watery liquid is then removed, and the pitchy matter, which is principally composed of thebaia, is next to be heated to ebullition with enough of rectified spirit to dissolve the substance. The solution having been put aside will be found by the following day to have crystallized, turning the liquid into a soft solid, in consequence of the abundant crystallization of thebaia. The mass, after complete crystallization, is to be strongly pressed in a cloth, and the solid cake powdered and dissolved in muriatic acid very much diluted; care being taken not to go beyond the neutral point. The filtered liquid is then to be evaporated so as to obtain a crystallization of muriate of thebaia; the mother liquid, separated from the first crop of crystals, is further carefully evaporated, at a heat not too strong, for a second crop of crystals of muriate of thebaia; and if everything has been properly done, after the muriate of thebaia has crystallized, in the course of some weeks the muriate of cryptopia will make its appearance, and may be readily recognized by the characters already detailed, and which cannot allow of its being mistaken for muriate of thebaia. When the new body has fully separated in a crystalline form, it becomes a question how it is to be obtained apart; for, although it appears to be very abundant, yet from its extreme lightness and tenuity it is exceedingly small in quantity. The crystallizations of the muriate of thebaia and the muriate of cryptopia, not being separated by an abrupt line of division, but the one shading into the other, the separation of the new body is not by any means easy.

The first quantity of the salt obtained by us, and the alkaloid from that salt, which, through the kindness of Mr. Brady of Newcastle, we had the honour of submitting to the first meeting of the Pharmaceutical Conference at Bath, was obtained by a tedious operation of careful floating off and re-crystallization.

When the substance had been obtained as pure as possible in this way, it was found, on strong sulphuric acid being added, to give a purple colour, thus showing it not to be a salt of thebaia, but in all likelihood to be rather characteristic of a new substance belonging to opium. Afterwards, however, on boiling the precipitate produced, by the addition of ammonia to its solution, with strong rectified spirit, a crystallization was deposited on the sides of the glass, which, with strong vitriol, gave a deep blue colour with a tinge of violet; while, on the other hand, the mother liquid gave an alkali which, with strong sulphuric acid, gave at once the deep blood-red colour characterizing thebaia. The salt which had given the purple colour had therefore been a mixture of the two salts, of the muriate of thebaia and the muriate of cryptopia, the red and blue of the mixed reactions having, of course, given a purple. It is our belief that the salt, as obtained from the mother liquid of muriate of thebaia, is a chemical compound of the two salts; nor does this belief seem unreasonable, for, on making the muriate of cryptopia with the pure alkaloid, we have never been able, by repeated crystallization, to get it in such a state as to give other than a blue colour with sulphuric acid, nor to produce crystals at all similar to those in question. It soon became quite clear to us, that in order to obtain the new substance in a quantity sufficient to enable us to investigate its nature more closely, it would be necessary to devise some better method than the one explained. This was the plan we adopted. The hard pressed cakes of the last crystallization of a number of preparations of muriate of thebaia were dissolved in as small a quantity of boiling water as possible, and the liquid filtered hot. On cooling, we found the liquid to have crystallized, not in hard stony crystals like those of muriate of thebaia, but in a softer state, and generally in cauliflower-like masses. The whole was then subjected to strong pressure, and a portion of the solid cake, after being dried and powdered, we boiled with rectified spirits in the proportion of one to five. The liquid we filtered hot; and the mother liquid, after perfect crystallization, (the full quantity of liquid being kept up by the spirituous washings of the crystals of muriate of thebaia obtained by previous crystallization,) we again boiled with the same quantity of the crystalline cake as before. These operations we repeated as long as the crystals yielded gave an unmixed hard crystallization; but by-and-by, perhaps after six or seven crystallizations, the muriate of cryptopia accumulating more and more, we found that a whiter crystallization, in soft tufts, formed on the surface of the hard mineral-like muriate of thebaia. Whenever this appearance presented itself the mother liquid was poured off into an open vessel, and as the spirit evaporated the whole liquid set into a soft mass. (This takes place sometimes spontaneously, sometimes when stirred.) Next day we threw the soft mass upon a cloth and pressed out the liquid. The cake left was almost pure muriate of cryptopia.

The salt can be very easily rendered colourless, by crystallization and a small quantity of pure animal charcoal. It is not unworthy of remark, that the bleaching effect of charcoal is much more marked in the case of the salts of cryptopia than in those of the other alkaloids of opium.

There is no difficulty in knowing if the salt obtained is mixed with thebaia. If the minutest particle gives a blue colour with sulphuric acid, it is pure; but if it give the least tinge of purple, it still contains thebaia. To obtain the pure alkaloid it must be precipitated from its watery solution by ammonia, and the precipitate, after washing and drying, is to be washed freely with ether or spirit, either of which dissolves the thebaia readily, but has little action on the cryptopia.

The crystallized alkaloid is prepared by boiling the precipitated alkali in rectified spirit, and, as its solubility in spirit is very small, a large quantity of spirit must be used. The alkaloid crystallizes after cooling, and on being allowed to remain undisturbed for some time. The crystals, which are partly separated on the sides,—partly, and in greatest quantity, at the bottom,—are very minute, but by the aid of a powerful magnifying glass are found to be composed, especially those on the sides of the glass, of beautiful groups of transparent six-sided prisms. The crystals given by twenty ounces of rectified spirit, saturated at a boiling heat, do not weigh more than sixty grains; and a thousand water grain measures of the spirituous mother liquid, after complete crystallization, only give, on evaporation, a weight of 0·79 gr., so that cryptopia requires the large quantity of 1265 parts of cold rectified spirit for solution.

The quantity of cryptopia yielded by opium is very small indeed: we have only got, altogether, since it first came under our notice, about five ounces, in the form of muriate; and to obtain that quantity not less than four or five tons of opium have been operated upon; we do not suppose the whole of the cryptopia contained in the opium to have been obtained by us; but still there can be little doubt that the new alkali is, of all the constituents of opium, the smallest in quantity. An observation made by us quite recently shows, although we cannot say to what extent, that the quantity obtained does not show the full proportion existing in opium. It occurred to us that, as the cryptopia had been obtained from the thebaia crystallized from spirit, the spirituous mother liquid, which had been pressed out, ought to be a source of cryptopia; and an examination of a quantity of this liquid, which had been lying aside for some years, completely confirmed our idea. That liquid we found to have become quite gelatinous; and from our acquaintance with the peculiar character of the tendency of the salts of cryptopia to gelatinize, we were led to examine more closely the gelatinous mass. A Stanhope lens showed it to be composed of an infinity of minute crystalline needles. It was exceedingly difficult to separate the crystals, and we only succeeded by a slow filtration of some weeks, and at last by cautious pressure by means of a cloth. When the pressed and powdered mass had been boiled with rectified spirit, a crystallization was obtained from the filtered spirit. On washing the crystals two or three times with a little cold spirit, and then drying them, the blue reaction with strong sulphuric acid at once proved the crystals to be really cryptopia;* and the proof was strengthened by neutralizing the crystals with very dilute muriatic acid, when the characteristic jelly was formed by evaporation and cooling.

Cryptopia, being a strong alkali, cannot be mistaken for the principles of opium of an acid nature, such as meconic and thebolactic acids; nor for those that are neutral or of weak alkaline properties, such as meconine, narceine, narcotine, and papaverine; the other principles of opium, viz. morphia, codeia, and thebaia, are strong alkalis, neutralizing the strongest acids. As cryptopia possesses this character of strong alkalinity, in common with the three principles last mentioned, nothing more will be necessary than to contrast its other characters with theirs, to find to what extent these characters separate it from them, and give it a right to be considered a substance not hitherto known to exist in opium.

The very sparing solubility of cryptopia in spirit separates it widely even from morphia, the least soluble of the other alkaloids in that medium. The insolubility of cryptopia in ether does not distinguish it from morphia, but does so completely both from codeia and thebaia.

The action of strong sulphuric acid (pure) on cryptopia cannot allow of its being confounded with any of the other three. This acid produces a blue colour with the most minute quantity of cryptopia; a blood-red with thebaia; and no colour with either morphia or codeia.

The salts of cryptopia have a great tendency to give jellies on cooling from hot solutions. None of the others show this tendency. The muriate of cryptopia crystallizes in tufts, but of a different kind from those of muriate of morphia and muriate of codeia; while the muriate of thebaia crystallizes in hard, stony-like crystals. Again, the muriate of cryptopia is much more easily bleached with charcoal than either of the other muriates.

It appears to us unnecessary to carry the comparison further; we think we have said enough to show a difference of characters so distinct as to prevent the

* We are not quite in a position to affirm that the cryptopia obtained from the pressed crystalline cake had been given by the crystals seen by aid of the lens, or by something else that had existed side by side with them: we intend trying to determine this point, and hope to succeed.

chance of cryptopia being confounded with any of the other principles of opium.

It is already known that a blue colour is produced by the action of vitriol on papaverine, but the shade of blue is far more faint, and passes into an orange on the addition of a minute particle of powdered nitre. By the same addition to the blue of cryptopia green is produced. A faint green can also be produced by the addition of nitre to the blue of papaverine; but it is very faint, and requires careful management to produce it.* If the colour reactions were the only means of distinguishing cryptopia and papaverine from each other, they might be mistaken, the one for the other; but differing so much as has been shown in other respects, such a mistake is quite impossible.

As there is some analogy between cryptopia and the substance occasionally found in opium by Pelletier, and named by him pseudo-morphia, it appears to us right to point out a few features in which they differ so much as to show them to be quite distinct substances. They are both very insoluble in alcohol and in ether: in this respect they are analogous, but hardly so in any other; for instance, the pseudo-morphia separates from an acid liquid, while in such a case cryptopia could not separate.

Pseudo-morphia is insoluble in ammonia, but very soluble in caustic fixed alkalies; cryptopia, although insoluble in ammonia, is equally so in caustic mineral alkalies.

Diluted acids favour a little the solution of pseudo-morphia, but there are marked differences in this respect, sulphuric and nitric acids dissolving very little, muriatic acid sensibly more, and acetic acid much more. Cryptopia dissolves readily in any one of these acids.

Concentrated sulphuric acid turns pseudo-morphia strongly brown, and then decomposes it. Cryptopia is turned blue by the same agent, and so far from being thus decomposed, if the vessel used for the reaction be left exposed to the air, the colour disappears by dilution of the acid, through attraction of moisture. If the liquid, next day, be poured off, and a fresh quantity of strong acid again added, the blue colour is reproduced; and the same result may be brought out three or four times successively, the blue, of course, becoming more and more faint each time.†

Concentrated nitric acid turns pseudo-morphia red, passing into yellow, exactly as in the case of morphia. Cryptopia is coloured yellowish-orange, and the colour does not change.

Pseudo-morphia, like morphia itself, becomes of an intense blue with salts of the peroxide of iron, particularly with the perchloride. When cryptopia is submitted to the same reaction, it shows no change.

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* The rationale of the production of the green colour is easily comprehended. Sulphuric acid producing a blue and nitric acid an orange-yellow; when the two reactions are applied consecutively to one and the same quantity of cryptopia, the compound result is the production of a green colour; and as the action of nitric acid is more powerful than that of sulphuric acid, if the quantity of nitre added should be more than sufficient, the yellow would so predominate as to overwhelm the blue reaction of the sulphuric acid; in this case, however, we have never failed in bringing out the green by the addition of a minute quantity of cryptopia to the yellow liquid. The green is of a deep grass shade, and has a remarkable resemblance to that which is observed on heating meconine with slightly diluted sulphuric acid, and which is so highly characteristic of that substance.

† After the colouring action of vitriol on cryptopia has been exhausted, it will be found by calculation to have been really enormous.

ON THE PREPARATIONS OF CONIUM OF THE BRITISH PHARMACOPŒIA, AND THE TINCTURE OF THE LONDON PHARMACOPŒIA.

BY JOHN HARLEY, M.D. LOND., F.L.S., ASSISTANT PHYSICIAN TO KING'S COLLEGE HOSPITAL, ETC.

(*Continued from p.* 455.)

In my last communication I gave an account of some experiments with two samples of the *tincture of the dried leaf.* The conclusion to be derived from them clearly coincides with that formed of the tincture of the fruit, viz. that it is practically an inert preparation.

As far as a *spirituous* preparation of the dried leaf is concerned, I think my experiments are conclusive. They entirely accord with my previous experience, which first led me to mistrust the preparation.

Feeling, however, that it is a matter of considerable importance to determine whether the dried plant does retain any active properties, and if so in what degree, I have carefully examined the dried leaves, from a portion of which the tinctures employed in my experiments were prepared. Excepting in the *poultice,* the dried leaf is no longer used in the British Pharmacopœia; but the importance of the investigation will be recognized when it is observed that the dried plant is largely used in some other Pharmacopœias. Looking first to our nearest neighbours, I find that the French Codex contains no less than six preparations of the dried leaf, viz.:—1. An alcoholic extract; 2. A plaster made of this extract; 3. An injection, composed of an infusion of the dried leaf; 4. Powder of the dry leaves; 5. An æthereal tincture; and lastly, 6. A tincture.

The Norwegian Pharmacopœia has two preparations of conium. 1. The dried leaf, prescribed as follows:—"medium dose, 2 to 3 grains; 10 grains would be a dangerous dose." 2. An aqueous extract of the dried leaf treated by alcohol, of which it is said:—"medium dose 1 to 2 grains; a dangerous dose, 6 grains."

There is scarcely a Continental Pharmacopœia which does not contain these and similar preparations of conium.

The 'United States Pharmacopœia' contains four preparations of conium, three of which are derived from the dried leaf:—1, an alcoholic extract; 2, a fluid extract; and, 3, a tincture corresponding to that of the London Pharmacopœia.

It is to be observed that the dried plant is thus extensively used notwithstanding that some very competent observers have expressed doubts respecting its activity. Geiger indeed expressly states* that the dried leaves of hemlock do not contain any conia, and Pereira says† "no reliance can be placed on the dried leaves however carefully prepared, for they sometimes yield no conia, though they possess the proper hemlock odour and a fine green colour." Of these two statements the latter is nearer the truth, but it implies—what I believe is untrue—that some dried hemlock leaves do possess the active properties commonly ascribed to them.

The following are my own observations upon this point:—

Examination of the dried leaves used in the preparation of the tincture above referred to.

I. February 11, 1867. Took one ounce avoirdupois of each of the two samples of leaves, separated from leaf-stalk and in coarse powder, and packed

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* Magazin für Pharmacie, xxxvi.

† Pereira, Elem. Materia Medica, vol. ii. part ii. p. 195.

them in thin layers alternating with layers of fine sand in a percolator. f℥x of water containing 120 grains of caustic potash was poured upon them, and maceration allowed for 24 hours. The aqueous solution was then displaced by f℥viii of dilute alcohol (equal parts of rectified spirit and water), and maceration allowed for 24 hours more. The spirituous fluid was next displaced by water acidulated with sulphuric acid, and percolation continued as long as the running fluid possessed colour. f℥xxii of very dark greenish-brown fluid was thus obtained. A little more acid was added to produce exact neutralization of the alkali, and the turbid fluid filtered. Chlorophyl and sulphate of potash, destitute of conia or any of its salts, remained on the filter. The filtrate was evaporated over a water bath at a temperature under 160° F., until about ʒv of dark brown extract, of treacly consistence, remained. While still warm, this was rubbed up with fʒv of solution of caustic potash (1 part (HO, KO), 3 parts (H O)). A very faint odour of conia was evolved. The mixture was transferred to a long tube, and shaken at intervals with an equal bulk of æther. The æther assumed a yellowish-green colour. After 24 hours the æthereal solution was decanted, and the extract washed with fresh portions of æther as long as it continued to dissolve anything. The mixed æthereal solutions were then distilled. Half a grain of a clear, deep sap-green, thick, oily fluid, lighter than water, remained. It possessed a mint-like odour mixed with that of conia. To the tongue it was almost as bitingly acrid as conia itself, but in minute quantity it produced, like oil of peppermint, a sharp cooling sensation. Its taste was bitter, and it possessed, in an intense degree, the nauseous flavour of the dried leaf or its tincture. It was in fact a mixture of conia and the oleo-resin of the plant, coloured by chlorophyl. It imparted to water a strong alkaline reaction. Mixed with water acidulated with sulphuric acid it refused to dissolve, but the aqueous fluid obtained a tinge of colour, and, when evaporated nearly to dryness, a dark film of syrupy fluid remained, which, when mixed with a little solution of caustic potash, evolved a distinct odour of conia.

II. An ounce avoirdupois of the mixed leaves were taken and mixed with f℥vss of water and f℥ss dilute sulphuric acid P. B. Maceration was allowed for seven days at a temperature of 50° F. The fluid was then displaced by water. f℥x of bright sherry-coloured infusion was thus obtained. This was neutralized exactly by HO, KO, and filtered. A modification of chlorophyl, which gave a deep yellow colour with potash, and sulphate of potash, both free from conia or any of its salts, remained on the filter. The filtrate was treated as was that of No. 1, and the extract in like manner supersaturated with potash and washed with æther: a little less than half a grain of bright pale greenish-brown oily matter remained. It possessed a powerful odour, compounded of conia and the peculiar odour of the leaves with a minty addition. It smelt more of conia and less of mint than the product described under No. 1. Its taste was intensely biting, like that of conia itself, leaving a flavour of tobacco and peppermint, and the rank taste of the dried leaves. Treated with sulphuric acid the oily fluid partly dissolved, and the filtered solution manifested a purple tinge on evaporation, and furnished a little brown syrupy extract, which, upon the addition of potash, evolved a strong odour of conia, a distinct trace of which was obtained from the mixture by the aid of æther.

It appears from the foregoing experiments that the dried leaves do, when carefully prepared and preserved, retain a trace of conia; and it is equally conclusive that the quantity is much too small to furnish an efficient preparation.

III. In order to make my investigation complete, I subjected the leaf-stalks —primary, secondary, and tertiary—to the same process as that described in

No. 1. Taking the same quantity of the leaf-stalks, viz. ℥ii, I obtained as nearly as possible the same quantity of oily matter as from the leaves. Its physical and chemical properties were identically the same as those of the oily fluid obtained from the leaves.

It will be observed that I have not followed the usual process (that of distillation) for the extraction of conia in the above experiments. I have been induced to adopt the above method in order to prevent that decomposition of the alkaloid which takes place by prolonged heating with potash. If I had followed the prescribed processes, I should no doubt have been led to the same conclusion as Geiger, viz. that the dried leaves are destitute of conia.

I am now brought to the inquiry, What is the value of the *Cataplasma Conii*, P.B.? According to the most liberal computation it contains only half a grain of conia, and, as far as this principle is concerned, it may therefore be considered valueless. It is stated in Wood and Bache's 'Dispensatory of the United States' that two or three drops of conia may be given in the form of enema.

Succus Conii.—I now turn to another preparation of conium, the *Succus Conii.* This is, indeed, a most worthy representative of the famous hemlock, as I have most satisfactorily proved by its effect upon myself and others.

The drug with which I commenced my experiments was prepared by Mr. C. F. Buckle, of 77, Gray's Inn Road, W.C. He has kindly furnished me with the following particulars respecting the herb and the preparation of the juice:—

"June 1, 1866.—Received from Mr. Gaines 56 lbs. of *Conium maculatum* grown in Essex. The plants were fresh and fine, and just coming into bloom. The process of pulping between finely-grooved iron rollers was commenced at once; when complete, the pulp was subjected to the pressure of a very powerful hydraulic press, and 75 per cent. of juice obtained. This was immediately mixed with the proportion of spirit prescribed by the British Pharmacopœia, and the mixture set aside in a cellar. The whole of the process occupied ten hours, and was completed in one day. The mixture was subsequently filtered as directed, and bottled off." The resulting preparation was of a dark sherry-colour, possessed a delicate and agreeable herby taste and odour without acridity, and an acid reaction. Sp. g. 1002. f℥j yielded 30 grs. of extract, and 0·42 grs. of pure conia. Heated with a little caustic potash, it evolved suffocating fumes of conia. Heat, alcohol, nitric acid, all precipitated albumen. The boiled and filtered juice gave reactions indicating the presence of sugar (in considerable quantity), soda, magnesia, lime, phosphoric acid (in considerable quantity), sulphuric acid (a minute proportion), chlorine. Bichloride of platinum gave a muddy molecular yellow deposit; tannic acid, a fine flocculent precipitate; perchloride of iron caused a precipitate, but neither the per- nor proto-salts produced any discoloration.

Dec. 10.—At 11.30 A.M. I took fʒii with a little water. I remained quiet, and was engaged in close study all the rest of the day. No effect followed.

Dec. 11.—At 8.30 A.M. took ʒi of bicarbonate of potash in a large draught of water. At 10.30 A.M. took f ʒiii of the succus, and went by railway into the City. On walking back again, about three-quarters of an hour after taking the conium, I suddenly felt a heavy clogging sensation in my heels, and as I went along I was satisfied that this was due to impairment of muscular power. After walking about a mile up-hill this sensation was very decided, and on putting a foot upon the scraper at the door of the hospital the other leg felt hardly sufficient to support me. It was a dark, foggy day, and I could not test my vision for distant objects with any certainty, but on looking at a blazing fire at the distant end of the ward I felt giddy, and I seemed to want power in my eyes in order to fix my gaze firmly enough to get a good definition. I could not follow the rapidly shifting flames so as to clearly define one from another. I felt clumsy in my movements. I was quite sure of them, but I felt that I needed to make an effort to control my legs. By the time I had finished my visit (1 P.M.) these effects had completely passed off, and I walked away briskly a distance of two miles. The maximum effect was manifest about an hour and a quarter after taking the hemlock.

Dec. 13, at 11 A.M.—Took fʒiii of succus, and experienced the above-mentioned effects in only a very slight degree. The pulse and pupils remained natural. I was pretty actively engaged the hour following the dose.

Dec. 15, at 10.15 A.M.—Took fʒiv and immediately walked a distance of three miles. Felt a repetition of the symptoms which I experienced on the 11th, after ʒiii of the juice. Three hours after taking the drug the symptoms had entirely passed off, and I felt as strong and active as I ever did.

Dec. 17, at 10.45 A.M.—Took fʒvss of the succus, having previously observed the pupils and the pulse, and continued moving about in a small room, arranging certain matters. I had forgotten the conium altogether, but was suddenly reminded of it by the occurrence of the following disorder of vision, which would, probably, be loosely called giddiness. It was what I might term voluntary giddiness,—a giddiness within my own control. So long as my eyes were fixed upon a given object, the definition and capacity of vision for the minutest objects were unimpaired; but the instant I directed the eyes to another object, all was haze and confusion, and, if standing, I felt giddy. As soon, however, as the eyes again rested upon an object, the confusion of vision and sense of giddiness instantly disappeared. It was clear to me that the adjusting muscular apparatus of the eye was enfeebled and its contractions so sluggishly performed, that they could no longer keep pace with those of the external muscles of the eye. Three-quarters of an hour after taking the conium this symptom suddenly appeared. At 11.45 (an hour after the dose) it was much increased: a general muscular lethargy affected me; the eyelids became so heavy that it required a considerable effort to raise them, and the implication of the third nerve was still further indicated by widely dilated pupils. I sat down to make these observations, and began to feel so oppressed with rapidly increasing muscular lethargy, that I got up and tried to shake it off.

At 12, noon, I first felt weakness in my legs, and then, as these symptoms were rapidly increasing and my vision was very much puzzled, I felt some alarm; at the same time the earliest beginning of the sensations of squeamishness and faintness, which tobacco produces on those unaccustomed to its use, came on. I sat down again once or twice, but I was afraid of maintaining this posture, for I felt that it would so much encourage the lethargy that it might get the better of me. I therefore walked about and tested the muscular power of my legs. At this time I was cold, pale, and tottering. The pulse, which had been considerably excited by the sudden accession of the foregoing symptoms, was now sixty-eight and quite regular. The sensation of nausea soon passed off, but the diminution of muscular power increased, and I felt that if this continued, my legs would soon be unequal to support me. I could still go upstairs awkwardly, but the legs felt strangely light and powerless. The weakness was especially felt in the hamstring muscles. The mind remained perfectly clear and calm and the brain active, while the body seemed heavy and well-nigh asleep. There was, in fact, a direct diminution of power in all the voluntary muscles, almost amounting to paralysis; and of all the motor-nerves, the third was the earliest and most deeply implicated. The greatest exertion was at one time required to elevate the eyelids.

At 1.30 P.M.: pulse fifty-six; beginning to feel warmer; pupils less dilated; the heaviness of the eyelids and the voluntary giddiness diminishing; muscular power returning.

At 2.30 P.M.: all the symptoms had passed off. As in previous experiments, I totally abstained from all kinds of stimulants during the action of the medicine. At this time the urine was alkaline, from the effects of a dose of potash taken at 8.30 A.M. After luncheon I wrote letters till 4 P.M. and then walked briskly a distance of three miles. I abstained from stimulants all day, and finished the day's work by drawing a microscopic object.

A *second sample* of the Succus was obligingly sent to me by Messrs. Allen and Hanburys. Its sp. g. was 1015, the greater density being chiefly, if not altogether, due to the larger proportion of albumen and sugar. In all other respects the Succus corresponded with that already described.

Dec. 24.—N. P., a young woman of average health and strength, took f ʒj. Excepting a slight feeling of nausea, no effect followed.

Dec. 27.—She took f ʒj and ♏xl of the Succus. No effect followed.

Dec. 28.—She took f ʒiij. Within half an hour, she became giddy and tottering. The muscular weakness increased, and during the next half-hour she was hardly able to walk. At the end of an hour the symptoms began to subside, and two hours and a half after taking the dose they had wholly passed off, leaving her in her usual health.

A *third sample* was kindly forwarded to me by Messrs. J. Bell and Co. The sp. g. of this preparation was intermediate between that of the first and second samples, viz. 1005. It contained less albumen than either. In all other respects it agreed with the other samples, and furnished the reactions above mentioned. It was prepared June 3, 1863.

Dec. 28.—N. D., a rather delicately-constituted young woman, took f ʒij of this Succus. No efforts followed, but she vomited an hour afterwards. This was probably due to other causes.

Dec. 29.—Took f ʒiv. About twenty minutes afterwards she experienced nausea, and became giddy and unable to walk. An hour after taking the dose, there was nearly complete muscular paralysis, the eyelids were closed, and the pupils widely dilated. The mind was perfectly calm, clear, and active, and she tried without success to raise her eyelids when I requested her to do so; the pulse and respiration were normal. The former had been accelerated at the outset of the symptoms. The surface was warm. The maximum effect was produced about an hour after taking the medicine. She remained in the state above described about three-quarters of an hour. The symptoms then subsided almost as rapidly as they came on, and three hours after taking the dose she was able to walk about as actively as ever, and attend to her duties. Next day, she complained of slight pain in the legs.

From the above investigations, it is conclusive that the Succus of the British Pharmacopœia possesses in an eminent degree the poisonous properties of the hemlock, The experiments with the third sample are peculiarly valuable, as they show that the preparation undergoes no change by keeping. Having thus distinguished the *Succus* from the inert tinctures, I trust that these will henceforth be excluded from the Pharmacopœias, and that medical practitioners will rely solely upon the Succus, which, in the compactness of the dose required, in the absence of any objectionable taste and odour, and in the potency and certainty of its operation, leaves nothing to be desired.

As a substitute for the *Cataplasma Conii*, P.B., a piece of lint saturated with the *Succus*, or, if heat and moisture be required, a bran poultice containing an ounce or an ounce and a half of the *Succus*, may be used.

78, *Upper Berkeley Street, W.*

(*To be continued.*)

ON A NEW SYRUP OF IPECACUANHA.

BY MR. J. F. BROWN.

The familiar Ipecacuanha Wine is one of the most unsatisfactory of the Galenical preparations in common use. Scarcely a week elapses after it has been made and filtered, before a turbid and unsightly deposit begins to form, and increases in amount until a layer of mud-like matter ornaments the bottom of the bottle, and the unpleasant alternative is offered to the dispenser, either of using a preparation which will destroy whatever pretensions to elegance his mixture possessed, or of filtering out the offending precipitate and thereby impairing its efficiency as a medicine.

It does not reflect credit on British Pharmacy, that no universally acceptable substitute has yet been found for this preparation, which remains the sole representative in our Pharmacopœia (with the exception of Dover's Powder) of so important a drug as ipecacuanha.

The Edinburgh Pharmacopœia gave a formula for a syrup, but its *modus operandi* was very complicated, including three separate macerations, and a distillation—the latter to recover the spirit employed.

Of the permanence and efficiency of the French syrup, made by dissolving the alcoholic extract of the root in water, and adding strong syrup, but little is known, as the extract is not in use in this country.

The substitution of proof spirit for wine as the menstruum, has little or no effect in preventing the precipitation.

The following formula was suggested to me by the persual of an able paper "On Ipecacuanha Wine," read by Mr. George Johnson at the Pharmaceutical Conference held at Birmingham, September, 1865, the pith of which was this:—1. That the active principle of the root—the alkaloid emetina—was naturally combined with an organic acid, the ipecacuanhic. 2. That the deposit in Vin. Ipec. chiefly resulted from the oxidation of this compound, which is thereby rendered insoluble.

Emetina is known to be freely soluble in dilute acids, forming with them salts, some of which are crystallizable.

Remembering, too, the property of sugar in preventing oxidation, it occurred to me that by exhausting the root with dilute acid and forming a syrup from the result, a stable compound would be obtained.

I accordingly made a pint as follows :—

Ipecacuanha in coarse powder, $1\frac{1}{4}$ oz. avoir.
Dilute Acetic Acid, 10 fl. oz., or 9 s.
Spirit of Wine, $\frac{1}{2}$ fl. oz.
Refined Sugar, 1 lb.

Macerate the ipecacuanha in the acid for three days, then pack in a small percolator, adding acid till 10 fl. oz. are obtained; to this add the spirit, and dissolve the sugar in the liquor with a gentle heat. The syrup should be made to measure 20 fl. oz.

The sample thus made has been kept from that date (November 6th, 1865) until now, standing upon the syrup-shelf in the shop, the bottle being closed merely by a turned-wood box inverted over its mouth to exclude dust and flies.

About three months after it was made, a faint cloudiness began to appear scattered here and there, but it did not increase in amount, and the mass of the syrup is now as bright and clear as the first day it was made, and is not haunted by even the ghost of a precipitate.

The therapeutic value can scarcely be estimated until it has been more generally tried; it possesses in a marked degree the characteristic odour and flavour of the root, and when substituted for the wine or tincture in our own prescribing, I have not observed any difference in activity.

It is possible that the presence of the acid may be a drawback to the general employment of this syrup, although the majority of mixtures in which ipecacuanha is prescribed would not be injured by a little acetic; the want of limpidity, as compared with wine or proof spirit, and consequent increased difficulty in measuring small quantities, may be another; but it is a fair question whether these are not more than balanced by the possession of a preparation uniformly palatable, sightly, and efficient.

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

Assafœtida.

BY DR. J. E. POLAK.

Assafœtida called in Persian *Anguzeh* (of which our word *asa* may be an abbreviation), and in Arabic *Heltit el mumtin*, was in former times abundant on the trachyte range lying between Ispahan and Mahiar. Thither the assafœtida collectors from Khorassan came every year in spring; they surrounded the plant with a bank of stones, cut off its stem, and then collected the gum-resin. But as they left no stems for producing seed, only some isolated plants are now to be found in this locality. The plant is however still plentiful between Abadeh and Murgab, where as well as in the southern province of Laar, assafœtida is collected. About Abadeh in the spring the sheep feed on the leaves of the plants; and I was assured by credible witnesses that the milk and butter obtained from the animals thus pastured, is so fœtid that none but the inhabitants can make use of them. I have also received from Herat through an English physician, several shoots which were quite covered with gummi-resinous tears. From the occurrence of the plant in the hot province of Laar and other regions it is evident that it is adapted to a warmer climate and a lower elevation above the sea-level.

The greatest quantity of assafœtida is exported to India, where it is employed for culinary purposes. It forms a frequent ingredient of the sauces eaten with *pillaw*. Its medicinal use in Persia is very extensive, especially against spasm; there are persons who have so accustomed themselves to its use, that it has become to them as much a necessary of life as opium is to an opium-eater. In fact it exerts by long use a remarkable action in tranquillizing spasmodic pains, a property which deserves to be more regarded in Europe.

The young shoots of the plant, after immersion in vinegar, are willingly eaten by the Turkomans. In many parts of the country I was informed that they fence round the fields with assafœtida plants, as a protection from the attacks of insects.—*Persien; das Land und seine Bewohner*. Leipzig, 1865. Zweiter Theil, p. 282.

Case of Poisoning from Privet Berries.

The following interesting case, in which Privet Berries were assumed to be the indirect cause of death, has been communicated to the 'Medical Mirror' by Mr. James Cheese, M.R.C.S. Eng.:—

On Sunday, the 24th of September last, C. C., a little, girl, aged two years seven months, was brought to me owing to some anxiety felt by her parents because of the tardiness of her recovery from what was supposed to be a simple attack of bilious diarrhœa. The child had been ill fifteen days, during which time she had been treated by her mother, firstly, with purgatives to work off the imagined bile and after with aromatic confection to stop the diarrhœa. She had, from being a remarkably robust child, with regular and good appetite, become thin, pallid and appetiteless, and on the day before I saw her, slight bronchitis had supervened. This was then the only history I could elicit. Her father was coachman to a lady in the neighbourhood, and it was much at his mistress's desire that the child was brought to me. There appeared nothing remarkable about the case, and I was content to order her a bland nourishing diet with a gentle cordial tonic.

I heard no more of my little patient until the following Sunday, when I was summoned to her as she was reported to be sinking. I found her more emaciated with slight fever, more bronchitis and entire loss of appetite, much exhausted, apparently from the dyspnœa accompanying the chest symptoms, and complaining of considerable pain in the bowels, the abdomen being tympanitic. I then ascertained for the first time that on the day previous to her illness beginning, she had been found with some wild berries in her hand, of which she had apparently been eating, she was afterwards sick and had a rather profuse attack of diarrhœa, which her mother regarded as a good symptom, and, as before said, encouraged by means of purgatives, hoping thereby to get rid of the berries, which she supposed had made her child bilious; this was allowed to go on nearly a fortnight, it was then checked by the conf. arom.; and she was a day or two after first brought to me. During the week which passed between the first and second time of my seeing her she had been taken to a town, some miles distant, to see another practitioner, she had meanwhile had occasional returns of diarrhœa.

At this my second visit, I found the bronchitis the most urgent symptom, and ordering her cream, milk, and port wine as a diet, a turpentine application to back and chest, with a mixture of ammonia and ipecacuanha wine, I left her till next day, I then found her rallied and much better of the bronchitis, which never again required special treatment, in other respects there was but slight change. I advised a continuation of the same diet and withheld the mixture, giving small doses of ol. jecoris in milk. Her thirst now increased, and she would always take any fluid. I should mention that there never was at any time any appearance of blood in her evacuations, which were never much other than little altered food; the liver acted very slightly. The tympanic abdomen never softened, but during the last week of her illness there was a hardened mass to be felt in the right iliac fossa gradually increasing to the size of a tennis ball. The diarrhœa and pain were only kept in check by the regular exhibition of small doses of Dover's powder, from this period she continued under similar treatment, the tongue at no time being either much furred or reddened, she occasionally took a little beef tea made from the essence of beef. I continued to see her daily and saw her sinking, I could not think from simple direct poisoning, to all appearances not from ordinary disease alone. The matter of the berries had never been laid much stress upon, although I gave it as my opinion that they had originally caused the mischief. I should also observe that, during the fourth week of her illness, two large worms (*lumbrici*) were passed by the bowel. She was precocious in intellect, very tractable and quite conscious to the last; she died quietly, after a slight convulsive movement of the left side, on the thirty-seventh day of her illness.

During her life, I could not ascertain the nature of the berry she was supposed to have eaten, but with some inquiry after death, I was able without doubt to determine it to have been the *Ligustrum vulgare.*

Mudar, a Substitute for Ipecacuanha in the Treatment of Dysentery.

Mr. J. J. Durant states (Indian Med. Gazette, May, 1866), that he has found the powder of the bark of the root of mudar (*Calotropis gigantea*) an excellent substitute for ipecacuanha in the treatment of dysentery amongst the native population. In every acute case in which he prescribed mudar it either effected a complete cure in a few days, or at once changed the character of the disease from bloody and mucous to bilious diarrhœa. He administers it in similar doses to what are usually given of ipecacuanha, never beginning with less than one scruple, and seldom going beyond one drachm. He usually gives it alone, but when a weak stomach is suspected in the patient he combines it with carbonate of soda, creasote, bismuth, prussic acid, etc. Like ipecacuanha, mudar, in large doses, is a reliable cholagogue; it is also a sedative to the muscular fibres of the intestines, particularly of the rectum and colon, rapidly allaying all pain, tenesmus, and irritation, and putting a stop to dysenteric action. Its most marked effect is the production of a copious flow of bile, which follows its use in about twenty-four hours.—*Amer. Journ. Med. Sci.*

On the Use of Spider's Web as a Styptic.

Mr. Robertson states in the 'Dental Cosmos,' that—On one or two former occasions I have written something on the use of the spider's web as a styptic in cases of excessive hæmorrhage after extracting a tooth. I now wish to add the result of my experience in another case. I do it with the hope and belief that it may be an essential service to some of my professional brethren, and perhaps to some of their patients. It may be thus serviceable on two accounts. First, it can always be obtained, and everywhere, and sometimes when other more popular remedies cannot so readily be obtained; and second, because in my hands it has proved efficient where everything else has failed.

About a year ago a young man, about eighteen years of age, came to my office to have a lower molar tooth extracted. I examined the tooth, took my forceps and extracted. The operation required rather less force than usual. The tooth came out entire, and clean, and with no laceration of surrounding parts, except the necessary severing of the periosteum. But from the first, blood flowed more freely than usual. I directed my patient to rinse his mouth with cold water, which he did considerably longer than the usual time of the flow of blood in such cases, but with no diminution of its flow. I then applied tannin on pledgets of moistened cotton, filling the socket with them. After repeating this application two or three times, the bleeding ceased, and he left. In about three hours after, he returned, bleeding as profusely as ever. I then filled the socket from whence the tooth came with cotton saturated with perchloride of iron. This I repeated several times, with a delay of a few minutes between the applications, without any apparent effect. I next applied the persulphate of iron, full strength, in the same manner, and with no better result. Finally, I procured some spider's web, with which I filled the socket, as I had before done with the cotton, when—I need not say that I was gratified to see—the bleeding stopped almost immediately, and there was no more recurrence of it.—*Amer. Journ. Pharm.*

THE PROPOSED PHARMACY BILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I notice in your Journal for this month (March) that, at a conference held at the rooms of the Pharmaceutical Society, between the Council of the Pharmaceutical Society and gentlemen not connected with the Pharmaceutical Society, it was arranged that in the forthcoming Pharmacy Bill all "Chemists and Druggists" in business at the time of the passing of the "Bill" should be admitted "*Members*" of the Pharmaceutical Society, although not allowed to style themselves "*Pharmaceutical Chemists*," unless they pass the *Major* examination of the Society. But as at present a man must pass the examinations of the Society before he can be a "*Member*," when he has passed, he will only be on a level with those who have taken no trouble whatever to qualify themselves, and who will enjoy the same privileges as those who have worked hard for them. I do not consider this fair, Mr. Editor, to those gentlemen who have passed. The public of course would not understand the difference between the terms "Pharmaceutical Chemist" and "*Member*" of the Pharmaceutical Society. They (the public) naturally imagine that, as *Membership* is the highest degree granted by the Society, any man who is a *Member* of the Society is of course a Pharmaceutical Chemist; hence it follows that a passed man will not stand any higher in the opinion of the public than the man who has been admitted without any examination whatever. In order that the public be not deceived, and as a means of being just to those gentlemen who have passed the examination of the Society, I would suggest the establishment of a higher degree than *Membership*. If a Fellowship were to be established, with a separate examination (more stringent of course than the Major), and fees, the amount of which the Council should decide; and let all who are admitted to Membership by the forthcoming Bill, and all who join the Society as apprentices after the passing of the said Bill, pass the examination for the Fellowship, if they covet that honour. But let all who have joined the Society previous to the passing of the Bill be elected "*Fellows*" on passing the present Major examination. This arrangement, I think, would satisfy those gentlemen who have voluntarily passed the examinations of the Society, and could not be objected to surely by those who have not passed any examination whatever—although, to judge from the correspondence which has taken place lately in the Journal, some would like to be members of the Council and Board of Examiners, and occupy any other post of honour, without the trouble of examination or anything so absurd. In conclusion, I would remind those gentlemen who now clamour so vehemently at the door of the Pharmaceutical Society for admittance, that they had the opportunity (many of them) of joining the Society without any trouble except the payment of a small fee. But no; there was nothing then to be gained, as they thought, by doing so; but now they see they were mistaken, and that there really is an advantage in being a Member of the Pharmaceutical Society, they immediately begin to cry out that they have a right to enjoy those advantages equally with those who have taken trouble to gain a right to them. If they had any pluck, Mr. Editor, they would set to work and obtain for themselves these advantages, and not beg them. The way of earning them is open to all.

Yours truly,

A MAJOR ASSOCIATE.

THE PROPOSED PHARMACY BILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—This month the readers of the Pharmaceutical Journal are made fully acquainted with a very important clause of the proposed amended Pharmacy Bill. This clause proposes to admit to all the benefits of the Pharmaceutical Society any person who may apply for admission, provided he has already registered as a Chemist and Druggist. This proposition, it would seem, emanates from the Council, and such being the case, the question presents itself, Have the Members of the Council fully considered the consequences of taking such a step, which cannot but be a gross breach of faith, not only to the examined members, but also to the founders and the public at large. It has been repeatedly stated in the Journal, so repeatedly indeed that its very reiteration has become almost wearisome, that the doors of the Society are closed to all except those who pass the examinations. On the strength of these assertions, hundreds of young men (myself included) have qualified and passed; but now the Council proposes virtually to ignore our claims, and pass over our heads men who not only will not take the trouble to obtain a certificate of qualification, but who have systematically and resolutely tried to frustrate all the efforts made by the Society to elevate the status of the trade.

It might form a not unprofitable subject for meditation by the proposers of the new measure, What will be the effect on the public mind? At last, after years of toil, Pharmaceutical Chemists have come to be regarded at least as men who know their business, and a large and increasing amount of confidence exists in reference to them. The end the founders of the Society had in view appears to be gradually approaching, when the Council, the men entrusted with the direction of the Society, and who are supposed to be the guardians of its interests, purpose admitting to the highest honours at their disposal any one who thinks proper to apply for them. This is, to say the least of it, unfair; for if outsiders are indiscriminately admitted (which, under the proposed alteration, they must be; for if one is allowed to enter without examination, how is another to be kept out?) the effect on the public mind must, cannot fail to be most prejudicial; a want of confidence will be created in regard to its members which it will take years to overcome. It is true there is a proposed distinction, but the public cannot be expected to realize that distinction; to an ordinary observer it would appear the same thing whether a man put over his door "Member of the Pharmaceutical Society," or "Pharmaceutical Chemist." I am perfectly aware that a large number of the present members are unexamined; but I am sure that no examined member would for a moment grudge the Founders the position they occupy. If it had not been for them, we should not have had a Pharmaceutical Society, with all its advantages; not the smallest proof of the value of a connection with it is the clamour and efforts now being made by those who will not take the trouble to qualify to obtain admission on their own terms.

The Founders will, in the ordinary course of events, soon pass away; but if the doors of the Society are now opened, the race of unexamined members would be continued for a very considerable time longer.

In reply to one of the deputations which waited on the Council last month, the President, whom we may presume to express the opinions of the Council, said—"It was impossible to forget the struggles and trials of early years, how only by undaunted perseverance and faith the Founders of the Society had raised themselves to the position they now held. They had nothing to gain by opening the doors. They were satisfied to go on prospering as they had done of late, and the agitation out of doors was of more benefit than harm. Never had their numbers kept up as during the past few years; at no time were there so many apprentices on their books, nor were they ever so sanguine as to the future condition of their Institution." Such being the case, where is the necessity for further legislation at present? why throw away what has been already attained to satisfy a few clamorous outsiders? would it not be better to go on prospering at the present rate for a few years longer, until the Society is still stronger?

Then, again, a money compromise was mooted. What amount could or would be fixed? Those members who have been members since 1852 must have paid from 15 to 20 guineas in annual subscriptions, older members of course considerably more; but as a rule the examined members have had far heavier expenses. I am accustomed to think I passed with almost the minimum cost, but as I resided nearly 200 miles from London, I had the expense of two journeys up, which, together with the examination fees, books, and incidentals, together with a month's loss of salary, owing to my having a severe illness, the result of excessive study, will make a total of not far short of £20, besides subscriptions since that time. It is not unusual to meet with those who, having been into the laboratory and attended lectures, etc., estimate the cost to them at from £100 to £150. What money payment, therefore, can equalize the positions of those who have worked and those who wish to buy their position?

I may be met with the objection that my views are illiberal; possibly many may think so, but I maintain that the first principles of an Institution like the Pharmaceutical Society should be *justice* —justice to those who have worked so long and so nobly for it—to those who have been induced to join it on the conditions it has for years so persistently stated, and last, but not least, it is bound to keep faith with the public; after being just, then it will be time to be generous.

Another question for the consideration of the proposers of this scheme is, as the outsiders would not be compelled to join, how many would be likely to do so; and, on the contrary, how many members now paying their annual guineas would immediately cease to do so?

As a proof of the feeling existing in this city, the following protest has been presented for signature to all the Pharmaceutical Chemists (eight in number); five have signed, two are to be seen to-morrow, and only one has refused:—

To the President and Council of the Pharmaceutical Society.

We, the undersigned members of the Pharmaceutical Society, desire to protest against the course adopted by the Council, as indicated in the proposed "Amended Pharmacy Bill," in reference to the admission of unexamined Chemists and Druggists to the full privileges of the Society, being of opinion that such course is unfair, both to the founders of the Society and the examined members, and is decidedly inimical to the interests of the public.

(Here follow the signatures.)

In conclusion, I would venture to suggest to the Council, whether, in making any change of this kind, it would not be well to take the opinion of the members throughout the country? Yours truly,

JOHN MILLS.

Chester, March 22, 1867.

CONCENTRATED MEDICINES.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—I think every member of the Society must feel that we owe a debt of gratitude to Mr. Daniel Hanbury, for bringing forward in his "Notes on Prescribing," the subject of the undue concentration of medicines. It was only yesterday, that on handing to a lady a 3 oz. bottle of drops containing 12 doses, for which I asked 1*s*. 4*d*., she said, *What! 1s. 4d. for that little bottle!* whereas for some time she has been cheerfully paying the same price for a ℥vj mixture, the dose of which was a sixth part.

My only wish on reading the article was that you had borrowed an Americanism for once, and appended in the boldest italics, "Medical Journals, please copy."

As bearing on the remuneration part of the subject, I may also say that I hail the prospect of a speedy incorporation of the whole trade, but that I should rejoice therein much more could I hope that those to be admitted into membership with the Society, would endeavour to raise *their prices* as well as themselves to a higher level (a reform much needed),—instead of fearing, as I do, that some of them will quote that membership in support of the statement that their cheap physic is as good as that of their higher-charging neighbour. I shall be glad to find my fear a false one.

I am, Gentlemen, yours respectfully,

One who thinks that Time, Skill, and Care are worth Money.

March 6, 1867.

NOTES ON PRESCRIBING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In confirmation of Mr. Hanbury's remarks on the extraordinary form in which medicines are nowadays prescribed, I send you subjoined a copy of a prescription brought to me this morning to be dispensed.

You will observe that the medicine is simply a dilute solution of hydrocyanic acid, of which the single ounce ordered is sufficient to last the patient about eleven days. The extreme volatility of hydrocyanic acid is in itself a sufficient reason why such a medicine should never be prescribed in the form of a bottle of drops, to be opened three times a day for nearly a fortnight; but, not content with this, the prescriber has ordered the acid to be taken in soda-water, the evolution of gas from which is calculated to render the dose still more uncertain.

I am, Sir, your obedient servant,

J. Sands.

London, March 4th, 1867.

[A Copy.]

℞ Acid. hydrocyan. dil. *Ph. Lond.* ʒij
Aqua destillat. ʒvj.
Take 15 drops three times a day in a little soda-water.

Miss ——, *March 3rd*, 1867.

COMPULSORY EDUCATION.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—May I beg space to say, in reference to the renewed attack on me by Mr. Thompson, of Leeds, (given in your last number,) that I certainly do not "expect my authority to be of greater weight than that of the presidents of all the colleges." But I claim the right, when my opinion is assailed, to quote the authority of the eminent men referred to in *confirmation* of it when fairly available.

Your readers can judge between us.

I am, Sir, yours obediently,

B. B. Orridge.

30, *Bucklersbury, London, March 25th*, 1867.

THE USE OF CALABAR BEAN IN TETANUS.

In the 'Lancet' of March 2nd, the successful treatment of two cases of Traumatic Tetanus with the Calabar bean are given by Dr. Eben. Watson, of Glasgow, and are interesting, as affording some definite information as to the effects of the internal administration of Calabar bean. The following is abstracted from Dr. Watson's paper: "At half-past two P.M. of the 15th November, one square of Squire's gelatine paper, containing the extract of Calabar bean, was put on the patient's tongue through the space left by a missing tooth. Shortly after getting it she felt easier, was more cheerful, and kicked up her heels as she lay in bed on her abdomen, to show the power she had over them. At three P.M. she got two other squares, at seven P.M. three squares, and at ten P.M. two more. No severe spasms occurred during this evening; she had only a few short starts, but she was always very rigid in both body and limbs, and the opisthotonos and trismus were quite marked. She was more cheerful, however, and spoke more distinctly. Pupils rather contracted. She was to have two squares of Calabar paper every hour during the night.

"*16th.*—This morning I found her quite rigid, and with frequent and severe spasms. In fact, I thought either that the papers were not sufficiently strong, or that they were losing their influence on the patient. I now therefore ordered the following preparation:—Extract of Calabar bean, 12 grains; white wine, 1 ounce. This made a muddy sort of wine of the Calabar bean, every five drops of which contained about one-eighth of a grain of the extract. Such a dose was to be given every half-hour, the effects being carefully watched by my assistant. It will be noticed that the doses were given very close together, for we had already learned that their effects were very short-lived. These doses were regularly given till seven P.M., by which time she had taken eighty drops, or two grains of the extract. Only momentary twitches had occurred, and these principally when spoken to. At half-past seven P.M. she was in a semi-comatose condition, lying on her back, with no arching, mouth open, pupils pretty well contracted, breathing quiet and regular, pulse rather hurried and full.

On the 18th she continued better, and the dose was increased to 10 drops every hour. Notwithstanding this increase, she had three fits on the 19th, when a stronger dose was determined on. For this purpose I ordered the following pills:—Extract of Calabar bean, 12 grains; ginger powder of sufficient quantity to make 24 pills: one to be taken every hour. By mistake the apothecary made these pills of twice the strength ordered, viz. containing each one grain instead of half a grain of the extract. This was not, however, discovered till the evening, so that the patient took one grain of the extract every hour for eight hours without any particular effect being produced. But half an hour after the ninth had been swallowed, the patient fell into the following state:—Her eyes were widely opened, staring and glassy; the pupils were contracted to pin points; the pulse was rapid and intermitting; there was a mucous rattle in the throat, and the breathing was jerky and fitful. Patient did not answer questions, and gave no sign of sensibility. She had no spasms, neither could they be induced. In fact, all the muscles were completely relaxed, except those of the back, which were still rigid. She either could not or would not move any of her limbs, or make voluntary efforts to swallow. Some brandy-and-water and seven drops of the tincture of belladonna were poured down her throat, she not resisting, and this was repeated in five minutes. No effect was produced on the pupils, but the expression became less death-like. Towards morning the spasms, though less violent, could be easily induced; and next morning, at half-past eight, I found no traces remaining of the very remarkable state in which she had been on the previous evening.

It was thought prudent to discontinue giving the bean, until Dec. 6th, when it was recommenced in the form of tincture, made after the recipe of Dr. Fraser (Edin. Med. Journ. vol. ix., p. 124),* who considers 5 minims to be equal to 3 grains of the kernel; a dose of five minims of the above tincture was given every two hours, and on the following day, without any aperient medicine having been given to her, patient had five large

* *Tincture.*—Take 1 oz. Calabar bean (deprived of husks), macerate with 1 oz. spirit of wine for forty-eight hours; then percolate with spirit of wine, so that the resulting tincture may measure 2 oz.; commencing dose, 5 minims. There is also a tincture very generally used, made in the proportion of $2\frac{1}{2}$ oz. of the bean to 20 oz. of spirit of wine.

watery evacuations from the bowels. This was the more remarkable, because she had previously required a strong dose of castor oil, often fortified with croton oil, to move the bowels, and except from the effect of such medicine, they had always remained confined. I have little doubt, therefore, that this was another of the physiological actions of the bean, viz. catharsis. After this date the recovery was very rapid, and by Dec. 22nd she was quite well.

The second case was that of a boy, aged 13. The treatment with the tincture was commenced Dec. 7th, 5 minims every two hours for two days, with considerable benefit. On the 9th, 4 minims every hour; but on the 12th there was a return to the first dose of 5 minims every two hours. On the 14th the dose was again increased to 6 minims every two hours; but on the 24th there was a great improvement, when he took the dose only three times a day; a few days afterwards he was quite well.

THE FRENCH PHARMACEUTICAL CONFERENCE (ELEVENTH SESSION), AND THE INTERNATIONAL CONGRESS OF PHARMACY (SECOND SESSION).

We beg to draw the attention of the various Pharmaceutical Associations throughout the United Kingdom to the invitation just issued by the Executive of the Paris Pharmaceutical Society for their second International Congress. Our own Society will be properly represented, and it is hoped that the provinces will not fail to act in unison, and endeavour to promote the interests of such an admirable organization. Under ordinary circumstances the three delegates to be selected should be the President, Secretary, and Treasurer. A knowledge of the French language is always advantageous, but in this instance is not an essential requisite. The delegates may be well assured of receiving every attention, and a most cordial welcome.

It is needless to state that, in consequence of the attractions of the forthcoming Exhibition, all France will find its way to Paris; both Conferences will therefore be held this year in the capital, both also at the School of Pharmacy, Rue de l'Arbalète.

The first, which consists of the reunion of the various French Pharmaceutical Societies, will have its meetings on the 17th, 18th, and 19th of August. The following is the programme, remarkable for its brevity:—

Scientific Questions.

1. The Botany of the Solaneæ.
2. Active principles of the Solaneæ with respect to their Chemistry, Pharmacy, and Toxicology.
3. The Tannin series.

The remaining points for discussion are technical and legal, including a proposal for discontinuing the second (lower) class of Pharmaceutists after a certain date. Papers must be sent in before June 15, 1867.

The International Conference, to which attention is more particularly directed, commences on August 21 (Wednesday), 1867, at noon. It will probably last five days.

Delegates are expected from all countries, care being taken that they represent regularly constituted societies.

Each association has the right to delegate three members, who may individually discuss any question raised, but are entitled to but one vote. When an association represents a whole state or country, it may send three delegates for every hundred of its members. The Paris representatives already chosen are MM. Dumas, Bussy, Director of the School of Pharmacy, and Guibourt, President of the Paris Pharmaceutical Society. Papers are to be forwarded before June 15, 1867, and every information will be given by M. Robinet, No. 3, Rue de l'Abbaye St. Germain, Paris. The main object of this Conference will be to endeavour to obtain one universal system of weights and measures, to assimilate the composition of important medicines, and to create a Codex for the world. Three questions will form the basis of its deliberations:—

1. The constitution of Pharmacy—what is the special character of the Pharmacentist—what part has he to play—how can he best discharge his professional obligations?

2. The construction of a universal Codex.

3. The best and most practical methods for determining the proportion of organic active principles, specially of the Alkaloids in substances containing them, and in pharmaceutical compounds of which they are the base; as for instance, Opium and Cinchona, with their several preparations.

How far those views are capable of being realized is a doubtful point; the Conference, however, is decidedly a step in the right direction.

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.

X. (Yarmouth).—Pereira's 'Manual of Materia Medica and Therapeutics,' by Farre, Bentley, and Warington, price 21*s.*

Student (Hertford).—See Regulations for the Botanical Prize in the present number of the Journal.

Pharmaceutist (Manchester).—See paper 'On the Adulteration of Saffron with the Stamens of Crocus,' by Professor Bentley, in Pharm. Journ., vol. 7, 2nd ser.

Registered Apprentice (Clifton).—Fownes's 'Manual of Chemistry' and Bentley's 'Manual of Botany.'

"*Alpha*" (Stoke on Trent).—The Journal can be bought for 1*s.* by order from any bookseller.

H. H. (Brighton).—Of the labels referred to, that for "Gregory's Powder" is not, but that for the "Lozenges" is, liable to the Medicine Stamp Duty.

"*Pestle*" (Liverpool).—We cannot reply to the inquiry.

"*A Constant Reader*" (Evesham).—Liebig's 'Principles of Agricultural Chemistry' (Walton and Maberly).

M. P. S.—Reform Bill. The subject has been under consideration, and steps will be taken in the matter.

J. H. L. (Woolwich) will see that the proposed Bill speaks for itself.

A. P. S. (Richmond).—The faculty of observation of natural objects is certainly susceptible of cultivation. It is one of the advantages of the study of natural history.

"*Acacia*" (Sittingbourne).—Charcoal made from acacia-wood is now commonly used in medicine; but we are not aware that it possesses the properties attributed to it by our correspondent.

Mr. Chaplin (Colchester) is thanked for his communication.

In reply to a correspondent last month, *Fucus Wine* may be made as follows:—Take of Grapes, 98 lbs.; Distilled Water, 16¾ gallons; White Sugar, 84 lbs.; Bitartrate of Potash, 16¾ oz.; Dried fucus, *Fucus vesiculosus*, 23 lbs. 9 oz. Crush the grapes, and pack them in a cask, with alternate layers of the fucus. Dissolve the sugar and bitartrate of potash in the water, and pour the solution upon the fucus and grape. Keep in a warm place, and, if necessary, add a little yeast to promote fermentation.

The British Pharmacopœia.—A correspondent (Wakefield) suggests that the price of the new edition of the British Pharmacopœia should be merely nominal to all who have the first edition; that every subscriber to the first edition should have a copy of the new work presented to him on sending back his old copy.

Wanted, the January, March, April, and May numbers of this Journal, 1866. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. XI.—MAY, 1867.

THE ADMISSION OF MEMBERS TO THE PHARMACEUTICAL SOCIETY.

A great question seems to be agitating the Society just now as to the desirability of conceding the privilege of membership to other than Pharmaceutical Chemists under the proposed extension of the Pharmacy Act. The proposition is treated by some as entirely new, and the Council are charged with having exceeded the power entrusted to them by their constituents in framing a Bill under which men on the register of "Chemists and Druggists" may be elected members of the Society; it is said that a meeting of the whole body should have been convened to express an opinion on the subject. On the power of the Council it is but necessary to refer to the special meeting held in 1864, and perhaps to incidental mention of the matter in the annual meetings which have been held since that time. Not only was full power to act given, but the greatest liberality to outsiders was enjoined. Correspondents of this Journal have complained that the Council fell short in their offer in 1865, and that the great benefit which would arise from a union of all members of the trade, and the institution of a compulsory examination for all men who should hereafter enter it, would be a full equivalent for greater concessions; some have even argued that there should be no distinction between present Pharmaceutical Chemists and the outsiders. The Council, as trustees, have had no easy task to perform, and according to present appearances their difficulties are not yet over.

A requisition has been sent to the Council to call a special general meeting, and a day has been fixed accordingly for the discussion of the provisions of the Bill.

The two letters which appeared in our last number, the one from a "Major Associate," and the other signed "John Mills," may be taken as a statement of the grievance.

They both start with a false assumption; namely that "*membership is the highest degree granted by the Pharmaceutical Society.*" They might quite as reasonably assert that when a Fellow of the College of Surgeons is elected to the Council of that body he takes a new and higher degree in his profession.

By the Charter, the Pharmaceutical Society consists of three sorts of persons, "*Members shall be Chemists and Druggists who are or have been established on their own account;*" "*Associates shall be Assistants to Chemists and Druggists;*" and "*Apprentices.*" For want of any better mark of distinction the members of the Society during the first ten years of its existence announced themselves as such; but the Pharmacy Act set up and protected a new title, that of "Pharmaceutical Chemist," whereby men who had proved their qualification should thereafter be known, and in consideration of the great service done by the Pharmaceutical Society to the public, in promoting the education of dispensers, it was enacted that all who were then members should have the privilege of enrolment as Pharmaceutical Chemists, and they continue such during their membership. The "Pharmaceutical Chemists" of the future, men who had passed the Major examination, might or might not, as they pleased, become members of the Society, but in any case they would hold the highest rank in the country as Pharmaceutists to the end of their lives. Accordingly, when exemption from juries was accorded, it was not to members of the Society, but to "Pharmaceutical Chemists." It is not surprising perhaps that some men, who felt proud of the good achieved by the Society, should have continued to proclaim their membership; but even Mr. Mills writes, "at last after years of toil, Pharmaceutical Chemists have come to be regarded at least as men who know their business, and a large and increasing amount of confidence exists in reference to them." One great mistake seems to be the notion that "Pharmaceutical Chemist" and "Member of the Pharmaceutical Society" are convertible terms. Another, that the public cannot be brought to understand the difference between them.

If those who fall into these errors could have heard how completely the gentleman who introduced the Bill of 1865 to the House of Commons, ridiculed such an idea and deprecated the multiplication of titles, they would perhaps come round to the belief that the public generally would know the meaning of names in due time.

Now as to the policy of the proposed concessions. It is very well known to those who took the most active part in promoting the Bill of 1865, that the want of success was not owing so much to the disinclination of the House of Commons to pass a restrictive measure as to the want of union among members of the trade who were to be regulated by it; and that want of union was caused entirely by the question of membership of the Society. Is it desirable still further to delay, perhaps for ever prevent, success by what the outsiders call illiberality? The Council thought not, and it may be fairly argued that they had other reasons for their offer of membership to "Chemists and Druggists."

When Mr. Mills quotes, in his letter, what the President said to one of the deputations, as to the struggles and early trials of the founders, the present prosperity of the Society, the advantage it had received from the late agitation, the fact of the members having nothing to gain by opening the doors, and that "*they were satisfied to go on prospering as of late,*" we think he stopped short at rather an important point. We understood the President to say in effect, "we *might be* satisfied," etc., "but we cannot forget the great object for which this Society was established, the uniform education of those who should practise pharmacy, and we believe that end can only be attained by the union of all Chemists and Druggists in one body." In that matter we sincerely hope the President did, as Mr. Mills says he might be presumed to do, express the opinion of the Council. It may seem inconsistent for this Journal to ignore the title of "Member of the Pharmaceutical Society," but looking at all the facts of the case we cannot avoid doing so, although we attach the greatest importance to membership, its duties and privileges. Of its privileges we need not speak; but for its duties and their performance we look through the last quarter of a century, and what do we find? We find in the beginning some half-dozen or a dozen men standing in such well-assured position in the trade that "they had nothing to gain." There was such a wide distinction between them and the ordinary race of chemists in that day that the very difference tended to their profit, and self-interest would have pointed to its perpetuation. But our founders rose to the occasion and superior to self-interest, determined to do all in their power for the general good, by assisting every chemist to attain the high level on which they stood. Ten years later, when the Pharmacy Act established the position of all who had joined the Society, the same liberality was extended to outsiders; and to these occasions we look for example as to the course which should be taken if we would obtain the crowning stone of the pharmaceutical edifice. Much has been said about the assurance always given that the door was permanently closed against all but examined men, but it should be remembered that that assurance was given when the question only of altering the bye-laws was under discussion in 1861, and a mere change in the internal arrangements of the Society would indeed have been a breach of faith, bringing with it no recompense to justify such a step. The case is widely different now; the extension of the Pharmacy Act would bring an ample equivalent for the concession, and lead to the end aimed at from the beginning. If, however, it were proposed to introduce these men in business as "Associates" with votes, in all the affairs of the Society, would it not be bringing them in with a grievance, and therefore rendering them less likely to co-operate heartily for the future good of the Society? The same, we think, applies to the chemists and druggists of the future, who must necessarily have passed an examination, which if it proved them worthy to become chemists and druggists would prove them also worthy to be elected members of a Society formed expressly to embrace all the chemists and druggists of Great Britain.

One argument brought against this measure is the doubt thrown on the accession of members after the passing of the Bill, and it seems to be assumed that chemists and druggists would be satisfied with mere registration. To this it is only necessary to reply that if such were the case it would nullify all the other objections, as a man who declined to become a member could not possibly announce himself to the world as one, and if so few would do it, the chance of swamping the Society would be small indeed.

Some objectors use the very popular plea of £. *s*. *d*., and truly it is marvellous to find men charging all their high premiums, lecture fees, laboratory instruction, and travelling expenses to the debit of their account with the Society. Can it be that their success in business depends altogether on their possession of a title, and not at all on their professional ability to practise the art in which they have been declared competent? Do they not carry into their own shops and laboratories some useful knowledge applicable to their every-day requirements,—knowledge which gives them a positive advantage over unskilled neighbours? Would they depend entirely on a diploma for success?

We believe many members of the Society have not made themselves fully acquainted with the provisions of the Bill, although they have been described very often in this Journal, it is printed *in extenso* in our present number, and we would commend a perusal and a careful consideration of it between this and the day of general meeting, that the advantages to be obtained may not be lightly thrown away.

THE BRITISH PHARMACOPŒIA, 1867.

This work is now ready for circulation, and in a few days, we have no doubt, it will be in the hands of most of our readers. Those who have not already done so should immediately give the requisite instructions to their booksellers, to ensure early supplies.

We have already stated, in the notice we gave two months ago of the proof copy which was distributed to members of the Medical Council, what the general character of the work is, or at least what it was in the form in which it was then submitted for examination and approval. Scarcely any alteration has since been made in it, so that our description still applies substantially. It is published in one size only, that of a post octavo of 458 pages, the price of which is six shillings.

There is reason to believe that a very different reception awaits the present edition of the British Pharmacopœia from that which consigned its predecessor to what practically amounted to suppression. It cannot be denied, however, that the British Pharmacopœia of 1864 was, in some respects, an improvement upon any previously published Pharmacopœia; but there were several serious errors committed in it, which caused it to be almost entirely ignored by the medical profession.

The 'Lancet,' in a recent notice of the proof copy of the new edition of the Pharmacopœia, says:—

"In addition to an entirely new arrangement of the subjects treated of in the Pharmacopœia, an extensive alteration of names, especially of those applied to drugs derived from vegetable sources, a great accession of medicines not noticed in the previous issue of the work, an improved method of arranging and describing processes, and indicating in connection with each substance all the preparations in which it is used, and in most cases the doses in which it is administered,—very important changes have in other respects been made. In almost every page of the work there is evidence of more than an ordinary revision of the matter, which appears, for the most part, to have been re-written. This, indeed, was essential, for one of the grave objections urged against the Pharmacopœia of 1864 was, that there was a want of unity and consistency in it, which was ascribed to the peculiar circumstances under which it was produced by three separate committees working at great distances from each other, and each representing separate and independent interests. In order to remedy the defects arising from this cause, it was necessary, not only that processes should be fully and fairly tried, and improved if found to be faulty, but that these trials should be made in such a way as to supply the requisite information to some one capable of correcting or re-writing the descriptions of them. More than two years have been occupied by the editors, Professor Redwood and Mr. Warington, in performing this duty, and if the result of their labours should prove as satisfactory to those by whom the Pharmacopœia will be used, as it seems to have been to those who have cursorily examined the proof-copy of it, the profession will not begrudge the time and money spent in attaining so important an object."

The 'Medical Times and Gazette' says:—

"All in all, we are much pleased with the proposed Pharmacopœia. If we were to select any one mark whereby to distinguish it from that of 1864, we should fix upon its thorough workmanlike character. In every line is observable the great pains the Committee have been at to please the profession at large. The meed of praise they deserve is a great one; we hope it will be freely awarded them by the profession."

Again, the 'British Medical Journal' says :—

"The revised *Pharmacopœia* has, we are happy to find, been very well received at all hands. The book has undergone extensive and searching criticisms during the last week or two ; and the most flattering testimonies have been received from critical authorities. Our readers can judge for themselves, from the searching analysis of changes which we are publishing from week to week, of the extent, variety, and importance of the improvements."

It is evident from these and many other equally favourable opinions that have already been expressed by medical and chemical authorities, that the new Pharmacopœia will be at once adopted, as far as it can be, when it appears, and it therefore behoves every pharmaceutist and chemist and druggist, to set to work at the earliest possible time in preparing for its adoption. Some time must of course be allowed for getting the new and altered preparations made, and we think it would be desirable that the Medical Council should fix upon a time, say the 1st of June or of July, when the British Pharmacopœia of 1867 may be considered to have authoritatively superseded all others.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *3rd April*, 1867,

Present—Messrs. Bird, Bottle, Brady, Carteighe, Deane, Hanbury, Hills, Ince, Mackay, Morson, Orridge, Palmer, Sandford, Squire, and Waugh,

The following were elected Members—

Allkins, Thomas Boulton	Tamworth.
Barlow, John	Wem, Salop.
Bisset, George M'Ritchie	Colombo, Ceylon.
Green, James Samuel	Nunhead.
Grosvenor, Clement Henry	South Kensington.
Smith, Edward	Torquay.
Richard Warner	London.

Resolved, That the Parliamentary Committee be requested forthwith to take the necessary steps to introduce the proposed Amended Pharmacy Bill into Parliament.

The following gentlemen were appointed Delegates on the part of the Society to attend the International Congress of Pharmaceutists, to be held in Paris in August next :—

The President, Messrs. Morson, Squire, Brady, Ince, Carteighe, Daniel Hanbury, Professors Redwood and Bentley, and Dr. Attfield.

Resolved, That the General Annual Meeting of the Society be held on Wednesday, the 15th May, at twelve o'clock precisely, and that a Conversazione be held on the previous evening.

In reference to the memorial presented to the Board of Inland Revenue, praying that Chemists and Druggists may be empowered, under a certain Licence, to sell Rectified Spirit of Wine in small quantities, and that the Licences for the sale of Rectified and Methylated Spirit be combined in one, the President reported the following answer:—

Inland Revenue, Somerset House, London, W.C.
26th March, 1867.

Sir,—I am desired by the Commissioners of Inland Revenue to acknowledge your letter of the 21st inst., suggesting, on the part of the Pharmaceutical Society of Great

Britain, the desirability of Pharmaceutical Chemists, and Chemists and Druggists, being permitted to retail, in quantities not exceeding one gallon, pure rectified spirit of wine, in the same manner as they are now licensed to sell methylated spirit, and to acquaint you, in reply, that the Board do not think it advisable to adopt the suggestion.

I am, Sir, your obedient servant,

G. W. Sandford, Esq. WILLIAM CORBETT, *Secretary.*

BENEVOLENT FUND.

The Treasurer was requested to purchase £1500 Consols to this account.

And the sum of twenty pounds was given to the widow of a late member of the Society, residing in Bedfordshire.

AT A SPECIAL MEETING OF THE COUNCIL, *April 24th*, 1867,

Present—Messrs. Carteighe, Deane, Hanbury, Haselden, Hills, Ince, Morson, Orridge, Palmer, Randall, Sandford, Savage, and Waugh.

The following requisition from Members of the Society, duly signed, was considered. In compliance therewith Wednesday, the 15th of May, at 2 P.M., was fixed for the said meeting, and the Secretary was instructed to give the notice accordingly.

To the Secretary of the Pharmaceutical Society of Great Britain.

We, the undersigned Members of the Pharmaceutical Society of Great Britain, being of opinion that the proposed "Amended Pharmacy Act," in reference to at least the 19th clause, will operate unfairly towards present Members, and be inimical to the interests of the public, do hereby request that the President of the said Society be asked to convene a *Special General Meeting* of the Members, to be held at the Society's house in Bloomsbury Square, on some day between the 6th and 11th of May next, for the purpose of taking into consideration and the general discussion of the said Bill; and that the Council be requested to take no further steps with regard to the said Bill until it has received, either in its present or some amended form, the sanction of the Members then assembled.

BOARD OF EXAMINERS, *April 17th*, 1867.

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

Eighteen candidates presented themselves for the Major and Minor Examinations; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemist).

*Thurston, Frederick	Ipswich.

MINOR (as Assistants).

Bemrose, Joseph	Liverpool.
Bishop, William Middlebrook	Worcester.
Cooper, Henry	Nottingham.
Churchill, Walter John	Birmingham.
Drury, Sydney	Canterbury.
Francis, James	Wandsworth.
George, Edward Robert	Norwich.
Holton, John Henry	Lincoln.
†Kite, John Cazeneuve	Rochester.
†Perry, William Henry	Louth.
Porter, John Thomas	Long Sutton.
Roberts, Harvey	Upper Clapton.
Wade, Walter	Westminster.
William, Thomas Howell	Ebbw Vale.

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* 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.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Brian, Arthur	Mr. Thomas	Boston.
Clift, Martin Luther	Mr. Bloor	Derby.
Groves, Henry Edward	Mr. Groves	London.
Hick, George	Mr. Hick	Bradford, Yorkshire.
Peake, Henry Felix	Mr. Dawson	Southampton.
Peake, William Alexander	Mr. Peake	Dover.
Ritson, George	Messrs. Ritson and Sons	Sunderland.
Ritson John	Messrs. Ritson and Sons	Sunderland.
Swann, John	Mr. Kitson	Worcester.
Targett, Charles George	Mr. Orchard	Salisbury.
Toone, John Alfred	Mr. Atkins	Salisbury.
Wise, Walter	Mr. Cooper	Maidstone.

BENEVOLENT FUND.

Annual Subscriptions received during April.—London.

	£	s.	d.
Applegate, E., Upper Holloway	0	10	6
Balch, Edwin, Brixton	0	10	6
Beilby, Michael, 338, Oxford St.	0	5	0
Bell, Wm. H., Albany St., N.W.	0	10	6
Bird, Robert, Clapham	0	10	6
Bradley, John, Kilburn	1	1	0
Bromley, R. M., Denmark Hill	0	10	6
Brooks, Chas., Wandsworth Rd.	0	10	6
Coles, Ferd., King's Rd., S. W.	0	10	6
Cooke, John, Hoxton Old Town	0	5	0
Deane, Henry, Clapham	1	1	0
Dunkley, Edw., 338, Oxford St.	0	5	0
Elkington, Edw., Bermondsey	1	1	0
Ellis, Henry, 338, Oxford St.	0	5	0
Faulconer, R. S., Walworth R.	1	1	0
Forrest, Richard, 20, Cork Street	1	1	0
Fox, Wm., 48, Church St., N.E.	1	1	0
Gadd, Charles, Vauxhall	0	5	0
Gale, Henry, Camden Town	0	10	6
Groves, E., Regent's Park Rd.	0	10	6
Haddock, G. J., 338, Oxford St.	0	5	0
Hardy, S. C., 338, Oxford St.	0	5	0
Howell, Maurice, Peckham	0	10	6
Huxtable, J., 104, St. John St. Rd.	1	1	0
Kendall, Chas. F., Clapham Rd.	0	10	6
Kershaw, G., Park Street, N.W.	0	10	6
Lane, Joseph, Hampstead	2	2	0
Large, J. H., 65, New North Rd.	0	10	6
Lawrence, F., Kentish Town Rd.	0	10	6
Machray, Wm., 338, Oxford St.	0	10	6
Morgan, D., 7, Manville Terrace	0	10	6
Paffard, W. H., 338, Oxford St.	0	5	0
Porter, Wm. Henry, Brixton	0	10	6
Provost, J. A., 338, Oxford St.	0	5	0
Roberts, A. J., Walworth Road	1	1	0
Smallfield, J. S., 10, Little Queen Street	0	10	6
Stathers, John, Notting Hill	0	10	6
Tanner, Benj., 338, Oxford St.	0	5	0
Taylor, Thomas, Peckham	0	10	6
Wearing, R. H., 338, Oxford St.	0	5	0
Wigg, H. J., 338, Oxford St.	0	5	0
Wilson, Thos., 338, Oxford St.	0	5	0
Wilson, Thos., Upper Holloway	0	10	6
Wood, Edw., Binfield Road, S.	0	10	6
W. T. C.	0	10	6

Country.

	£	s.	d.
Abergavenny, Ackrill, George	0	10	6
Berkeley, Bell, Edward C.	0	10	0
Bewdley, Newman, Robert	0	10	6
Blackheath, Lavers, Thomas H.	1	1	0
Bradford, Blackburn, Bailey	1	0	0
,, Harrison & Parkinson	2	2	0
,, Rogerson, Michael	1	1	0
Brecon, Bright, Philip	1	1	0
Bridport, Beach, James	0	10	6
Brighton, Cornish, William	0	5	0
Bristol, Ackerman, Theophilus	1	1	0
Bromley, Shillcock, Joseph B.	0	10	6
Chertsey, Boyce, J. P., & Son	0	10	6
Chester, Baxter, George	0	10	6
Colchester, Chaplin, John L.	0	5	0
,, Manthorp, Samuel	0	5	0
,, Prosser, Evan T.	0	5	0
Deptford, Lloyd, Henry	0	10	6
,, Lockyer, George	0	10	6
Devizes, Madge, James C.	0	10	0
Doncaster, Howorth, James	0	10	6
Dover, Bottle, Alexander	1	1	0
,, Hambrook & Son	0	4	0
Dudley, Dennison, Matthew	0	5	0
Durham, Belough, Henry M.	1	1	0
,, Burdon, John	0	10	6

	£	s.	d.
Durham, Coward, Edward	0	5	0
,, Monks, Captain (7th N. Durham R. V.).	0	5	0
,, Morton, John	0	5	0
,, Peele, Henry A.	0	10	6
,, Sarsfield, William ...	0	10	6
,, Wortley, John	0	10	6
Ealing, Barry, Thomas	0	10	6
Exeter, Bromfield, Charles	0	5	0
Folkestone, Hammon, Richard .	0	5	0
Gateshead, Elliott, Robert	0	10	6
,, Garbutt, Cornelius D.	1	1	0
Gloucester, Berry, Edward	0	5	0
,, Stafford, William ...	0	5	0
Gosport, Hunter, John	0	5	0
Halifax, Jennings, William ...	1	1	0
Harwich, Bevan, Charles F. ...	0	5	0
Hawthorn, Rawle, William......	0	9	0
Hay, Davies, John L.	0	5	0
Hull, Baynes, James	0	10	6
,, Earle, Francis	0	10	6
,, Hall, Henry R. F.........	0	5	0
,, Kirton, Joseph B.	0	10	6
,, Metcalfe, Christopher L.	0	10	6
Jersey, Millais, Thomas	1	1	0
Kidderminster, Steward, Josiah	0	10	6
,, Steward, Theo.	0	10	6
Lancaster, Wearing, William...	0	10	6
,, Whimpray, John ...	0	10	6
Leeds, Harvey, Thomas	0	10	6
,, Reynolds, Richard	0	10	6
Leicester, Butler, Thomas E....	0	5	0
,, Pickering, Henry ...	0	5	0
Leominster, Davis, D. Frederick	1	1	0
Lincoln, Tomlinson, Charles K.	0	10	6
,, Woodcock, Page D. ...	0	5	0
Liverpool, Alpass, Horace S. ...	1	1	0
,, Bramwell, George ...	0	10	0
,, Fergusson, John......	1	1	0
Llangollen, Jones, Humphrey...	0	5	0
Lower Tooting, Medcalf, Ebenezer	0	10	6
Ludlow, Cocking, George.........	0	5	0
Manchester, Benger, F. Baden	0	5	0
,, Carter, William ...	0	10	6
,, Hayward, Charles	1	1	0
,, Jackson, Thomas	0	10	6
Manchester, Paine, Standen	0	5	0
,, Walsh, Edward ...	0	10	6
,, Wilkinson, William	0	10	6
,, Williams, Edwin...	0	5	0
,, Wright, Charles ...	1	1	0
Newcastle-on-Tyne, Brady, H. B.	1	1	0
,, Potts, Thomas	0	10	6
,, Proctor, B. S.	1	1	0
Newport, Mon., Pearman, H. ...	0	10	0
Northampton, Barry, J. and E.	1	1	0
Norwich, Caley, Albert J.	0	10	6
Nottingham, Jenkins, Joseph ...	0	10	6
Oldham, Henthorn, Joshua......	0	10	6
Plymouth, Sloggett, Thomas C.	0	2	6
Portsmouth, Pasmore, George...	0	5	0
Preston, Oakey, Joseph M.......	0	10	6
Romford, Lasham, John.........	0	5	0
Rugby, Lewis, Thomas C.........	0	5	0
Ruthin, Bancroft, J. J.	0	10	0
Ryde, Gibbs, William	0	10	6
,, Wavell, John..............	0	10	6
Salford, Manfield, John W. ...	0	5	0
Sleaford, Heald, Benjamin......	0	10	6
Southampton, Manby, George...	0	5	0
Southsea, Rastrick and Son......	0	10	6
St. Alban's, Roberts, Albinus ...	1	1	0
St. Day, Corfield, Thos. J. T....	0	10	6
Stevenage, Fresson, Lewis F. ...	1	1	0
Stourbridge, Bland, John H. ...	0	10	6
,, Hughes, Samuel ...	0	10	6
,, Morris, Alfred P...	0	10	6
,, Nickolls, James ...	0	4	0
Stroud, Gay, George	1	1	0
Sunbury, Leare, James	0	5	0
Sunderland, Ritson, Thomas ...	0	10	6
,, Walton, John	0	10	6
Sydenham, Pocklington, James	0	10	6
Teignmouth, Cornelius, R. Bussell	0	5	0
Torquay, Whiteway, W. H. ...	0	10	6
Todmorden, Lord, Charles	1	1	0
Wakefield, Gissing, Thomas W.	0	10	6
,, Taylor, John	0	10	6
Walton-on-Thames, Power, E...	0	5	0
Waterloo, Pheysey, Richard ...	1	1	0
Whitchurch, Bailey, John B....	0	10	6
Worthing, Cortis, Charles	1	1	0

BENEVOLENT FUND DINNER.

Second Supplementary List of Donations and Subscriptions.

	£	s.	d.
Bishop, Robert, Eye	1	1	0
Burden, Thomas, 6, Store St., W.C. .... *An.* 10*s.* 6*d.*			
Davis, D. F., Leominster	1	1	0
Ellis, Benj., Shepton Mallett...	1	1	0
F. A., Stoke-on-Trent	0	4	0
Hibbert, Walter, Neath.........	5	5	0
Hodge, Henry, and Co., Blackman Street, Borough.........	5	5	0
Newman, Robert, Bewdley ...	1	1	0
Whitfield and Son, Worcester..	5	5	0

Errata.—Page 531, *Newton*, F. Salisbury, *for* £10 *read* 10*s.* Page 569, *Stowmarket*, Simpson and Son, *for* £1. 1*s.* *read* 5*s.*

PHARMACEUTICAL MEETING.

Wednesday, April 3rd, 1867.

MR. 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:—

British Journal of Dental Science,—Chemical News,—Chemist and Druggist,—Educational Times,—Photographic Journal,—Technologist,—Watts's Dictionary of Chemistry,—L'Union Pharmaceutique,—Revista Farmacéutica: from the Editors. Journal of the Chemical Society,—Journal of the Linnean Society,—Journal of the Society of Arts,—Transactions of the Botanical Society of Edinburgh,—Proceedings of the Royal Medical and Chirurgical Society of London: from the respective Societies. The Calendar of the University of London for 1867: from the University. Report of the Proceedings of the International Horticultural Exhibition and Botanical Congress held in London in May, 1866: from the Committee. An Account of a Second Case in which the Corpus Callosum was defective: by Dr. Langdon Down. The Distinctive Characters of the principal British Natural Orders of Plants: by Mr. W. A. Tilden. Ensino da Pharmacia em Portugal e nas Principaes Naçoes da Europa: por Pedro José da Silva,—Cenno sopra un nuovo rimedio contro il Cholera-Morbus e Appendice; pel Farmarcista V. F. Merletta: from the Authors. Specimens of Cocoa-nut Palm, and several other Fruits: from Daniel Hanbury.

The PRESIDENT directed the attention of the meeting to a number of specimens of fruits which were on the table, and which had been kindly placed at the disposal of the Society by Mr. Daniel Hanbury.

The following papers were then read:—

THE CODEX AND THE BRITISH PHARMACOPŒIA, 1864.

BY A. F. HASELDEN.

(*Continued from p.* 583.)

In resuming the subject of the Codex and the P. B., I would observe in explanation that the three or four articles of the Materia Medica mentioned in my former communication were set down without any particular regard to order, and simply to give an idea of the kind of observations I was likely to make. I shall now give some precisely as arranged in the Codex, in order to show clearly what the arrangement is, reserving for myself the privilege of adding my own remarks in English, and, as before stated, shall select those upon which useful or interesting comments are most likely to follow.

*Bdellium d'Afrique. Gomme-résine produite par le *Balsamodendrum africanum* Endlicher (*Heudelotia africana* Guillemin); Térébinthacées-burséracées.

Beccabunga, *Veronica Beccabunga* Linn.; Scrofulariacées. Plante fraîche.

These two—the first with the asterisk, and the second without—I have transcribed exactly as in the Codex, which will afford a pretty correct notion of the arrangement of the articles in the Materia Medica, with the addition, in some instances, of remarks. Neither Bdellium, the gum-resin of which is said to resemble myrrh, nor Beccabunga, Brooklime, the green plant of which is to be used, have any place in the P. B.; the last time the Beccabunga figured in the Materia Medica of the P. L. was in that of 1787, and both Bdellium and Beccabunga formed part of the Materia Medica of Lewis's New Dispensatory in 1785. Bdellium is not now very often imported in separate chests, it comes more as an adulteration of myrrh, and is picked out from the latter, and I believe is sold as second or cheap myrrh. I have a specimen on the table, which will afford a very good notion of what it is; it really possesses none of the fine fragrance of good myrrh. The Natural Order is given as Térébinthacées-burséracées. Lindley places it amongst the Anacardiaceæ, and Bentley, Amyridaceæ. Several of these little differences occur, and I merely mention it, not that I think it very important, but that it is sometimes puzzling when these diversities of arrangement are met with.

*Belladone, Atrōpa Belladonna Linn.; Solanacées. Root, Leaf. *Observation* as Codex.—The root of belladonna should be recently dried and freed from the broken pieces of stalk often found intermixed. No remark is made as to the condition of the leaf, for comparison sake turn to the P. B. and it runs thus: —The leaves, fresh and dried, and the fresh branches gathered, when the fruit has begun to form, from wild or cultivated plants in Britain.

Characters:—Leaves alternate, three to six inches long, ovate, acute, entire, smooth, the uppermost part in pairs, and unequal. The expressed juice, or an infusion, dropped into the eye, dilates the pupil. Again, the root, dried; imported from Germany. Characters:—From one to two feet long, and from half an inch to two inches thick, branched and wrinkled, brownish-white. An infusion dropped into the eye dilates the pupil. I should much regret if these descriptions of characters should be taken away in any edition of the P. B., although they may not always be as clear as some wish. It is true that the Codex supplies directions, and very good ones, such as may be found in some of our Pharmacopœias and Dispensatories for the gathering, collecting, and preserving of roots, bulbs, corms, buds, barks, leaves, flowering tops, flowers, fruits, and seeds, but these cannot take the place of individual descriptions of character; it may with some truth be said that every educated pharmaceutist should be thoroughly acquainted with the substances upon which he operates, and should know them at sight. I need not ask if it is really so, or if the memory and the eye-sight do not require frequent jogging, or whether the commercial article always answers to the description.

*Benjoin de Sumatra Amygdaloïde. Solid balsam extracted from *Styrax Benzoin*, Dryander. Styracinées.

Benjoin de Siam, with a Vanilla odour.

The description here given of the Sumatra Benzoin is that of an amygdaloidal character; and earlier Materia Medica writers gave the same; if a greyish mass, with white pieces embedded here and there as specimen can be so described, then it is correct to say so, but the real amygdaloidal benzoin of commerce of the present day is the so-called Siam benzoin, but still it does not follow that all the Siam partake of the amygdaloidal character. I have here three excellent samples of Siam benzoin, one having the true amygdaloidal character, as you may clearly see a representation of the sections of blanched almonds, surrounded by a pale brown cortical wall; in the others, the resemblance is more of a light brown granite. These three partake largely of the fine Vanilla odour, but I do not find that the almond representative is at all superior in odour to the other two, but when powdered it is whiter. I am induced to dwell upon this subject, because, as you all know, benzoin is now so much employed in the preparation of benzoinated lard used in many ointments; in the Codex it is also introduced, so that it is not only interesting commercially, but also pharmaceutically; the grey Sumatra of which I have spoken answers well enough for tinctures and general purposes—incense, for instance, amongst others—but it does not possess qualities entitling it to be used for the benzoinated lard. The prices of the specimens I have on the table run thus:—Grey Sumatra, 3*s.* 3*d.*; granite Siam, 5*s.* and 6*s.*; and amygdaloidal Siam, 7*s.* 6*d.* per lb.; so that it is clear if we wish to crack a nut with Siam we must pay for it.

Bigaradier, *Citrus vulgaris*, Risso. Citrus Bigaradier, Nouv. Duhamel; Aurantiacées. Divided thus:—

*The leaf, employed under the name of orange leaves. The flower, as orange flowers.

The fruit green and not ripe, named Orangette or Petit-grain; these are the unripe fruit which fall from the tree soon after the blossoming, and commonly called orange peas.

The fruit ripe, which is the bitter orange.

*The epicarp, known as bitter orange peel or curaçoa. The oil and the water are distilled from the flowers, both of which are much esteemed in England, and the water is becoming more used every day as a flavouring, and in France may be called the rival of Vanilla.

*Bistorte, *Polygonum Bistorta* Linn. Polygonacées. The root. Bistort, or Snake-weed. Is considered a good astringent by French writers, and was so formerly in England, and, besides being administered internally, was employed as an injection in gleet, etc., but it has now made way for what some consider more certain remedies.

*Bouillon-Blanc ou Molène, *Verbascum Thapsus*, Linn.; Scrofulariacées. The leaf and flowers of Mullein are used, and considered softening and pectoral; the seeds are said to have been used by poachers to poison fish. Lind.

*Bourrache, *Borago officinalis*, Linn.; Borraginées. The leaf and flower of Borage are used in tisanes, and pass for sudorifics and diuretics.

Buchu ou Bucco, Diosma crenata, Linn.; Rutacées. The leaf.

Busserole, Raisin d'ours ou Uva-ursi, *Arbutus Uva-ursi*, Linn.; Vacciniées. The leaf. These last two, Bucco and Uva-ursi, which are much esteemed with us, do not carry the asterisk, while borage and mullein, discarded remedies, have it. This may probably be due to the fact that they (the latter) are popular remedies.

*Cachou, Catechu. The astringent juice, of which there are many kinds extracted by decoction with water, either of the fruit of *Areca Catechu* L. (Palmiers), or of the wood of *Acacia Catechu* (Légumineuses), or of the leaves of Nauclea Gambir (Rubiacées). Remark—However numerous the sources of Catechu, it possesses in all similar properties, which it owes to one principle, l'acide cachutique, catechutic acid or catechucin, very soluble in boiling water, but only slightly in cold. This explains why in the different parts of India where the catechus are prepared, the most valued result, not from the direct evaporation of the products of boiling, but from the thickening and drying in the open air of the deposits formed upon the cooling of the liquids. Catechu consequently is not entirely soluble in cold water, but should dissolve completely in boiling water and hot alcohol; it should contain neither starch nor earthy matter; a greenish-black precipitate is produced by the persalts of iron.

The only kind of catechu which is described as officinal, because it is one of the best, and has taken the place of the others commercially, is the catechu of Pegu or Cashcuttie (this is the black catechu of the P. B., but the pale catechu is preferred pharmaceutically with us). This is a pure extract, of a dark brown, solid and brittle, with a slightly bitter and very astringent taste, succeeded by a sweetish taste. It is in rectangular loaves, which, in spite of a large leaf with which each has been enveloped, are united in one mass. It is probable that, like the Gambir, it is an extract of the leaves of the Uncaria Gambir. The P. B. says the extract from Pegu is that of the inner wood of Acacia Catechu.

*Cannelle de Ceylan, *Cinnamomum Zeylanicum*, Breyne, Lauracées. The bark peeled, yielding a volatile oil of a very sweet odour, having a specific gravity of from 1·025 to 1·059, giving crystals instantaneously upon the admixture of nitric acid. This is, I need scarcely add, the ordinary Ceylon cinnamon oil.

*Capillaire du Canada, *Adiantum pedatum*, Linn.; Fougères. This kind is considered superior to the *Adiantum Capillus-Veneris*, and should be used. Syrup of maidenhair was a remedy for coughs amongst old women when I was an apprentice.

Carvi, *Carum Carvi*, Linn.; Ombellifères. The fruit.

Cascarille Officinale, *Croton Eluteria*, Swartz; Euphorbiacées. The bark.

*Centaurée (Petite) *Erythræa Centaurium*, Pers.; Gentianées. The flowering tops.

*Chiendent Officinal ou Petit Chiendent, Triticum repens, Linn.; Graminées. The rhizomes or underground shoots. I find it somewhat difficult to understand why caraway and cascarilla, most valuable, the one as a carminative, and the other as a tonic, should not have the asterisk, which is given to centaury, a discarded bitter, and to Triticum repens, or couch-grass, the virtues of which, though lately much extolled, are very doubtful. I have frequently prepared a liquor of it, but it appears to me to contain little beyond sugar and starch and some mucilage, but I am inclined to think that farmers who are bothered by it might turn it to some account in brewing.

Colchique, *Colchicum autumnale*, Linn.; Colchicacées.

*Corms, Flowers and *Seeds. As in the P. B., the corms and the seeds are preferred. The wine of the seed or corm was no doubt the active principle of the once celebrated Eau Médicinale d'Husson, for which there was a modest charge of eight or ten shillings for about ninety minims, about two doses.

*Copaiba, Colombo, and Colocynth are, as with the P.B., all in good repute.

*Coriander has the asterisk in preference to caraway, which is not easily accounted for, unless it is that the oil of coriander is scarce and dear, while that of caraway is, on the other hand, cheap and plentiful.

*Croton-Tiglium. Nom francisé du *Croton Tiglium*, Linn.; Euphorbiacées. The seeds are called also Tilly grain, or seeds from the Moluccas. The best Croton seeds, I am told, come from Penang.

*Cubèbe ou Poivre à Queue, *Cubeba officinarum*, Miquel. *Piper Cubeba*, Linn.; Pipéracées. The fruit.

This is sometimes called *Piper caudatum*, or Tail-pepper. I shall be excused mentioning this, I trust, because the tail or, as described in the P.B., the stalk, of rather more than its own length, will assist the student in distinguishing it from other peppers. Students do occasionally hesitate at naming the pepper, though seldom the powder; there is an apparent familiarity with the odour, which, says the P.B., is characteristic.

*Curcuma Long et Rond, *Curcuma tinctoria*, Guibourt. The tubers. The long and round turmeric have the asterisk, and though turmeric can scarcely be said to be used as a medicine, seeing that its chief employment is in the composition of curry powder and the preparation of test paper, I think it might have been retained in our Materia Medica with some others, and particularly so as I find them amongst the Materia Medica specimens in the examiners' room.

*Dictame de Crète, *Origanum Dictamnus*, Linn.; Labiées. Flowering plant. It is the marjoram of Candia, or Dittany of Crete, possessing properties similar to those of *Origanum vulgare*. Oil of Thyme is no longer retained in the Materia Medica of the P.B., but I think it might have been, with as much reason as oil of rosemary; it is true it is not so dear, and is much employed in veterinary surgery, but that does not render it less useful as an adjunct to liniments, and as a remedy in toothache it has often been found quite as efficacious as oil of cloves.

*Digitale, *Digitalis purpurea*, Linn.; Scrofulariacées. The leaf gathered a little before blossoming-time; the flower only when it is prescribed. The P.B., speaking of the leaf, says to be gathered when about two-thirds of the flowers are expanded. There are nine or ten preparations from foxglove in the Codex, cigarettes amongst others; but I must not talk about them now, as I hope to do so when I come to the preparations.

*Douce-Amère, *Solanum Dulcamara*, Linn.; Solanacées. The stem.

Elémi du Brésil—resin obtained by incision from the *Icica Icicariba*, DC.; Térébinthacées-burséracées. Remark: a soft resin when fresh, formed of tear-like particles, the colour of which varies from yellowish-white to yellow and yellowish-green. It possesses a strong and agreeable odour, and has a strongly perfumed flavour, which at the last becomes very bitter. Dissolved in boiling alcohol, it yields a precipitate upon becoming cold of a crystalline resin, white, opaque, and very light, named Élémine. The P.B. says, botanical source undetermined, chiefly imported from Manilla. Characters: a soft, unctuous, adhesive mass, becoming harder and more resinous by age; of a yellowish-white colour, with a rather fragrant fennel-like odour; almost entirely soluble in rectified spirit. There is not much difference in the descriptions, but one comes from the east, source undetermined; the other from the west, source apparently satisfactorily accounted for, but which Mr. Hanbury considers has disappeared from ordinary commerce. (Pharm. Journ. 2nd ser. vol. viii. n. x. p. 576.)

*Ellebore Blanc, *Veratrum album*; Colchicacées.

Fève d'Épreuve du Calabar. Semence du *Physostigma venenosum*; Papilionacées.

Fève de Saint-Ignace. Semence de l'*Ignatia amara* Linn. f.; Loganiacées.

*Fougère Mâle, *Nephrodium Filix-mas* Richard; Fougères. The rhizome and leaf.

*Fragon Épineux ou Petit Houx, *Ruscus aculeatus* Linn.; Asparaginées. The rhizome. Commonly called butcher's-broom and knee-holly. It was in old English pharmacy one of the five opening roots; in France it is considered slightly diuretic and aperitive.

*Galipot. Resin dried upon the trunks of pines; it is collected in France upon the trunk of *Pinus maritima* Linn. A resin bearing this name is used in England in the composition of patent dressings for the preservation of the bottoms of ships.

*Gélatine animale (for baths), extracted from bones and from the skin and cartilages of mammiferous ruminants, commonly known as Colle de Flandre; then comes the remark that, under the name of Grénétine, there is a purer gelatine, extracted from the cartilages of calves, and the fresh skins of young animals.

Grenadier, *Punica Granatum* Linn.; Granatées.

*Bark of the root.

Flower called wild pomegranate.

Epicarp named pomegranate bark.

Juice of the fruit, rich in gallic acid.

Remark: The ancients were aware of the vermifuge property of the pomegranate bark, and they prescribed the bark of the root, undoubtedly because they had observed that it was more active than that of the trunk or branches. However, the bark of commerce, which is obtained from Portugal, rarely fails in action, although obtained from the trunk or branches. The fresh rind of the root, or even the fibrous root of the cultivated pomegranate, is employed with success in France.

*Guimauve, *Althæa officinalis* Linn.; Malvacées. Root, leaf, and flower. Marshmallow is a great favourite with our Continental friends, therefore cannot be surprised to find that it is used in many ways; a syrup of the root prepared with cold water, might often be employed as an adjunct, with quite as much reason as the syrup of hemidesmus of the P.B., which is too weak to bestow any flavour beyond that of sugar.

*Huile de Cade: a blackish liquid product obtained by dry distillation from the wood of the Oxycèdre or Cade (*Juniperus Oxycedrus*, Linn.). This substance is deserving of some notice, from the fact of its having the asterisk, also because it has of late been prescribed and used in England, more especially in London, under the name of juniper tar oil, also juniper tar soap; whether it really possesses any qualities superior to similar products is somewhat doubtful, and the following observations from the Codex naturally lead up to the assumption, that other species of tar are frequently substituted:—For some time past this product has been replaced by another of a like nature, called oil of pitch (*pisselæon*), this floats upon the water in which the black pitch is received, one of the resinous products from operating upon the wood of pine and fir trees; as an application, and even as an internal agent, the various kinds of tar have been employed from time immemorial; to use a common expression, tar, as a remedy, is as old as the hills, and, like most other things, there is a fashion in it,—at one time ordinary Stockholm tar, then Barbadoes tar, and now juniper tar oil.

*Huile de foie de Morue: oil extracted from the liver of the fresh codfish. I must beg to translate in full the observations upon this substance, as I think them well worth your attention, more especially as much of the oil attempted to be passed off upon the public as the most efficient is, to an extent, of the repugnant character which is mentioned as rendering it unfit for medical purposes. The Codex says:—Cod-liver oil differs very much in colour, according to the process by which it has been prepared; the very brown oils which result from the more or less advanced state of decomposition of the livers, and which have a repugnant odour and taste, are on that account even unfit for medical use. The very white oils, which have been decolorized or bleached by any chemical agent or means, should also be rejected. The blonde or pale amber-coloured oils, which are prepared by digesting the fresh livers at a temperature below 100° Centigrade, are to be preferred; this temperature signifies below 212° Fahrenheit; the P.B. fixes it at 180°, this would be equal to about 82° Centigrade. To continue, 1 gramme ($15\frac{1}{2}$ grains) of oil, mixed with three drops of concentrated sulphuric acid, yields a magnificent violet colour, which gradually brightens and passes to a cherry red, the mixture becoming later of a blackish-yellow.

*Ipecacuanha Annelé ou Officinal, *Root of Cephælis Ipecacuanha*, Rich.; Rubiacées. The remarks upon ipecacuanha coincide in the main with those of the P.B., with the simple addition, that it should be freed from the pieces of woody stems found in it, and that no other kind than the one indicated should be used.

*Iris de Florence, *Iris Florentina*, Linn.; Iridées. The rhizome. Although this substance may be found in almost every pharmacy in England, and is largely employed in the preparation of dentifrices, and the base of many perfumes, to say nothing of the nursery and toilet violet powder, it has no place in our Materia Medica, nevertheless it is interesting to the pharmaceutist, as few could now do very well without it; and I may mention that the student should be able to recognize it, as it may be found amongst the neat little boxes with glass slides in the examiners' room.

*Jalap Tubéreux ou Officinal, *Exogonium Purga*, Benth.; Convolvulacées. The tubers. Jalap has attached to it some descriptive comments similar to those of the P.B., rather more wordy, and finishing with the remark, that jalap contains from fifteen to eighteen per cent. of resin. I have obtained as much as twenty from sound jalap, both from that of Tampico and Vera Cruz, as commercially known; the resin being a preparation is not found in this part of the work, consequently lacks the description given in the P.B., with the means of distinguishing it from other resins and determining its purity.

*Jujubier, *Zizyphus vulgaris* Lamarck; *Rhamnus zizyphus* Linn.; Rhamnées. The fruit. The jujube fruit has the asterisk attached. The tree, supposed to have been brought from Syria, is now cultivated in the south of Europe; the fruit is rather larger than an ordinary French olive, more the size of a fine Spanish one, of an oval shape; when ripe, and dried in the sun, they are kept for pharmaceutical purposes. You will perceive by some dried ones which I have brought, that the epicarp is very thin but coriaceous, and of a red colour, in the interior there is, beyond the pulp or mesocarp, a long hard shelly endocarp, containing an oily kernel or seed; the flavour of the fruit is pleasant, somewhat between that of a date and a raisin. The fruit is said to be softening, pectoral, and good for coughs; the *pâte de jujubes* was formerly supposed to contain some, and of course it is ordered in the Codex, but in England it is considered a myth, nevertheless there is much difference in *pâte de jujubes*, some remaining soft and pliable much longer than others.

*Jusquiame Noire, *Hyoscyamus niger*, Linn.; Solanacées. The leaves of the full-grown plant.

*Jusquiame Blanche, *Hyoscyamus albus*, Linn.; Solanacées. The seed. Remark: White henbane is considered less active than the black, therefore, except by a special order to the contrary, the leaves, or the preparations from them, of the *Hyoscyamus niger* should be sent. As to the seeds, those met with in commerce are always of the *Hyoscyamus albus*. It is scarcely necessary to add that the P.B. only recognises preparations from the leaves and branches of *Hyoscyamus niger*.

Kino de l'Inde. The dried juice of *Pterocarpus Marsupium*, Roxburgh; Légumineuses-papilionacées. The asterisk is not attached to this substance, and the remarks appended coincide in general with those of the P.B.; the concluding part—that its solubility in water and spirit diminishes according to its age or the time it has been kept in stock—may be suggestive; if so, the sooner it is made into tincture or a spirituous solution, the better. It may be worthy of remark, that the tincture does not gelatinize if kept in small bottles, say two-ounce bottles, while they are full. I have some now prepared in 1863, perfectly liquid in the full bottles but gelatinized in one that is half filled, some having been used.

*Néroli ou Essence de Néroli. The commercial name of the volatile oil extracted from the flower of the bitter orange.

*Nicotiane ou Tabac, *Nicotiana Tabacum* Linn.; Solanacées. The leaf. Although the asterisk is attached, no remark is added. Well, the employment or enjoyment, as the case may be, of tobacco is so great both at home and abroad, that it would seem almost superfluous to make any comments thereon, except perhaps that under circumstances of excess in enjoyment, it becomes not only deleterious but dangerous, and though it may increase thought it diminishes action.

*Opium. The inspissated juice, obtained by incisions in the unripe or green capsules of the poppy, *Papaver somniferum* Linn.; Papavéracées.

In the remark, after defining the Smyrna opium as the officinal, and describing its appearance, it is said, that in the moist state it should yield at least ten per cent. of morphia, and when dried from eleven to twelve. It is further stated, that though more rarely, another opium, described as Constantinople opium, is met with which contains thirteen to fourteen per cent. of morphia; and, in continuance, that in France an opium has been obtained from the white and purple garden poppy, equal in quality to the ordinary of Smyrna, and that in the north of France, opium obtained from the capsules of the Pavot œillette, a variety of the *Papaver nigrum*, contained as much as 20 per cent. of morphia. This opium, observes the Codex, should be reserved for the extraction of the alkaloid. Could such opium be produced with certainty it might prove a good speculation to turn poppy-grower, but hitherto experience has pointed in the other direction.

*Ortie Blanche, *Lamium album* Linn.; Labiées. The flower. The white dead-nettle is considered of sufficient importance to carry the asterisk, while pareira brava, with us considered rather an important article, is not. The student will observe that the Codex follows Auguste St. Hilaire, and assigns its (pareira brava) botanical name as *Cocculus platyphyllus* or *Albuta rufescens* after Aublet. The P. B. *Cissampelos Pareira* Linn.

*Patience Sauvage, *Rumex acutus* Linn.; Polygonacées. The root. Dock-root was formerly used as a remedy for itch, in the form of ointment, or made into a wash by boiling; in France it is considered depurative and antiscorbutic.

*Pensée Sauvage. The flowering plant of the pansy, or heartsease, is also considered valuable in cutaneous disorders.

Pissenlit ou Dent-de-lion, *Taraxacum Dens-leonis* Desfontaines; Synanthérées-chicoracées. The root and leaf. Taraxacum does not appear to be thought so much of in France as a remedy as with ourselves. There is but one preparation of it in the Codex, and that is an extract from the juice of the leaves,—the root, from which our preparations are made, being disregarded in reality; possibly this arises from the fact that the fresh leaves of dandelion are eaten as freely in salads as the garden endive with us.

*Quinquina gris Huanuco, *Grey Bark* of the English, *Cinchona micrantha* R.P.

*Quinquina Calisaya, Royal Yellow Bark, *Cinchona Calisaya* Weddell.

*Quinquina Rouge, Red Bark. These three kinds of cinchona are required by the Codex to be kept. There are copious remarks attached to each, with descriptions, but this is a field of itself which I must leave each to explore for himself. This month's 'Pharmaceutical Journal' contains some interesting information upon the bark remitted from India.

*Réglisse, *Glycyrrhiza glabra* L.; Légumineuses-papilionacées. The root. Liquorice is much esteemed in France, and there are several preparations of it; sometimes the root or subterranean stem is used, and sometimes the commercial Italian or Spanish juice purified. For my own part, no extract of liquorice equals that prepared from fresh English root.

*Salsepareille du Mexique, and Salsepareille de Honduras, answering to our Jamaica and Honduras sarsaprillas, are the only kinds recognized in the Codex. The root is to be deprived of stumps or chumps. It seems to be a favourite medicine, as there are several preparations.

*Scammonée d'Alep. Gum-resin obtained by incisions made in the root of *Convolvulus Scammonia* L.; Convolvulacées.

Remark.—Good scammony is grey externally, light, friable, with a characteristic and not disagreeable odour, making a bright fracture: in contact with water it is white, contains from 75 to 80 per cent. of resin, burns with flame in contact with a lighted candle, should not contain starch, and should not leave more than 7 or 8 per cent. of ash after burning. The cheesy odour and flavour mentioned in the P. B., and indeed by writers generally, is omitted; possibly it is too mild to be observable. Assuredly it does not come out very strong by the side of Gruyère and some other cheese met with in France.

*Thé. *Thea Chinensis* Sims; famille des Ternstrœmiacées. The leaf.

Remark.—Two principal kinds of tea are met with in commerce, black and green. There are many varieties, but they depend for their peculiar qualities more upon the mode of preparation than upon any difference in the plant. The small canister upon the table contains a sample of one of these peculiar kinds; it has a perfumed flavour, and a very small quantity added to ordinary tea is sufficient to flavour most deliciously the contents of a large teapot. I received it from a friend coming from China; it is wrapped in paper, covered with what appear to be Chinese letters, but I am no adept in that language.

*Vanille, *Vanilla sativa* Schiede; Orchidées. The fruit. I could not pass this favourite flavouring without a word of recognition. The Mexican is accounted the best, and then the Bourbon. There is some little difficulty in keeping it. If enclosed in a bottle, the moisture given off is apt to produce a mouldy growth. The French keep it in tins, between layers of powdered white sugar, and this sugar is afterwards used in confectionery.

I may mention some few important articles contained in the P. B. Materia Medica which I do not find in the Codex; for instance, bebeeru bark, bael, capsicum, gamboge, chiretta, elaterium, hemidesmus, kamela, and podophyllum. From amongst ordinary fruits, we have in the Codex the fig, strawberry, raspberry, red currant, mulberry, apple, plum, and the raisin; and among many simples in the Codex, with and without the asterisk, are musk seed, smallage, lion's-foot, bear's-foot or ladies'-mantle, garlic, galium, houseleek, ground ivy, lycopodium or club-moss, sorrel, eryngo, periwinkle, coltsfoot, and many others. This brings me to the end of this portion of the Materia Medica, which I have endeavoured to make as interesting and as little tedious as possible. Without asking any one to take the book and study it, I will add a word or two before parting this evening. My younger listeners may draw their own conclusions.

The *cui bono?* of education has been mooted over and over again, within and without these walls. Let me tell a simple fact of my early life. When a very little boy, the youngest of nine boys, my parents wisely and kindly determined that I should go to school and rough it, and at a later date sent me to France to get what some folks were pleased to call a smattering of French. Well, perhaps it was only a smattering, but had I been denied this, and had my parents simply joined in the general cry of *cui bono?* I should not now in all probability have been able to read this book, nor should I have had the pleasure of meeting you this evening and offering for your consideration this portion of my labours.

Materia Medica: Second Series.

This part treats of substances derived from minerals, and chemical products. As in the first series, these are arranged alphabetically, and attached to each is a description of its physical qualities, the means in most instances by which its purity can be ascertained, and the care needful for its preservation. I shall select some only, give the remarks of the Codex, and occasionally those of the P. B. The ordinary chemical names and synonyms are in French, and the modern chemical name in Latin. To proceed to the Articles—

Acétate de Cuivre Basique, Sous-Acétate de Cuivre, Vert-de-Gris, *Subacetas cupricus;* Subacetate of Copper, or Cupric Subacetate. Description in Codex. A bluish-green mass, containing particles of copper and remains of the grape marc, with a decided metallic taste, only partially soluble in water. In the manufacture of this Latin name, the noun substantive of the second element is converted into an adjective, cuprum into cupricus, and as acetate, carbonate, and sulphate are of the masculine gender in French, they have been so rendered it in Latin, but in the P. B., as in the former P. L., they were looked upon as nouns ending in *-as* increasing in the genitive and of the feminine gender, in the Dublin Pharmacopœia they were made neuter. So the Codex would write Subacetas cupricus, P. B. Subacetas cuprica, and P. D. Subacetas cupricum. Without attempting a solution of this problem, one cannot keep down the rising thought—if these three cannot agree about the gender of a word, how long will it take to realize the vision of the universal Pharmacopœia? But to return.

*Acide Arsénieux, Oxyde Blanc d'Arsenic, Arsenic Blanc, *Acidum Arseniosum;* Arsenious acid, white arsenic. When recent, it is glassy and transparent; in time it becomes opaque. It is odourless, volatilized by heat, and emits, when thrown upon live coal a strong smell of garlic; it is very slightly soluble in cold water, more so in boiling; a solution of it gives a yellow precipitate upon the addition of hydrosulphuric acid. The B. B. is as follows:—Characters. A heavy white powder, which, when slowly sublimed in a glass tube, forms minute brilliant and transparent octahedral crystals. It is sparingly soluble in water, and its solution gives with ammonio-nitrate of silver a canary-yellow precipitate, insoluble in water, but readily dissolved by ammonia and nitric acid. Tests: Entirely volatilized by heat, four grains of it dissolved in boiling water with eight grains of bicarbonate of soda, discharge the colour of 80·8 measures of the volumetric solution of iodine. Comparing the two, there is materially little or no difference; both arrive at similar results, though by slightly different agents.

Acide Phénique, Phénol, Acide Carbolique, *Acidum Phenicum;* Phenic or Carbolic acid. In long colourless, prismatic needles, of a strong peculiar odour, resembling that of creasote, melting at about 35° Centigrade (95° F.), boiling between 187° and 188° Centigrade, of a density of 1·065. It attacks powerfully the skin and mucous membranes, does not redden litmus, liquefies upon the slightest access of moisture, is but sparingly soluble in water, but dissolves in all proportions in alcohol, ether, glycerine, and the fixed and volatile oils. It is not in P. B. of 1864; will be in that of 1867. It does not carry the asterisk; its employment to any extent as a detergent, escharotic, or disinfectant, is comparatively of recent date.

*Alcool, Esprit de Vin, *Alcool;* Spirit of Wine. A limpid, colourless liquid, very volatile, having a clear and pure taste, leaving no residue when evaporated; when mixed with distilled water there should be no cloudiness, neither should a strange taste or disagreeable odour be observable. The strength of it is ascertained by means of the centesimal alcohometer. Absolute alcohol marks 100°; rectified spirit (esprit de vin) 85°, and weak spirit (eau de vie, or brandy) 56°. These strengths, which are those of commerce, do not agree with those adopted in the Codex. This does not seem to me to be the proper place for alcohol; I shall refer to it again. In the P. B. alcohol is placed in Appendix B. Rectified spirit containing 84 per cent. of alcohol is the recognized spirit. The observations as to taste and smell resemble those of the Codex, but the P. B. gives another test for fousel oil. Four fluid ounces with three measures of the volumetric solution of nitrate of silver, exposed for twenty-four hours to bright light, and then decanted from the black powder which has formed, undergoes no further change when again exposed to light with more of the test.

*Carbonate de Soude (Bi-), Sel de Vichy, *Bicarbonas Sodicus;* Bicarbonate of Soda or Sodic Bicarbonate. The name Sel de Vichy or Vichy salt is given to it because it is the chief ingredient in the Vichy water, the rather over-valued remedy for gouty symptoms. Description: Opaque masses having a weak alkaline taste, turning reddened litmus paper to blue, soluble in ten parts of cold water. The solution of this salt should not yield a precipitate upon the addition of an acid nitrate of baryta or silver, nor by sulphate of magnesia. The P. B. adds that it imparts a yellow colour to flame, and loses a portion of its carbonic acid at 212° F.

*Carbonate d'Ammoniaque, Alcali Volatil Concret, *Carbonas Ammoniæ.* Following the system of nomenclature correctly, this should, I think, have been *Carbonas Ammonicus.*

*Chlorate de Potasse, *Chloras Potassicus*; Chlorate of Potash, or Potassic Chlorate. A salt in white, shining plates, unchangeable in the air, of a fresh or cool and slightly sour taste, fusing upon live coal, of which it greatly quickens the combustion. Heated in a retort it melts and gives off oxygen, leaving chloride of potassium; it dissolves in twenty parts of cold water, and in less than two of boiling (depositing crystals on cooling). The aqueous solution should not be cloudy upon the addition of nitrate of silver. The P. B. adds that it explodes when triturated with sulphur.

*Chlorhydrate d'Ammoniaque, Sel Ammoniac, *Chlorhydras Ammoniæ.* This should have been *Chlorhydras Ammonicus, Ammonic Hydrochlorate.*

*Chlorure de Potassium, *Chloruretum Potassicum* ; Chloride of Potassium, Potassic chloride. A salt in colourless cubes, taste approaching that of chloride of sodium, but slightly bitter ; sparingly soluble in alcohol. Dissolved by three parts of cold and two of boiling water, the aqueous solution yields an abundant white precipitate upon the addition of nitrate of silver, and a yellow by chloride of platinum, and should not be precipitated by ferrocyanide of potassium.

*Dextrine, *Dextrina* ; Dextrine. A pulverulent substance, white or yellowish, insipid, completely soluble in water, which it thickens ; insoluble in alcohol at 80°. The aqueous solution assumes a purplish colour in contact with iodized water. Not in P. B. ; it seems out of place here.

*Glycérine, Glycerine. A syrupy liquid, obtained by acting upon or decomposing neutral fatty bodies. Glycerine is colourless, inodorous, with a sweet taste, leaving no acrid or bitter after-taste; it does not redden litmus paper, nor turn syrup of violets green. The density of glycerine is 1·26 (30° Acidometer of Baumé). Oxalic acid and the soluble salts of baryta cause neither cloudiness nor precipitate; nitrate of silver only a slight degree of opacity. It should not change colour upon the addition of sulphide of sodium, nor when boiled with caustic potash ; its combustion should be perfect and leave no residue. P. B., Characters: A colourless thick fluid, oily to the touch, without odour, of a sweet taste; freely soluble in water or alcohol. When decomposed by heat it evolves intensely irritating vapours. Test: Sp. gr. 1·26.

*Iodure de Potassium, *Ioduretum Potassicum ;* Iodide of Potassium, or Potassic Iodide. In white cubic crystals, anhydrous, having a sharp taste, soluble in less than their own weight of cold water, and six times their weight of alcohol at 90° ; sulphuric acid separates the iodine, producing a blue with starch-paste. This salt is sometimes contaminated with carbonate and iodate of potash, the chlorides of potassium and sodium, and bromide of potassium. Alcohol at 90° separates the two first salts, and the chlorides are recognized by mixing with a solution of the iodide of potassium an excess of nitrate of silver, collecting the precipitate and treating with ammonia ; the chloride of silver dissolves in this liquid, the iodide remains insoluble. To determine the presence of bromine, pour into the solution of iodide of potassium an excess of a solution of sulphate of copper, and pass through it a current of sulphurous acid, and filter, to separate the iodide of copper formed. The supernatant liquor, put into a tube with a little chlorine-water, becomes yellow if bromine is present.

Os Calcinés, *Ossa calcinata :* Calcined bones. They are the product of the calcination, or burning, of the bones of oxen and sheep, in contact with air ; they should be quite white, are composed of phosphate and carbonate of lime, dissolve in dilute hydrochloric acid with slight effervescence. In Appendix A. of P. B.

*Sulfate de Magnésie, Sel de Sedlitz, Sel d'Epsom, *Sulfas Magnesicus ;* Sulphate of Magnesia, Magnesic Sulphate. It may at first seem strange that this salt should be called Seidlitz Salt, but it is substantially correct, the chief ingredient in the real Seidlitz, or Seidschutz, water being sulphate of magnesia, although in the artificial powders sold in England it is omitted, in order to make a more agreeable though less active preparation by the substitution of tartrate of soda.

I feel that I have written enough to give an idea of this portion of the Materia Medica ; it would have advanced another step towards completeness if a chapter had been added (and a few pages more would not have appeared much among so many) devoted to those substances which are obtained from the vegetable kingdom by chemical processes,—I allude to morphine, codeine, quinine, cinchonine, strychnine, brucine, atropine, aconitine, cicutine, and veratrine ; and in this chapter it would have been more correct to have placed alcohol, dextrine, naphtha, and perhaps some others. This brings me to the end of the Codex Materia Medica. In my next communication I shall commence the Pharmacopœia, or that part containing the preparations.

(To be continued.)

THEORY OF THE UNIVERSAL CODEX.*

BY JOSEPH INCE.

I wish, in anticipation of the Paris International Congress, to direct attention to some sentences contained in the preface to the Codex. "The Commission was convinced that the French Pharmaceutical Codex, with the exception of some additions and modifications, which would have altered neither the general sense of the text nor the dose of its essential formulæ, might have become an universal Pharmacopœia." "It had hoped" is the last sentence "that it might have placed under the protection of the name of the third Napoleon a work for the public health which should have been universal." The declaration of the Congress goes still further. "At this moment, when different States are so strenuous in their endeavours to generalize the use of one uniform system of weights, measures, and coinage, the Congress will naturally have under consideration the necessity of establishing a Codex, or legal formulary, which shall give the law to Pharmaceutists throughout the civilized world. Such a Codex would determine uniformity of composition, in all Pharmacies, of the most important remedies, whose use has been established by universal experience." The second question, therefore, for discussion in August next is, the means to be employed for the construction of an universal Codex. I believe such views to be utopian and unphilosophical, and their fulfilment to the last point undesirable. With your permission, I proceed to give a reason for the faith within me.

Let a man with no wish to establish or defend a theory consult the pages of the British Pharmacopœia, the conviction will force itself upon his mind, as he surveys its various preparations, that it is specifically English, its main characteristic being strength. It *remains* English, examine it anyhow, or anywhere, or at any time. Its tinctures, extracts, spirits, simple and compound formulæ, its choice of drugs and plants, the routine of its remedial agents, its general plan, its special applications, the doses of its posological table, the entire absence of other tinctures, extracts, spirits, simple and compound formulæ found elsewhere, stamp it as essentially, undeniably, and nationally British. Leaving the work as it exists in print, the practice of medicine amongst ourselves, which once created, but now is regulated by this book, bears identically the same characteristics. Investigate the formulæ contained in that wonderful compendium, 'The Pharmacologia,' by the late Dr. Paris, or a batch of recipes from any dispensing English house; read them without order or selection, and desiring earnestly not to confirm a foregone conclusion; yet view them in every twist of the kaleidoscope—the dose, the choice, and the avoidance; the combination and the mannerism are national and British. Now take the Codex, at this moment under consideration: its whole arrangement is steeped in the atmosphere of French national life; it is a book written for the French nation, containing French formulæ, and in consequence is not to be judged by English modes of

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* *Vide* chapter in Paris's Pharmacologia, entitled 'The Influence of Soil, Culture, Climate, and Season.'

thought, of which the very illustrations given by Dumas, while advocating the advantage of the Universal Codex, is sufficient proof. "The time has arrived when countries which are in incessant communication, which every day exchange their visitors by thousands, should feel it their duty to examine whether it be not a matter of inconvenience to specify, for example, under the common name of Syrup of Hydrocyanic Acid, a remedy which in Belgium contains four milligrammes of Hydrocyanic Acid in a tablespoonful, and ten milligrammes in France according to the new Codex, or even seventeen according to the old Pharmacopœia?"

The Commission, it appears, were not able to affect this assimilation. "But," I translate once more, "it has gone further as far as concerns Cherry-laurel-water, also a powerful remedy, and it has completely assimilated the French and Belgian formulæ."

What Pharmaceutist in this room, save those who make French Pharmacy their study, ever heard of the preparation "Syrup of Hydrocyanic Acid"? In what English recipe has it yet been seen? Do *you* keep it in your Pharmacies? Is there an English Pharmaceutist to whom the idea of the assimilation of distilled Aqua Laurocerasi would suggest itself as a question of importance? Before we smile at the selection of these formulæ as either trivial or childish, let us turn to one of the most important chapters of the Codex, the Syrups, in all about 115. Were we in one word to describe French Pharmacy, we should probably say "Sugar." It is not my duty to-night to enter into details, but three of these syrups are so important that they had better be enumerated.

SIROP DAICODE.

Syrupus de Papavere albo.

Ext. Opii	0·50 (50 centigrammes.)
Aq. Dest.	4·50 (4 grammes and 50 centigrammes.)
Syrup. Simpl. . . .	995·00 (995 grammes.)
	1000·00

Dissolve the Extract of Opium in distilled water, filter, and add the Syrup.
Twenty grammes contain 0·01 (one centigramme) of Extract of Opium.

SIROP D'OPIUM.

Syrupus cum extracto Opii.

Ext. Opii	2 (2 grammes.)
Aq. Destill.	8 (8 grammes.)
Syrup. Simpl.	990 (990 grammes.)
	1000

Dissolve the Extract of Opium in cold distilled water, filter, and mix with Syrup.
Twenty grammes contain 0·04 (4 centigrammes) of Extract of Opium.

SIROP DE KARABÉ.

Made by the addition of 0·50 (50 centigrammes) of Spirit of Amber, to each 100 grammes of the Syrup of Extract of Opium.

Respecting these, and a mass of distinctive formulæ, assimilation is impossible, no counterpart existing among ourselves. There can be no assimilation without corresponding points of similarity; on the other hand, either blame or ridicule attached to this class of remedies would betray ignorance of the requirements of special and characteristic Pharmacy.

The special mode of the manufacture of the Syrups,—their strength, which in our eyes would be considered weakness,—and their Pharmaceutical application, would well serve as a subject for an evening lecture.

We next come upon a whole train of Mellites and Oxymellites, Conserves, Chocolates, Electuaries, Jellies, Pastes, Oleosaccharates, Medicated Lozenges and Species,—with regard to which I have simply to observe that, strange as they may appear to us, the thought never occurred to a grave commission that there was anything in their composition to provoke a smile; neither, indeed, is there. These formulæ are the ultimate printed embodiment of hereditary French practice, and they fulfil better than anything we could suggest the remedial purposes for which they were intended. They apply to a nation which, in soil and climate, in social life, in mental and physical organization, is absolutely as well as geographically distinct from ours. The two systems of Pharmacy cannot be exchanged.

Before leaving France, let me point out a possible source of error. The compound syrup of ipecacuanha is not an opium preparation, and the compound powder of ipecacuanha (Poudre d'Ipécacuanha Opiacée) is made with dried extract of opium; one gramme contains nine centigrammes of dry extract of opium, being nearly double the strength of our own preparation.*

For this, however, an apology is made—"L'usage a consacré en France l'emploi de cette formule." Surely if an error has been committed in the Ark, that is no reason why it should be transmitted through the ages. Such a variation from the known strength of Dover's Powder is much to be regretted, and it seems remarkable that the formula recognized all over the world should not have been adopted; assimilation, like charity, should begin at home.

Let us transplant the Universal Codex, French or English, to another clime; send it to India, Java, or Central Africa. But first strike out the English ointments and the French pomades; keep back all essences that are not distilled, else the essential oil will float quietly on the surface; re-arrange every dose, and choose different drugs; alter the formulæ for pills, and consign the pastes and jellies to the waves.

[And as it would plainly be impossible to get medical men and the public to abandon the galenical formulæ to which they have been accustomed, the Universal Codex must contain a selection at least of those of all countries, and become

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* SIROP D'IPECACUANHA COMPOSÉ.
Sirop de Desessartz.

Ipecacuanha	30
Fol. Sennæ	100
Thyme	30
Fol. Papav.	125
Magnes. Sulph.	100
White Wine	750
Aq. Flor. Aurant.	750
Aq. Bullient.	3000
Sacchari q. s.	

PULV. IPECAC. COMP.

English
Dover's Powder.

Ipecac	1
P. Opii	1
Potass. Sulph.	8
	10

(1 Opium, 1 Ipecac. in 10)

French
Poudre de Dower.

P. Potass. Nitrat.	40
„ Potass. Sulph.	40
„ Ipecac.	10
„ Glycyrrh.	10
Ext. Opii Siccat.	10
	100

GERMAN PHARMACOPŒIA.
Pulvis Ipecacuanhæ Opiatus.

Pulv. Opii	1
P. Ipecac.	1
Sacchar. Lactis	8
	10

a huge voluminous compendium; or it must abandon formulæ altogether, and include only the simpler substances, such as Carbonate of Soda, Corrosive Sublimate, Iodide of Potassium, and Castor Oil. But Pharmacopœias do not *happen* to exist; they are formed to meet certain clearly defined requirements, and must differ according to the habits of the people who are to use them, the drugs which a country produces, climate, and other considerations. The Indian Pharmacopœia, now being drawn up, is designed to afford to European residents, and to the many natives at present educated in the Government Colleges, convenient formulæ for prescribing *inter alia* those drugs commonly found in India.—*D.H.*]

That a Pharmacopœia should in the main be built up. Granted that commercial enterprise developes the resources of the world, by bringing the produce of widely separated lands within the common reach, nevertheless that is the truest wisdom which, by a knowledge of the very soil and climate, most renders Pharmacy independent of foreign aid. This also is the doctrine of acclimatization so nobly followed out by Montigny and his successors: why should our ships bring that which our own soil will grow? And though we must wait in patience for a "new heaven," we may anticipate the "new earth;" give the ground a chance, and thus may it become *justissima tellus*, and repay cent. per cent. the cultivator's toil. But just as the grand art is to discover plants which will suit the soil, so must the book which describes formulæ suit the nation; nor can any real uniformity be adopted so long as remedies are frozen in one climate and melted in another.

No man can change his nationality, he bears it with him to the Tropics and Labrador; but he *can* change the climate and his whole mode of life, and hence the routine of ordinary business arrangements may help us in the consideration of this subject. No Pharmaceutist blindly executes a foreign outfit; his trade interest requires that it should be adapted to the exigencies of travel; to do otherwise would be the surest mode of forfeiting the confidence of his employer. How, let me ask, do you fill a medicine chest for the journey up the Nile? Supply a famous quantity of the Sulphates of Quinine and Zinc--read Elliot Warburton, and keep your customer.

I will not trouble you further with the question, it seems scarcely worth an argument. But one objection must be met. Some think it would be most desirable to assimilate the strength of medicinal solutions. I believe this would add one more source of confusion and anxiety. What profit would it be to render solutions uniform when you never can assimilate the dose? Supposing quinine had all the world over the strength of one grain to the drachm,—three drachms would be a dose in England—but the London dispenser would be staggered by a prescription from Calcutta, though coming with all the dignity of an assimilated solution. It has been my lot to have been thrown theoretically, commercially, and in daily life with French and Belgian Pharmacy; I know practically the effect of remedies on what is popularly termed the "foreign constitution." I should hesitate to exhibit two ounces of Haustus Niger to a man on the other side of the Channel,—in a choleraic season I should tremble for the result. A drachm of any purgative syrup and a glass of seltzer would in general prove successful; nor am I astonished at the fact, when I see a whole nation drinking strong ale, and another claret. Assimilate a purgative solution, or any other—assimilate the long list of tonics, the entire range of chemicals, the whole products of Materia Medica, and the resulting formula must still be arranged to suit the country where its influence is to be exerted.

There are two assimilations to which Pharmacy can lay no special claim, but which it would be wisdom for it to adopt—the first being uniformity of weights and measures. The adoption of the Metric-decimal system would be the gain of the world. Bear in mind that this would modify no dose, alter no strength, and change no formula; but Pharmacy should not stand aloof from the advantage offered by this simple and accurate mode of computation.

The second is the use of Latin, the language of definition, the commonwealth of scholarship, a dialect like the Easter benediction, Urbi et Orbi. Strange that France should selfishly have produced its new Codex in a tongue not understanded of by the common people.

How is a Pharmacopœia created?

There are men in all ages who have a passion for the healing art. By patient observation and repeated trial some remedy attracts their notice. Medicine must begin inevitably in speciality. First in order, peculiar virtues are attributed to herbs, roots, and flowers. Metals and chemical combinations follow, and slowly yet surely fresh remedial agents are added to the list.

Nor does the physician work alone; the progressive march of chemistry renders its aid daily more essential and conspicuous; the chemist helps by direct experiment and research,—so only,—for here comes the broad line of demaracation between the medical profession and the chemist. The one originates and dictates, the other aids experimentally, and works out theory; but the latter can no more usurp the physician's office than the chisel can turn sculptor.

"From what has been said," writes Dr. Paris, "it is very evident that the mere chemist can have no pretensions to the art of composing or discriminating remedies; whenever he arraigns the scientific propriety of our prescriptions, in direct contradiction to the deductions of true medical experience,—whenever he forsakes his laboratory for the bedside, he forfeits all his claims to our respect, and his title to our confidence."

By this united work formulæ are shaped out, first oral and traditional; to be confided next to the doubtful care of manuscript, from which they are finally rescued by the press. Other labourers follow in the track, coming with more accurate and wider knowledge, and, never be it forgotten, with the heritage of former discovery. Many a vaunted panacea is rejected, and many an absurdity is quietly sifted out; the true remains, whether it be the metal dug from the soil, or the tree whose leaves are for the healing of the nations. Hence certain remedies are common to the world. But the physician, reaping the advantage of the facts of science, moulds them to his purpose. His practice, that is his actual system of therapeutics, is taught him, not by books, but by every influence of external nature—by the habits, physical and moral, natural or acquired, of the men, women, and children with whom he is thrown in contact, by their daily lives, and by their daily deaths. His formulæ are not his own creation, but are dictated to him by the law of his surroundings. No learned commission sitting in solemn conclave can in German fashion evolve a Codex from its inner consciousness; take the physician, with all his skill, out of the circle of his existence, be it never so wide, and he goes to a different school, where he is taught another lesson. New influences compel new thought, new therapeutics, and new formulæ; and thus not only is he writing day by day, and hour by hour, his Pharmacopœia, but is weaving the threads of nationality into its every page. These threads cannot be disentangled.

The CHAIRMAN, in thanking Mr. Ince for his communication, said the subject was an interesting one, especially just now, as it was likely to be discussed at the meeting of the Pharmaceutical Congress at Paris this year.

Dr. FARRE said he fully endorsed every word of Mr. Ince's paper. It was with some difficulty that they had effected an amalgamation of the English, Scotch, and Irish Pharmacopœias, between which much less difference had previously existed than there was between the Pharmacopœia of this country and some of those on the Continent. When they considered that the compromise effected in the British Pharmacopœia of 1864 had failed to satisfy the parties concerned, he thought it would be hopeless to expect to produce a universal Pharmacopœia that should please all.

Dr. Attfield thought the subject was at least one that offered topics that might be discussed with advantage at the Congress in Paris. If they could hope for as much success in the production of a universal Pharmacopœia as had attended the production of the British Pharmacopœia, they might be satisfied. He thought, at any rate, that some general principles might be fixed upon as the basis of all European Pharmacopœias.

Mr. Squire thought much good would be done if the authors of different Pharmacopœias could be induced to agree in the mode of adjusting the strength of preparations. In the French Codex it was generally found that the proportions were one in ten or one in five, and this was the case also with many, but not with all the preparations in the British Pharmacopœia. If such a method were generally adhered to, he thought it would greatly assist prescribers in recollecting the strength of preparations.

Professor Redwood said it was deserving of consideration in connection with the subject before the meeting that, at the present time, there was a great similarity in the medicines used in many parts of the world that were widely removed from each other, not only by distance but also in the nature of the climate and the habits of the people. If they compared the Pharmacopœia of the United States with that of this country, no essential difference would be observed. Then our Pharmacopœia was used throughout Australia and in our colonies generally; and even in India, where the climate and habits of the people were so different, although they had a Pharmacopœia of their own, it was founded on the basis of the English Pharmacopœia. They were, no doubt, aware that a new Indian Pharmacopœia was now in course of preparation, and he should be glad to hear from Mr. Hanbury, who was engaged in preparing that work, how far they found it necessary to deviate from the processes of the British Pharmacopœia. Comparing the Pharmacopœia of this country with those of other European countries, he thought there would be much less difficulty in assimilating those of Germany and Austria than that of France with ours. He agreed with much that had been stated by Mr. Ince, but was not prepared to admit that nothing could be done towards assimilating the processes of different Pharmacopœias.

Mr. Hanbury said, as reference had been made to the Indian Pharmacopœia which was now in course of preparation, he might observe that it would comprise almost all the formulæ of the British Pharmacopœia, and, in addition, would include certain drugs of Indian commerce and products derived from them, which had long been in use in that country; and it would be used as a text-book in the various colleges of India. He agreed with Professor Redwood in thinking that there would be far less difficulty in assimilating our formulæ with those of Germany than with those of France. Our Pharmacopœias, ever since 1788, had been constantly tending in the direction of "simplicity," and the same thing had been taking place to a great extent in the German Pharmacopœias, but it was not so in that of France.

NEW GAS STOVE.

Mr. Henry Deane introduced to the notice of the meeting a gas stove which he had constructed for pharmaceutical and other similar purposes. The description, with drawings of this stove, will be inserted in our next number.

PHARMACEUTICAL MEETING, EDINBURGH.

A meeting was held in St. George's Hall, on Tuesday evening, 16th current, at nine o'clock; Mr. Kemp, President, in the chair. There was a very good attendance. The President introduced Mr. Morrison, Dentist, who made the following communication:—

Mr. President and Gentlemen,—Your worthy Secretary, Mr. Mackay, with his usual desire to do good, by bringing under your notice anything calculated to be of use to the members of the Pharmaceutical Society, has asked me to describe to you these moulds. I need not say that it affords me very great pleasure indeed, to comply with his most polite request. Before, however, entering on the subject, perhaps you will kindly allow me a few minutes to explain how it happens that I appear here this evening in the capacity of a mould-maker. In the interest of a friend, who every day of his life is obliged to use suppositories, I have from time to time applied to Mr. Noble, druggist, Circus Place, to supply these most useful articles. One day, while talking over the manufacture, that gentleman kindly let me into the secret of how they were made. The disclosure of the idea of making holes in a lump of clay, with a stick, to serve as moulds to make *hundreds* of pharmaceutical products, so tickled my fancy that I believe I smiled all over, very much to the annoyance of my friend Mr. Noble. Mr. Noble, sticking up for the dignity of the profession, brought me suddenly back to my propriety by telling me that, however primitive I might think the affair, clay moulds were "the best things out." Notwithstanding this supposed, or, if you like it better, suppository settler, it did not settle me; it occurred to me that, nevertheless, I could and would make some little improvement. Whether I have succeeded is not for me to say, but you to settle.

The ordinary method of making these productions by means of clay moulds seems to me to have three very distinct *disadvantages*. The first is, that, even though with care, one might manage to make clay moulds serve some little time, there will always be the great drawback of the *shrinking* of the clay, which, rendering the moulds *irregular* in form, will tend to prevent the perfect delivery of the product or casting. The second objection to clay moulds is, that clay, being a very bad conductor of heat, can never admit of any mould, however perfectly made, delivering as fast as filled. The third objection arises from the fact that, as all clays shrink *irregularly*, no two castings from clay moulds can ever be alike, or either of them true to any form. Besides, the mangling of the cast substance itself,—the result of a rough, irregular mould,—there is the washing and dressing of the product afterwards, which product, notwithstanding all the care taken in the get up, never can, by any possibility, be said to be good-looking.

To aid in making articles exact in size, and consequently a no less exact *measure* or *weight* of the substances used, and to be in *keeping* with the general neatness of all pharmaceutical productions, is the object of these moulds, which I shall now very briefly describe. I may here state that there are two reasons why the description is so. One is, that the moulds are, in construction, so perfectly simple, that you have only to look at them to find them speaking for themselves. Another reason is, that while I beg leave of the Society to present it, with the plan, patterns, drills, and cutters, for the use of any of its members, Mr. Noble, with his usual desire to oblige, has kindly consented to at all times show the finished article, so that no one can ever be at any loss how to proceed in the making.

To guide those, however, who wish to be first in the field, I may here state that there are three patterns, two drills, and two cutters. The three patterns give six castings of the *best gun-metal*, there being, as marks, two castings from each pattern. The larger cutter is used without any drilling; the smaller cutter *after* the larger drill. The small drill is used to make the holes for the steady pins, and for the *jointing* of *both moulds*.

Mr. Morrison, in illustration of his remarks, submitted a set of the moulds both for pessaries and suppositories. They were made of gun-metal, and beautifully finished. He also laid upon the table different kinds of suppositories and pessaries, all of which had been made by the moulds then under examination. These productions were very much admired, and the meeting was unanimous in thinking that the mode now proposed for the manufacture of these articles was at once the quickest and readiest way of making them which had been hitherto invented. Mr. Morrison presented the steel cutters, moulds, etc. to the Society.

After some remarks, Mr. J. A. YOUNG moved a vote of thanks to Mr. Morrison, for his kindness and courtesy in bringing this useful and practical matter before the meeting.

Mr. MACKAY seconded the motion, and begged, in the name of the Society, to thank Mr. Morrison for having so liberally presented the cutters, etc., and concluded by suggesting that, when the moulds were made and ready to be sold, they should bear the name of "Morrison's Moulds."

This was carried by acclamation.

The PRESIDENT then delivered the following—

VALEDICTORY ADDRESS.

Gentlemen,—As our meetings, during the session which is now about to close, have been comparatively few, and our labours proportionally light, it is not necessary, in reviewing the subjects which have been brought before us, that I should detain you by any lengthened observations.

At our opening meeting, in November last, Dr. Stevenson Macadam read an excellent paper "On the Testing of Water for Impurities," and illustrated his subject by a series of interesting experiments on various samples of water, obtained from different parts of the country, in the course of which he pointed to the fact that in those localities where the attacks of cholera were most numerous and severe, the water used by the inhabitants for household purposes was much contaminated by organic impurities, which seemed to act as a predisposing cause of the disease. The subject was, therefore, not only useful to us as pharmaceutists, but of great importance in a sanitary point of view, as shown by the large amount of public attention which it is receiving, and the efforts which are being made in various towns and villages throughout the kingdom to secure a plentiful supply of pure and wholesome water.

There is a melancholy interest attaches to our second meeting. On that occasion the late Dr. Scoresby Jackson read a valuable paper, in which he gave an able and comprehensive analysis of the French Codex, which was fully reported in the Journal.

By the death of Dr. Jackson, the Pharmaceutical Society has lost an enlightened and sincere friend,—one whose kind and obliging disposition, combined with his intimate knowledge of Materia Medica, and his ardent desire for the advancement of the science and practice of Pharmacy, encouraged us to hope for his occasional assistance at our future meetings.

This hope, however, is not to be realized, and we can now only regret the great loss which our Society, among others, has sustained, by the sudden removal of one already distinguished for his general attainments, and who seemed destined to reach the highest position in his profession.

At the beginning of last month, a conversazione in connection with the Society was held in the Industrial Museum, the use of which was kindly granted for that purpose by its distinguished director, Professor Archer.

In addition to the attractions of the building itself, and its wonderful contents, we had the pleasure of listening to an able lecture by Dr. Stevenson Macadam, on "Spectrum Analysis," beautifully illustrated by means of a powerful battery, which, together with the excellent arrangements, seemed to give great satisfaction to the large and brilliant assemblage of ladies and gentlemen, who honoured the Council with their presence on the occasion. Including the conversazione, our present meeting is the fourth, and I am sure we all feel greatly indebted to Mr. Morrison for bringing before us the results of his experiments with a view to improve the form and facilitate the preparation of pessaries and suppositories; although, as we all know, important improvements have recently been made in both respects, still I think we must be satisfied that Mr. Morrison, by his beautiful moulds, which he has exhibited and described to-night, takes an important step in advance, and puts it in the power of every pharmaceutist not only to produce them with ease and promptitude, but to finish them in the best style.

There is reason to believe that the desire for an improved Pharmaceutical Bill still remains in full force, and that another effort will be made to secnre it; and it is pleasing to observe that the conciliatory spirit manifested lately by the leading representatives of the various bodies interested in the matter has tended very much to improve the prospect of success, and to pave the way to an amicable arrangement of the various provisions on which differences of opinion have been expressed, and a speedy settlement of the whole question. It is to be feared, however, that on account of the present state of political parties, we shall have to wait another year before our hopes in regard to the proposed measure can be realized, and a broad legislative foundation laid for the future progress and elevation of the pharmaceutical profession.

As you are aware, there has been, for some time back, a very general desire for an improved edition of the 'British Pharmacopœia.' That desire, it appears, is now about to be gratified by the republication of the work, with several of our old and familiar preparations restored to their officinal position, many new ones introduced, and other important changes made which afford evidence of progress, and of a desire on the part of the Medical Council to adapt it to the requirements of the profession, and make it a true exponent of the present state of British Pharmacy.

It is gratifying to observe that the Benevolent Fund of the Society is in a hopeful condition, and that the recent effort made by the Committee in London to excite a greater interest in it on the part of the members has been rewarded by such a degree of liberality as to encourage the hope that the sum of ten thousand pounds, originally named as the capital fund, will ere long be realized and even exceeded. Although it is not pleasant to contemplate the necessity of such a provision being made, or the possibility of our requiring assistance from such a quarter, yet it is by no means improbable that, out of the large number of individuals engaged in the business of Pharmacy, which, while highly honourable in itself, seldom leads to fortune, and in the majority of instances yields but a humble subsistence, cases will occasionally present themselves, not only deserving of our sympathy, but requiring prompt, efficient, and kindly aid. As evidence of this, we have it already on record that the fund has been the means of bringing comfort to several desolate homes and aching hearts.

The British Pharmaceutical Conference, which is to be held this year in Dundee, bids fair to be highly successful, judging from the number of important papers already promised, and the names of the authors. I have no doubt the proceedings will be such as to attract a large number of members and visitors, to elucidate many subjects connected with Materia Medica and Pharmacy, and give a fresh impulse to their investigations.

I have now, in conclusion, to thank you for permitting me so long to occupy the position of President of this branch of the Pharmaceutical Society, and to acknowledge the kind and able assistance I have received from the members and Council, and especially from our Secretary, Mr. Mackay, whose services to the Society, both here and in London, are exceedingly valuable and highly appreciated, and whose prudent counsel, and untiring zeal, have not only guided and encouraged me in the discharge of my duties, but done much to render them both light and agreeable.

At the close of the Address, Mr. Mackay proposed a very special vote of thanks to Mr. Kemp, whose term of office as President was this evening about to close. Mr. Mackay mentioned that Mr. Kemp had now occupied the position of President of the Society in Edinburgh for three years, and that during that time he had been most constant in his attention to the duties of the chair, never having been absent from any meeting of importance, throughout the whole period of his presidentship. Mr. Kemp's activity and zeal on behalf of Pharmacy were well known, and it must be gratifying to all to learn, that though he was about to leave the chair, the Society would continue to benefit by his sound judgment and excellent advice, as he would retain his position both as a Member of Council and as an Examiner.—This was carried with loud and hearty applause.

THE ANNUAL MEETING.

The Annual Meeting was then held, and commenced by the President requesting the Secretary to read—

THE ANNUAL REPORT.

The Council have again, on the termination of another Winter Session, and close of a financial year, to lay before the Members of the Society the Annual Report and Statement of Accounts for 1866.

The scientific meetings for the session 1866–67, just closed, have been below the average in point of number. This is to be regretted, but the Council express a hope, in which they trust they will not be disappointed, that next session may be more productive in original and scientific communications. The present opportunity, in connection with the recent meetings, cannot be allowed to pass, without making marked allusion to the very deep regret, which, not only those connected with this Society, but also a large portion of the general public, felt at the death of Dr. Scoresby-Jackson, Lecturer on Materia Medica, whose useful and promising career was so suddenly closed by his early and unexpected death. Possessed of talents of a very high character, and of a disposition so amiable and attractive as to make him the friend of many and the enemy of none, with strong sympathies and eager desires for the promotion of pharmaceutical science, his loss is not only much to be regretted, but by every member of this Society to be deeply deplored. As a somewhat new feature in the proceedings of the Session, the Council feel much pleased in being able to notice the great success which attended the conversazione, lately held in the extensive galleries of the Museum of Science and Art, and which, through the kind attention of Professor Archer, was placed at the disposal of the Society for the purpose of holding the meeting.

The Council have again to complain that no essays were lodged in competition for the President's or Register Fund Prize. Associates and apprentices are urged to write papers on any pharmaceutical or chemical subject; and to lodge them for competition with the Secretary, on or before 1st November of the present year.

The new edition of the Pharmacopœia being now completed, and the work itself at the present time passing through the press, and likely to be in the hands of those interested in the course of a few days, is, the Council thinks, matter for congratulation. They believe some additions, alterations, and modifications of certain formulæ have been made, which doubtless pharmaceutists generally will hail with much satisfaction.

During the past year the Library of the Society has been rather more frequently applied to than usual, and the Council feel gratified to know this; and have much pleasure in intimating, that it is their intention to make considerable additions in this department during the approaching summer.

The Council are very much pleased to be able to congratulate the Society upon the rapid advance, which, during the last few weeks, has made towards a reconciliation of the conflicting differences which have for so long divided Pharmaceutists from their brethren and neighbours, Chemists and Druggists. While the whole drug trade, and indeed the community at large, feel that some protection by legislative enactment was required alike for the education and regulation of the former, and safety and protection to the latter, yet there did exist a certain amount of jealous feeling towards our own body, a manifestation of which produced a hesitancy and unwillingness on the part of Government to grant, what we have so long desired and fought for—namely, a satisfactory extension of the Pharmacy Act of 1852. Those difficulties, however, the Council are glad to know are at an end, and they much rejoice in the result of the meetings recently held in Bloomsbury Square, by which much of a strong opposition has been withdrawn, and the assistance of those most interested obtained, in order that the views long since enunciated by our ever to be respected founder, Jacob Bell, may be more completely carried out under the sanction of a new Act of Parliament.

The Council cannot but rejoice in the extraordinary position in which the Benevolent Fund at present stands; the successful efforts in connection with this scheme must have afforded the London Council very great satisfaction. It has often been said that it is more blessed to give than to receive, and it is to be hoped, that not only does this feeling find an echo in the hearts of all who have contributed to this noble object, but that the feeling may continue to extend itself, until the remaining sum of about £2000 be realized, thus raising the capital stock of the Benevolent Fund to the amount contemplated from the first, viz. £10,000. The annual interest from such a sum, combined with yearly contributions, will then enable the Council to meet the increasing demands which must of necessity be made upon them, and thus relieve the wants, and add to the comfort, of many of our members, who, from misfortune and adversity, the dispensation of Providence, or other causes, stand so much in need of liberal, kind, and steady support. It is even consoling to know, that by the distribution of this fund the widow and fatherless will not be forgotten, and that, therefore, no one need hesitate to give their mite, and thus contribute to increase the source from which such a stream of kindness, benevolence, and sympathy, will continue unceasingly to flow.

The following is an abstract of the intromissions of the Secretary for the year 1866:—

John Mackay in account with the Pharmaceutical Society, from 1st January to 31st December, 1866.

1866.		£.	s.	d.	1866.	£.	s.	d.
May 22.	Cash from London	50	0	0	Various Books for Library	6	11	5
,,	Ditto ditto	0	10	0	Postage Stamps	1	14	7
Dec. 30.	Balance due to Secretary ...	7	6	4	Attendance at Door of Meetings...	0	7	6
					Expenses of Annual Meeting	7	3	10
					Rent of Rooms and Hall	30	0	0
					Insurance on Museum	0	6	0
					Painter	0	18	6
					Printing Bills, Labels, etc.	4	12	6
					Bottles for Museum	0	1	0
					Curator (Mr. W. Hill)	5	0	0
					Petty Expenditure	1	1	0
		£57	16	4		£57	16	4
					Balance due to Secretary...........	7	6	4

We, the undersigned, have examined the foregoing accounts, with vouchers attached, find them correctly stated and entered, and the balance due to the Secretary as at 31st December, 1866, seven pounds six shillings and fourpence sterling.

J. R. Young.
Wm. Ainslie.
David Kemp.

Edinburgh, 16*th April,* 1867.

The following office-bearers for 1867–8 were then proposed to the meeting, and carried unanimously:—

President—Mr. J. R. Young, of Messrs. Macfarlan & Co.

Vice-President—Mr. Ainslie, of Gardner & Ainslie.

Council—President and Vice-President, Messrs. G. Blanchard, Flockhart, Aitken, Gardner, Noble, Raimes, H. C. Baildon, Buchanan, Kemp (Portobello), D. R. Brown, G. Burrell (Montrose), Hodgeton (Brechin), and Mr. Kinninmont (of Glasgow).

Examiners—President and Vice-President, Messrs. Kemp, Gardner, D. R. Brown (of Macfarlan & Co.), Aitken, Noble, Buchanan (of Duncan & Co.), President and Vice-President in London, and Secretary in Edinburgh, *ex officiis.*

Curator of Museum and Library—Mr. W. Hill.

Library and Museum Committee—President and Vice-President, Messrs. D. R. Brown, Noble, and Mackay.

Secretary—Mr. John Mackay.

THE ANNUAL SUPPER.

The annual supper in connection with the Pharmaceutical Society of Great Britain was held in the Café Royal, Register Street, Edinburgh. Mr. James R. Young presided, and the vice-chairs were occupied by Mr. Wm. Ainslie and Mr. George Blanchard, The company numbered about 130, and among those present were—Professor Maclagan, Mr. David Kemp, Portobello; Dr. Argyle Robertson, Dr. Ritchie, Mr. H. B. Brady, Newcastle; Dr. Robertson, Mr. Kinnimont, Glasgow; Mr. Wm. Aitken; Mr. Kerr and Mr. Hodge, Dundee; Mr. Bruce Allan, Mr. Thomas Finlayson, Mr. James Buchanan, Mr. James Gardiner, Mr. H. C. Baildon, Mr. T. M'Culloch, Dr. Carter Moffatt, etc. After supper, the Secretary intimated that letters of apology had been received from Dr. Stevenson Macdam, Dr. W. D. Adams, Mr. John Black, Mr. Moffatt, Mr. Edward C. C. Stanford, Glasgow; Dr. J. Smith, etc.

The Chairman, having given the usual loyal and patriotic toasts, which were all heartily responded to, proposed "The Pharmaceutical Society." He said twenty-six years had come and gone since the Society had sprung into existence. Before those days there were chemists and druggists, and good ones, too; but they stood isolated and disunited, jealous of each other, without any bond of union, without any required standard of education, without any system for united action, and even without any definite position in general society. Such was the state of things when the Society commenced its operations under the guiding hands of Jacob Bell and William Allen. The manifesto issued by those venerable men stated that the object of the Society was to improve, strengthen, and consolidate the position of Pharmaceutists in Great Britain, and within two years of its formation a journal had been started, and a large number of their class had united in the movement. Ten years passed away; and in 1852 the Act of Pharmacy was passed, under which they held in Scotland, for the first time, their examinations and their meetings. Though that Act was not all they deserved, he had every reason to believe that their position would be further improved by a second Act, which might be looked for early in the next Session. He was glad that, at the end of such a period of time, the Pharmaceutical Society should be found still standing to its original bases—struggling to place themselves on an equal footing in every respect with the high-school Pharmaceutists of the Continent.

The toast was received with loud cheers, and given with all the honours.

Croupier Ainslie then gave "The Royal Colleges of Physicians and Surgeons," alluding to the harmony which existed between those bodies and themselves, to which Professor D. Maclagan replied.

Mr. D. Kemp then proposed "The Memory of Jacob Bell," the founder of the Society, which was drunk in solemn silence.

Amongst the other toasts given during the evening were—"The President and Council in London," "The Honorary Members of the Society in Scotland," "The Museum of Science and Art in Scotland," "The Retiring President," "Pharmaceutical Education," "The Council in Edinburgh," "Assistants and Apprentices," etc.

The toasts were agreeably interspersed with songs and recitations by several of those present.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Tenth General Meeting, held at the Royal Institution, on March 14th, 1867; the President, Mr. R. Sumner, in the chair.

The minutes of the previous meeting were read and passed.

Mr. B. Fergie was proposed by the Secretary, and seconded by Mr. Redford, as a member of the Association, and duly elected.

The following donations to the Library were announced:—The 'Pharmaceutical Journal' for March, from the Society. The Proceedings of the Liverpool Polytechnic Society. The Proceedings of the Liverpool Architectural Society.

The thanks of the meeting were passed to the donors.

Mr. Sharp exhibited a blow-pipe lamp from Mr. Mottershead, of Manchester, and explained its action.

Mr. Abraham said that Mr. Mawson had asked him about a small stove for use in making pharmaceutical preparations, and said to be employed in the neighbourhood, called the magic stove.

Mr. King alluded to some experiments which he had made in using petroleum spirit with a blast of air for heating purposes.

The Secretary said that Mr. Griffin had invented a furnace on a similar principle.

The President then called upon Mr. Charles Sharp, who first read a suggestive note "On the Medicinal and Economic Uses of Insects."

Mr. Sharp then read a paper "On Pharmaceutical Advertising," in which he animadverted on the practice of advertising certain proprietary articles in an objectionable manner, which is calculated to lower the dignity of pharmacy in the estimation of a discerning public.

Mr. Sharp admitted that it was difficult to draw the line between legitimate and illegitimate advertising, but thought there were cases too glaringly suggestive of quackery to be creditable to pharmacy. He thought that pharmaceutists should be determined to present a rigid face against the received notion that physic meant humbug, and that the great art of pharmaceutical chemistry consisted in pseudo-scientifically persuading the public that its whiskers needed replenishing and its moustaches dyeing, and that the great happiness of mankind was dependent upon odorous Arabian balsams, chemical food, and $13\frac{1}{2}d.$ boxes of Barnum's pills.

Mr. Sharp considered it to be the religious duty of every man who practised pharmacy to place that science in a fair and honourable position in the eyes of all men, and that he who resorted to the expedients of the quack and showman that thereby he might make a better living, while he fed himself, starved his avowed profession till it became a shadow and a myth.

The conscientious man would endeavour to call things by their correct names, and whenever he had occasion to set up a sign-board would properly word the statement thereon. If he was merely a retailer of Warren's blacking and clay pipes, with a half-dozen apologies for dispensing bottles in an invisible corner, he would not look so obliquely at matters of conscience as to apply to his sale of these things the words "family and dispensing chemist." He would call a horse "a horse," and would never confound that animal with another asinine member of creation in such a manner that if he established himself in the business of a horse-dealer, he would paint a horse over his door, and with impunity sell mules to a public which believed it was purchasing Arabian steeds. That advertising which was distinguished from an honest statement of certain articles should be known as Barnumizing. The pharmaceutist was perfectly justified in conveying information to the public respecting any article or preparation sold by him; but when day after day he put forth a series of statements conveying to the public that the article produced could not be produced elsewhere, and that all who pretended to supply it resorted to "tricks of trade," with the additional gratifying information that the Queen and Royal Family had condescended to take a pot of pomatum or a box of pills, and that the aristocracy were flocking to obtain it, with the usual imploring request to send for a copy of testimonials, then the chemist and druggist voluntarily resigned the dignity of his calling, and became a member of the College of Quackery.

Mr. Sharp advocated the formation of a Pharmaceutical Ethical Association, which should deal as the Medical Associations and the Odontological Society had done, with all suspicious advertisements. He thought that as the time had arrived when Parliament was to be asked to place pharmacy on a footing with the restrictive professions, it was the duty of the Association and others like to it to seriously consider whether it should retain in its ranks men who systematically abused their brethren, and bowed at the infamous shrine of Holloway, Parr, Morrison, & Co.

An animated discussion ensued, and a vote of thanks to Mr. Sharp was proposed by Mr. Redford, and seconded by Mr. Abraham, for his very interesting, useful, and amusing paper. It was carried unanimously.

Eleventh general meeting, held March 28th, 1867; the President, Mr. R. Sumner, in the chair.

The minutes of previous meeting were read and passed.

The following donations were announced:—

To the Library—'New York Druggists' Circular' for March, from Mr. Mercer.

To the Museum—Specimens of blue, white, and Greek gall, by Mr. Robinson.

The thanks of the meeting were accorded to the donors.

Mr. Redford made some remarks on a draft of the new Pharmacy Bill, contained in the 'Drug Circular.'

The President called upon Dr. Birkbeck Nevins to read a paper entitled "Remarks on the new French Codex."

The Author stated that he had been disappointed in perusing this work, in which he expected to find a scientific digest of modern pharmacy. The principal characteristics of the work are—firstly, the great extent of the Materia Medica, which has more than twice the extent of that of the British Pharmacopœia; and the large number of indigenous plants which it contains, in many cases of very similar properties. The apparent reason, as gathered from the preface, is, that in so large a country as France some plants are abundant in one part, and others of similar nature in another. An examination of plants indigenous to England, contained in the Ph. Br., shows that the number is only 1 to 8 or 9, compared with those indigenous to France included in the French Codex.

The second characteristic is, that the Codex had, to a very large extent, the appearance of an herbalist's list rather than that of a chemist's. Of the herbs to be kept by all chemists in France, and therefore marked with an asterisk, many have been left out of the Ph. Br.—some, in the author's opinion, unadvisedly. Among these were mentioned buckbean and tormentilla. In speaking of the use of herbs in medicine, he took the opportunity to speak highly of 'Culpepper's Herbal,' improved by Brook, as being free from humbug and valuable in those cases in which the author of it spoke from personal experience.

Of chemicals to be kept by all French chemists, chromic acid, codeia, acetic ether, and boro-tartrate of potash are not met with in the Ph. Br.

A list of strange things retained, as crabs' eyes, coral, egg-shells, dried vipers, oil of eggs, etc., concluded this part of the paper.

A short account of the French system of weights and measures was then given, and the English equivalents of those ordinarily used pointed out. In the directions for preparations, there is evidence of a want of discrimination in many cases. Simple things have profuse explanations, whilst important and difficult ones are passed by. In the directions for making oxygen, no mention is made of peroxide of manganese; half a page is given to the powdering of lump sugar; and when ordering the pulverization of cantharides, it gives no better direction than telling the operator that "he must neglect no precautions to save himself from the powder of the cantharides;" various lactates are directed to be made from lactate of lime, but no formula is given for the preparation of that substance; and, worst of all, in preparing prussic acid the process given is, to make anhydrous hydrocyanic acid, pour out and weigh the product, and afterwards dilute it with water, with scarcely any precautions as to handling or inhaling such a volatile and deadly substance.

Some of the preparations may mislead an English chemist, if he should have to make up a French prescription. Thus, there are three preparations of opium, either called laudanum or very similar to it in name, containing respectively 1 part of opium in 13, 1 in 10, and 1 in 4. Sweet spirits of nitre is not our spiritus ætheris nitrosi, but a solution of nitric acid in alcohol. White precipitate is our calomel. The vegetable juices are not the same as the succi of the Ph. Br. Collyria are not necessarily liquids, but include all applications to the eye, as ointments and powders.

In conclusion, the author said that his object had been to view the French Codex from a prescriber's point of view, and therefore many points were left unnoticed which had been sufficiently dwelt upon in the able reviews that have already appeared.

Mr. ABRAHAM proposed a vote of thanks to Dr. Nevins for his valuable paper, and said that he had met with some good things in the French Codex.

Mr. REDFORD seconded the motion, and asked Dr. Nevins if he considered that, in this country, there was any tendency to a milder treatment of disease than formerly. Dr. Nevins considered that in some respects it was so.

The PRESIDENT and several members offered remarks on the paper, and a vote of thanks was carried by acclamation.

Twelfth General Meeting, held April 11th, 1867; the President, Mr. R. SUMNER, in the chair.

The minutes of the previous meeting were read and passed.

The following donations to the Library were announced:—The 'Pharmaceutical Journal' for April; the 'Chemist and Druggist;' the 'New York Druggists' Circular;' the Proceedings of the American Pharmaceutical Association, from Mr. Parrish, of Philadelphia; the Proceedings of the Liverpool Architectural Society; the Proceedings of the Liverpool Polytechnic Society. A vote of thanks was passed to the donors.

A letter was read from Dr. Edwards, acknowledging his election as honorary member, and thanking the Association for the honour. He also promised a paper on Canadian Pharmacy.

Mr. SHARP exhibited a specimen of Professor Redwood's preserved meat, and described the process. The sample had been prepared six months, and was perfectly sweet. It was tasted by the members present, and considered good, but rather short of flavour and over-cooked.

Mr. Sharp apologized for not reading the paper announced, and instead of it read one on "The New Pharmacy Bill."

He said that there was great reason to be glad that a Bill had been prepared which had a prospect of being carried. Approving of much in it, there are features open to criticism. Thus the poison schedule is very incomplete, and he thought that unless it embraced a much larger number of poisonous substances, it would be much better to have omitted it altogether. If retained, all persons dealing in poison should undergo examination, as at present herbalists and many others lie under no restrictions such as would be imposed upon chemists.

He objected strongly to the proposition to allow persons passing the Minor examination to practise as chemists and druggists. Useful as that is to test the acquirements of those who work under the superintendence of a principal, it falls far short of what should be required from the responsible head of an establishment. For example, in the Minor examination no knowledge of doses is required,—an important point now that active principles are so much employed instead of the drugs themselves. Nor is the candidate required to distinguish between genuine and spurious drugs.

He conceived that the highest standard attainable consistent with the proper knowledge of all subjects connected with pharmacy should be set up, and that the pharmaceutist or chemist should be rigidly required to possess a fairer knowledge of all such points in his profession as might affect the dispensing of potent medicines to the public. It was not proper that any person should be recognised by law as qualified to dispense medicines and retail poisons who had not been proved by a high examination to be in all respects competent.

Mr. Sharp also objected to the terms Chemist and Druggist and Pharmaceutical Chemist as being in their abstract meaning synonymous. He preferred the titles Licentiate in Pharmacy and Pharmaceutical Chemist, as showing more clearly the distinction between those who have passed the several examinations.

Mr. Shaw said that the proposed Bill contained clauses concerning which there would doubtless be considerable difference of opinion. The proposed admission of chemists and druggists to membership of the Pharmaceutical Society would be severely criticized; but, as the Association was not wholly composed of Pharmaceutical Chemists, but included chemists and druggists, and others not connected with the trade, he thought it undesirable to discuss the question at present. He would just allude to the poison schedule, and the clause in reference to it. In the Bill introduced by the Society in 1865, there was no poison schedule, whilst in that of the United Society of Chemists and Druggists there was one, and he noticed that the present schedule was much shorter than that. He was under the impression that the Council would have preferred to have had no poison schedule, but the decision of the Parliamentary Committee in 1865 was, that any future Bill should contain one. With respect to the operation of the clause requiring the placing of a poison label on all the articles mentioned in the schedule, he thought that it might compromise the dispenser, and was not sufficiently explicit in excepting poisons prescribed by the faculty. He alluded to liquor arsenicalis, prussic acid, and others even in a diluted form, which might be prescribed without instructions to label them poison. Would the dispenser feel himself at liberty to label them poison in all cases? and, if he did not, and an accident occurred, would he be exonerated from blame? He suggested that it would be very desirable to have a rearrangement of the clause, so as to relieve the dispenser from this difficulty. Mr. Sharp had alluded to the insufficiency of the proposed examination of chemists and druggists under the new Act, but he (Mr. Shaw) considered that there was sufficient elasticity in the arrangement for the examinations to make them more stringent both as regards the Minor and Major.

Mr. Abraham said he was one of those who doubted whether it was desirable, in the interest of Pharmaceutical Chemists, to seek for further powers, and he should very much regret if anything were done which would diminish the present value of the title, "Pharmaceutical Chemist." To be a member of the Pharmaceutical Society was at present equivalent to that title, and to make such, without examination, all the present chemists and druggists, their assistants and apprentices, who chose, was, he feared, calculated to put the Society in a worse position than it occupied about the year 1852, when chemists actually in business were last admitted, without examination. He thought that every one should be distinguished by his proper title, and protected in respect to the use of that title, and not otherwise. He was sure that the change was proposed in the most liberal spirit, though he thought it impolitic, for the Council of the

Society had always been most ready to receive outsiders on any reasonable proof of fitness. The examinations were conducted in that spirit, and any person might pass them, and any unfit might qualify himself to pass them.

Mr. Shaw remarked that, as Mr. Abraham had stated his opinion on the question of admission to the Pharmaceutical Society, he would merely say that he considered the Council of the Pharmaceutical Society scarcely authorized by the members generally to make the concessions which had been published, more especially with regard to admission to membership.

Mr. H. S. Evans agreed with Mr. Sharp, that the Minor examination was not sufficiently stringent for a qualification, and stated that many candidates came for examination with a lamentable ignorance of the appearance of drugs and of botany. He urged that it was necessary to make concessions, and to reopen the door to existing chemists in order to pass any Bill, and that the Pharmaceutical Society had gone as far as possible in order to attain this end.

The President, Mr. Sumner, proposed a vote of thanks to Mr. Sharp for his paper, which had raised a valuable discussion. He said that the practical must be aimed at, and concessions made. To pass a Bill, Parliament must be shown, first, the necessity for action; secondly, that an educational Bill was what they wanted.

The vote of thanks was passed by acclamation.

LEEDS CHEMISTS' ASSOCIATION.

The sixth meeting of the Session was held in the Library of the Philosophical Society, on the evening of March 13; the President, Mr. Thompson, in the chair.

The following were elected Associates:—Messrs. Buck, Hardman, and Parker.

Mr. Mayfield read the paper of the evening upon "The New French Codex." By a rapid survey of the seventy-five sections in which the formulæ of the work are arranged, he brought before the meeting the more salient points of difference between it and our own pharmacopœia, forcibly exhibiting its much more elaborate character, although its merits in comprehensiveness are so greatly marred by the retention of absurd relics of past ages of credulous polypharmacy. In the discussion which followed the reading of the paper, it was suggested that under the French law requiring certain medicines to be kept by pharmaciens, it must be very difficult to expurgate obsolete remedies for which some demand might exist, and hence new remedies were added without many old ones being withdrawn.

After the thanks of the meeting were offered to Mr. Mayfield, some further arrangements were made in connection with the cabinet for specimens of Materia Medica, projected by the Associates, and to which they reported that many liberal subscriptions had been given.

This concluded the meetings of the present session.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE CULTIVATION OF JALAP.

BY DANIEL HANBURY, F.L.S.

The considerations which render it expedient that the cultivation of Jalap should be attempted in some other country than that in which the plant is indigenous, are the following:

1. The present supply of Jalap is precarious and fluctuating.
2. The drug is often of bad quality even when genuine, owing to the rude method in which the tubers are dried, and frequently to their having been collected while too young and small.
3. The frequent admixture of other roots with the Jalap of commerce.

The cultivation of jalap to be successful must result in producing the drug identical in medicinal activity with that hitherto employed, of uniform good quality, of moderate price, and in sufficient quantity to be noticeable in the market. Experience alone can determine whether all or only some of these desiderata can be attained.

Let us now consider what is the climate and what the soil, of the region in which the jalap-plant (*Exogonium Purga*, Benth.) naturally thrives;—and what the method actually pursued for collecting and preparing the drug for the market. On these subjects the most graphic information that I have met with, is contained in a letter addressed by Dr. Schiede, a German traveller and botanist to Dr. D. F. L. von Schlechtendal; it bears date *Mexico*, 26 *October*, 1829, and was published in the periodical called *Linnæa* the following year. Of this letter, the following is a translation:

> Before I leave Chiconquiaco * I must communicate to you the most interesting facts which I have observed on the occurrence of *Convolvulus Jalapa*, as well as what I have learnt respecting the collection of the root and its preparation for the market. In my last collections from Jalapa, I sent you a large number of flowering specimens, and added a short description of the plant, so that this latter I may here omit.
>
> The herbaceous plant whose tuberous root furnishes the almost indispensable medicine called *Jalap*, does not grow in the immediate vicinity of Jalapa, but several thousand feet higher on the eastern slopes of the Mexican Andes, especially about Chiconquiaco and the neighbouring villages, and also, as I hear, about San Salvador, on the Eastern slope of the Cofre de Perote. The mean altitude at which the plant occurs, may be stated as about 6000 feet. In this region, it rains almost the whole year through. During summer fine clear mornings are commonly succeeded by violent showers in the afternoon; in winter indeed these latter do not occur, but dense mists lie for days and weeks with but few clear intervals, on the mountains as well as on their declivities. The plant prefers shade and is found only in woods where it climbs over trees and bushes. The flowers appear in August and September. The root is dug up during the whole year, but probably that is preferable which is collected before the young shoots appear,—that is to say in March and April. The tubers are sometimes elongated, sometimes round, and always terminate in a rootlet. In the fresh state they are whitish, almost inodorous and full of a viscid juice which has a peculiar acrid taste. When collected, the larger tubers are cut through, but the smaller left entire. As drying them in the sun would probably be impracticable, they are placed in a net and then hung over the almost-constantly burning hearth where by degrees they dry, and by which process they almost always acquire a smoked appearance and somewhat sooty smell. In about ten to fourteen days the *Purga* is dry, and is then taken by the collectors, who are mostly Indians, to Jalapa where it is bought up, and whence it is conveyed by way of Vera Cruz into the markets of Europe.
>
> The Indians of Chiconquiaco are commencing to cultivate the Jalap plant in their gardens. The future will show whether its powers are in any degree impaired by cultivation. Cultivation will afford the advantage that the roots may be collected at the most favourable time of year, which in the thick forests is attended with difficulty. I do not abandon the hope that *Convolvulus Jalapa* may some day be planted in our gardens on a large scale; is not the potatoe a native of a similar region? The plant will scarcely bear the severity of a German winter in the open air, but the spring and autumn frosts will not, I think injure it, for it has to endure the same reduced temperature in its native home.
>
> I now hear that the root has also been exported from Tampico, which shows that it occurs northward of the mountains of Chiconquiaco, perhaps in the Sierra Madre.

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* *Note.* Chiconquiaco is a village situated on the mountain known as the Cofre de Perote, and in the region called by the Mexicans *Tierra fria*.—D. H.

To this account may be added a few lines extracted from a letter received from a valued correspondent of my own in Mexico, to whom I am also indebted for more than a hundred living tubers of the jalap plant.

> "The tubers of Jalap require a deep rich vegetable soil (*débris* of the "leaves of *Pinus*, *Quercus*, *Alnus*, etc.), and as they grow at an elevation "of from 7000 to 10,000 feet above the level of the ocean, they can stand "a good deal of cold and even frost during the night. In the daytime "from 60° to 75° Fahr. is their almost daily warmth. Around Cordova, "the plant will not succeed, the climate being too warm. I would advise "you to plant some of the tubers out in the free air, treating them like "Dahlias, that is to take up the roots in October, and plant them again in "March or April. Although the plants may not flower or ripen seeds, the "tubers will grow in size, and what is more important, will multiply "underground *ad infinitum*. If Jalap-roots so far have failed in Europe, "it is because they have been treated as hothouse plants."

Having these data regarding the climate and soil which are natural to the jalap-plant, we must next consider what regions offer conditions sufficiently similar to render the culture of the plant probably successful. It is plain from the accounts I have quoted that a humid climate having a temperature rising in summer to about 75° F. and sinking in winter to the freezing point, is that which the plant naturally affects; and this is confirmed by the fact that the plant thrives perfectly well in the open air during the summer months, in gardens in the south of England, but that it will not endure unprotected the severe frosts of winter. Whether the great altitude above the sea-level at which it occurs in Mexico, is an indispensable condition for its complete development, is a point on which we have no information.

In Cornwall and in some localities in Devonshire, as well as on the southern side of the Isle of Wight, it is probable the jalap-plant would thrive in the open ground as a garden-plant during the whole year, and it is very desirable that experiments should be made to determine this point. In Madeira it would probably also succeed well if planted in situations sufficiently elevated.

But if it be necessary to select the situation in the British dominions which for climate and elevation above the sea-level presents conditions most nearly resembling those of the jalap yielding region of the Mexican Cordillera, we must, I think, look to some localities in India; and of those that can be named the Neilgherry Hills in the Madras Presidency offer perhaps the greatest combination of advantages for attempting the cultivation of jalap. Not only is there a Government garden at Ootacamund where the plant might in the first instance be cultivated, but there are numerous other localities in the neighbourhood, slightly differing in climate and soil, where experiments might be carried on. To these advantages must be added the fact that Ootacamund is the habitual residence of numerous intelligent Europeans, whose attention has been specially directed, in connexion with Cinchona-culture, to those circumstances of soil, climate, planting etc., on which the successful introduction of a foreign plant is dependent.

There are doubtless other localities in India, as for instance certain regions in the Himalaya, in which the culture of the jalap-plant might advantageously be attempted, but until a supply of the roots is abundant, it will probably be wise to restrict experiments to one spot.

It must not however be supposed that no attempts to cultivate jalap have hitherto been made, though it may be safely asserted that none have resulted in obtaining for the market a better supply of the drug. In Mexico as Schiede relates, the Indians were commencing in 1829, to cultivate the plant in their gardens; and I have been informed by a London druggist that some of the jalap now found in the market is derived from cultivated plants. The late Dr. Royle states that he sent plants obtained from the Royal Horticultural Society and from Dr. Balfour of Edinburgh to the Himalayas, where he hoped they would soon be established.* In 1862 I forwarded to Mr. N. Wilson, Curator of the Botanic Garden, at Bath, Jamaica, a jalap-plant of which he wrote to me in October 1863, that it was growing luxuriantly at an elevation of 2000 feet, and that he had no doubt the plant could be cultivated on the mountains of Jamaica as an article of commerce.

The culture of *Exogonium Purga* Benth. is also being attempted in the south of France by Professor Dr. J. E. Planchon of Montpellier and by M. Gustave Thuret of Antibes, but the summer climate of those localities is so much drier than that of the region in which the jalap plant is indigenous, that success is doubtful. Tubers have also been sent to Madeira.

There is one other point in connexion with this subject upon which we seem to require information, and that is the age at which the jalap tubers can be collected to most advantage. It is well known that the jalap of commerce consists of tubers of all sizes between those weighing a few grains up to such as weigh several ounces;—and that the larger and those which are internally most compact, dry and resinous are preferred.

The adoption of a better method of drying the tubers than that at present pursued will also deserve attention. It is probable that this object will be accomplished by slicing the tubers while fresh, and drying them with the gentle heat of a stove.

NOTE ON THE SUBSTITUTION OF MANGOSTEEN (*GARCINIA MANGOSTANA*) FOR BAEL (*ÆGLE MARMELOS*).

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG.

The scarcity of Bael, indeed the impossibility lately of obtaining it in any quantity in this country, has led to its adulteration with other fruits, and, in some cases, even the entire substitution of these for the genuine drug. The most remarkable of these substitutions, and one which, as far as I know, has been hitherto unnoticed, has lately occurred in the offering at a drug sale of the dried broken rind of the fruit of *Garcinia Mangostana* for Bael. The Mangosteen thus offered consists of irregular fragments of rind (pericarp) without any adhering pulp. The pieces are convex, three, four, or more lines thick, and covered externally by a smooth, deep reddish-brown easily separable epicarp. The inner surface is of a pale reddish-brown or reddish-yellow colour, smooth, marked with projecting vertical lines, and entirely free from adhering pulp and seeds. The texture is compact, and the colour throughout of a uniform deep reddish-brown. The pieces break with difficulty, and present a close fracture. They have no perceptible odour, and but a very slightly astringent taste. Some of the pieces are marked externally by the closely adhering radiating stigmas. These project from the surface, are of a dark colour, and wedge-shaped.

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* *Manual of Mat. Med. and Therap.* ed. 1853, p. 553.

In Birdwood's *Catalogue of the Economic Products of the Presidency of Bombay*, Bombay, 1862, it is stated at p. 57, that *Exogonium Purga* Benth. is "cultivated on account of Government at Hewra." I am however assured that there is some error in this statement and that the plant does not now exist in the Hewra garden.

From the above characters of Mangosteen rind, it will be seen that it may be readily distinguished from Bael, by its much greater thickness; darker colour of its substance and that of its external and internal surface; the entire absence of adhering pulp and seeds; its easily separable epicarp; and in the presence upon some of the pieces of the projecting radiating dark-coloured wedge-shaped stigmas. The latter character, when present, is a very marked one, and will afford at once a ready means of distinguishing Mangosteen from Bael.

I shall probably return to this subject in the next Journal, but at present have only time to call attention to the substitution. In the meantime, if any readers of this note should meet with specimens of Bael of which they are in doubt, I shall be glad to receive a sample for examination.

THE DRUG TRADE.

BY "SCRUTATOR," M.P.S.

A laxity of morals is bad enough in any business, but more especially so in that of a chemist and druggist, or, in modern parlance, "pharmacien."

One would think that if a sense simply of right and wrong were not sufficient to preserve a strict rectitude in a supply of drugs and chemicals, at any rate it would through the emulative spirit developed by the Pharmaceutical Conference.

It would not be too much to expect that some part of the demon avarice would be banished by a great proportion of those who *profess* to furnish the public with pure articles; a demand which the public have a right to expect, when they apply to a respectable tradesman, and give, without demur, whatever price is asked, that is fair.

Perhaps one of the most pitiable sights is, when a chemist condescends to lower the quality of his drugs used in dispensing. A far greater evil is enacted than the mere grasping an extra percentage out of his customers' pocket, for an absolute danger to his patron's health is at any time imminent. The physician is deceived, loses his confidence in the dispenser, and the patient loses his faith in the physician. Two instances may be mentioned out of many that have come before the writer's notice within the last year. One, when a customer called for a quarter of an ounce of laudanum. When asked if he knew the dose, he replied, Oh, yes; he had been in the habit of taking it all for a dose daily for a considerable time. He was warned not to do so in the present instance, the warning was not heeded, and the poor fellow was found two hours afterwards with his head on his desk in a state of stupor. The next case happened with a prescription containing a full dose of Scheele's hydrocyanic acid, which had been taken to a chemist.

The physician was surprised that the expected effect had not been produced, and increased the dose. The prescription was then sent to another chemist, whose acid was of the full strength; the consequence was that the young patient very nearly lost his life. This does not come under the head of *accident*, but may be more properly designated a *greedy* thoughtlessness.

Such occurrences as these, as well as the great discrepancy in the prices charged in dispensing, caused the writer of these few lines to make an analytical examination of many of the articles in common use, when such an unexpected result followed, that he is induced to make public a few of the analyses, not with any vindictive spirit, but with a sincere hope of doing some good, if ever so little. Indeed, the writer believes in many instances the vendor has not any idea of the evil he is committing, or the difference of product, when, as he thinks, he only makes a very slight alteration in a formula, as a more liberal allowance of water in a tincture, or when sp. ammon. comp. is replaced by an ammoniacal "mixture."

It may be said that very likely the samples examined were procured from small shops in an obscure locality; it, however, was not so, for they were obtained without distinction from some doing a large respectable trade, and standing well with their brethren.

The city, too, is a large one, containing more than eighty chemists and druggists and others, dealing life and death to the public, with, it is to be feared, very generally only a regard for a good pocket lining. How can a pharmaceutist expect to have the respect of the medical profession, if the quality of his goods varies so greatly?

The following are results from the examination of four articles only out of many, and taken as they happen to occur in the writer's laboratory note-book:—

Hydrargyrum ammoniatum (Br. Ph.).—In this case a pennyworth was sent for from nineteen different shops. Of these thirteen were grossly adulterated, only six being commercially pure. The quantity in each packet varied from twenty to thirty grains.

No. 1. Hydrargyrum ammoniatum 78·78, carbonate of lead 21·22 per cent. It effervesced strongly with acids, turned yellow with iodide of potassium.

No. 2. Hydrarg. ammon. 95 15, carbonate of lead 4·85 p. c., same reaction as No. 1.

No. 3. Entirely white-lead.

No. 4. Hydrarg. ammon. 65·68, chalk 34·32 p. c.

No. 5. Hydrarg. ammon. 70·02, carbonate of baryta 29·98 p. c.

No. 6. Corrosive sublimate 10·82, white-lead 89·18 p. c.

Nos. 7, 8, 9, 10. All mixtures containing a small quantity of white precipitate, in neither of them exceeding 15 per cent.

Nos. 11, 12, 13. Mixtures containing from 50 to 70 per cent. of ammonio-chloride of mercury.

Sp. Æth. Nitrosi (Br. Ph.).—In every instance a prescription was written as above. It must be remembered that the British Pharmacopœia orders a sp. gr. 843, while the London of 1836 allows only 834.

Twenty samples were obtained, of which only four answered the required tests. All the others either were methylated or diluted in an unwarrantable degree with water. The following are six of the analyses:—

No. 1. Methylated, sp. gr. 848·4, contained a large quantity of aldehyde, slightly acid, yielded 1·21 vol. of nitrous ether.

No. 2. Very similar to last, but very acid, and not so much aldehyde.

No. 3. Sp. gr. 910·5, yielded only 1·12 vol. of nitrous ether, not much aldehyde, contained 25 per cent. of water.

No. 4. Sp. gr. 940, methylated, only $\frac{9}{10}$th of a vol. of nitrous ether; a small quantity of aldehyde, very acid, adulterated with 40 per cent. of water, or $\frac{2}{5}$ths water. The worst sample of all.

No. 5. Sp. gr. 922, very acid; large quantity of aldehyde, only ·75 of a vol. of nitrous ether, adulterated with 33·3 per cent. of water.

No. 6. Sp. gr. 918, large quantity of aldehyde, yielded 1·11 vol. of nitrous ether, adulterated with 25 per cent. of water.

All the above were charged at the rate of 4*d*. and 6*d*. per ounce. Not a bad profit—of more than 600 per cent.

Tinct. Opii (Br. Ph.).—Twenty samples were obtained with a written prescription; ten were sent for from the principal firms, and the others without distinction.

The results showed that only four made the tincture from dried and powdered opium, and possessed the colour of a sample prepared strictly according to the British Pharmacopœia. This opinion was deduced from the quantity of dried extract. The remaining sixteen did not nearly approach the sample specimen in any one quality. The quantity of extract was short, the colour weak, and in sometimes not a trace of spirit to be found!

It seems the general opinion that drying the opium is not of the slightest consequence. Any one who has tested samples of opium must be aware of the great difference in the quantity of water present in different samples, utterly preventing any calculation of putting an extra quantity of the crude drug to make up for loss. Nothing can fairly compensate for the very simple process of drying and coarsely powdering.

The standard tincture before-mentioned, had a very dark brown colour, yielded 21 grains of hard extract per ounce.

For the sake of accuracy a sand bath was prepared, on which the same quantity of all the samples to be tested were evaporated to dryness at the same time, so that the heat should be the same in every one.

The following were analyses of six of the samples:—

Nos. 1, 4, and 5 were from three of the most respectable firms, and 2 and 6 from businesses known as doing a good country trade.

No. 1. Light colour; yielded per ounce 16·88 gr. of extract, and contained 48 per cent. of rectified spirit.

No. 2. Colour very fair; yielded per ounce 14 gr. of extract; contained 36·8 per cent. of *methylated* spirit and *acetic acid.* This firm supplies and refits a large number of ship medicine chests.

No. 3. Colour very light indeed; 12·36 gr. per ounce of extract, 50 per cent. of spirit.

No. 4. Rich dark brown colour; 19·04 gr. of extract per ounce, 60 per cent. of spirit.

No. 5. Colour good; 18·48 gr. of extract per ounce, 50 per cent. of spirit.

No. 6. Blackish-brown colour; 19·87 gr. of extract per ounce. *No spirit* at all in this sample, but evidently made with diluted acetic acid.

Sulphate of Copper.—The samples of this salt, especially those from firms doing much business with farmers, were simply atrocious. A pure sample was not obtainable at all. This, however, is not to be wondered at, when we see the prices advertised in the periodicals. A pure sample ought to contain,—

$$CuSO_4\ 63{\cdot}92,\ HO\ 36{\cdot}08.$$

The test of ammonia and chlorine is now rendered useless, or nearly so; for the adulterant is not sulphate of iron. In many samples sulphates of soda, zinc, etc. were found.

The following were four of the samples out of eight:—No. 1 was sold to a farmer as excellent and genuine. No. 2 and 3 were sold to another as saving them much trouble, by being powdered. No. 4 was recommended as something superior to everything else known for agricultural purposes, and guaranteed to be made from the best blue vitriol!

No. 1.	Oxide of copper	= 15·39
	Oxide of iron	= 6·23
	Oxide of zinc	= 6·71
	Sulphuric acid	= 32·90
	Water	= 38·77
		100·00

This sample of blue vitriol (?) had a lightish blue colour, and quite free from red efflorescence. The analysis would answer nearly to two parts sulphate of copper, and one each of sulphates of iron and zinc.

No. 2.	Oxide of copper	= 17·48
	Soda	= 7·17
	Sulphuric acid	= 26·42
	Water	= 39·85
	Earthy peroxide of iron	= 9·08
		100·00

This was labelled "Superior Mixture for Wheat." It had a tarry flavour, probably from the admixture of a little spirit of tar. The colour was a reddish-brown. It was evidently a mixture of about $1\frac{1}{2}$ part sulphate of copper, one part of Glauber's salts, and coloured with probably a little bole or Venetian red.

No. 3.	Oxide of copper	= 19·70
	Oxide of iron	= 7·98
	Sulphuric acid	= 28·54
	Water	= 36·08
	Earthy colouring matter	= 7·70
		100·00

This was labelled "Extra strong prepared Vitriol," specially recommended as superior to all others. It had a reddish colour, and was coarsely powdered.

No. 4.	Oxide of copper	= 24·01
	Soda	= 4·93
	Sulphuric acid	= 30·16
	Water	= 40·90
		100·00

This was labelled "Powdered Vitriol; no charge for powdering," was a clean, nice-looking, light-blue powder. It consisted of three-fourths sulphate of copper, and one-fourth Glauber's salts.

These are only a few of the articles that have come under the writer's notice, all more or less of which were either very inferior, or else decidedly adulterated.

Perhaps at a future opportunity a few more results may be noticed, if only for the purpose of calling attention to the necessity of having uniform quality and commercial value.

NOTES ON PRESCRIBING.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—In addition to the admirable notes on this subject given by Mr. Hanbury, and corroborated by others of our members, I beg to add a few from my own experience. I first advert to the difficulty often found in deciphering what the prescriber *really means*. When I was an assistant in town some years ago a prescription was brought to be dispensed, but the establishment, consisting of five, could not make it out to their satisfaction. I was deputed to wait upon the doctor for an explanation; for some reason he did not deign that, but thrust the prescription into the fire and wrote another; the inference being that he *could not read his own writing!* I have, since I have been in business, had prescriptions that have not only puzzled myself, but all the medical profession in the town. Is not that abominable, to say the least of it? Again, it sometimes happens that the doctor orders a *particular—private* preparation,—and therefore it is impossible to make up the medicine without obtaining the article from the said house. What is that? I call it medical quackery, or, at all events, annoying; and there is room to surmise the doctor and the chemist understand each other—a matter which is certainly unfair and unprofessional to others.

Further, I would that there was more uniformity in our charges; it is a source of great dissatisfaction often to our customers and ourselves. There is something very petty in dispensing medicine, as many do, without paying themselves for their *time and skill;* and I hope to see a scale of prices in accordance with the medicines prescribed put forward, so that there may in future be more uniformity, or approximation thereto, in our charges as regards mixtures of an ordinary kind, and others composed of nearly all tinctures or concentrated preparations. I think by so doing our business would be more comfortably conducted, and the public more satisfied.

I am, Gentlemen,

Yours respectfully,

April 23, 1867. M. P. S.

THE PROPOSED PHARMACY BILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I am only one of many who have expressed their disapproval of the policy of the Council of the Pharmaceutical Society in the proposed Pharmaceutical legislation. Those who have passed the examinations of the Society, spent their time and money with the object of obtaining a title, which, (as the Council represented) being a guarantee of efficiency, would gain for them a reputation, and raise them to distinction, by enabling them to stand out before the public as fully qualified practitioners in pharmacy. By such representations as these, myself and many others have been induced to brave the trouble and expense of passing these examinations; in some cases the monetary question is rather a serious item: calculating examination and lecture fees, loss and deficiency in salary for a few months, and other necessary expenses, my expenses amounted to about £50. I was most economical in my expenditure, and consider I succeeded at a small cost; some of my fellow-students assure me that it cost them £100, and others £200. But now the Council are turning the cold shoulder to our interests, ignoring our claims, and virtually removing our titles, by making the distinction between the title of the Pharmaceutical Chemist and the supposed new-comers so vague and insignificant, that the public can never be expected to realize nor recognize the difference. Many Pharmaceutical Chemists now inscribe themselves over their doors, and on their labels, "Members of the Pharmaceutical Society," and in the opinion of the public the two will always be inseparably associated. "A Major Associate" correctly states that "they (the public) will naturally imagine that as *Membership* is the highest degree granted by the Society, any man who is a *Member* of the Society is of course a Pharmaceutical Chemist." You may with equal reason admit a man as a member of the Royal College of Surgeons, and not allow him to call himself a surgeon.

I am not a bigoted or prejudiced man, and willingly admit that all accomplished chemists and druggists are not within the pale of the Pharmaceutical Society. There are many well-qualified chemists who have attained respectable positions in the trade, who are connected with the United Society, or are what are termed outsiders, some of whom would even grace the title of Pharmaceutical Chemists. Yet there is a multitude of others (and I say it from observation) who, if druggists, can scarcely be called chemists, as they know as little about chemistry, Materia Medica, and the principles of pharmacy, let alone botany, as they do of the philosopher's stone; who, although well versed in mixing paint and selling ha'porths of castor oil and pennyworths of whiting, etc., would be puzzled to describe the difference between an acid and an alkali, or state the constituents of air or water. And yet the Council propose virtually to place these (if they be willing) on a level with those who have passed all the examinations.

Such a step as the proposed Bill is without controversy not only unfair, but a gross breach of faith, and an act of treachery both to the examined and unexamined members, on the part of the Council of the Pharmaceutical Society; and we have the flattering consolation of being the duped victims of the same. The greater part of those who have passed the examinations have enrolled themselves as Members or Associates of the Society (if I may judge others from myself) from a feeling of attachment to the Society, rather than for the advantages gained thereby, which to a country chemist are very few. If therefore the Council will not attend to the interests of the present Pharmaceutical Chemists, the former cannot expect to receive their continued support, nor need be surprised when the contributions materially fall off—as they assuredly will if the Bill passes in its present state. There will be no encouragement for young men to prepare for the examinations, as any ignoramus may be placed in an equal position, and enjoy the same privileges, if he chooses to apply.

It may rightly be asked, where is the necessity for further legislation at present? Our worthy President, I repeat our worthy President (although now pursuing a mistaken policy) never spake truer words than when he said "They had nothing to gain by opening the doors. They were satisfied to go on prospering as they had done of late, and the agitation out of doors was of more benefit than harm. Never had their numbers kept up as during the past few years; at no time were there so many apprentices on their books, nor were they ever so sanguine as to the future condition of their Institution." This testimony is confirmed by the increasing number of candidates for the various examinations, as all apprentices and assistants who are aspiring to a respectable standing in their profession, are qualifying themselves by passing these examinations; hence the Society would in a short time become all that ambition can desire. Then why not go on prospering until the Society is stronger? If the Bill passes, Pharmaceutical Chemists have nothing to gain, but all to lose, whilst the outsiders will gain everything and lose nothing; then, the reason of the course of the Council is merely to satisfy a few clamorous outsiders, who will not take the trouble honourably to qualify themselves, but seek a royal road to the attainment of their ambition, and have succeeded in inveigling the Council to their assistance. These outsiders never did the Council any good, and probably never will; but, on the contrary, have said bitter things, and tried to do all the harm they could; they were never satisfied, and probably never will be; they have often disagreed amongst themselves, and when the Council has succeeded in getting them into their family, we fear they will find them, or many of them, dissatisfied, wayward, troublesome children. Although the Council has conceded to them almost everything they asked, yet some have the conscience (or rather no conscience) to demand being placed on an equality with the founders; who, to say the least, are all men of acknowledged standing in the trade, which cannot be said of all outsiders; many are men of distinguished ability; and to whose persevering adherence to the Society, sacrificing time, and from fifteen to thirty years' pecuniary support, we owe the existence of the Society.

Some may charge me with holding uncharitable and illiberal views; but I maintain that charity begins at home, and liberality consists not in giving away everything to starve oneself.

In the first article in the last number of this Journal, the writer reminds the members of the meeting held, when they instructed the Council to be liberal with the outsiders. This observation reminds me of a remark in 'Punch' some time ago, to the effect that when the Allies during the Crimean war conceded to the Russians an inch, the latter took the Dardanelles; and it is evident when the members gave the Council the permission alluded to, the former never intended the latter to go to the length they have.

After all, Mr. Editor, the executive of the Pharmaceutical Society will not find us hard dealers if, in the abundance of their liberality to strangers, they will only show a little justice to their old friends, by ceasing to split hairs, and appoint a tangible distinction between the title of Pharmaceutical Chemists and those to be brought in,—one that the public will readily perceive, and cannot fail to recognize and admit. I would propose, as an outsider has suggested, that there be three degrees:—Fellows, Members, and Licentiates. Fellows: the present examined members, and those who shall hereafter pass the Major Examination. Members: the present unexamined members. Licentiates: the future members they hope to have without examination, and to the latter I would grant all the privileges as now agreed upon. Or, if thought preferable, there might be only two degrees; in one of which the two first-named classes might be united as Fellows or Members, and the last as Licentiates. If the Council will do this, I, and many who think with me, may shake hands with that body, and say go on; but if the Council persist in pursuing their present policy intact, our interests will no longer be safe in their hands, and I would recommend the adoption of a proposal made to me, namely, that all the present Members and Associates who feel themselves aggrieved by the conduct of the Council, combine, and protest against it. I have no doubt many gentlemen will be willing to receive the names of such, or an arrangement might soon be made.

In conclusion, Mr. Editor, I hope and believe the Council will reconsider the matter, and deem it both just and wise to regard the interests, and merit the continued support and confidence of their *attested friends*, than trust altogether to the liberality of the new-comers, the prospects of which, at the most, are very uncertain and unsatisfactory. Apologizing for the length of this letter, the insertion of which in your next number I shall be obliged, and beg to subscribe myself,

Yours very truly,
A "P. C." BY EXAMINATION.

April 19th, 1867.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Mr. Mills, in his letter of last month, comments with some severity on the late proceedings of the Pharmaceutical Council, and of those who in relation to the Pharmaceutical Society are termed outsiders. As a member of the trade I have taken part in these negotiations, and finding myself within reach of his scourge, and that he has struck I can appeal to him, in the words of Themistocles, "to listen."

I believe I cull all the argument of his letter under the following heads:—

Injustice to the examined men, to the founders, and to the public.

The effect on the public mind of the unfairness of the Council admitting to the highest honours any one who applies for them, thus creating a want of confidence it will take years to overcome.

The question, where is the necessity for future legislation at present; why throw away what has been already attained, to satisfy a few clamorous outsiders? And money,—or the hardship to those who have spent money to educate themselves.

Before assailing the injustice of others, would it not have been fairer for your correspondent to have assured himself that he was not committing the same delinquency? He calls us a few clamorous outsiders who have been guilty of frustrating all the efforts made by the Society to elevate the status of the trade. He says, "We cannot come into contact with Pharmaceutical Chemists without producing dire consequences, and they are truly shocking to read; the effect on the public mind, it is asserted, cannot fail to be most prejudicial, and a want of confidence will be created which it will take years to overcome," etc. I believe Mr. Mills has not followed very attentively the late march of events; we certainly are not few in number, for we represent the larger proportion of chemists and druggists. Has Mr. Mills read any report of the Manchester meeting,—of the meeting of the trade at the London Coffee House,—and lastly, of our Conference of the 19th of February, at Bloomsbury Square? If he had, or had he read his own Journal of January, he would have seen the proposition he so much objects to, issued by the authority of the Pharmaceutical Council as a basis for consideration; and it would have been more just to state objections at once, than after three months' delay, and when the Bill is printed, to object to its clauses. We are not conscious that we have impressed the Pharmaceutical Council by clamour; we had not intended to do so, and those who have any personal knowledge of our proceedings will smile at this jaunty way of calling us names. Mr. Ince aptly described our bearing at the Conference as respectful and manly, and HE was present on the occasion. Mr. Mills can take my word, if it will save him any time, that in all sections of the trade there is a general feeling of mutual friendship and esteem, the friendship of fellow-tradesmen, and esteem for the high position the Pharmaceutical Society holds. Neither at the public meeting at the London Coffee House, nor on any subsequent occasion, either in public or in the Press, has one unbrotherly word been used by a member of our trade towards the Pharmaceutical Society; the words of strife are aimed at us, and we feel the injustice of the assertion that we "have tried to frustrate all efforts to raise the status of the trade," and such is our debased condition that we—whose existence depends at this present moment on public confidence—cannot but "create a want of confidence in the public mind it will take years to overcome." When we speak of justice to the examined members, to founders, and to the public, we must see Justice as she is, with scales poised to weigh before deciding, and with eyes bandaged to keep out of view purely personal interests. Let us examine the weights for either side of the scale. Here are 4000 chemists and druggists, outsiders, to be legislated for. How are their rights to be reconciled with the fact of a society not their own, having Parliamentary powers to register the trade, to admit all future members, to act as public prosecutors, etc.? Certainly not by treating two-thirds of the trade as aliens to a society in favour of which they break up their own own organization.

A practical proof that legislation is needed, is the continuous Parliamentary efforts of one or both sections of the trade during the last ten years. Four years' separate action of the United and Pharmaceutical Societies has proved how futile is the attempt to obtain any Pharmacy Act that is not acceptable to the great majority of chemists and druggists. It is late indeed for one to raise his voice against legislation. I believe no pharmaceutist who has considered the question is unaware that legislation is necessary to consolidate the foundations of his Society; but, I will admit, legislation of a certain character, *i.e.* a character that will duly recognize the position of the Pharmaceutical Society. This will be justice to the Society, and to its early career; and being justice to the Society, also to the members. Let us see how that object may be attained, and how it will be frustrated. The object can be gained by the adoption of this measure. The Government has intimated a willingness to consider any Bill on which the trade is agreed. Now the result of public meetings and conferences between the Pharmaceutical Council and the outsiders, is the acknowledgment of the right to the title of Pharmaceutical Chemist being restricted to its present holders, and the agreement that future induction to the trade through the Minor and Major Examinations shall be a monopoly for the Pharmaceutical Society, to which is intrusted the registration of the trade, and every authoritative act in connection with it.

What action will lead to another result? viz. to the Government doing what it has before attempted, to initiate a Bill itself, influenced partly by the Pharmaceutical Society, and by the pressure of that machinery that non-pharmaceutists, the majority of the trade, can put in motion? The postponement of legislation. The result must still be a compromise, but a blow will be struck at the Pharmaceutical Society by the introduction in our directing body of a mixed element; for instance, the appointment of Government examiners (an attempt not made for the first time by the House of Commons, in opposition to the claims of the Pharmaceutical Society. Legislation being thus demanded by chemists and druggists, and unity amongst ourselves being necessary to escape Governmental legislation, where is the injustice if we are jealous of the position of the Pharmaceutical Society, in securing to it these privileges? The examined members can never lose the advantages of a higher training for their business; the founders would be rejoiced to see the edifice crowned, or rather to witness the second foundation of their Society, and what injustice can befall the public? Whilst doing justice to the Society by obtaining for it its legitimate influence, are we not doing justice also to the public, by proceeding without further delay to pass a Pharmacy Act that will close our doors to all but qualified dispensers?

I cannot see the consistency of deferring the Pharmacy Act, and talking with such deep concern of the public. Will delay, and a tedious one, in the settlement of this question, benefit the public? What future does Mr. Mills see for us and for the public?—and here he makes a proposition. He says, "Go on prospering at the present rate for a few years longer until the Society is still stronger." What will the Pharmaceutical Society do when it is stronger? So much and no more than it can do at the present time. Then, as now, there will be found an organization outside of the Pharmaceutical Society, that will stand in the way of any exclusive privileges being given to a Society existing only in virtue of a permissive Act of Parliament. Mr. Mills himself speaks of this remote contingency in words that would be synonymous with the "Greek kalends." He says "the end the founders of the Society had in view appears to be gradually approaching;" and he is content with this shadowy vision of what may happen at a distant period. He would mar the combined efforts of pharmaceutists and non-pharmaceutists, to effect now in this session the darling project of Jacob Bell's existence; he would negative the unanimous wish of Chemists and Druggists to recognize the Pharmaceutical Society as the educating, examining, and registering body of the whole trade on conditions which only could command general assent, and are already accepted by the Pharmaceutical Council, and then he taunts us, that *we* have systematically and resolutely tried to frustrate all efforts to raise the status of the trade, and are creating a want of confidence it will take years to overcome. Mr. Mills may well say, in apologizing, that his views will be considered illiberal. We consider them illiberal and unwise. We need no justification for our wishes. The Pharmaceutical Society has attained much, we wish it may attain more, nay, the allegiance of every chemist and druggist in the kingdom.

The next point is the unfairness shown by the Council in admitting to the highest honours any one who thinks proper to apply for them. As in any consolidation of the trade no member can be ostracized from a society under whose ægis, if wisdom indeed handles it, the trade reposes, this must apply to election on the Council. I believe very exaggerated notions exist in the minds of some Chemists as to the number of outsiders who will support, by money payment, the Pharmaceutical Society, and thus become members. They can only sit on the Council in the proportion of one-third; I believe they will not number one-tenth. From the opportunities I have had of reckoning on this point, I can assert that 500, at the utmost, will be the number. It may scarcely be invidious to add that they will be our best men, appreciate the advantages of business attainments, and with them the possession of well-known names in pharmacy will be as powerful as at present for election to the Council.

This advantage of membership, to be claimed only for a limited period, say two years, will be for practical purposes a compliment paid to non-pharmaceutists. Mr. Mills calculates on a much smaller number, as he intimates, that if only the non-contents should retire, the outsiders will not enter in numbers sufficient to replace them.

The last objection is a money objection. I will not do Mr. Mills the unkindness to attach much importance to this. The outlay of money is to be considered with reference to the return it produces, and if Mr. Mills has expended £20, he has value received in the knowledge he has gained, to more efficiently, and therefore profitably, pursue his calling,—in fact he has educated himself for his business, and he could not feel flattered by being ticketed or classed merely as a man whose education had cost so much money. Many men outside the Pharmaceutical Society have spent more money to learn their business than many Pharmaceutical Chemists. Provided his health is fully restored, I must lay myself open to the charge of withholding my condolence from a man who has fallen into a severe illness through excessive study. Here again the fruits of study, as of virtue, ever reward its votary. I can picture to myself your correspondent restored to health. With a mind tutored to think by the study of mathematics, he has the enjoyment of the treasures of German and French literature: the advantage of reading Télémaque only, in Fénelon's courtly style, must have paid much off the debt.

I cannot see Mr. Mills really begrudging fellow-membership to some fellow-tradesmen when he can and they cannot revel in the classics. Is it nothing that the result of excessive study has familiarized his memory with the poetry of Homer, the military tactics of Xenophon, and the fervid eloquence of Demosthenes? He can, and but too many of us cannot, delight in the elegant Latinity of Cicero, the orations in Livy, the exuberance of Ovid, the terseness of Tacitus, the irony of Juvenal; he can drink deep in the stream of the silvery cadence of Virgil's hexameters. These delights we don't envy him the possession of, they are the fair property of those who strive to attain them; but Mr. Mills must be content with the gifts of such culture of mind that a high education only can bestow, and he must not place the means to this end in a position they cannot consistently occupy, viz. where they will form an impediment to the union of Chemists and Druggists by a Pharmacy Act.

For myself, I am independent of any Pharmacy Act to become a Pharmaceutical Chemist, and having nothing personally to gain, I am in this respect on a level with your correspondent; but I have looked beyond my own interests, and I have faith that the judgment and patriotism of Pharmaceutical Chemists will place far above some slight personal distinction they may now have, that for which their Society was established,—the incorporation of the trade, and the elevation of the status of Pharmacy in this country. The golden opportunity of presenting a Bill to effect this, is now in their hands. No voice, save their own, will decry it. The trade are wishing the Bill "God speed," and confidently awaiting to see among the members of the Pharmaceutical Society that spirit of compromise, the legitimate and honourable offspring of self-negation, which has animated the outsiders throughout these negotiations. They have placed the Pharmaceutical Society in the van to do for every chemist and druggist what the great majority desire, and on the Pharmaceutical Society they throw the responsibility of failure.

I remain, truly yours,

S. C. Betty,

Member of the Executive Committee of Chemists and Druggists.

1, *Park Street, Gloster Gate,*
Regent's Park, London.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I have just read the article in this month's Journal on "Pharmaceutical Legislation." I cannot but think that the Council, in their desire to "act liberally to outsiders," have altogether sacrificed the interests of those whom it was their especial duty to protect.

The case, as I view it, is this. Members of the Society have paid heavy fees, have subscribed annually to the Society, and, in many cases, have passed a scientific examination, on the express understanding that, in return, they were to receive a distinctive title, marking them out to the public as men peculiarly qualified for their profession. Now, however, the Council propose to destroy this distinction entirely, and to do so without supplying its place by any pecuniary or professional equivalent; and when those who have thus worked hard and paid money to obtain a position, seek for some justification of this extraordinary proceeding, the reply is, that "the Council were instructed to act liberally to outsiders." Unquestionably they were; and, in like manner, we are all of us instructed to "do good to them that despitefully use us," but the man who should carry out this precept with such generous ardour as to neglect to "provide for those of his own house," would "deny the faith."

It will be replied, that I am proceeding on a false assumption, and that the distinction is not removed, that "the one title protected by law, and becoming understood by the public, is that of Pharmaceutical Chemist," and that this protection will continue to exist. Granted; but the practical question is, "Does not the Council propose to give to all who may be willing to pay a guinea a year, a title which the public will take to mean quite as much, or even more, than the protected title of 'Pharmaceutical Chemist'?" We must not suppose the public, or even medical men, to have an intimate acquaintance with the latest editions of our "bye-laws and regulations." In their estimate of the value of a diploma, they will be guided by general principles of analogy.

It will be assumed that the Pharmaceutical Society has a public reputation as an examining body, that it stands in a similar relation to chemists as the

Colleges of Physicians and Surgeons or the Society of Apothecaries stand to medical men, giving to those who may pass its examinations a certain legal title and *status*. Now, what is the corresponding title given by these analogous institutions? It is that of Fellow, Member, or Licentiate, denoting that the recipient has been taken into association with the Society, having previously been found by examination to be fitted for that position; hence, although we may be in doubt as to the real qualifications of a man who simply styles himself "surgeon," or "consulting surgeon," yet when we know that he is a "Member" of the College, we are at once satisfied that he is a legally qualified man, and, reasoning from analogy, the public and medical men also, will conclude that the man who is a "Member" of the Pharmaceutical Society, holds an equally good, or probably a superior position to the Pharmaceutical Chemist.

The existing regulations of the medical examining Boards and of the Pharmaceutical Society itself, would warrant this conclusion. What then becomes of the distinctive title "Pharmaceutical Chemist"? Practically, though not legally, the distinction is annulled, and a higher and better appreciated title may be had by any druggist who chooses to register, and pay a guinea a year.

It is clear that the examined members and founders of the Society are entitled to more consideration than the present proposals contemplate. What would medical men think, if the Society of Apothecaries were to admit unexamined men as "Licentiates" or "Members," on the simple conditions that they were to subscribe yearly, and were not to style themselves Apothecaries, but only "Licentiates" or "Members of the Society of Apothecaries," and "Registered Medical Practitioners"? The whole of the examined men would rise in one body to protest against such an unjust confusion of tit es.

I know that the Council have many difficulties to encounter, and that for any Bill to have a chance of passing, there must be concessions on both sides. I would suggest, that all who are now members of the Society shall, after the passing of the proposed Bill, be designated Fellows, and shall retain their connection with the Society on payment of an annual subscription of half a guinea instead of a guinea. If it be found impossible to confer both these privileges, then at least one of them should be granted.

I would further suggest, with regard to those who may qualify after the passing of the Bill, that as those who pass the Minor examination will be eligible for election as Members, that those who pass the Major examination should be eligible for election as Fellows. I fear that unless this marked distinction is made, there will be very few who will take the trouble and bear the expense of qualifying as "Pharmaceutical Chemists."

I am, Sir, your obedient servant,

An Examined Member.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Now that so much is being said and done with regard to a Pharmacy Bill, it behoves those interested to bestir themselves to a right understanding of what is proposed. That a reform is needed no one will deny; that such reform cannot be obtained but by the authority of law, all will admit. This being the case, the object should be to pass a good Bill, one to benefit all and hurt none.

Does the proposed Bill benefit all? It may benefit many, but it will be to the injury of others—the members of the Pharmaceutical Society. Whatever faults it may have in detail, the twentieth clause is the one which stands pre-eminent. I feel sure the majority of the members of the Pharmaceutical Society will bear me out in saying that it is a most flagrant injustice.

1st. To the founders, who, having worked so nobly, and having paid their money for so many years, naturally expected to see some fruit from their labour, but as they get older, instead of seeing the stream of improvement become clearer and clearer, growing gradually in strength, they will see it certainly stronger, but polluted with the most ignorant members of the trade.

2nd. In 1852 a great cry was made; the druggists were at least permitted, if not asked, to join the ranks of the Pharmaceutical Society, with the express understanding that they were to enjoy the privileges of membership, and that, after the passing of the Act, no one should be admitted but by examination; many joined, and have paid their guineas ever since, and now others are to be let in. Is it not a breach of faith to these, after the hopes held out to them?

3rd. To the examined members. Here I can speak from experience; for more than nine years previous to going up, I was a constant reader of the Journal; during that time I tutored myself in believing, that the Society would be closed against all comers, unless their competency was proved. Having passed the ordeal of examination, what has it cost me? Many years of hard study, and £50 in direct expenses. The examined only can realize the work of study, with the privations it entails; but being encouraged with an assurance that theirs would be a rich reward, worked on and gained this reward, which is certainly sufficient, if it be not violated.

Now, what is the use of the title but as a means of enabling the public to select a qualified man? and what good would a man get by passing the examination and not using the title? In face of all this, men of no standing may be allowed to put over their doors "Members of the Pharmaceutical Society," thus palming themselves off before the public as equal to those who have passed. The difference between "Pharmaceutical Chemist" and "Member of the Pharmaceutical Society" is quite plausible in theory, but not in practice; the public will not, in fact cannot, be taught the difference.

The agitators for this Bill talk of admitting those only who have a claim. Now, the only claim which I think admissible is that of competency; and if they be competent, why not show their names in the pass lists? and if they cannot do so, have they a right to usurp the hard-gained privileges of others? They talk of vested interests, and wish to protect theirs; then why not let us have ours?

Of course our opponents in this matter will take no notice of what we may say; the only hope of any protection must be from our own exertions. This being the case, let the examined members (and those who think with them) call meetings, and adopt such measures as will tend to prevent the title of membership being given to any but examined men. Deputations have been sent from the United Society of Chemists and Druggists, and from druggists belonging to no body, to Bloomsbury Square; then let a deputation go from us, and if we fail there let Parliament be petitioned. Hoping you will insert this in the Journal,

I am, yours truly,

Audi Alteram Partem.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—Would it not be possible to get a clause put into the Bill to regulate the sale of poisons, and authorizing Pharmaceutical and Registered Chemists to sell any medicines whose composition is generally known and no exclusive proprietorship claimed, recommending the same by printed labels or handbills, for the cure and relief of any disease, malady, ailment, or affection for which they are known or supposed to be useful, without the same being liable to the stamp duty? Why should we not have the same privilege as other traders of making known to the public the uses and advantages of the articles we sell by handbills and advertisements without a stamp duty being imposed, and also mulcted in penalties of from two to ten pounds by Her Majesty's Honourable Commissioners of Inland Revenue, in a way and to an extent the Legislature never could have contemplated, annoying and most injurious to the trade, and degrading and disgraceful to the Government of the country?

As I understand it is intended to call a general meeting shortly for another purpose, this subject might be taken into consideration at the same time if notice is given, and if not thought desirable to insert a clause in the Bill, immediate steps should be taken by petitions and other means for the removal of so intolerable a grievance.

You will oblige me in calling the attention of the members of the Society and the trade generally, to the subject, by the insertion of this in the Journal for next month.

Yours respectfully,
JOHN P. BOYCE.

Chertsey, April 17, 1867.

THE AMENDED PHARMACY BILL, 1867.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—We understand that a circular has been forwarded to some of our examined members, urging them to sign a requisition to the Council to convene a Special Meeting for the purpose of opposing that clause of the new Bill by which "*chemists and druggists in business at the time of the passing of the Act are made eligible for admission as Members of the Society under the byelaws thereof*," but are NOT to use the title of Pharmaceutical Chemist. The circular professes to represent the examined members, as indignant at what is considered the injustice which will be done them if this Act become law.

We, the undersigned Members of the Pharmaceutical Society, Pharmaceutical Chemists by examination, beg to protest against the views enunciated in this circular, and to express our cordial approval of the liberal policy adopted by the Council towards all chemists and druggists. Considering the difficulties that have hitherto existed in the matter of trade legislation, we believe the Bill framed by the Council to be the best compromise that could have been effected under the circumstances. We feel convinced that the sincere desire of the vast majority of our members, whether examined or not, is to consummate the wishes of the founder, and to fulfil the object he had in view when the Society was formed, namely *the amalgamation of the whole trade, and the compulsory examination of all persons entering it after a given time.*

Our firm belief is, that this Bill will effectually accomplish both these objects, and we trust the Council will spare no effort to pass it into law at the earliest possible opportunity.

We are, Sir, yours respectfully,

CHARLES BOORNE, *Bristol.*	JOSEPH INCE, *London.*
JOHN BOUCHER, *Bristol.*	JOHN MAYFIELD, *Leeds.*
ISAIAH BOURDAS, JUN., *London.*	C. R. QUILLER, *London.*
W. H. BELL, *London.*	RICHARD REYNOLDS, *Leeds.*
H. B. BRADY, *Newcastle.*	J. ROBBINS, *London.*
MICHAEL CARTEIGHE, *London.*	G. F. SCHACHT, *Clifton.*
ROBERT ELLIOTT, *Gateshead.*	WILLIAM SMEETON, *Leeds.*
H. S. EVANS, *Liverpool.*	C. SYMES, *Birkenhead.*
SAMUEL GALE, *London.*	FREDERICK TIBBS, *London.*
R. W. GILES, *Clifton.*	CHARLES UMNEY, *London.*
W. H. HOLROYD, *London.*	ALFRED UTLEY, *Liverpool.*
WALTER HOLGATE, *Liverpool.*	EDWIN B. VIZER, *London.*

THE PAST AND THE FUTURE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Now that there seems every probability of a more perfect union amongst all classes of Chemists, Pharmaceutists, and Druggists, which, it is to be hoped, will result in a more comprehensive scheme of self-government and inherent power, it may not be amiss to fairly examine the questions, "Why has the Pharmaceutical Society hitherto failed to draw within its fold the bulk and majority of those practising pharmacy?" How comes it, that so few (about 2000) amongst us are members, when so many are, even now, after frequent concessions at different times, "outsiders"?

It may be said, that the better class of Chemists *have* joined the Society, and this, to a certain extent is, doubtless, true; yet there are many highly educated men who still hold aloof from us, and so long as this is so, the Pharmaceutical Society cannot hope to make any very decided progress. In short, the Society has not been satisfactorily successful on the voluntary principle, and compulsory measures can only be taken with the assistance of non society men.

So far as I can understand the matter, and looking at it in a broad light, there are two reasons why this is so.

1. The failure, on the part of the public, to understand and appreciate the value of the title "Member of the Pharmaceutical Society."

2. The failure, on the part of the Chemist, to find any perceptible or real advantage, either to his position or business, from the use of the title.

With regard to the first of these reasons—it is an indisputable fact that the public, as a body, do not attach any particular value to the words, "Member of the Pharmaceutical Society." Here and there we find one who partially understands it, but even this one thinks it somewhat strange that in many towns the leading chemists do not possess this distinction, and, naturally enough, at once assumes there can be very little meaning in it. The general public have a very hazy notion of the Society: some imagine it to be (as the word *Society* implies) a sort of brotherhood, or free-and-easy club, with a subscription of a guinea or so a year, and an annual dinner; others, again, imagine it to be a species of trades-union, possibly to keep up retail prices, and keep down the salaries of assistants, etc., and other cognate matters—*ergo*, a society to be avoided at all hazards; but few, very few, have the least glimmering of the pride and ambition that cheers the heart of the true pharmaceutist.

The second reason may be regarded merely as a consequent, or corollary, of the first—inasmuch as, if the first be true, the second must inevitably follow; for it is hardly possible to suppose the public really to appreciate the value of the Society without supporting its members; but if they have no appreciation, then the Society man has no advantage over the non-Society man, and this, to a great extent, explains why so many are still "outsiders." The proposed "additions to and amendments of" the Pharmacy Act, epitomized in the Journal for April last, do not remove the difficulty, but, on the contrary, will render confusion more confounded. A member of the Society has hitherto been always a Pharmaceutical Chemist, and now we are to have Chemists and Druggists members also; this advances the latter at the expense of the former, for any advantage that can accrue to the fact of membership, will be held by both *equally*. Is this right or fair to those who have already passed their examination and paid the fees?

The Council have undoubtedly done wisely and well in making the concessions they have. It has been evident for some time past that, as a body, we are losing our status, or rather, not progressing with the age, and progress can only be secured by a united effort. If the concessions now made have "removed the differences which prevented success in 1865"—and that no opposition will be offered to the future Bill by any section of the trade—then the Parliamentary Committee should be authorized to frame the Bill on a broader basis, and give a distinct and definite title to those who are already Pharmaceutical Chemists, and another to those about to be admitted, and at the same time both should be titles that could be easily and readily understood by any one unconnected with the Society, *i. e.* by the public.

In order to do this satisfactorily, I would propose (and earnestly urge its acceptance by all concerned) to strike out the name "Society," and let it be called in future The (Royal?) College of Pharmaceutists; let all present Pharmaceutists be called Fellows (F. C. Ph.), and those about to be admitted without examination be called Members (M. C. Ph.). After this the examination for F. C. Ph. should be gradually made very severe, so as to become in a few years a degree of real merit and worth, the examination for ordinary members to be pretty much as at present.

We have a College of Physicians, a College of Surgeons, a College of Dentists, a College of Veterinary Surgeons—why not a College of Pharmaceutists? But beyond all this, the idea of "College" is so very much preferable to that of "Society." There is something of real worth in the very word, which all the world knows and appreciates. Depend upon it, that if this be not done now, we shall be compelled to advance to it in another ten years or so, and it would be just as well to save these ten years, when so very favourable an opportunity now presents itself, for obtaining all reasonable requirements and demands.

EDWARD SMITH.

8, *The Strand, Torquay, April* 12, 1867.

COMPULSORY EXAMINATIONS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As the question of "compulsory examination" seems still to occupy the attention of chemists and druggists in England, perhaps a few remarks on the "mode of doing things" in this colony may be interesting to some of your readers. There are in this town, and, in fact, all over the country, an over-abundance of druggists. In Cape Town alone there are over twenty. It is one satisfaction to know, however, that all those engaged in this business are competent men, and thoroughly acquainted with their profession.

This is owing to the fact that the Government will allow no one whatever to deal in drugs, etc., without passing an examination before a medical board appointed by the Governor. Any person, however, who can produce evidence of having passed the Minor or Major Examinations is exempt from such an ordeal. The "medical board" expects the candidate to have a proficient knowledge of Materia Medica, Pharmacy, Botany, and Chemistry, etc., and the examination altogether is quite as stringent as the "Minor."

Thus, all over the country, men that sell medicines are men who know the difference between Epsom salts and oxalic acid; consequently fewer blunders (comparatively) are made here than in England.

I am, Sir, yours, etc.,

Cape Town, Cape of Good Hope. J. WILKINSON.

A BILL 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, or for the compounding the prescriptions of duly qualified medical practitioners, and commonly 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, entitled 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:

Persons selling Poisons or compounding prescriptions to be qualified.

1. From and after the 31st day of December, 1867, it shall be unlawful for any person to keep open shop for retailing, dispensing, or compounding poisons, or for compounding the prescriptions of duly qualified medical practitioners, or to assume or use the title "Chemist and Druggist" or 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.

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 Registrar hereinafter named shall submit such resolution to the Medical Council, and if the Medical Council shall resolve that such resolution ought to be confirmed, the said Registrar shall then submit the same for the approval of one of Her Majesty's Principal Secretaries of State, and if such approval shall be given, then such resolution, confirmation, 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.

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 heretofore, 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 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.

Apprentices and Assistants to be registered.

4. Any person who, for two years prior to the time of passing this Act, shall have been apprenticed to, or who, at the time of the passing of this Act, shall be of full age and shall have been actually engaged and employed in dispensing and compounding prescriptions, as assistant to any Pharmaceutical Chemist, or any such Chemist and Druggist as defined by Clause 3 hereof, may, on transmitting to the Registrar, before the 31st day of December, 1868, certificates, according to the Schedules D and E to this Act, be registered under this Act.

Chemists and Druggists in business may be registered.

5. Such of the Chemists and Druggists, defined by Clause 3, as may, on or before the 31st day of December, 1868, by notice in writing, signed by them, and given to the Registrar, request to be registered under this Act, shall, on production of certificates according to the Schedules C and D to this Act, be registered accordingly.

Examiners under Pharmacy Act to be the Examiners under this Act.—Certificate of competent skill, etc.

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 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, with the approbation of one of Her Majesty's Principal Secretaries of State.

Application of fees to purpose of Pharmaceutical Society.

7. Such fees shall be payable upon every such examination and registration as aforesaid, as shall from time to time be fixed and determined by any Bye-Law, to be made in accordance with the Pharmacy Act, with the approbation of one of Her Majesty's Principal Secretaries of State, 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 Pharmaceutical Society to make orders for regulating register to be kept.

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.

Duty of Registrar to

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, and if no answer shall be returned to such letter within the period of six months from the sending of the letter, 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.

make and keep register.

11. Every Registrar of Deaths in the United Kingdom, 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 may charge the cost of such certificate and transmission as an expense of his office, and on the receipt of such certificate, the said Registrar shall erase the name of such deceased Pharmaceutical Chemist, or Chemist and Druggist, from the register.

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

12. No name shall be entered in the register, 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 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.

Annual register to be published and be evidence.

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

Penalty on wilful falsification of register, or for obtaining registration by false representation. 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. 15. Any person keeping an open shop for the retailing, dispensing, or compounding poisons, or for compounding the prescriptions of duly qualified medical practitioners, or who shall take, use, or exhibit the name or title of Chemist and Druggist or Chemist or Druggist, not being a duly qualified Pharmaceutical Chemist or a 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, shall, for every such offence, be liable to pay a penalty or sum of £5, and the same may be sued for and recovered in the manner provided by the Pharmacy Act for the recovery of penalties under that Act, and shall be dealt with as the Commissioners of Her Majesty's Treasury shall direct.

Reserving rights of certain persons. 16. Nothing hereinbefore contained shall extend to 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 to retail dealers in the ordinary course of wholesale dealing nor with the retailing of poisons for use in manufactures or photography; 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 resident on the premises whereon the business shall be actually carried on, 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.

Poisons to be distinctly labelled. Penalty on omissions. 17. It shall not be lawful to sell, give, or deliver any poison, either wholesale or by retail, or in a solid or liquid state, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the word poison, and with the name and address of the seller, giver, or deliverer of the poison, and any seller, giver, or deliverer of any poison not so distinctly labelled, 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 offence, and for the purposes of this clause the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller.

Registered persons exempt from Juries. 18. All persons registered under this Act shall be exempt from service on juries.

Chemists and Druggists eligible for election as Members 19. Every person who is or has been, or shall for the time being be 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.

of Pharmaceutical Society.

20. 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 by highway or road from the General Post-Office in St. Martin's-le-Grand.

Council of Pharmaceutical Society.

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. This Act may be cited as the Pharmacy Act, 1867.

SCHEDULE A.

Arsenic, and its preparations.
Oxalic Acid.
Prussic Acid.
Chloroform.
Cyanides of Potassium and Mercury.
Strychnine, and all poisonous vegetable alkaloids and their salts.

Aconite, and its preparations.
Opium, its Extract, and Laudanum.
Emetic Tartar.
Corrosive Sublimate.
Nitrates of Mercury, and Red and White Precipitate.
Belladonna and its preparations.
Essential Oil of Almonds, unless deprived of its Prussic Acid.
Cantharides.
Savin and its Oil.

SCHEDULE B.

Name.	Residence.	Qualification.
A. B.	Oxford Street, London.	In business prior to Pharmacy Act, 1867.
C. D.	George Street, Edinburgh.	Examined and certified.
E. F.	Cheapside, London.	Apprentice or Assistant prior to Pharmacy Act, 1867.

SCHEDULE C.

Declaration by a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1867.

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 respecting a person who was in business as a Chemist and Druggist in Great Britain before the Pharmacy Act, 1867.

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, and that to my knowledge , residing at , in the county of , was in business as a Chemist and Druggist, and 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.

To the Registrar of the Pharmaceutical Society of Great Britain.

We hereby declare that the undersigned , residing at , in the county of , had before the passing of the Pharmacy Act, 1867, been employed as an Assistant to a Pharmaceutical Chemist or Chemist and Druggist, and attained the age of twenty-one years.

As witness our hands, this day of , 186 .

A. B., Assistant.
C. D., Pharmaceutical Chemist.
E. F., Chemist and Druggist.

NATURAL HISTORY SOCIETY'S CONVERSAZIONE, MONTREAL.

We are glad to see that at the annual Conversazione of this Society, our valued friend Dr. J Baker Edwards delivered an address, illustrated by beautiful experiments, on "The Relations of Force." Force he showed to be mechanical, chemical, electric, etc.; and these to be generally associated in action in a series of cause and effect, as well as convertible the one into the other. This, with the illustrations by means of scientific apparatus, was decidedly one of the most interesting portions of the evening's proceedings, and showed the complex and beautiful proportions of nature. The radiance of the sun, said he, is not simple light, but may be compared to the fragance from a thousand flowers, or the harmony of an orchestra. It is itself one of the great harmonies of nature. It is radiant force.

REVIEWS.

PHARMAZEUTISCHE WAARENKUNDE, von Dr. OTTO BERG, Professor an der Universität zu Berlin. Berlin, 1863. 8vo. pp. 684.

HANDBUCH DER PHARMACOGNOSIE, von Dr. A. WIGGERS, Professor zu Göttingen. 5te Auflage. Göttingen, 1864. 8vo. pp. 779.

HANDBUCH DER PHARMACOGNOSIE DES PFLANZEN- UND THIERREICHS nach dem neuesten Standpunkt bearbeitet, von Prof. Dr. HENKEL in Tübingen. Tübingen, 1867. 8vo. pp. 629.

LEHRBUCH DER PHARMAKOGNOSIE DES PFLANZENREICHES, oder Naturgeschichte der wichtigern Arzneistoffe vegetabilischen Ursprunges, für Pharmaceuten, Mediciner und Chemiker, von Dr. F. A. FLÜCKIGER, Docent an der Universität in Bern. Berlin, 1867. 8vo. 1 Lieferung, pp. 128.

Since the publication of Pereira's 'Elements of Materia Medica and Therapeutics,' the last volume of which completed by the author bears date 1850, no comprehensive work on the same subject has appeared in the English language. The last edition of that work is an abridgment, from which are omitted those drugs which find no place in the British Pharmacopœia. This is a disadvantage to the student who has to gather from other authors the information he would possess regarding many of the substances with which, as a future druggist, he ought to become acquainted. The original edition of Pereira's work was, however, by no means perfectly suited to the wants of the pharmaceutist, for so large an amount of space was devoted to discussing the effects of drugs on man and the lower animals (a subject which the druggist is not called to study) that it became both unwieldy and costly.

Yet a comprehensive work descriptive of all the drugs in which the pharmaceutist has to deal is very essential. Students at the present day are too apt to regard with indifference as objects of study those drugs which are not included in the pharmacopœia, forgetting that the well-educated pharmaceutist ought to be thoroughly conversant with the history of every pharmaceutical substance found in commerce, and that the term *officinal* has by no means the limited signification sometimes imposed upon it, but that it properly belongs to those plants which furnish any product to the druggist's shop.

We have been led to these remarks in considering the very excellent and comprehensive works on Materia Medica which are at the disposal of the German student. Of these we have selected four whose titles are placed at the head of this article, but it would have been easy to mention several others emanating from authors scarcely less distinguished than those whose names appear in connexion with the works in question. Though written with the same object,—that of furnishing the druggist with a history of the different substances in which he trades, these works are by no means similar in style and form, that of the late Professor Berg departing the most widely from the customary arrangement.

The plan Dr. Berg has adopted is an analytical method carried out to its extreme length, and often and necessarily made to depend on characters that are doubtful, or very difficult of observation. In proof of this, let any one turn to the chapter on sarsaparilla and observe the manner in which differential microscopic characters are proposed for the various sorts of that drug. We will not weary our readers by following our author through his laborious but unprofitable details. Suffice it to say that the student having discovered that sarsaparilla must be placed among the *true roots* and *rhizomes with roots*, and that it is not a rootless rhizome, or a tuber, or a bulb, or a bulbil, or a bud, has next to trace it to the division of *monocotyledonous roots*, among which it falls into its place as having *bark compact, amylaceous, or horny*. This is only to prove that the root is sarsaparilla. The characters derived from the form of the cells of the nucleus sheath proposed by Schleiden years ago, are here amplified to the extent of being made to offer distinctive characters for all the eleven varieties of sarsaparilla with which Dr. Berg was acquainted. We need hardly say that in our opinion these alleged distinctive characters have practically no real existence, though the author may doubtless have possessed single specimens in which he observed them.

The analytical method adopted by Dr. Berg leads to some strange grouping. Thus Colchicum Seeds, Nux Vomica, and Coffee, are arranged together, because they are seeds having a horny albumen. What student, what druggist, would think for one moment of endeavouring to ascertain that nux vomica was nux vomica, by means of Dr. Berg's elaborate and ingenious tabular analysis of *seeds, parts of seeds, and spores?* But, however unpractically arranged Dr. Berg's work may appear to the English reader, it is hardly possible to say too much in praise of the accurate and laborious study of which it gives evidence. Nor is this work the only proof we have of Dr. Berg's services in the field of pharmacological research. The beautiful series of illustrations of medicinal plants published in conjunction with Mr. C. F. Schmidt of Berlin, and the Anatomical Atlas of Drugs recently noticed in the pages of this Journal, by Mr. Brady, establish claims to our grateful remembrance of the late professor.

The natural arrangement adopted in Professor Wiggers' comprehensive and well-digested treatise is in accordance with that usually followed in this country. One section is devoted to Materia Medica derived from the animal kingdom.

Although not classified in botanical order, Professor Henkel's Handbook is of a far more practical character than that of Dr. Berg. Taking exception in some judicious observations in his preface to the unnecessary minuteness with which some recent pharmaceutical writers have described microscopic characters of no practical importance, Professor Henkel remarks that although the apothecary must be fully *au fait* with the use of the microscope, so as to be able to examine with it any substance that may come under his notice, it is his (Professor H.'s) opinion that anatomical characters are of value to the pharmaceutist only in so far as they afford means of determining the genuineness and good quality of any drug in which they can be observed. Microscopical examination, he thinks, is of practical value as supporting and confirming pharmacological diagnosis; and description of minute structural characters for their own sake, is not only superfluous, but an actual waste of time which would be better devoted to other subjects. The microscopical characters of Rhubarb observes Dr. H., afford no information as to quality at all comparable in value to the simple tests of odour and appearance which the fractured drug presents to notice.

In looking through the pages of Dr. Henkel's Handbook, there is abundant evidence that the materials scattered through the pharmaceutical journals of Europe have been carefully studied—and it is in this character that is to be found the great difference between German works on Materia Medica and those which have of late appeared in this country.

Of Dr. Flückiger's work, of which the first part only has appeared, we can speak with much satisfaction, our only regret being that it is in German instead of in English. Neither it nor the other works we have reviewed say anything as to the medicinal properties of drugs nor do they enumerate or describe the pharmaceutical preparations into which each drug enters. In fact they are purely pharmacological, in this character approaching more nearly those of the older writers on drugs, such as Pomet, Dale, Geoffroy, Alston, Hill, etc., than to those modern works designed to meet the wants of two classes of readers, the medical and pharmaceutical.

BOOKS RECEIVED.

On the Use of Chlorine in the Treatment of Asiatic Cholera and Choleraic Diarrhœa. By William M. Dobie, M.D. Edin.

In this pamphlet Dr. Dobie narrates the results of his experience of the value of chlorine as a remedy for cholera in the recent epidemic at Chester. The experience thus gained by him certainly calls for its more extended use, in order that the true value of chlorine in cholera may be properly tested.

Chemistry, Inorganic and Organic, with Experiments and a Comparison of Equivalent and Molecular Formulæ. By Charles Loudon Bloxam, Professor of Practical Chemistry in King's College, London, etc. etc. London: John Churchill and Sons, New Burlington Street. 1867. Pp. 676.

The Poisons of the Spreading Diseases. By Benjamin W. Richardson, M.A., M.D., etc. London: John Churchill and Sons, New Burlington Street. 1867. (Pamphlet.)

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.

G. P. (Portsmouth).—"Watch-maker's oil." Olive oil from which the stearine has been separated by freezing.

X. I. T. (Bishopwearmouth).—"Chlorodyne." The composition of this remedy has not been made public, but the formulæ for several imitations have been published. See Pharm. Journ. Vol. III. (2nd. Series) p. 584; also Squire's 'Companion to the British Pharmacopœia.'

"*Glycerine and Lime Cream.*"—A correspondent, J. C. H., sends the following formula:—

℞ Ol. Amygd. Dulc. f ℥xvj
Aq. Calcis f ℥viij
Tinct. Cantharidis f ℥j.

Mix and add perfume with a little glycerine, if desired.

S. V. T. (Ossett).—Apply by letter to the Secretary of the Chemical Society.

O. O. (Hexham).—*Adulteration of Olive Oil.* See Vol. XII. p. 484.

A Correspondent (Norwood) wishes to know the best method of mixing the following:—

℞ Ferri Iodidi gr. xx
Potassii Iodidi ʒi
Camphoræ ℈ij
Sp. Vini Rect. ℥ss
Lin. Saponis ℥iiss
Ft. Linimentum.

In whatever manner the ingredients are mixed, a sediment will be formed; but by proceeding as follows, the least objectionable result may be obtained:—Rub the iodide of iron with a little reduced iron, and about one drachm of water, and in the filtered solution dissolve the iodide of potassium, add this to the camphor dissolved in the spirit and soap liniment. By this means the formation of the sticky mass complained of by our correspondent will be avoided.

M. P. D. (Tenby) (1) wishes for a formula for preparing "Cod-liver Oil with Iodide of Iron and Quinine." (2) *Granular Effervescing Salts*, Vol. I. (2nd Series) page 301. (3) The work is expected to appear shortly.

M. P. S. (Bristol).—"Rose Soap." We believe the colour of this soap is due to vermilion, ground in water, and thoroughly incorporated when the soap is melted.

"*Associate*" (Leicester).—(1) *Syrupus Ferri Pyrophosphatis.* Vol. I., 2nd series, page 449. (2) *Succus Cotyledon. Umbilic.* is made by adding to the freshly-expressed juice of the plant 25 per cent. of spirit.

"*Honorum cæca cupido.*"—Candidates will hear from the Secretary in July.

"*Nehpets.*"—Apply to the Secretary.

"*Omicron*" (Stourbridge).—The mixture in question cannot be made "presentable:" in whatever order the ingredients are mixed, the quina will of necessity be separated.

W. H. (Leamington).—*Syrup of Phosphate of Iron.* Try the formula given in the British Pharmacopœia.

S. P. S.—Some little time will be allowed to students before the new work is exclusively used in the examinations.

W. B. (Retford).—*Tincture of Larch Bark.* The form for the tincture will be found as a foot-note to the article referred to by our correspondent. Vol. XVIII. page 35.

"*A Correspondent*" (Derby).—Application should be made at the Patent Office, Southampton Buildings, Chancery Lane.

"*Pharmaceutist*" (Monmouth).—Apply by letter to the Secretaries of the respective Societies.

"*An Examined Member*" begs to add his protest against the proposal of the Council of the Pharmaceutical Society, to admit all outsiders to membership without examination, and adds, "It would be a great injustice to examined members, many of whom, myself among the number, value membership as much as the title of Pharmaceutical Chemist."

We beg to acknowledge the receipt of communications from *Mr. B. Vennall* (Cheltenham), *Mr. W. Hickman* (Notting Hill), "*A Member,*" "*Justitia*" (Birmingham), "*Contunde Bene*" (Preston), "*A Founder,*" and "*A Young Member by Examination*" (Manchester).

Wanted, the July number of this Journal, 1865. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

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. VIII.—No. XII.—JUNE, 1867.

PHARMACEUTICAL LEGISLATION.

The difficulty which stood in the way of the new Pharmacy Bill a month ago has been removed, and we hope no further objections will be found among those who, if it pass into law, will be affected by it.

It was no easy matter for the framers of this Bill to produce a measure which should be satisfactory alike to all parties, and the mere mention of the concession of certain privileges set those who were in possession, as well as those who were not, to consider their value. An abstract consideration of this kind would naturally increase the divergence between the two classes, making one more anxious to obtain, the other less willing to give, and we cannot therefore be altogether surprised at the protest raised against the 19th clause of the proposed Act. We gladly hail it too, as acknowledgment of the value of the Pharmaceutical Society; and it may be construed inferentially as a testimony to the wisdom and good faith with which the Council have hitherto performed their duty. But an abstract consideration was not all that was required on this occasion. Added to the question of "*What are my privileges?*" it should be asked, "*For what purpose was the Society, from which I receive them, established, and how can that purpose be best accomplished?*" Now, to those who conduct the affairs of the Society this latter question must always be present, and an answer drawn from their failure to pass a Bill in 1865, fully accounts for the undoubted liberality with which they propose now to deal with "outsiders."

Foremost in the recorded aspirations of the founders stands the desire to advance Chemistry and Pharmacy, by the education of those who should practise the same, and chief among the means of accomplishing that end, the union of all Chemists and Druggists in one Society. Various circumstances, chiefly perhaps the want of an appreciation on the part of the public of the necessity for such a measure, prevented Jacob Bell from obtaining compulsory powers in his Act of 1852, and the Society has had to work long enough on the voluntary principle to establish such a position as makes its membership valuable. In doing this, it has brought the profession of Pharmacy more prominently before the public than it ever was before; it has sent educated Pharmaceutists into all parts of Great Britain to teach their neighbours that it is important that dangerous medicines should be compounded only by careful hands, and it has thereby paved the way for an enforcement of its original claims. The advance in general education has done much to assist in this matter. Patients now know more of the nature of medicines than they did formerly; science, in isolating the more active principles of medicines, has rendered their administration more dangerous, and their preparation therefore a work of acknowledged skill.

And now, when the public almost ask for an assurance of qualification, is it not possible to obtain that further power which was denied to us in 1852? We say, yes; and we say that the Pharmaceutical Society is master of the position. But many a general who has appeared in the outset of his campaign to be master of a position has signally failed in the end, and after failure how easy to mark the flaw in his tactics which led to disaster! None more common, perhaps, than that of undervaluing his adversary.

And has the Pharmaceutical Society no enemy in this matter? In 1865 it certainly had; an enemy perhaps incapable of victory, but quite equal to mischief, as the issue proved. There were, and there are, chemists and druggists, who in the beginning were incredulous as to the success which might be achieved by union, and who deemed the aspirations of Jacob Bell and his friends as visionary; they declined to join the Society when they might have done so without examination, and perhaps they have felt since that to submit to the ordeal would be a sort of degradation, but they have maintained their position in the trade, and an English Parliament, thank God! is always very conservative of vested interests.

Now these are the men who baffled the Society formerly, and these are the men who could still delay legislation. Withal they are men whom the Pharmaceutical Society was formed to embrace as members—Chemists and Druggists in business on their own account. We are glad, therefore, to find that the Special General Meeting of the Society, held on the 15th ult., by a great majority, confirmed the proposition of the Council to admit them to membership in the event of obtaining Parliamentary authority to examine all men entering the business hereafter.

It is not simply removing an enemy, it is also making a friend. The interests of Pharmaceutical Chemists and Chemists and Druggists are identical; and although it may, perhaps, be thought that in our foregoing remarks we have treated the concession merely as a justifiable compromise, we by no means regard it entirely, or chiefly, as such. We hold to the first great principle of the British constitution, that those who are governed should have a voice in the governing body: this is justice. But it is something more than justice, it is policy; inasmuch as the moment you give a man such a voice you make him conservative of the honour and interest of the body corporate, whereof he feels that he is an essential part. Inside the pale of the franchise he will be with you, outside he will be against you; within he will promote your objects, because they are his objects also; without he will thwart you at every turn, because he is not allowed to claim fellowship with his brethren; he is rejected as one of the "*residuum.*" For these latter reasons we have urged the admission to membership of the Society of all men on the roll of Chemists and Druggists; of men already in business perhaps, because their union would enable the Pharmaceutical Society to compel the examination of all future dispensers; of men to be registered by virtue of that examination, because it would be a test of their fitness for membership. The charge against us has been that the Major Examination was too stringent for men engaged in small country shops. The opinion of competent authorities has been given that the man who could pass the Minor Examination might be safely trusted in his business. But beyond this we have only to look back to the progress of the examinations from the beginning; and, as we generally forecast the future by our experience of the past, we may safely prognosticate that if the Minor be found insufficient it will be amended to the necessities of the time.

We could but remark that all the arguments of the remonstrants at the Special Meeting tended to show the value of the title "Pharmaceutical Chemist," and that title by the new Bill is preserved inviolate for its present possessors, and men who may hereafter gain it by passing the highest examination. The assertion that the public will never know the difference between "Pharmaceutical Chemist" and "Member of the Pharmaceutical Society" we take to be an insult on the public understanding.

On the whole, it was right and proper that this Special Meeting should be held. It might be true, as one of the speakers observed, that the Council had been urged on to the present concession by the Meeting of 1864, but many of the members appear to have forgotten that, and now the concession may be considered as definitively settled by the tribunal to which those who disapproved referred it for a decision.

There seems to be one great misunderstanding as to the effect of Mr. M. Carteighe's resolution, submitted immediately after Mr. Collins's amendment had been accepted. It has been asserted that assistants and apprentices will lose their vested interests in the trade in the event of the Bill becoming law. This is an entire mistake. They may enjoy the present rights of Chemists and Druggists to the end of their lives. But, as it was urged that their admission to *Membership of the Society* would delay the perfecting of the institution for another generation, the meeting agreed to make them eligible only to be elected as Associates. To Apprentices, at least, we believe this will be a positive benefit, for it is not always the greatest kindness to a boy to allow him to rest on his oars while his fellow-students are working to surpass him; indeed, the introduction of Apprentices to the exempting clause of the Bill has always seemed to us an error.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *May* 1*st*, 1867,

Present—Messrs. Bird, Bottle, Brady, Carteighe, Deane, Edwards, Evans, Hanbury, Hills, Ince, Palmer, Randall, Sandford, Squire, and Waugh,

The following were elected MEMBERS—

Horton, Arthur Thomas ....Liverpool.
Sharp, David Blakey..............................Sunderland.

Edward Pratt, of Barnstaple, having paid his arrears and subscription for the current year, was restored to Membership.

Resolved, That free Laboratory instruction be given to the Jacob Bell Scholars for the Session 1867–68.

BENEVOLENT FUND.

The sum of Five Pounds was granted to a distressed Member of the Society, late at Manchester, and the sum of Ten Pounds was granted to the wife of a Member, late at Cheltenham.

The Treasurer was requested to purchase £250 Consols, making the sum invested £9000.

MEETING OF THE COUNCIL, *May* 15*th*, 1867,

Present—Messrs. Bottle, Carteighe, Deane, Edwards, Hanbury, Haselden, Hills, Ince, Morson, Orridge, Palmer, Randall, Sandford, Savage, Squire, Standring, and Waugh, To arrange the business for the Annual General Meeting at *noon*, and the business for the Special General Meeting, convened for *two* o'clock.

BOARD OF EXAMINERS, *May 22nd*, 1867.

Present—Messrs. Bird, Carteighe, Cracknell, Darby, Deane, Edwards, Gale, Garle, Giles, Hanbury, and Haselden.

Fifteen candidates presented themselves for the Minor and Major Examinations; the following passed, and were duly registered:—

MAJOR (as Pharmaceutical Chemists).

Armitage, Edward Hewson	Louth.
Curé, Charles	Mauritius.
*Naldrett, George Thomas	Brighton.
Owen, Edward	Montgomery.
*Ross, Lewis Buttle	Driffield.
Williams, James	Mildenhall.

MINOR (as Assistants).

Round, Frederick	Lincoln.
Rushton, Alfred	Chester.
Tansley, Isaiah	Lowestoft.
Warrior, Henry	Bradford.
Williams, William Pyatt	Nottingham.
Wise, Walter	Maidstone.

REGISTERED APPRENTICES AND STUDENTS.

Name.	Residing with	Address.
Archard, Frank Ernest	Mr. Pooley	Bath.
Cottman, Henry	Mr. Penney	Poole.
Gimblett, Washington	Mr. Stoddart	Bristol.
Hayward, George Frederick	Mr. Long	Croydon.
Hurst, John Beckett	Mr. Hurst	Louth.
Ingham, John	Mr. Medcalf	Tooting.
Smith, Mark	Messrs. Parr and Atherton	Nottingham.
Spackman, Henry Charles	Mr. Biggs	Hampstead.
Warren, William	Messrs. Boyce and Son	Chertsey.
Westwood, William Bury	Messrs. Westwoods	London.
Wharton, William	Mr. Berdoe	London.
Wilkins, George	Mr. Kendall	Stratford-on-Avon.
Wilkins, Gilbert H.	Mr. Keen	Bath.

BENEVOLENT FUND.

Annual Subscriptions received during May.—London.

	£	s.	d.
Andrews, Frederick, 23, Leinster Terrace, W.	0	10	6
Breton, Walter, 137, Cannon St.	0	10	6
Fenn, John T., 83, Regent St., Westminster	0	5	0
Goosey, William, Stepney	0	10	6
Henty, H. M., St. John's Wood	0	5	0
Hogg, Robert, 9, Albion Place, Hyde Park	1	1	0
Hyslop, John C., 54, New Church Street, W.	0	10	6
Rowntree, Thos., 1, Westbourne Road, N.	0	10	6
Slipper, James, 86, Leather Lane	0	10	6
Tibbs, F., 47, Blackfriars Road	0	10	6
Vizer, Edwin B., 63, Lupus St., Pimlico	1	1	0

Country.

	£	s.	d.
Abergele, Ellis, William	0	5	0
Ampthill, Allen, George	4	4	0
Bath, Pooley, John C.	0	5	0
„ Rolfe, William A.	0	5	0

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* Passed in honours; eligible, at the end of the Session, to compete for the Pereira medal.

	£.	s.	d.
Bath, Tylee, John P.	1	1	0
„ Walker, Henry John	0	10	6
Beverley, Hobson, Charles	0	10	6
Birmingham, Churchill, John	0	5	0
„ Musson, T. G.	0	10	6
„ Southall, Son, and Dymond	1	1	0
Blandford, Groves, Willington E.	0	10	6
Brentford, *Old*, Ralfs Henry C.	0	7	6
Bridgnorth, Deighton, T. M.	1	1	0
Brighton, Brew, Thomas A.	0	10	6
„ Glaisyer and Kemp	1	1	0
Bristol, Hodder, Henry	0	5	0
„ Sircom, Richard	0	10	6
„ Stoddart, William W.	0	10	6
Bromley, Baxter, William W.	0	10	6
Burslem, Blackshaw, Thomas	0	10	6
Cambridge, Deck, Arthur	0	10	6
Canterbury, Amos, Daniel	0	10	6
„ Hall, John R.	0	10	6
„ Harvey, Sidney	0	10	6
„ Linford, John S.	0	10	6
„ Paine, William	0	10	6
Cardiff, James and Williams	0	5	0
Carlisle, Sawyer, James	0	5	0
Chatham, Crofts, Holmes C.	0	10	6
„ French, Gabriel	0	10	6
Chelmsford, Baker, Charles P.	0	10	6
„ Baker, Garrad	0	10	6
„ Seaton, George	1	1	0
Chowbent, Warburton, Thomas	0	5	0
Coningsby, Brown, Samuel	0	5	0
Crewkerne, Strawson, Henry	1	1	0
Croydon, Long, Henry	0	5	0
Denbigh, Edwards, William	0	5	0
Edinburgh, Baildon, Henry C.	1	1	0
„ Buchanan, James	0	10	6
„ Macfarlan, A. Y.	0	5	0
„ Macfarlan, J. F. & Co.	1	1	0
„ Raimes and Co.	1	1	0
„ Tait, William	1	1	0
Exeter, Cooper, George	0	10	6
„ Husband, Matthew	0	10	6
„ Palk, John	0	10	6
„ Stone, John	0	5	0
Exmouth, Thornton, Samuel	0	5	0
Falkirk, Murdoch, David	0	10	0
Fordingbridge, Haydon, F. W.	0	5	0
Glasgow, Currie, John	0	5	0
Gosport, Mumby, Charles	0	10	6
Grantham, Hall, Thomas	0	10	6
Harlow, Wood, John E.	0	5	0
Haverfordwest, Saunders, D. P.	0	5	0
Heavitree, Brailey, Charles	0	5	0
Horsham, Williams, Philip	0	10	6
Jedburgh, Rawdin, Joseph	0	5	0
Kaffraria, Daines, Thomas	0	10	6
Leamington, Davis, Henry	0	5	0
„ Jones, Samuel U.	0	10	6
Leatherhead, Hewlins, Edward	0	10	6
Leighton Buzzard, Richmond, R.	0	10	6
Liverpool, Barber, George	0	10	6
„ Bromley, Charles	0	10	6
Maidstone, Rogers, William	0	10	6
Monmouth, Dawe, Sampson	0	10	6
Norwich, Sutton, Francis	0	10	6
Oxford, Prior, George T.	0	10	6
Plymouth, Hill, Simon	0	2	6
Portobello, Kemp, David	0	10	6
Putney, Farmer, John	0	5	0
Ramsgate, Morton, Henry	0	5	0
Rhyl, Jones, E. Powell	0	10	6
Richmond, *Yks.*, Thompson, T.	0	10	6
Romford, Pertwee, Edward	0	10	6
Shields, South, Mays, R. J. J.	0	10	6
Shrewsbury, Blunt, Thomas	0	10	6
„ Cross, William G.	0	10	6
St. Albans, Martin, Henry G.	0	10	6
Taunton, Fouracre, Robert	0	10	6
„ Prince, Henry	0	10	6
Tenterden, Bolton, Thomas	0	5	0
Torquay, Brown, William	0	5	0
„ Hearder, Davis, & Co.	0	10	6
„ Millar, F. C. Moss	0	10	6
Torrington, Fowler, Henry	0	5	0
Tunbridge Wells, Gardener, C.	0	10	6
„ Howard, R.	0	10	0
Wandsworth, Nind, George	0	10	6
Warrington, Webster, S. M.	0	5	0
Weaverham, Manifold, John J.	0	10	6
Woolwich, Bishop, Thomas	0	10	6
„ Parkes, John C.	0	10	6
Yarmouth, Bond, John	0	5	0

BENEVOLENT FUND DINNER.

Third Supplementary List of Donations.

	£.	s.	d.
Brown, Edward, Leeds	10	10	0
Burden, Edward, 38, Duke St., Grovenor Square	2	2	0
Chemists and Druggists' Cricket Club (balance in hand, per Mr. E. Johnson, Hon. Sec.).	4	10	0
Crofts, Holmes, C., Chatham	0	10	6
Deighton, T. M., Bridgnorth	5	5	0
Kemp, David, Portobello, N. B.	0	10	6
Long, Henry, Croydon	0	10	0

Errata.—Page 530, Howden, Robert, 78, Gracechurch St., *for* £2. 2*s*. *read* £5. 5*s*. Page 622, *before* Bemrose, Joseph, Liverpool, *insert* †; *for* William, Thomas Howell, *read* Williams Thomas Howell.

CONVERSAZIONE.

The Society's annual conversazione took place on Tuesday evening, the 14th of May. A large number of visitors responded to the invitations of the Council, and there was also a numerous attendance of members and their friends. The various rooms of the Institution were filled throughout the evening, and the different objects of interest which the Council, through the kindness of friends, had brought together for the occasion, sufficiently served to occupy the attention, and engage the conversation of those present. The Royal Botanic Society, as usual, kindly furnished a number of plants and flowers in bloom, which served to decorate the halls and passages. Some fine works of Art, contributed by Mr. Thomas Morson, jun., and by Messrs. Vokins, were hung on the walls of the reception-room. The Council were also indebted to Mr. Palmer for some magnificent specimens of chromo-lithography; to Mr. Phillips for some fine reproductions of antique bronzes; to Mr. Butler for a bust of Hugh Falconer, F.R.S., and some other sculpture; to Mr. Vernon Heath for a series of beautiful photographic illustrations to 'The Lady of the Lake,' and other photographic views; to Messrs. Jackson and Graham and Messrs. Gillow & Co. for a number of fine bronzes; to Mr. Morson for two finely wrought vases; and to Messrs. Phillips and Co. for some Majolica ware. The London Stereoscopic Company showed some portraits and photographs; and Mr. Daniel Hanbury kindly contributed a portrait of Professor von Fehling, of Stuttgart, the president of the jury for chemical and pharmaceutical products at the Paris Exhibition.

Mr. Baines, F.R.G.S., the well-known African traveller, lent for the occasion a large number of highly interesting coloured sketches from South Africa and Western Australia, which were made by himself during his travels. These were displayed upon one of the walls, and attracted a great deal of attention. During the evening also a number of transparent views of the Victoria falls were projected upon the screen by Mr. Highley in the lecture-room, and Mr. Baines, who had drawn the views himself, kindly attended and entertained a large audience with his description of them. In the Council-room, Professor Bentley made a fine display of medicinal and economic plants in the living state. Among them were the *Cinchona Calisaya*, *C. officinalis*, *Podophyllum peltatum*, *Anamirta Cocculus*, *Coffea arabica*, *Thea viridis*, *Cinnamodendron Zeylanicum*, and *Artanthe elongata*. Mr. D. Hanbury showed some very large sheets of amadou, some of them more than three feet in length; also specimens of ben-nuts, derived from *Moringa aptera* and *M. pterygosperma*, and dried flowering specimens of the plants; specimens of the plant which yields savanilla rhatany, viz. *Krameria ixina*, var. *granatensis;* specimen of *Hemidesmus indicus*, and a large head of fruits of *Elettaria speciosa*, from Java. Mr. Howard, F.L.S., exhibited a beautiful series of drawings, by Mr. Tuffen West, of sections of barks of *Cinchona succirubra*, showing the renewed bark, grown after partial decortication, under the application of moss. Mr. W. C. Hugman contributed a large Australian bat; Mr. H. C. Lang some rare moths and butterflies; Mr. J. Jardine some new species of algæ; and Mr. Leadbeater some foreign birds, beautifully preserved.

Dr. Guy exhibited under the microscope some curious and highly interesting crystallizations produced by the *sublimation of the alkaloids*, such as morphia, strychnia, etc. Dr. Helwig has quite recently announced the possibility of subliming minute quantities of any of the alkaloids, and obtaining a sublimate of definite and characteristic crystalline forms. The method of operating has been simplified and improved by Dr. Guy, and it is described as being easily applied to as small a quantity as the $\frac{1}{60}$th of a grain of the alkaloid. In the case of strychnia, for instance, a minute portion is placed on the lid of a porcelain crucible; a ring of glass, such as is used for microscopic mounting, is put round it, and a circular disk of thin glass is placed on the top of the ring. The heat of a spirit-lamp is then applied to the porcelain, the alkaloid fuses, and a deposit is ultimately obtained on the glass, which when examined by the microscope is seen to possess a crystalline form, and which, it is stated, also answers to the colour tests for strychnia. The sublimate obtained from solania is said to be sufficiently characteristic for the recognition of that alkaloid. Dr. Gladstone kindly lent the apparatus for obtaining the absorption of spectra of different liquids contained in hollow wedges, and Mr. Tribe, showed a number of the spectra during the evening. The physical examination by this means of different liquids is daily becoming of more importance, not only in research, but also in the identification of substances. Mr. Deane contributed a large number of specimens illustrative of the papers on Microscopic Analysis applied to Pharmacy, which were read by himself and Mr. Brady at the meetings of the Pharmaceutical Conference, and have been published in this Journal. Thus the characteristic crystals obtainable from tincture of opium, Battley's solution, extract of meat, etc., were shown under a number of microscopes. The instruments used for this purpose were furnished by Mr. How, who has recently brought out a new student's microscope, which is very cheap and, judging from those exhibited, exceedingly good. Mr. How also exhibited a new and very convenient apparatus, designed by Mr. Keates for determining the igniting-point of petroleum, coal oil, photogen, etc. Messrs. Spencer, Browning, & Co., showed the new micro-spectroscope, designed by Mr. Sorby, F.R.S., and Mr. Browning. This instrument can be attached to any ordinary microscope. It is inserted in the place of the eye-piece, and enables the operator to obtain the spectrum of the light from any object, either opaque or transparent. Thus the spectra of very small quantities of blood, aniline colours, etc., can be easily observed; moreover the apparatus affords the means of comparing the spectrum from one substance with that of another, and it therefore constitutes a valuable means of identifying a number of bodies. For instance it greatly facilitates the recognition of blood-stains, often a medical legal question of great nicety. Messrs. Spencer and Browning also exhibited a new form of direct vision spectroscope, and a spectrum telescope for examining the spectra of stars and comets.

Professor Wheatstone, F.R.S., kindly contributed some new instruments of his invention. One was a machine for showing the augmentation of the power of a magnet by induction currents produced thereby and reacting on the magnet itself. Another instrument which excited great interest was a telegraph thermometer. By its means it is possible to read with accuracy the temperature of an ocean bed, or any place inaccessible to the observer himself. It consists of two boxes connected together by small telegraph wires. The first contains a delicate Breguet metallic thermometer. The second is furnished with a Fahr. and Cent. scale, and a needle capable of moving along it. Upon turning the handle of the second box, a current of electricity passes through the wires, and causes the needle to point to the exact temperature which the thermometer in the other box is at that moment recording. Professor Wheatstone also sent a compact and elegant magneto-electric machine, generating currents of electricity suitable for the exhibition of vacuum tubes, etc. Messrs. Murray and Heath contributed a number of microscopes of different kinds, including one adapted to sea-side use, also a demonstrating class microscope, and a very cheap and excellent instrument for students. They also showed a new telescope lamp suitable for use with the microscope, or for similar purposes. It consists of three tubes having spiral movements one within the other, the oil or paraffin being contained in the inner one. The height of the lamp is regulated with the greatest nicety by simply turning one tube within the other; the spiral guides effectually prevent any slipping. Mr. T. Ross and Messrs. Smith and Beck contributed some of their best microscopes, and exhibited a number of very interesting objects during the evening. Mr. Casella sent some of the new mural standards, containing the metre and yard engraved on porcelain. This material has been selected, by the advice of the Chemical Society, as best suited to resist the influence of time and weather. Mr. Larkin exhibited some models of crystals, geometric figures, etc.; and Mr. E. Blakeman showed some models for constructing glyptic formulæ. This method of showing the constitution of chemical bodies was introduced by Dr. Hofmann in his lectures at the Royal Institution, and has since been adopted by Dr. Frankland and some others. A number of coloured balls, representing atoms, are connected together by arms, the latter representing the atomicities, or bonds, of the respective elements.

In the museum, two new engines were at work at intervals throughout the evening. One of these was the gas-engine invented by M. Hugon. It was exhibited by Mr. Caspar, the English agent, and appears to be a great improvement upon the one brought out some time back. No electricity is needed to work it, but the mixture of gas and air is forced by bellows into the cylinder, and is fired by a most ingenious arrangement of small gas flames. The great advantages possessed by this engine are that it can be started in a minute and as readily stopped. It requires no attention while it is at work, and there is no risk whatever, either from fire or boiler explosion. The other engine exhibited was the hot-air engine now being manufactured and sold by Edwards and Co., Limited. Many attempts have been made at different times by engineers to employ the expansive force of heated air as a motive power in the place of steam. Such a principle promises great economy of fuel, and the Ericsson and other caloric engines were constructed in accordance with it; but they failed through several practical defects. The present hot-air engine differs from its predecessors mainly in the fact that the power, instead of being derived from the expansion of air heated in a separate generator, is obtained by the expansion of air heated by contact with the fuel itself, or, in other words, by the expansive force of the heated products of combustion. This is accomplished by placing the fuel in a grate which can be hermetically closed, forcing the air required for combustion into it by means of a pump worked by the engine itself, and compelling the heated gases from the fire to pass through the cylinder and lift the piston before they escape. The grate consists of a strong cylindrical air-tight iron vessel, lined with segments of fireclay. The fuel is introduced through the fire door, and the fire lighted in the ordinary manner, the fire-grate door being immediately closed, and the draught obtained through the ash-pit door. When the fuel is well ignited, the ash-pit door and the grate door are both closed air-tight, and secured by fastenings. The fly-wheel is then turned round two or three times by hand; this, by working the air pump, forces a supply of air into the grate. It here comes in contact with the fire, supports the combustion, and also acquires great expansive force. It consequently presses on the piston in the cylinder, raises it, and the engine is set in motion. At the end of the stroke the expanded gases escape by a waste-pipe, which may be connected with an ordinary chimney. This engine is remarkably compact, one of two horse-power occupying a space of only six feet square, and as it requires no fitting it is portable. It requires no chimney to create a draught, the products of combustion being forced out. Consequently the heat in the waste gases may be readily utilized; as, for instance, by conducting the gases in a pipe round an apartment to warm it, or for warming water by circulating the flue pipe through a tank, etc. The dominant advantage claimed for the engine however, is economy: one of two horse-power costs only a shilling per day for fuel.

Upon one of the tables were placed specimens of the new preparations included in the British Pharmacopœia just published. These were contributed by several members of the Society. Messrs. Johnson and Matthey exhibited some very fine specimens of chemically pure hydrate of soda and of metallic sodium. These products are now manufactured on the large scale at a comparatively low price by the Magnesium Company. They also showed some large ingots of fused platinum, some new pigments, and specimens of sodium amalgam, etc., illustrating Mr. Crooke's process for extracting gold. Mr. Robbins contributed some very rich pieces of gold and silver quartz from the Ovens gold-mines in Nova Scotia; and also specimens of Dr. Richardson's new styptic colloid and anæsthetic ether. From the Woolwich Arsenal laboratory Mr. Spiller sent a series of interesting photographs of the new ordnance and of some of the results of recent gunnery experiments. Professor Abel, F.R.S., contributed a portable easily extemporized battery for military and submarine purposes, some specimens of gun-cotton, and also an iron shell made to represent a piece of coal, and used in the American war for mixing with the fuel on board blockade runners when about to fall into the enemy's hands.

Mr. Beanes, F.C.S., sent for exhibition a new form of ozone generator. By this machine a constant and very powerful current of air, highly charged with ozone, is obtained. This ozonized air is now being practically applied to the decolorization of sugar. It is also proposed to be used for the purification of the air in sewers, for the ventilation of the wards of hospitals, etc. The ozone is produced by a powerful brush discharge of electricity. The apparatus was shown in action, and explained by Mr. Ladd. Mr. Pratt exhibited an ingenious little machine for writing in type. This apparatus would be especially useful to, and is, we believe, partly intended for the blind. Mr. H. Deane contributed a gas stove suitable for pharmaceutical purposes. Messrs. Krohne and Seseman showed some improved atomizers, for producing medicating sprays; and Messrs. Weiss and Son, a syringe invented by Mr. Ashton. Messrs. Knowles, Smith, and Harburton sent a new pill-machine. Messrs. Johnson and Co. sent a number of platinized dishes, scale pans, etc. Professor Tennant, F.G.S., contributed some fossils and minerals; and Mr. Wright also sent a good collection of minerals.

THE TWENTY-SIXTH ANNIVERSARY OF THE PHARMACEUTICAL SOCIETY.

The Annual General Meeting was held at the House of the Society on Wednesday, the 15th of May, 1867.

MR. GEORGE W. SANDFORD, PRESIDENT, IN THE CHAIR.

The President, in opening the meeting, said :—

Gentlemen,—We meet once more, according to the provisions of our Charter, to discuss the general condition of the Pharmaceutical Society; its past, its present, and its future. I believe there has never been a more important period in its existence. We, at least many of us here present, can recall the circumstances of its rise, the little threat of interference in the business of Chemists and Druggists which stirred among them one of the most easily assailable feelings, I might more properly say *instincts*, of human nature, that of *self-defence*. Prior to 1841 the members of our trade had no doubt possessed this instinct *individually*—so individually perhaps that each acted on the belief "that a man's enemies are they of his own household," and a chemist sought only to protect himself against neighbouring chemists. Gentlemen, I look back to Mr. Hawes's propositions of 1841, which at the time were regarded as compassing our destruction, as the best possible thing which could have happened for us. They elevated that which was but an instinct into something much higher—they carried us out of ourselves and united us to our fellows, as it were enlarging ourselves, and making selfishness justifiable. They led us to comprehend the true importance of Pharmacy, and the legitimate means by which to advance it and its professors; they taught us that public safety required a certain educational qualification in dispensers, and happily there were among us men sufficiently enlightened to see that we could only hope for success by ministering to the public necessity. But, gentlemen, there was this other great virtue attaching to our founders which can never be too much valued, whether as an honour to them or an example to us,—they were men who already possessed the necessary qualification, they were appreciated by the public and had something like a "patent-right" to public confidence; but possessing this, and profiting thereby as individuals, they sank the instinct of "*self-preservation*," and gave freely of their honour to those who had none, in order to found a Society, confident that such self-sacrifice would ultimately secure power to work out the object they had at heart, *i.e.* "the elevation of the character and status of our body by means of education;" this could only be secured in the succeeding generation, by taking existing chemists and druggists as they were, to establish the Society on a broad basis. Gentlemen, we know how earnestly our founders, headed by Jacob Bell, endeavoured to obtain from Parliament power to compel all future chemists and druggists to submit to examination before commencing business; we know how much power was obtained, and we know that Mr. Bell, accepting it as an instalment, worked on to the end of his life with ever-increasing zeal to attain his object. Could he have been spared a few years longer, I believe we should ere now have achieved the success he so desired and for which we are now working. I say I believe we should have obtained that consummation of his wishes, because public opinion has recognized the necessity, and it only needed union among the present generation of chemists to secure it. Jacob Bell was the man to bring about that union. I trust we may yet be successful.

As it is, we may congratulate ourselves on the present position of the Pharmaceutical Society. Recognized by the Government, approved and assisted by the higher branches of the medical profession, sought after now by chemists and druggists to whom our success has been a convincing argument,—the game is to some extent in our own hands; it is for us to make or mar it by an adherence to, or a divergence from, the liberal policy of our founders As on this very morning we shall be called on to decide weighty matters connected with our future conduct, I will say no more about it just now.

Gentlemen, during my presidency, there has arisen an association which I think I mentioned hopefully at its commencement, but of which now, according to the way of the world, for it has achieved success, I may speak exultingly as an offshoot from this Society,—I mean the British Pharmaceutical Conference. It was established principally, I think, by men who have to thank Bloomsbury Square for opportunities of education and development; others I know belong to *it* who do not belong to *us*, but I can only regard the Institution as likely, in all respects, to promote our interests. Here we are occupied more with creating pharmaceutists; in the Conference meetings it is the business of those pharmaceutists to advance the science of pharmacy, to spread abroad a love of it which will elevate the trade of a druggist into the profession of pharmacy, but still, I hope, without destroying the business habits of its votaries. That the active members of the Conference have a due regard to the mixed nature of our business, and the mischief which would result by overlooking that fact, I think was fully proved by the admirable paper on Pharmaceutical Ethics, read by Mr.

Ince at Nottingham. Some of you had the pleasure of hearing it, but all, at least, have had the opportunity of reading it, and must confess that while Mr. Ince elevates the science he no less endeavours to improve the man. A careful study of that paper, gentlemen, would make such pharmaceutists as we should be proud to welcome to membership of this Society.

My term of office has been long enough to embrace the rise and fall of a Pharmacopœia. I remember that on the first occasion of addressing you from this chair, I mentioned the issue of the Pharmacopœia of 1864, and perhaps I congratulated the Society on the fact that we had been invited to assist in the compilation of that work. It was a book from which great hopes were entertained; practical men had been employed on it, and the medicinal preparations of London, Edinburgh, and Dublin were assimilated. All seemed to promise well, and its almost universal condemnation has been a cause of great disappointment; doubtless there was reason for adverse criticism, but I cannot help thinking that so much general prejudice was excited against it in the beginning, that that Pharmacopœia has never had a fair trial. Of this fact I can speak with great certainty, namely, that pharmaceutists have been placed in a most uncomfortable predicament, not knowing whether prescribers wished their medicines to be compounded according to P. L. or P. B. The law bade us use the latter,—a kind of common understanding kept us to the former. I think, gentlemen, we should now do our best to establish the forms which have been published in the present month by the Medical Council; and when I say that, I would not presume to dictate to prescribers, but I know practically that when a prescription is handed to a dispenser, which has already been made up elsewhere, one of his first considerations is, "Which Pharmacopœia is used by Mr. So-and-so?" Both may be justifiable, but he is naturally anxious that there should be no variation even in the flavour of a mixture to shake his customer's confidence either in him or his neighbour. Should it not therefore be a rule with us, unless any instruction to the contrary appear on the prescription, loyally and faithfully to adopt the new order?

Gentlemen, you will bear with me, I know, at the end of my unusually long term of office, if I congratulate myself—and I congratulate you no less—on one most agreeable circumstance which has occurred recently,—I mean our dinner in aid of the Benevolent Fund. You will recollect that when our good old friend Thomas Herring was with us at these annual gatherings, he never failed to propose a dinner. When he was taken from us, another good friend took up the cause,—need I mention Mr. Orridge?—he urged us to spend our money not only for the good that it would do to the recipients, but for the increase that it would bring to our income, to enlist the sympathy of those who could give, as well as relieve the wants of those who needed. I would not have you suppose that the Council had ever been backward in granting relief from this fund; on the contrary, every worthy applicant had been assisted, but Mr. Orridge was anxious to commence granting annuities. Gentlemen, he was quite right, and I cannot help thus publicly thanking him, and thanking you too, who so nobly responded to the call in February last.

You cannot tell with what misgiving I took my place at the head of your table on that evening, or with what thankfulness I left it when assured by the happy faces around me and the noble contribution made to the Benevolent Fund, that my inability as a Chairman had not been allowed to mar the object of our meeting.

The Secretary will now read the Report.

The Financial Statement having been previously published, it was resolved—"That the Financial Statement be taken as read."

FINANCIAL STATEMENT.—*From January 1st to December 31st*, 1866.

Receipts.		£	s.	d.
Balance in Treasurer's hands		527	13	1
Life Members' Fund:				
Fees	42 0 0			
Interest	76 6 10			
		118	6	10
Government Securities:				
Interest		84	2	2
Rent		100	0	0
Arrears of Subscription		74	0	6
Donation to the Society		1	1	0
Subscriptions:				
360 London Members	378 0 0			
1426 Country Members	1,497 6 0			
124 Associates	65 2 0			
198 Apprentices	103 19 0			
		2,044	7	0
Fees:				
66 Pharmaceutical Chemists . . .	435 15 0			
86 Assistants	348 12 0			
113 Apprentices	237 6 0			
36 Registration Certificates	1 16 0			
		1,023	9	0
Fees:				
Lecture		165	7	6
Laboratory		481	17	5
Journals:				
Balance of Account		218	5	5
		£4,838	9	11

Expenditure.		£	s.	d.
Life Members' Fund:				
Investment		34	14	1
Government Securities' Investment		1,154	13	11
Conversazione	86 7 5			
Pharmaceutical Meetings .	5 2 6			
Repayments	6 16 6			
British Pharmaceutical Conference, donation to	10 0 0			
Sundries	12 0 0			
		120	6	5
House Expenses		33	5	6
Rent, Rates, Taxes, and Insurance .		434	13	0
Repairs and Alterations		36	8	6
Apparatus		18	10	9
Library		68	8	0
Museum		33	6	7
Furniture		5	18	0
Stationery		20	12	5
Postage		48	19	0
Printing and Engraving		34	13	1
Advertisements		34	7	5
Law Costs (1863, 1864, 1865)		394	8	10
Carriage		2	7	10
Collector's Commission		32	13	8
Travelling Expenses		129	7	4
Gratuity to Mr. Sharp, late Librarian		21	0	0
Secretary and Registrar		337	10	0
Wages		157	7	6
Expenses of Society in Scotland . . .		70	16	11
Board of Examiners		151	4	0
Professor of Chemistry and Pharmacy, including duties as Curator and payment of Assistant .		300	0	0
Professor of Botany and Materia Medica, including duties as Curator and payment of Assistant		250	0	0
Subscription to Royal Botanic Gardens		21	0	0
Prize Medals, etc.		15	2	4
Laboratory:				
Director's Salary and Percentage on Fees	302 15 3			
Demonstrator	100 0 0			
Porter's Wages, etc. .	66 0 8			
Chemicals, etc.	92 9 11			
		561	5	10
Balance in Treasurer's hands		315	0	6
Balance in Secretary's hands		0	8	6
		£4,838	9	11

BENEVOLENT FUND ACCOUNT FOR THE YEAR 1866.

	£.	s.	d.	£.	s.	d.		£.	s.	d.
Subscriptions	391	6	0				One Year's Annuities to Mrs. Goldfinch and David Peart	60	0	0
Donations	90	16	6				One Quarter's Annuities to Wm. Jacobs Froom and Thomas Novis	15	0	0
				482	2	6	Widow (with one child, a cripple) of a late Member at Ramsgate; husband was drowned	20	0	0
Dividends				202	10	8	Member, late at Pontefract, with wife and three children	25	0	0
							Widow of a late Member at Sunderland towards expenses in getting her child in an Orphan Asylum	10	0	0
							Member, late at Bury St. Edmunds	10	0	0
							Widow of a Member late at Dover	21	0	0
							Member, late at Twickenham, with wife and two children (wife in a consumption, son suffering from an affection of the heart)	15	0	0
							Widow of a Member, late at Poplar	15	0	0
							Premium on the orphan Bentley's Policy of Assurance	1	11	2
							Advertisements	3	1	0
							Postage	10	0	0
							Printing and Stationery	13	17	6
							Purchase of Consols—£519. 3*s*. 4*d*.	458	6	11
							Balance in Treasurer's hands	6	16	7
				£684	13	2		£684		

Invested in Consols, 31st December, 1865	6,730	16	8
Purchase of Consols, as above	519	3	4
	£7,250	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 in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1866 :—

On account of the General Fund, New 3 per Cents............ £4000
Life Members' Fund, 3 per Cent. Consols 2650
Benevolent Fund, 3 per Cent. Consols 7250
Bell Memorial Fund, 3 per Cent. Consols 2050

Frederick Barron,
Walter Breton,
John B. Mackey,
William McCulloch,
Robert Westwood,
Auditors.

14*th March*, 1867.

It must always be a matter of satisfaction to the Council to commence the annual report with a good balance sheet, but in a time like the present, of agitation, expectation, and hope, it is especially so, as it gives evidence of the confidence reposed in this Society,—a confidence that whatever future regulations may be made affecting Chemists and Druggists, those who are enrolled under the Pharmacy Act of 1852 will find themselves safe from any vexatious interference. This, and the ability, year by year, to add to invested capital without in any way curtailing legitimate expenditure, may be regarded as the "*trade*" view of the question. But there is an inference, perhaps even more gratifying, to be drawn from a full exchequer. It is evidence of a desire, and a desire backed by action, to elevate the practice of pharmacy in this country to its proper level, as well as to promote the union and safety of pharmaceutists. It must be gratifying to see that the predicted downfall of the Society, by the dying-out of its founders, has not yet come to pass; that examined men, Pharmaceutical Chemists, join in sufficient numbers to keep up the present effective force, and that the increase in Associates and Apprentices is reassuring as to the future. These young recruits all come through the Examiners' room, but not all through the School of Pharmacy attached to the Institution; and this may be taken as a proof of the increased opportunities for an acquirement of professional knowledge afforded by Masters to Apprentices. Still the number availing themselves of the advantages of the laboratory gradually increases; and it is found that the arrangement made to admit students for certain days of the week only, has acted very beneficially, by giving many the opportunity of attending who would have been altogether unable to attend day by day. The Council cannot too strongly urge on masters the importance of insisting on, and on apprentices the great benefit of attaining, a proper classical education at the outset. To the latter the Board of Examiners could give overwhelming proof of the value of early education in the experience afforded them in the contests for the Bell Scholarships; the position which some of the successful competitors for these scholarships have taken should be well regarded by youths entering the drug trade.

One very noticeable feature in the reports of the last few years has been the balance of the Journal account. The opinion expressed, that instead of being an occasion for considerable outlay it might be made a source of profit to the Society, was regarded as altogether too extravagant for belief, seeing that nearly all the Journals issued were distributed gratuitously; but gradually the balance was reduced on the debit side of the sheet, and is now increasing as a credit. Instead of about £50, as in 1865, we find the net profit of 1866 to have reached £218. This is of course due principally to the advertisements, for which an extra sheet has of late been provided, but the sale of the work has increased by about a thousand Journals in the year; and as this carries information regarding the Society to a wider circle, it is a point of some importance.

It is gratifying to remark that whilst matters which may be regarded as political have called for an unusual amount of attention from the Council, the Benevolent Fund for the aid of unfortunate members of the Society has not been overlooked. In the past year two annuitants have been elected, each to receive £30, and temporary assistance has been given to every deserving applicant. But the cheering feature in the account is the increase in the annual subscriptions. No longer ago than 1861 they stood at £50; in 1866 they reached £391, exclusive of donations. The financial statement stops short at the end of 1866, but the festival held in February of this year cannot be allowed to pass unnoticed. The Council, impressed with the importance of augmenting the invested capital to at least £10,000, (the amount originally declared to be necessary before commencing annuities), resorted to the favourite English method of raising money by a social gathering. The challenge was not only accepted by the members of the Society, but by many other gentlemen who added greatly both to the pleasure of the evening and the funds of the charity; so much so, that when the next financial statement is put before you it will appear that about £1500 resulted from the dinner of 1867. A very gratifying proof of interest in the cause was afforded also by the Junior Members of the trade, who inaugurated a ball in aid of the Fund, and handed over the proceeds (£30) to the Society. At this moment the invested capital amounts to £9000; and the Council earnestly trust, by the hearty co-operation of the Society, to see the long-desired "ten thousand" secured before the Christmas of '68 comes round. There have been applicants to whom temporary relief has been granted, who, in the judgment of the Council, should be introduced as candidates for annuities.

Readers of the Journal have doubtless observed a statement that an invitation has been sent to the Pharmaceutical Society of Great Britain to attend the International Congress of Pharmacy to be held in Paris in August next. The programme sets forth some objects for discussion which may, at present, appear impossible of attainment; but the tendency of such a gathering is undoubtedly good, and several gentlemen connected with the Society have accordingly been requested to attend.

The prospect of an extension of the Pharmacy Act, which in 1866, owing to the unsettled condition of the business before Parliament, seemed obscure, shone more brightly at the opening of the present session. The Council had never ceased to consider the question earnestly and honestly. Indeed, in February, 1866, suggestions framed in accordance with the report of the Select Committee of the House of Commons, which sat in the previous year, were handed to the Home Secretary, and presented again at the Home Office this year. It is well known that the chief causes of failure in 1865 were, first, the absence of regulations regarding the sale of poisons; secondly, the want of concurrence in the details of the proposed measure on the part of chemists and druggists not connected with the Pharmaceutical Society. As time rolled on, those who had been opponents changed their views; they saw that their effort to establish a second Board of Pharmacy, while one, tried and found efficient, was already in existence, could not be attended with success, although perhaps it might prevent any other settlement of the question. They were anxious for restrictive legislation for the future, and accordingly they held a public meeting of Chemists and Druggists at the London Coffee-House, to consider the "Suggestions" of this Society.

It may seem tedious to recapitulate events on which so much has been said and written during the last three months; but it is the duty of a Council, in summing up their proceedings of the year, to state fully to their constituents the course of action which has been pursued, and more especially on so important a subject as this.

At the interview which took place between the representatives of the chemists who attended the meeting at the London Coffee-House and this Council, the points on which they differed were extremely small. Having regard to the great public objects for which the Pharmaceutical Society was established, and a full conviction that any elevation of private interest over public good would be productive of mischief, the Council, acting in the spirit of the Special Meeting of the Society held in 1864, and using the discretionary power entrusted to them, had removed one difficulty by conceding the privilege of membership to those who might hereafter be registered under the proposed Bill as Chemists and Druggists, *i.e.* to persons actually in business at the time of the passing of the Bill, and assistants of the same date on commencing business, as well as such as may hereafter pass the Minor Examination; but reserving always the title of Pharmaceutical Chemist for those who shall pass the Major Examination, and the right to sit on the Council to Pharmaceutical Chemists.

The last restriction was objectionable, and it was argued that all affected by the Bill should have a voice in the governing body; accordingly the further proposition was made that men already in business should be eligible for the Council, with the limitation that two-thirds of the Council must always be Pharmaceutical Chemists. Under this arrangement it will be seen that ultimately, *i.e.* when men in business prior to the passing of the Act shall have passed away, the Council must be composed entirely of Pharmaceutical Chemists. This being accepted, and a recognition of the vested rights of apprentices being made, a Bill was framed accordingly, and submitted to the Government.

Exception having been taken to the admission of chemists already in business to membership without examination, a special meeting has been called to assemble this day at two o'clock; and the members generally will then have the opportunity of expressing their opinion on the question, whether, for the sake of obtaining that for which the Society has so long struggled, *a legislative enactment compelling all men hereafter to submit to examination before entering the business*, it is not wise to extend the privilege of election to all who belong to the class described in the Charter as the persons who shall constitute the Pharmaceutical Society, "Chemists and Druggists who are or have been established in business on their own account."

Mr. Wiggin, Ipswich, proposed the adoption of the Report, and remarked that he did so with great pleasure, for he considered it very satisfactory on all points, and that it was only on the last two or three paragraphs there could be any difference of opinion. The financial position of the Society was good, and the meeting would observe they had been creeping on slowly and by degrees to their present condition. With regard to the Council, they ought to give those gentlemen great credit for straightforward conduct, and in considering the question of the Pharmacy Bill, he hoped they would be very cautious, and not jump to any hasty conclusion. He had come up from the country to support those principles on which the Society was founded. In again alluding to the report, he observed that it was most satisfactory, and he moved—"That the Report be received, adopted, and printed in the Journal and Transactions."

Mr. Lavers (Blackheath), in seconding the motion, agreed that the Report was a very satisfactory and liberal one, and he had no doubt, if the resolutions expressed in it were carried out, that the future would be prosperous.

Mr. Waugh observed, that there was an omission in the Report with regard to the position that the Journal occupied. He thought it right for the meeting to know that although the Society had not a great many members in Scotland, and that she was not very profitable to them, yet he could not overlook the fact that the financial success of the Journal was due to a Scotch member, Mr. Mackay. At first that publication was very expensive to the Society, but Mr. Mackay, with his natural Scotch shrewdness, brought the matter before the Council, and urged upon them the course which was subsequently taken, and now, instead of being a loss, it had become a profit. He thought it might be gratifying to Mr. Mackay to know that the meeting had taken notice of his exertions.

Mr. Henry Long said, with regard to the statement in the Report that "it must be gratifying to see that the predicted downfall of the Society by the dying out of its founders has not yet come to pass; that examined men, Pharmaceutical Chemists, join in sufficient numbers to keep up the present force, and that the increase of Associates and Apprentices is reassuring as to the future," that he considered the trade never was in a better position than it was at the present time. He thought one of the great sayings of the late Jacob Bell was, that "if you could get one half of the chemists and druggists to emigrate, it would be better for the other half that remained." He was inclined to think that the same result had been brought about by a different mode, viz. the numbers who were leaving the trade disgusted with it, and the disinclination on the part of the public to recruit it by apprentices; for he did not think the trade was in general favour as an investment, that was, he did not think that parents and guardians had any great desire to introduce their young friends into it. The long hours must be done away with, and the Sunday trade also, before they could think of getting young men to feel the required interest to join the profession. He had often heard people say, that they would be very glad to do such-and-such a thing if other people would do the same, but that was not his mode of argument; let every one act for himself, although he thought that if there were a little more unanimity in the trade, it would become more flourishing and the members of it would be far more comfortable. He had observed, during an experience of seventeen years, that the number of pharmaceutists advertising for situations was decreasing as compared with the outsiders, and he thought that the class of men who applied for situations did not come up to that standard that the Society were striving to attain. He would wish to see a little more liberality on the part of the masters, so that the trade would be more looked up to by eligible young gentlemen. He thought the trade a good investment at the present day, for they had only to show the public that they could supply an article a little better at a little higher price, and they were sure to get it.

Mr. Squire thought that nothing could be more in favour of elevating the position of the chemist and druggist than the efforts of this Society. The number of gentlemen that came up for the Major and Minor Examinations were on the increase. It was said that a great many young men at present in situations were exceedingly ignorant; there was no doubt about it, but if they had had the advantages that this Society afforded they would not be so. Education and examination should never be forgotten.

Mr. Long thought that the reason there were so many ignorant people in the trade was, that it was not sufficiently lucrative to induce gentlemen of position and education to join it. He was told that in the country, gentlemen took apprentices without premiums and pushed them into the trade, no matter what their position and standing.

Mr. Wiggin said he was one of the country chemists, and he would rather prefer a country assistant to one brought up to the London trade. He thought those gentlemen who spoke disparagingly of country business, knew nothing, and therefore had better say nothing about it. He considered the country members were the great supporters of the Society, being in point of numbers four to one,—a proportion which he believed would be very considerably increased whenever the new Pharmacy Bill came into operation. So far as the country members went, a great many, and he among them, had come up many miles to support the statement of the Chairman, and he was sure it was more than the Londoners would like to do, to go as many miles into the country for the same purpose.

Mr. Hills did not remember the remark of the late Mr. Jacob Bell, alluded to by Mr. Long. From what he (Mr. Hills) knew of Mr. Bell, he felt sure that his object was that every one in the trade should enjoy the same privileges that he did; he was fond of literary pursuits, and, at the same time, was a good man of business, although from his tastes and education he preferred the former. He (Mr. Hills) did not think, for a moment, that Mr. Bell was for excluding men from the trade; he was not the caterpillar on the leaf, complaining of too much life in his brethren in the dust; his great object was the elevation of the trade. With respect to the business of a chemist and druggist, he was of opinion that it afforded a good living for men of small means, and it was presumed that those who entered upon the business had received a liberal education, without which, at the present time, a man could not expect to succeed; it was education and attention to business which formed his capital, and made the man. It was the same in all other professions. With regard to early closing, he thought it was very desirable, but it must not be forgotten that a chemist and druggist could never leave his business entirely, and could never decide when it was necessary for his customer to purchase an ounce of "salts," or a dose of castor oil. A chemist must always be ready and willing to sell medicines when asked for, and should endeavour to carry out the early closing movement as far as practicable.

Mr. Pedler was of opinion that there never existed such a friendly feeling between employers and employed as that which existed at the present time, and he thought that if Mr. Long had been at the Conversazione, on the previous evening, he would have been pleased with the intelligent and gentlemanly appearance of the younger portion of the assembly. So far as the Society went, he was happy to see the position which they held at the present time, as proved by the statement in the report, that £1500 was collected at the dinner. He remembered that if they had tried to raise that sum some years ago, it would have been an utter failure, they would not have been able to have raised £500.

He had said at meetings of the Society, over and over again, "Educate, educate," and he was still of the same opinion, for the more educated gentlemen were brought into the trade, the more favour it would have with the public. That was the great wish of the late Mr. Jacob Bell; and the more the Society followed the advice laid down by him, the more it would prosper.

Mr. Edwards was of opinion that Mr. Long's observations had been a little misunderstood, with regard to his allusion to a statement made by the late Mr. Jacob Bell. The meeting would find it in print in the answer to correspondents by Mr. Bell, "I dare say what would please the greater part of the chemists of England is that if one half were to emigrate." He (Mr. Edwards) was inclined to think that in many towns there were such great numbers of chemists and druggists that one half still wished that the other half would emigrate.

Mr. Savage said, in reference to the advantages conferred by this Society on its examined members, that he had a case in point. About a year ago, a dispenser was required at the Sussex County Hospital, and in reply to an advertisement they had 35 applicants. Six of these were selected from the rest to undergo a *vivâ voce* examination before a Sub-committee, and the only two at all eligible were examined members of this Society,—the one elected having obtained 80 (out of 100 marks), the other upwards of 50, whilst the maximum of the others, non-pharmaceutists, did not exceed 28!

The resolution, as suggested by Mr. Wiggin, was then put and carried unanimously.

Mr. Andrews asked the Chairman whether there was any possibility of ladies being allowed to attend the Conversazione in future.

The President said that question had been mooted in the Council, but the house of the Society did not afford sufficient space; if, however, permission could be obtained to hold the Conversazione at the South Kensington Museum, it would, he thought, be very desirable to invite ladies.

Mr. Andrews thought the number of members would be greatly increased thereby, for if Mrs. Jones knew that Mrs. Smith was at the conversazione, she would be sure to make Jones join the Society to enable her to go too.

Mr. Wiggin asked the Chairman, whether the Society had no power to interfere in matters relative to dispensers at hospitals.

The President said they had no such power, there was no authority over such appointments, except that exercised by the Hospital Committees; he was glad, however, to add, that in some cases it was a standing rule to appoint Pharmaceutical Chemists, and recently, when a question arose at Bedford as to the fitness of a dispenser for his duties, it had been proposed by some influential members of the Committee (Lord Wensleydale and Mr. Hastings Russell) to send him to the Pharmaceutical Society for examination.

The names of the candidates for the Council for the ensuing year were read, and twelve members were appointed to act as Scrutineers in the election. The President then read the list of members nominated to serve as Auditors, and there being only the requisite number nominated, the following gentlemen were duly elected.

Barron, Frederick, 2, Bush Lane.
Mackey, John Brunt, 15, Bouverie Street.
M'Culloch, William, 5, Coleman Street.
Meggeson, George, Kilburn.
Westwood, Robert, 16, Newgate Street.

On the motion of Mr. M'Culloch, a vote of thanks to the Council for their services during the past year was carried by acclamation. In acknowledging this, the President stated that as the Special Meeting was to commence at two o'clock, he thought it would be desirable to adjourn this meeting until a later period of the day, in order to receive the voting-papers; and, on the motion of Mr. Randall, the meeting was adjourned accordingly.

SPECIAL GENERAL MEETING OF THE PHARMACEUTICAL SOCIETY.

The Members of the Society re-assembled at 2 o'clock, and the Secretary read the following requisition, which had been addressed to the Council, and the notice which had been issued in accordance therewith.

"We, the undersigned Members of the Pharmaceutical Society of Great Britain, being of opinion that the proposed 'Amended Pharmacy Act,' in reference to at least the 19th clause, will operate unfairly towards present Members, and be inimical to the interests of the Public, do hereby request that the President of the said Society be asked to convene a Special General Meeting of the Members, to be held at the Society's House in Bloomsbury Square, on some day between the 6th and 11th of May next, for the purpose of taking into consideration and the general discussion of the said Bill; and that the said Council be requested to take no further steps with regard to the said Bill until it has received, either in its present or some amended form, the sanction of the Members then assembled."

The PRESIDENT said he felt his present position to be somewhat of a novelty. This meeting had been called by those who thought the Council had been unmindful of the interests of the Society (cries of No, no); still, however much opinion might differ, he could but regard the agitation which had arisen as an evidence of the interest taken by the members generally in the welfare of the Society, the appreciation in which it was held, and indirectly as a testimony to the services of the Council in maintaining its position. The Council had been requested to call this meeting between the 6th and 11th, but it required ten clear days' notice, and as the notice had to be given in the Journal which appeared on the 1st of the month, it would have been impossible to hold it before the 11th, and it could scarcely be expected that members would come from the country to attend two meetings in two succeeding weeks; the meeting had been called to discuss the proposed Pharmacy Bill, and he now left it to the requisitionists to proceed with the question.

After a silence of some minutes,

Mr. COLLINS inquired whether they were going to have a Quakers' meeting.

Mr. MORSON said the meeting had been called in obedience to a requisition signed by many members of the Society, and now waited to hear the object of the requisitionists.

Mr. TUGWELL (Greenwich) said, that although he was not one of the gentlemen who signed the requisition to convene this meeting, yet taking exception to the proposed changes by the Council, he would accept Mr. Collins's challenge, and try to "bell the cat." He would preface his remarks by stating that in taking exception to the views of the Council, he did so in no unfriendly or personal sense, but simply to the proposed action of the executive of the Society; he would first draw their attention retrospectively, and then prospectively. This Society was established in 1841, by a few leading members of the trade, and to whom great honour was due, for the educating and elevating the whole body of chemists in this country. The great principle of the Society was, that after a date long since passed, no one could be a member unless he had passed an examination, as required by the bye-laws of the Society; in 1853 the doors were again opened to admit those that *had then* been established in business for themselves for, he believed, five years, and from that date up to the present, no one had been enabled to join the Society, except by the recognized and legitimate means of examination,—so that the Society, as now constituted, either meant that a member must have been in business for himself for five years prior to 1853, consequently of some nineteen years' experience, or else that he was one who had proved his fitness by passing the necessary examination. Every gentleman that had spoken that morning at the general meeting had expressed his great satisfaction at the successful and prosperous state of the Society, and it is one, he thought, that would point the argument to continue as they were. He believed that at the present time the gross total of members was nearly 4000. Of this number over 1000 had come up for examination and passed; of course this included the Major and Minor Associates. Now on looking to the year now passing, we find that the considerable number of 107 had so passed, and that 91 apprentices had enregistered themselves on the Society's books; this was highly satisfactory, and yet the Council have now proposed a change to inundate the Society with any one now in business on simple registration, *even down to assistants and apprentices of two years' standing.* This change, he thought he was prepared to prove, was both unnecessary and unlawful; that it was unnecessary the great and increasing prosperity of the Society proved, that it was drawing gradually but surely all the *élite* of the trade into membership, and the time was rapidly approaching when any one wishing to have a respectable position in the trade or with the public, must of necessity be a member of the Pharmaceutical Society; and that the change was illegal, an answer, written by Mr. Bremridge to the Bath chemists, very clearly proves in that official document (Pharm. Journ. Vol. VIII. p. 429), which says, "*And the bye-laws are very stringent in providing that no person shall be elected a member, who is not on the register of Pharmaceutical Chemists!*" So that this proposed change cannot be legal, according to our bye-laws confirmed by Act, unless afterwards ratified by the Home Secretary. And, further, he thought it an act of injustice to those gentlemen whom he thought the very cream of the Society—he spoke of the Major and Minor Associates; gentlemen who had passed all the required curriculum of study at great expense of both time and money, and who, acting on the oft-repeated assertion, that the doors of the Society were finally closed, and that there should be no more leaping over the wall, and on the *bona fides* of the Council they had gained this title, that was daily becoming more and more valuable. *And yet these very men the Society had raised, and were raising, had no voice, yea or nay.* This was too bad. Ten or fifteen years ago, the Society had comparatively little to tempt one to join it; the very name 'Pharmaceutical' was little known and less understood; but now, day by day, it was becoming of greater value, and more appreciated by those who could claim its membership and title. A few years ago, had any two gentlemen of equal attainments and business tact commenced in any town, and one of these gentlemen could write up 'from Savory and Moore, Bell and Co., or Allen's, of Plough Court,' etc., he thought no one present would deny, that he would probably succeed much better than the other gentleman. And why? Because the fact of his having lived in one of those firms of well-established reputation, gave a positive proof that he had at least seen the business well done, and might reasonably be supposed to be competent and trustworthy. Now *all* young men could not possibly live at those firms, but they can all gain a now fully established reputation by passing the examination of our Society. Personally, he was one of those who had passed the examination required of those established in business, and he could add his testimony, that it was essentially of a good and practical character; and, in fact, no person who could not pass that ordeal had the slightest claim to be admitted one of its members. A great deal had been said about the late and universally respected Mr. Bell's being most anxious to unite the whole of the trade within our Society. He believed he was so, but speaking from acts, and from acts only, could we judge of one who was no longer in our midst? Our bye-laws, of which he believed he was one of the most active propounders, say most positively that, after a date now long passed, no person can become a member otherwise than by passing the required examination. That to his mind was most conclusive evidence of Mr. Bell's views. As to the proposed change and consequent difference between a member and Pharmaceutical Chemist, that he held to be so far identical, that the two terms were used by members themselves as synonyms, and at the present moment every individual member was of necessity a Pharmaceutical Chemist, although by a bye-law a Pharmaceutical Chemist might not be a member. He would not longer occupy their time, but would move as an amendment to the proposed change by the Council, "that no further steps should be taken to legislate on this matter, as the Society, simply as a voluntary one, would soon render such steps unnecessary, by drawing into its membership every respectable chemist in the country; and further, that the Council should, before taking steps involving the absolute destruction of the bye-laws of the Society, take the opinion, yea or nay, of the whole Society by means of voting papers, that being the recognized principle of the Pharmaceutical Society."

Mr. Abraham rose and read another resolution, whereupon the President inquired whether it was intended as an amendment on that proposed by Mr. Tugwell, which had not yet been seconded.

A discussion ensued, which ended in the withdrawal of Mr. Tugwell's motion, and—

Mr. Abraham (Liverpool) then read the following motion:—

"That the indiscriminate admission of chemists and druggists to the membership of the Pharmaceutical Society would destroy the value of the title 'Pharmaceutical Chemist;' that the chemists and druggists, having had no part in gaining for the Society the reputation which it enjoys, have no claim to its honours, and that it is not expedient to depart from the test of examination which has so long prevailed in the admission of members to the Society."

He said, the Society was formed about twenty-six years ago, when membership was obtained by the payment of a subscription, but soon a Board of Examiners was appointed, and no one was admitted except those who satisfied the Examiners. A Royal Charter was obtained, and by degrees the Members assumed the title of Pharmaceutical Chemist, and, subsequently, the Pharmacy Act was passed by the Legislature, under which they acquired the exclusive right to that title; and then the Society thought proper to admit such chemists and druggists as were properly recommended to them. The door was kept open for a short time, and for only a very short time, and it had been said over and over again, that the door was now only open to Examined men. The title of Pharmaceutical Chemist had become of increasing importance; it tended to denote qualification, and proved one of two things, either that the man entitled to bear it had so much public spirit as had induced him to subscribe many years ago to the funds of the Society, and that he had been in business ever since, as well as previously; or it showed that he had, by passing an examination, satisfied the Examiners of the Society that he was fit to be a Member, and had the scientific knowledge necessary to perform the duties of a Pharmaceutical Chemist. The title had become honourable to the Society, and a useful guide to the public, as well as to the medical profession. A member of that profession, at the conversazione on the previous night, said that he invariably recommended his patients to Pharmaceutical Chemists. It was now proposed to admit to the Society every chemist and druggist, so that every man that sold sand, or scouring-stones, and all kinds of things, and chose to term himself a Chemist and Druggist, might now become a Member of the Pharmaceutical Society, and would be at liberty to place over his shop "Member of the Pharmaceutical Society." What would be the result? It would destroy the value of the title of Pharmaceutical Chemist. The Council and the founders of the Society were to be held in the highest esteem throughout the whole country, for the position that the Members held at the present time was due to them; but he hoped that they would do nothing so inconsistent with the objects of the Society, as that proposed. In the Bill (a copy of which he held in his hand) it was proposed to admit all chemists and druggists, and all who could call themselves assistants, and apprentices who had been in the trade two years. That, he thought, was most unfair. It was said that it would give the strength of numbers, but he did not believe it would, he feared it would diminish the numbers; and those who were registered under the Act would have no inducement to come up for examination, if all were admitted without. What would be the attraction to persons already Pharmaceutical Chemists? There would be none; all could take their membership as a right, and would cease to regard it as an honour, and on those grounds he thought the Society would not gain much. It was said that they ought to make some concession; that a Bill was required, and that the outsiders would prevent their obtaining a Bill unless some concessions were made. He did not believe that the outsiders had the influence that the pharmaceutists supposed—they had the same interest in getting a Bill; and what right had they to become Members of this Society, if they did not comply with the conditions on which the Society was founded? It was urged, that those who contributed to the funds should be represented. He thought it was reasonable that they should pay for their registration; but if that charge would cause the Society to lose their good name, he thought the latter had better pay it themselves. If the outsiders found fault with the proposal to register them, leave them unregistered, as the Apothecaries were in 1815, but they would find a great difficulty in afterwards proving their qualification. Subsequently the Act was passed under which the Medical Council was constituted. When that Bill was obtained, the Apothecaries did not claim to be admitted as physicians, although they were registered under the same Act; nor did they claim to be Surgeons, although they passed an examination, alleged to be more difficult than that required to be passed by a surgeon. He, therefore, could see no reason for the chemists and druggists claiming to be admitted as Members of this Society. He concluded by reading a letter addressed to the meeting, signed by a number of Pharmaceutical Chemists of Liverpool, who were opposed to the scheme, and also the resolution that he wished put to the meeting. (A number of other communications from various parts of the country, some in favour of and some against the proposed Bill, were also on the table.)

Mr. Boyce (Chertsey) said, as a founder of the Society, and one of the persons who had signed the requisition to call the present meeting, he rose with the greatest pleasure to second the resolution proposed. He fully agreed with all Mr. Abraham had said; and, as he had so ably and carefully brought the question before the meeting, he would not detain them long. He denied that the Council were instructed or authorized to introduce the proposed Bill, which would perpetuate the ignorance and incompetency of chemists for the next fifty years. A few might have advocated its principles, but he held in his hand extracts from the Journal within the last two or three years, written or spoken by about eighteen of their most distinguished members, quite opposed to it, and read one from the Journal of December, 1864, where it says, "Examinations are the very foundation of the Society and the maintenance of their integrity, the tenure by which its privileges are held. Now, here lies the answer to any enemies (who chuckled over the notion that we were *in extremis*, offering a farce of an examination to all comers), the assurance to any friends who trembled under the idea that we were sacrificing principle to expediency to gain popularity in times of commotion (an honest fear which we must respect in them), and a proof to the public that men holding any diploma are worthy to be trusted." He would ask if there are men equally good outside of the Society, as has been stated? Why had they not years since contributed by their money and efforts to so valuable and liberal an institution? and, if they are so qualified, why have they not shown it by submitting to an examination? and, if they did not like that, why did they not come in without, when the door was open? By waiting till we have attained property, position, and privileges they show nothing but unscrupulous selfishness in clamouring for a full participation in them, and he, for one, would never assent to it.

Mr. J. R. Collins hoped that before any resolution was come to they would adopt the maxim, "*Audi alteram partem.*" The honourable gentlemen who moved the resolution and those who had hitherto addressed the meeting, utterly ignored the main points in discussion. Doubtless, if we members of the Society could have our own way, outsiders should only join us on our own terms, but when we attempted legislation affecting others than ourselves, they had a *locus standi* to criticize the conditions attempted to be imposed on them. In this room we might be very unanimous, and applaud each other to the echo, but when we approached Parliament, and asked for powers which we had not hitherto possessed, a willing ear was lent to those who asserted we were interfering with their vested rights. Over and over again in this place had he attempted to induce the Council and the Society to accept a compromise in the spirit laid down in the amended Bill, but stimulated by the responsive cheers and aspirations of a united interest, the Council in an evil hour propounded a Bill having more respect to the imaginary position of the members of the Society than to the actual position of those without its pale. What was the consequence? The Select Committee of the House of Commons became divided into two hostile camps, one division being inspired by the Pharmaceutical Society, the other by the rival combination, known as the United Society of Chemists and Druggists; the result was a dead-lock, and the report was that no legislation was necessary. He remembered being at the House of Commons when the Select Committee was sitting, and finding the President and sundry important members of the Council cooling their heels in the corridors, when presently Sir FitzRoy Kelly appeared on the scene and announced that there would be no Bill. He must confess to surprise at such a result, but for different reasons to those advanced from time to time by the honourable member for Dartford, who, in spirit if not in words, has said we might "as soon expect roses in December, ice in June," as expect the Legislature to enact any law restricting in any way the practice of pharmacy. In his opinion, the cause of the failure of the last application to Parliament was due, not so much to the disinclination of the House of Commons to legislate on the subject, as to the opposition of the outsiders, who were able to convince Members of Parliament that the interests of an important section of the community were not duly considered in the Bill promoted by the Pharmaceutical Society. And so the United Society remained masters of the field. But "sweet are the uses of adversity." The Council, by a process of logical induction, now see what he had seen all along, that no legislation is possible without the co-operation of chemists and druggists without the pale of the Society, and without legislation regulating the whole trade the Society is doomed to destruction at no distant period; indeed, Mr. Bottle, of Dover, some years ago made an ingenious calculation as to when the last member of the Society would go down the gulf of time. The Society was composed of two classes, viz. those who from time to time were admitted upon payment of an annual subscription, and examined members, and instead of examined members "exalting their horn," as some of them had, they should be only too thankful to the founders of the Society who had provided for them an almost gratuitous education, and extend something of the liberality with which they had been treated to their less fortunate brethren. The seven remonstrants from Peterborough—he supposed Peterborough to be the head-quarters of the insurgents, as two of the signataries hailed from that city—complained that their status would be affected by the "ugly rush" contemplated by the Amended Bill; but in this month's Journal there is a manifesto signed by twenty examined men, who are not at all afraid of their honours being degraded by rude contact with the outsiders, or their escutcheon blemished by allowing unexamined men to be "members" of the Society if they should think fit. And among this band of twenty good men stand the names of Ince, Giles, and Gale; if these, who are among our great men, in the interest of our Society, are willing to extend the hand of fellowship to those without, surely the seven dissentients may be content to be in such good company. The mere possession of a diploma was nothing in itself. Mental superiority was that which really elevated us one over another, and enabled its possessor to rise in the social scale. The great object of our association was to combine the whole trade together, having a common object, the elevation of our art and ourselves in social importance,—and this by showing ourselves worthy of public confidence, resulting in obtaining legislative sanction to the principle that all who practise pharmacy shall in time to come give evidence of their competency by examination. If we fail in accomplishing this, the great end of our association is unattained,—we proclaim our own failure and hasten our dissolution; but if we are able to carry the Amended Pharmacy Bill now proposed, we shall carry into effect the long cherished views of our founders—many of them now no more—and preserve our own existence. The issue raised by Mr. Abraham's motion is this, that it is better to remain as we are, even at the risk of ultimate extinction. He objected to such a consummation, and asked them to read, mark, and inwardly digest his amendment, which affirmed a great future good would be attained by a small present sacrifice. Mr. Collins concluded by moving the following amendment:—

"That, in the opinion of this meeting, the proposed amendment of the Pharmacy Act is both wise and expedient, as by enlisting the support of those members of the trade outside the pale of the Society, the way is cleared for carrying into effect the primary objects of the founders of the Society, viz. the consolidation of the whole trade, and legislative provision for the compulsory examination of all persons entering the same after a given time. This meeting would further express its entire approval of the action taken by the Council, and pledges itself to support by all possible means the passage of the Bill through Parliament."

Mr. Vizer had great pleasure in seconding the amendment. He wished to know where those gentlemen were who had called the present meeting. He understood that it had been called by those who considered their rights had been invaded, and their interests sacrificed to the benefit of outsiders; that, having spent their time and money in passing an honourable examination, they were now to be deprived of the benefit of the title which, at great cost, they had secured. But where were those gentlemen? He was surprised to find that they had been compelled to fall back upon the advocacy of those whom one would have expected to have found among the most liberal and staunch supporters of the Bill. The absence of those gentlemen rendered the resolution proposed by Mr. Abraham utterly worthless. The present was essentially a reform age, and the usually quiet arena of Pharmacy was not to be exempted, and rightly so; there was room for reform, and those present had met with the determination that reform should be carried, and the franchise extended. The universal feeling was in favour of legislative power being brought to bear by which to regulate the trade. Bills had been brought forward by the Pharmaceutical Society; opposition Bills had been presented by the United Society side by side with our Society's, and, as every one foresaw, had been rejected. The House of Parliament itself had advised action, but hitherto all efforts had been without effect. The "lion in the way" had always been, Who was to hold the ruling power? The Pharmaceutical Society justly claimed that privilege, but, unfortunately, had failed to recognize the right of outsiders to representation on the Council. These gentlemen most justly felt indignant, and opposed the Bills, in which Mr. Vizer most fully concurred. It had been used as an argument by the Pharmaceutical Council that the Society did not interfere with rights of outsiders, and therefore there was no cause to complain. He differed from that opinion, which could not be correct, inasmuch as their apprentices and their own sons would have to abide by what was done by the Pharmaceutical Society. The Bill before the meeting removed all obstacles. The rights of outsiders were fully considered; the power of representation was amply provided for; that for which the Society had long been fighting, and which was the fondest hope and aim of

Jacob Bell, was about to be realized, when, behold! outside opponents having been silenced, an enemy rises within the camp, and the present meeting was called to destroy the Bill. He believed the whole antagonistic feeling arose from an error in judgment. Gentlemen who had passed their examination seemed to think that all their money and time had been expended in purchasing an empty title. He most emphatically denied such an assumption, and asked whether there was a single gentleman present who had so small an opinion of his own individual influence in society as to imagine that, if his next-door neighbour were to put up, in letters a foot deep, "Member of the Pharmaceutical Society," that, as a natural consequence, all his customers would forthwith desert *his* establishment to flock his neighbour's door? He felt bound to confess the absence of all such fear in his own mind. Members present said it was the honour of the Society of which they were jealous. He (Mr. Vizer) was sorry to differ from that opinion, and, although unable to read the "inner man," was still of the opinion that it was the *title*, and not the Society's welfare, at the bottom of the present agitation. He trusted members would, in considering the question, look more to the future than to-day. Those gentlemen who originated the Society, and spent their time and money in its promotion, derived no personal advantage, but we were now reaping the fruit of their labours; so to-day members might not personally receive benefit, but future generations would, and rejoice over what we were now engaged in advancing. While supporting the Bill, he made an exception to the latter part of the 19th clause, by which assistants and apprentices were to be admitted to equal privileges with persons already in business. He considered this a step too far, involving an almost unlimited period before the Act would bear the smallest fruit. He felt satisfied the Council would be willing to concede this point, restricting the privileges of that clause to persons actually engaged in business at the time of the Act passing, and the interests of assistants and apprentices being provided for in some other way. Mr. Vizer concluded by appealing to the liberal feelings of members in support of the amendment moved by Mr. Collins, by which the "keystone" to the arch, whose foundation had been firmly laid by the ever-honoured Jacob Bell, should be at once and for ever fixed, and the entire trade united into one common brotherhood.

Mr. G. H. Wright, in allusion to a remark from Mr. Abraham, of Liverpool (that he knew a druggist who sold cleaning-stones, and hoped the Society was not going to admit such men), drew attention to the fact of country druggists being compelled to sell articles not kept by London druggists, and quoted a case of an *examined* member of the Society, in a country place, selling silver-sand, which did not, in Mr. Wright's opinion, at all detract from the said druggist's fitness to dispense prescriptions. He hoped they would not judge a man's intellect by what he sold.

Mr. Henry Long supported the amendment, for whenever an Act was passed, the principle of vested interest must be respected, and the deferring legislation, which was what was most to be desired, would only increase the evil by increasing the numbers to be admitted. He advocated a little liberality.

Mr. Pedler said he thought the question a very serious one, and it would, in his opinion, be folly to ask for a Bill in a divided state. He pointed out to the meeting the great difficulty there was in obtaining a Bill, and again urged the necessity of a calm consideration of the question before them. He was inclined towards Mr. Abraham's views, and he asked the meeting not to be too hasty in deciding against those views.

Mr. Mumbray (Richmond) said he thought it very unfair to the Pharmaceutical Chemists to allow the outsiders to come in without having to go through any of the examinations, etc. It was all very well to say that there was a vast difference between the terms "Pharmaceutical Chemist" and "Member of the Pharmaceutical Society," but if these men were let in, what was there to prevent them from placing over their shops "Pharmaceutical Chemist"? and suppose they placed over them "Member of the Pharmaceutical Society," the public would not understand the difference.

Mr. Edwards (Dartford) said, apart from all personal considerations, the meeting could not exaggerate the importance of the conclusion that was to be come to that day. He could ask them to concede something, because he had to concede something in consenting to the Bill. It was not exactly the Bill he wanted, but he thought it would be wise on their parts to abandon all opposition. He thought the meeting were forgetting that the Society was not to continue the same as it was,—it was to be a new Society, which would affect every one in the kingdom. It had up to the present been open to any one to say

"I do not like the Society, I am not a member, and I will not become one." But he would not be able to say so now. No man would be able to bring his son up to the trade of a chemist and druggist unless he was a member of the Pharmaceutical Society. Nor would he be able to sell his business unless to some one who had passed its examination, consequently a man would say to himself, "If this is to affect my business thus, I must become a member." The meeting was not asked to allow the Society to remain as it was, but to allow the Society to go to Parliament and obtain powers that would govern and affect every man who in future should set up as a chemist and druggist. If they were ready to go on with the Society as it had been hitherto, then do away with the Bill; but, on the other hand, if they were of opinion that the object now in view was the object for which the Society was formed from the very first, then withdraw the opposition to the Bill, for it would grant them all the powers they required. Did they suppose for one moment that these extensive premises, large laboratories, and everything else connected with the Society, were constructed for the Society in its present form. No! it was plain on the face of it, that when the laboratories were made, a larger and a grander scheme was on foot, which had for its object the raising of the chemists and druggists of the whole kingdom to a proper qualification as dispensers of medicines. The question was not whether certain persons would derive any benefit from the Society, but whether the Society should have the power to touch every member of the trade and compel him to enter the Society. Then, supposing that they are admitted, the question arose, what name was to be given to them? The name proposed was a "Member" of the Society. It was all very well for gentlemen to state that the public would not understand what that meant; but that argument would also apply if they were called Associates. Then there were two parties to that question: the other side said they would not accept the title of Associate. The meeting must recollect that they had a reluctant and a careless House of Commons, that would not see matters as they did, and an opposition of any magnitude would be sure to throw out a Bill. If the meeting wanted a Bill at all, it must be one in a cordial spirit, one agreed to by both sides, or they would get none. In the living and dying words of the late Mr. Jacob Bell, they must either be content to go on as they were, or else open their doors more freely; and they might depend upon it that without they went to Parliament hand in hand, the House of Commons would throw out their most important clauses. There was more difference between the terms "Member of the Pharmaceutical Society" and "Pharmaceutical Chemist," than any others, which were all pretty much alike in the eyes of the public. It was said that the Society was going on very well. No doubt it was, but to what was it due, but the promise of legislative enactment? Some time ago, he remembered, their members diminished, but since they had tried to obtain the legislative influence they were now endeavouring to obtain, they had increased. He again alluded to the difficulties they had in their way, unless they could come to some arrangement by which both sides could go to Parliament and ask for a Bill unopposed. Without they did so, they would again most certainly decline.

Mr. Orridge, in reply to a member who expressed a wish to hear the opinion of some other members of the Council, said that there were two points on which he might state facts worthy of the consideration of the meeting. One speaker, Mr. Tugwell, had asked whether there was any evidence of the feeling of the late Mr. Jacob Bell relative to the Society embracing all the members of the trade. Now, beyond the information on this point afforded by the Journal, he (Mr. Orridge) was able to testify that it was at the express wish of Mr. Bell that he had moved a resolution to that effect,* and that this very resolution was drawn by Mr. Bell and handed to the chairman in his handwriting. He might further point out that, among those who had entered the Society when the door was thrown open was Mr. Abraham himself, and he, Mr. Orridge, was glad to welcome him as an ornament to the Society, and believed that if the door were once again opened in order to obtain unanimity with the view of a permanent settlement of the question by getting an Act for compulsory examination hereafter, that men would be found to enter not less competent than Mr. Abraham, and equally with him ornaments to the Society.

Mr. Richardson (Leicester) presented a resolution, which had been unanimously adopted by the Pharmaceutical Chemists of Leicester. He observed that he quite con-

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* Pharm. Journ. vol. xii. p. 106.

curred with the expressions it contained, but feared there were difficulties in its being carried out by the Council. He would not have troubled the meeting with any observations, had not some invidious remarks been made as to the necessity of calling the present meeting; as one of those who had been instrumental in memorializing the Council to do so, he took entire exception to such opinions, and if the present large and influential gathering was not to be ignored, it completely answered such insinuations. The Council would be strengthened by the discussion of that day, and whatever the result of their deliberations, he trusted the minority would yield to the views of the majority, and strenuously support the Executive in their arduous task. It always gave him great pleasure to hear the clear and eloquent remarks of Mr. Edwards, but he could not help calling to his notice the observations he made three years ago; he was then the champion of the Society, and, in a most brilliant speech, enunciated the views of the Council. Now, alas, with the Council, he had changed, and gave expression to opinions which were diametrically opposite. In conclusion, he would read to the meeting some of the remarks made by Mr. Edwards in 1864:—"The title of Pharmaceutical Chemist is a mark of distinction which is no part of the existing rights of the chemist and druggist. If it be said that they should have a voice in the Society by which they are governed, the reply is that they are not governed in any way. The Society does not control them or regulate their business in any way, and cannot do so, under the projected Act. It registers them, and thus preserves every right to them, and then shakes hands and has no more to do with them unless they wish it; you do not in any way govern them, and surely they cannot claim to govern *you*. It cannot be allowed that they should guide the affairs of a society of which they are not members, and to whose advancement they have never contributed a shilling. And then to give them the title and privileges of Pharmaceutical Chemists would be to break faith with the other class; the Government and medical profession and the public would say, 'You had this trust committed to you twelve years ago, in the belief that you would faithfully use it to train up a class of men who should be fully qualified for their duties; and believing that you were doing this, we have honoured and trusted you, and now you gravely purpose to deceive us all, and while we declare that the present state of pharmacy is disgraceful to the country, to admit all these men to your highest honours, and actually to dignify them with your scientific title. How can we think but with contempt of such a proceeding as this?'"

Mr. Reynolds (Leeds) said that the Examined Members of the Society had been brought so prominently into the discussion of this question, that, as one of that class, he felt justified in saying a few words. Whilst cordially approving of the Bill proposed by the Council, he did not regard as sound some of the arguments put forth in its favour in the leader which appeared in the Society's Journal for May. Thus, he could not admit that the public would readily recognise the distinction between a Pharmaceutical Chemist and a Member of the Pharmaceutical Society, for the present discussion had shown that many of their own members do not understand it; but he supported this measure because its object was no less than the primary one for which the Pharmaceutical Society was founded, viz. the incorporation of the whole trade, and towards that end the Society had been aiming with singleness of purpose for a quarter of a century. Now, as regards this object, it was impossible to exaggerate the gravity of that day's decision. Let it be borne in mind that there could be no standing still. They might give up the great aim that had hitherto animated their efforts and try to preserve their merely voluntary association, but if doing this, a process of gradual extinction would be their fate, whilst the State must ere long step in to effect, without their aid, that national organization of pharmacy which they had now the apparent opportunity of controlling. He would ask those members who were alarmed at the measure of the Council, if that body looked like revolutionists; why, many of its members had held their seats for twenty years, and if that did not make men conservative, he did not know what would. Depend upon it, the Council had made the best bargain they could, and, in order to attain an overwhelming advantage to the present and all succeeding generations of chemists, they had properly consented to a temporary sacrifice. Mr. Reynolds concluded by saying that the other Examined Members, residing in Leeds, joined him in supporting the Bill.

Mr. Morson assured the meeting that all the arguments this day brought forward had been fully and repeatedly discussed by the Council. Personally he had no sympathy with those members of the trade who had given no aid in the formation of the

Society, but, on the contrary, done much to impede its working; it was, however, his opinion that many of them had been unduly led by interested persons, and as the object of the founder, Mr. Bell, was the union of the trade, with a view to its ultimately consisting of educated men only, he was induced to support the Bill, and he thought it highly creditable to some of our best examined members that they had, with this view, generously set aside their own interests for what they considered a general good.

Mr. RANDALL (Southampton) reminded the meeting that the General Council of Medical Education, and the Select Committee of the House of Commons have recommended in the interests of the public, further legislation on this subject; and that several meetings of this Society have, during the past three years, unmistakably urged the Council to bring forward a Bill in order that the matter might not be taken out of the Society's hands; and have directed them to make liberal concessions to so-called "outsiders," so as to secure their co-operation. The Council, he contended, had thus been pushed by the members into their present position, rather than had sought it; and he asked, that confidence be still placed in them that they would make no surrender of privileges which the circumstances did not imperatively demand, for the accomplishment of the object in view.

The PRESIDENT said the subject had been so fully exhausted by various speakers that it seemed scarcely necessary for him to take up the time of the meeting. It was a question on which he had felt very strongly, and he now felt if the Pharmaceutical Society declined to proceed in endeavouring to obtain a Bill, after they had declared legislation to be necessary, they could not fairly oppose other parties who might choose hereafter to seek to regulate the practice of Pharmacy. It might be the Medical Council, it might be the Chemists and Druggists, not now connected with the Society, or it might be the introduction of a Poison Bill, with all sorts of absurd regulations by the Government. But he would have felt it a great advantage if this Society could have gone in with their Bill unanimously. Much had been said of the length of time which would be required to perfect the Pharmaceutical Society, and he thought it would remove one difficulty, if, instead of giving assistants and apprentices, who might be such at the time of the passing of the Act, the privilege of being eligible for membership of the Society on going into business, they were to be made eligible only to be elected Associates.

Mr. TUGWELL remarked that that course would mitigate the original proposition, and simplify matters, and very possibly decide the voting of the day, if it were fully understood that this suggestion would be acted on.

Mr. M. CARTEIGHE endeavoured to move an addition to Mr. Collins's amendment on this question of assistants, but it was decided that it should be taken afterwards as a separate motion.

Mr. ABRAHAM having replied at some length, a show of hands was called for, and Mr. Collins's amendment was carried by a large majority; it was then put and carried as a substantive motion.

Mr. M. CARTEIGHE then moved, and Mr. INCE seconded the following resolution, which was carried unanimously:—

> "That it be a recommendation to the Council that they arrange, if practicable, for assistants and apprentices at the time of the passing of the Act not being made eligible for membership without passing the Minor examination."

This meeting then terminated, and the business of the Annual Meeting was resumed.

It only remained to receive the voting-papers, which concluded the business of the day, and this meeting was adjourned to Friday.

ADJOURNED MEETING.

Friday May 17th, 1867.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

The Registrar placed on the table the Annual Registers of Members, Associates, and Apprentices or Students of the Society, and of all persons registered under the Pharmacy Act.

The Scrutineers brought up their Report, as follows:—

We, the undersigned Scrutineers, appointed at the Twenty-sixth 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:—

Voting-papers received	616
Disallowed for informality......	24
	592

Hanbury ...	552	Randall	461	Standring	397	Kendall	175
Deane	527	Haselden	457	Abraham	328	Boyce	168
Morson	526	Brady	443	Messer	300	Beaumont ...	141
Hills	522	Bottle	434	Palmer	257	Tippett	94
Squire	510	Carteighe	433	Stoddart.........	213	Wiggin	94
Mackay......	506	Evans	430	Arnold	179		

FREDERICK ANDREWS, *Chairman.*

JOHN HENRY BALDOCK. HENRY OWEN HUSKISSON.
THOMAS BURDEN. JOSEPH KETTLE.
W. T. COOPER. C. R. QUILLER.
CHARLES CROYDEN. W. A. SANGER.
SAMUEL GALE. GILES YARDE.

The Chairman declared the Council for the ensuing twelve months to consist of the following Members:—

ABRAHAM, JOHN, 87, Bold Street, Liverpool.
BIRD, WILLIAM LIONEL, 42, Castle Street East, Oxford Street.
BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
BRADY, HENRY B., 40, Mosley Street, Newcastle-on-Tyne.
CARTEIGHE, MICHAEL (Dinneford and Co.), 172, New Bond Street.
DEANE, HENRY, Clapham.
EDWARDS, GEORGE, Dartford.
EVANS, HENRY SUGDEN, 56, Hanover Street, Liverpool.
HANBURY, DANIEL BELL, Plough Court, Lombard Street.
HASELDEN, ADOLPHUS F., 18, Conduit Street.
HILLS, THOMAS HYDE (John Bell and Co.), 338, Oxford Street.
INCE, JOSEPH (Godfrey and Cooke), 26, St. George's Place, Knightsbridge.
MACKAY ,JOHN, 121, George Street, Edinburgh.
MORSON, THOMAS N. R., 38, Queen Square, Bloomsbury.
ORRIDGE, BENJAMIN B., 30, Bucklersbury..
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.
STANDRING, THOMAS, 1, Piccadilly, Manchester.
WAUGH, GEORGE, 177, Regent Street.

The Scrutineers handed to the President their Report of the returns for the Loca Secretaries.

A vote of thanks having been passed to the Scrutineers and to the Chairman, the meeting separated.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Thirteenth General Meeting, held at the Royal Institution, April 25th, 1867; the President, Mr. R. SUMNER, in the chair.

The minutes of the previous meeting were read and passed.

The following donations to the Library were announced:—The 'New York Druggists' Circular' for April, from Mr. Mercer; Inaugural Address, Queen's College; Proceedings of the Liverpool Polytechnic Society. A vote of thanks was passed to the donors.

Mr. W. Hartley, 50, Lord Street, was unanimously elected a member of the Association.

In the absence of miscellaneous communications, the President called upon Mr. H. S. Evans, F.C.S., to read the paper for the evening, on "Vegetable Organization, in Special Relation to the Natural History of Drugs."

Mr. Evans said: The action of medicinal bodies upon the animal organism is more exclusively the study of the medical practitioner, although to the pharmaceutist it pertains to a degree sufficiently to enable him to detect errors or act in emergencies. But the natural history of all the substances which form the Materia Medica is pre-eminently the pharmaceutists' and chemists and druggists' subject. The natural and chemical history, the mutual affinities and reactions, and the art of combining, and also of testing and determining the purity, genuineness, and general perfection of the properties of medicines pertain entirely to the chemist and druggist or Pharmaceutical Chemist. To us the physician looks for a supply of medicaments possessing qualities that shall produce certain defined effects, and through the physician the public relies upon us for the conscientious and faithful discharge of the physician's directions and orders. But how can we do this if we be ignorant of the natural qualities and properties of the medicines we assume the responsibility of dispensing?

It is a matter of no mean importance to the public in general, and the physician in particular, that the dispenser of medicines and compounder of physicians' prescriptions should be a notoriously qualified person, and that his knowledge and acquirements in the science and art of pharmacy should be well attested to the public by the certificate of duly appointed officers; indeed, it is due to the public health and safety that these responsible duties (on the due execution of which depends the life or death, the health or destruction, of the community at large) should only be allowed to be performed by persons who shall have submitted their acquirements to the judgment of fully qualified examiners. It is to be hoped, therefore, that the legislative measure now being considered may mature, so that after the commencement of 1868 the public will, for the future, enjoy the great boon of a compulsory qualification alike in the dispenser and the compounder, as in the prescriber of medicines. Mr. Evans then illustrated his subject by numerous instances of evil results arising out of ignorance on the part of the dealer in medicines of their characteristics, and how the like ignorance had retarded the progress of medical science, and had obscured the recorded experience of our forefathers, and that there was sad evidence of its operation in the present day. From his own observation, he had noted a sad apathy and inattention to those subjects without which a well-grounded knowledge of Materia Medica could not be acquired, indicating a deficiency too often on the part of those to whom the professional education of the pharmaceutical student has been entrusted. Tracing back the tide of medical science to the tiny rills of prehistoric knowledge, and to the primitive gathering-ground, whence have flooded out those mighty streams of medical knowledge, swelling to dimensions so gigantic that none can say to what they yet may tend, or set bounds to its resistless progress,—let us leave behind us the wreck-strewn beach, and career along its restless tide of knowledge to that higher intelligence which shall be lost in an ocean of universal happiness alike illimitable and imperishable. Independently of the great importance which the study of vegetable organization bears to other branches of pharmaceutical studies, seeing that 70 per cent. of the Materia Medica are of vegetable origin, there is in this subject an interest beyond all others. Mr. Evans then, by the aid of sections and preparations of vegetable structure and microphotographs, projected by the aid of the oxyhydrogen microscope, explained the course of the plant life, and the mutual relations and functions of the various organisms,—the effects of climate, soil, and culture upon the growth and development of specific properties being fully discussed. Like physiognomy, the general aspects of vegetables give us the first rude idea of a generalization and classification, and we thereby open an inlet to their individual characters. Strong presumptive evidence is thus afforded of the existence, patent or latent, of properties of a more or less potent character. The study of the relation between form and property is one so interesting and instructive that we leave the further development of the pleasing subject to the aspirations of the pharmaceutical student. The pursuance of this study requires the student to become an adept in botany, and both these studies are indispensable to complete the pharmaceutical qualifications. Many seem to view with aversion, or exaggerated notions of its severity, the study of botany, forgetting how many delights it affords; but an intelligent pharmaceutist cannot pass by with a careless or superficial glance a subject so important as that of vegetable organization, when so large a proportion, and that of the utmost medical value, of the Materia Medica is derived from the vegetable kingdom. Some, no doubt, who are preparing themselves to embark in our profession, are content to circumscribe the region of their knowledge by a simple acquaintance with the names of drugs, and the most ordinary uses to which they are applied. Some are devoid of ambition to rise above the pestle and mortar, and any appeal to such would fall dead and irresponsive upon their dull intellects; but they must be reminded that the age is a progressive one in thought and energy, and if not now regarded will be found to be so by them when too late, and to their bitter cost. By a present obedience to the voice of sensuous indolence, the golden opportunity will have been lost, and they stranded on the beach,—a wreck broken and scattered. Unable to cope with the accomplishments of their more energetic competitors, and incapable, through the calls and anxieties of active business, to correct the errors of youth, they will succumb unknowing and unknown. Botanical studies lay a foundation for, and greatly facilitate, the acquirement of knowledge, and pre-eminently permeate the every-day duties of the pharmaceutist; they practically influence his experience, and fit him the more readily to earn and merit the respect, confidence, and support of the public and the medical profession. But, apart from the simple commercial view of the subject, the knowledge acquired by the study is always putting itself forward in a useful and available form, rendering the possessor socially a more serviceable and important member of society, and fostering an ambition for the acquirements of general knowledge. It fits the possessor to associate in thought with those sturdy spirits that have gone forth the pioneers of untrodden deserts, opening to the world untold wealth and richness of resource. Thus, the moral as well as the social man is elevated; enlarged sympathies with mankind are awakened, and the resources for individual happiness, pleasure, profit, and enjoyments are greatly expanded.

The President proposed a vote of thanks to Mr. Evans, and expressed his admiration of the research and labour displayed in the lecture. He exhorted young men to follow the excellent advice given. The vote was carried unanimously, and most warmly.

Mr. Evans, in returning thanks, acknowledged the kindness of Mr. Guyton, who had prepared many of the photographs which had been exhibited.

ORIGINAL AND EXTRACTED ARTICLES.

THE PREPARATIONS OF CONIUM OF THE BRITISH PHARMACOPŒIA, 1864 AND 1867.

BY JOHN HARLEY, M.D. LOND., F.L.S.,

ASSISTANT PHYSICIAN TO KING'S COLLEGE HOSPITAL, AND TO THE LONDON FEVER HOSPITAL, ETC.

(*Continued from p.* 605.)

Extractum Conii.—Having completed my examination of the tinctures and succus, I come now to the consideration of the extract. Very few medicines have attained so great a reputation and have been so extensively employed as the extract of hemlock.

Introduced by Störck, in the year 1761, as a remedy of marvellous power in the removal of almost every inveterate disease to which the human frame is subject, it soon obtained admission into the Pharmacopœias; and, regarded as it is by practitioners of the present day as a powerful and useful remedy, it is still retained in almost every one of them. I myself have seen it prescribed almost daily, in doses varying from 1 to 5 grains, for the last twenty years. Nevertheless, it is to be observed that the efficacy of the extract has been questioned, and several times disproved, from the days of Störck down to our own times.

The following is the formula for the extract, to the agency of which Störck attributed his wonderful cures:—

"℞ Herbæ recentis cicutæ, quantum sufficiat. Exprimatur succus, isque recens lentissimo igne in vase terreo (sæpius agitando, ne amburatur) coquatur ad spissi extracti consistentiam, hoc extractum s. q. pulveris foliorum cicutæ in massam pilularem subigatur; ex qua fiant pilulæ granorum duorum."*

In some cases a few grains, taken daily for two or three weeks, were sufficient to remove, as it appeared, an old-standing disease, while in others the patient swallowed ʒii of the extract daily for four or five months without inconvenience. "The extract of hemlock," says Störck, "is a remedy absolutely innocent; it does not hurt the sight, but the contrary."

The following criticism, by an eminent contemporary of Störck, appears to me very just, and worthy of mention in this place:—

"Quin et incomprehensibile, ac plane paradoxon videtur, id statuisse. Præterquam enim quod nec in meis, nec in *Breslaviensium* pluribus, ea vis cicutæ confirmata fuerit, si consulam auctorem, qua namque dosi, a cicutæ extracto, hanc vim edi putet, video a granis 2 de die observasse eandem et sic porro a granis 4, ab 8, a 12, a 20, 30, 60, 120, 180, 240, idque haud rariore admodum casu sed frequenti.

"Si granum opii consuevit homini blandum conciliare, erunt alii qui indigeant dupla dosi, rariores qui triplo, quadruploque, rarissimi qui quintuplo, qui sextuplo uno die indigeant. Cicutæ autem dosis cur adeo immense augenda fit, ex comparatione cum ceteris paregoricis haud facile capitur."†

Störck's observations on the use of hemlock excited so much attention that his experiments were repeated in almost every country of Europe, and many of the leading practitioners of those times gave his far-famed extract ample trials. It needed but a short time to convince all observers that Störck had greatly overestimated its virtues. Not a few, however, were satisfied that it was a remedy of considerable value. Störck, Collin (*a*), Quarin (*b*), F. Hoffmann (*c*), Hill (*d*), Rouppe (*e*), Gataker (*f*), Andrée (*g*), W. Butter (*h*), Akenside (*h*), Spalowski (*i*), Burrows (*j*), have all advocated its use, and given us the result of their observations; but if we carefully examine their writings, we shall fail to recognise any mention of the least trace of those effects which distinguish the action of hemlock. I believe, therefore, that we are fully justified in concluding that the extract, whether prepared in Vienna, Amsterdam, Geneva, Naples, or in London, was practically, if not absolutely destitute of the active principle of the plant. Indeed, the impotency of the drug was occasionally recognized by some of these observers themselves, who attributed it to various causes,—the wrong plant had been used; the locality in which it had been grown, or the situation in which it had been exposed, was unsuitable for the elaboration of its juices; the herb had been gathered a month too soon or too late; the whole of

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* 'Essay on the Medicinal Use of Hemlock,' by A. Störck, 1761, p. 14.

† 'Epistola de Cicuta,' Antonius de Haen, 1766, pp. 20, 21.

(*a*) Observ. circa Morbos Acutos, etc., 1765. (*b*) 'Tentamina de Cicuta,' 1761.

(*c*) Observ. on the Internal and External Use of Hemlock, 1764.

(*d*) Sir J. Hill, 'Directions for those Afflicted with Cancers, with account of the Vienna Hemlock,' 1771.

(*e*) De Morbis Navigantium; acced. de effectu extracti Cicutæ, etc., 1764.

(*f*) 'Essays on Medical Subjects,' 1764. (*g*) Obs. on Störck's Treatise, 1761.

(*h*) 'Treatise on Kinkcough, with an Appendix on Hemlock,' 1773. (*i*) 'De Cicuta,' 1777.

(*j*) Prac. Essay on Cancers, with method of Administering Hemlock, 1767.

the watery juice of the expressed herb had been used, whereas the first portions should have been rejected and only the latter and more resinous part employed. Dr. Butter, with a more correct appreciation of the real cause, cautions against the employment of too much heat in the preparation of the extract, and gives the following directions for its preparation :—Evaporate the freshly expressed juice in a broad glazed platter over a charcoal fire, and, as soon as green clots form, stir the liquor frequently, keeping it at such a heat as will make them move about without driving them above the surface or occasioning an ebullition. Evaporate with constant stirring till the extract is of sufficient consistence to form pills. Such directions, taken in conjunction with the precaution "*ne amburatur*," given in the previous formula, sufficiently indicate by what agency the powerful juice was reduced to an inert mass. As with the dried leaf, so with the extract, the active principle has departed and a dead inert body alone remains. The above mentioned authors introduce us to scores of patients who are taking the extract of hemlock largely. We look from one to another to discover some evidence—no matter how slight—of its action, but we search in vain ; not a trace even of its earliest and most prominent effects are anywhere visible. We can hardly admit that these effects, evanescent though they be, could have been overlooked by such a body of intelligent observers. As scholars, at least, they were acquainted with the observations of Paulus Ægineta, Dioscorides, Plato, Galen, Plinius, respecting the action of hemlock ; and, as scientific facts, these observations were repeatedly advanced in the discussions which the treatise of Störck excited in those days.*

Passing by these earlier observers, I find the effects of hemlock practically indicated, for the first time, in the works of Dr. Fothergill. Speaking of a particular patient, he says, "The dose of hemlock (extract) was gradually increased from 20 to 70 grains a day; if he took more, it either made him sickish or created a singular kind of headache and giddiness."† These are, I think, real indications of the presence of hemlock. It must be observed, however, that the extract, used by Dr. Fothergill, was much more carefully prepared than that used by Störck and his contemporaries,—precautions having been taken both to collect the plant at the proper time, when the active principle is most abundant, and to avoid prolonged exposure of the juice to a high temperature.

A medical friend of Bertrand administered ʒj of carefully prepared extract, daily for a year, without result.‡ Dr. Allbutt, of Leeds, informs me that he "has often given the extract, in doses so large as to nauseate by its mere mass, without other results."

It thus appears conclusively that, from the time of its introduction to the present day, the extract has been regarded by many as an uncertain preparation, and it is remarkable that its value has not been long ago more satisfactorily determined. Christison, Geiber, Orfila, Pereira, and others, all concur in the opinion that most of the extract of conium of the shops is inert or nearly so. Pereira states that he was unable to procure any sensible quantity of conia from ℥iv of the extract.§ The observations on the extract are concluded in his work by the following statement, which is accepted, I believe, as a pharmaceutical axiom :—"The goodness of the extract may be determined by the disengagement of a strong odour of conia, when it is gradually triturated with liquor potassæ." This test is so readily applied, and appears at the same time so decisive, that any more elaborate analysis seems superfluous, and yet I ven-

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* Bertrand, 'Recueil de Mémoires de Méd., de Chir., et de Pharm. Militaires,' 1ère sér. vol. ix. p. 313.

† De Haen, op. cit. Viventius J., 'De Cicuta,' Naples, 1777, which contains a very complete reference to the observations of the Ancients on the action of Hemlock.

‡ Obs. on the Use of Hemlock, John Fothergill, M.D., Works, vol. ii. p. 59.

§ Elem. Mat. Med. vol. ii. pt. ii. p. 206.

ture to assert that no statement can be further from the truth, no test more fallacious. Half an ounce of extract, containing but a fraction of a grain of conia, will, on trituration with caustic potash, speedily evolve a powerful and penetrating odour of conia, and the effect is usually very much heightened by the simultaneous separation of a little ammonia. A great deal too much has been inferred from this reaction, and it is to this cause, I believe, that we have so long remained in a state of uncertainty respecting the virtue of the extract. A given sample has been pronounced good, because, on commixture with caustic potash, it has evolved a strong odour of conia. Attention to the following experiments will show the fallacy of such a conclusion.

I have already proved that the "succus conii" prepared last season by Mr. Buckle, of Gray's Inn Road, possesses in a powerful degree the poisonous properties of hemlock. As many sources of error are by this means eliminated, I am fortunate in being able to make two extracts, most carefully prepared from this succus, the basis of my investigations. One of these extracts was prepared strictly according to the directions given in the British Pharmacopœia, and contains, therefore, the albumen and chlorophyl of the juice,—this I shall call "ordinary extract." The other specimen was prepared by the same process, excepting that the colouring-matter, separated by exposing the juice to a temperature of 130° Fahr., was altogether rejected. This, therefore, I shall call "extract without chlorophyl." The evaporation of the juice in both cases was conducted at a temperature of about 160° Fahr.

Ordinary Extract of Conium of the British Pharmacopœia.—The following were the characters of this extract:—smooth, dull olive-green, of a consistence sufficient for forming pills, taste acidulous, free from all bitterness and acridity, but partaking slightly of the nauseous oleo-resin of the plant. *Triturated with a little solution of caustic potash, a powerful odour, compounded of conia and ammonia, was evolved.*

1. January 22, 1867. Took 250 grains of this extract, and having liquefied it with a little water and f ʒiv of solution of caustic potash (1 part to 3 of water), thoroughly washed the mixture with separate portions of æther. After distillation of the æther, there remained 1·8 grain of a dark sap-green oily matter, which partly solidified after some hours. It possessed all the physical characters of the impure conia, obtained from the dried leaf by the agency of potash and alcohol (see examination of the dried leaf). Treated with dilute sulphuric acid, a portion dissolved, leaving a remainder of oleo-resin, coloured with chlorophyl. The acid solution contained nearly 1 grain of hydrated conia.

2. April 7, 1867. I took 10 grains of this extract.

April 10: 15 grains.

April 13. I licked-up 20 grains. Not the slightest effect followed any of these doses, although the conditions for their development were as favourable as could be desired.

I gave this extract in the same doses to two female patients; the one suffering from an ovarian tumour, the other from anæmic headache and dimness of sight. No effects followed its use, not even in the latter patient, who was already predisposed for its action.

Extract without the chlorophyl.—This was of the consistence of treacle, and had a similar bright and clear, but a richer amber-brown, colour; odour faintly approaching that of the ordinary extract, taste pleasantly sweet and acidulous, without any trace of acridity. *Triturated with caustic potash, a strong odour of conia, mixed with that of ammonia, is evolved.*

1. January 26, 1867. Took 250 grains, and having liquefied it with f ʒi solution of caustic potash (gr. 32 in f ʒi), transferred the mixture to a retort, and distilled from a chloride of calcium bath, at a temperature varying from 260° to 270° Fahr. 8¾ fluid drachms of colourless fluid, with a faint greasy film,

passed over. f ℥v water, containing 50 grains of caustic potash, were now added to the contents of the retort, and distillation continued as long as alkaline fluid passed. ℥vi ss of fluid in all, was obtained. The conia was obtained from this by neutralization with sulphuric acid, evaporation, separation of the sulphate of ammonia, decomposition of the sulphate of conia with HOKO, and separation of the alkaloid by æther. It weighed only 0·2 of a grain.

2. By the process adopted in the separation of the conia from the ordinary extract (see above), I obtained from the same quantity (250 grs.) of this extract without chlorophyl exactly one grain of bright yellowish-brown oily fluid, which almost wholly dissolved in dilute sulphuric acid. It was, therefore, nearly pure conia.

3. February 13, 1867. I licked-up 5 grains of this extract. March 10. 10 grains. April 2: 15 grains. April 3: 20 grains. No effects followed either dose; nor could I obtain the slightest physiological action in the persons of two delicate women by giving the extract in the above-mentioned doses. To produce the slightest evidence of the presence of hemlock, 50 grains at least would have been required, but the doses were not further increased; for to be of any practical value, the extract should contain such a proportion of conia that its effects may be manifested after a dose of 10 or, at most, 20 grains.

It would not be fair, perhaps, to conclude from the foregoing experiments that all extract of conium is as deficient in medicinal power as the samples employed in these experiments have proved to be. Still, side by side with the facts referred to in this paper, they strongly persuade one to this view. The facts, indeed, of the particular case before us are very strong. The juice employed in the preparation of the extracts has been proved, both physiologically and chemically, to be replete in active properties,—f ℥j of the "Succus Conii" = f ʒvj of the juice of the plant, and 30 grains of extract, has been shown to contain 0·42 grains of conia; and every precaution was taken with the expressed juice to prevent decomposition by exposure to the air, to a high temperature, or to prolonged heat; and yet we find that 250 grains of it retain only a grain of the alkaloid. Again, two ounces of the dried leaf—equivalent to f ℥vj of the juice of the plant, and to very nearly 4 grains of conia—retain less than half a grain of the active principle. I say, then, that in face of these facts, there is a very strong body of evidence against the medicinal value of the extract.

With a view of determining what becomes of the conia during the process of evaporation, I have conducted the following experiments:—

1. Evaporated f ℥j of the Succus Conii, P.B., No. 1, over a water bath to the ordinary consistence of the extract. About an hour was required for the operation. After liberating the conia, and completely removing it, I found that it weighed 0·30 of a grain, 0·12 less than I obtained by the same process from the same quantity of the succus, to which I had previously added f ʒss of dilute sulphuric acid, P. B., in order to fix the conia.

2. Placed f ℥j of the same sample of "Succus Conii" in a retort, and distilled f ʒiiss by the aid of a water bath. The distillation occupied three hours. The first f ʒiss passed over during the first fifteen minutes, and was collected separately. Excepting that the first fluid was chiefly spirit, the distillates did not appear to differ; both possessed a stronger odour of the plant than the succus itself; both gave out an extremely faint odour of conia on the addition of caustic potash, both were rendered faintly opalescent by the addition of nitrate of silver and of chloride of mercury. The remainder was transferred from the retort to an evaporating dish, and exposed to the heat of a water bath for another hour. The syrupy residue was then mixed with potash, and thoroughly washed with æther. 0·19 gr. of conia was obtained, being 0·11 gr. less than was obtained by the first experiment, and less than half of the quantity contained in the ounce of "succus."

3. Exposed f ℥j of the "Succus" upon a plate in a glass-house with a south aspect, and where the natural temperature ranged from 70° to 90° Fahr. After thirty-four hours the small syrupy residue was treated with potash and washed with æther; 0·25 of a grain of conia was obtained.

Two facts appear from these experiments—first, that the active principle of the plant is to a certain extent vaporizable even at a natural temperature of 70° to 90° Fahr.; and secondly, that prolonged exposure to a high temperature is accompanied by a progressive diminution of the conia, the alkaloid being converted, as Dr. Christison has pointed out, into ammonia and some other secondary product.

Now the quantity of juice prescribed by the Pharmacopœia for conversion into extract, is about eight gallons, and the prolonged exposure to a temperature ranging from 140° to 212° Fahr., required to effect this process, is doubtless sufficient to remove all but a trace of the active principle; and it is obvious from the foregoing that, given an efficient juice, the power of the extract will be inversely proportionate to the bulk of the juice operated upon; hence, to obtain an extract of full power, it will be necessary to expose the juice in a number of shallow dishes, and in a layer not exceeding half an inch in depth, to a rapid current of dry air having the temperature of 150° Fahr. or thereabouts, so that the whole may be reduced to the consistence of an extract in the course of two or three hours. By this means an extract, containing 1 per cent. of conia at most, may be procured. And it is extremely doubtful whether a stronger extract can be prepared by this or any other process.

Such are the conclusions to which the foregoing experiments lead, and in respect of the use of the extract they are important. One fact is quite certain, viz. that the power of the extract has been greatly over-estimated. The present Pharmacopœia (1867) directs it to be given in doses of from 2 to 6 grains. Now, granting that this preparation retain the whole of the active principle, which, from my examination of the "Succus," I place at 1·4 grain in a 100 grains; 6 grains of the extract would represent only the 0·084 of a grain of conia,—a quantity insufficient to produce the effects of hemlock in a child two years old. The physiological action of hemlock is such, that doses which fall far short of producing it are of no use; and it is doubtful whether the possession of an extract containing 1 per cent. of conia—which I believe is the strongest that can be made—will be of any advantage, since 25 grains of it would be equivalent to only f ʒiv of the "*Succus*" of the Pharmacopœia.

It has been doubted by some whether the Athenian state-poison was wholly derived from the hemlock; I see no reason myself—on account of the expression "*μικρὸν πάνυ καταπότιον*, a very little dose"*—for doing so. The inspissation of the juice was effected, according to Dioscorides, by exposing it to the sun; and by this means a syrup may be prepared, of which, assuming the Greek plant to be equally powerful with that grown in these temperate regions, a tablespoonful or two would doubtless prove a fatal dose.

I will conclude these remarks by the following particulars, which will serve to render my account of the Succus Conii, No. 1, upon which I have chiefly based my experiments, more complete. f ℥j of the "*Succus*" yields six grains of white ash, which fuses with effervescence before the blow-pipe into a porcellaneous mass, dissolves with copious effervescence in the mineral acids, and the clear acid solution gives an abundant heavy yellow crystalline precipitate with bichloride of platinum. Hence it follows, that the juice contains one or more vegetable acids and potash.

It is to be observed that Schrader† makes no mention of either soda or sugar

* Theofrastos, Hist. Plant. iv. viii. p. 298, ed. Schneider.

† Berzelius, 'Traité de Chimie,' vol. vi. p. 254. Berlin. Jahrbuch, 1805, s. 152.

in his analysis of the juice, and that he, De Machy and Errhardt* mention nitric acid as one of its constituents. I have carefully examined the ash left by the combustion of the extract, and find myself in agreement with Bertrand and Baumé in being unable to discover a trace of nitrates.

Vapor Coniæ.—The use of the extract in the formation of the vapor is objectionable, for two reasons: first, the quantity of conia contained in the portion of mixture prescribed, is too small to relieve spasm; and, secondly, any influence which a minute portion of the alkaloid might possess, would probably be more than neutralized by the simultaneous evolution of ammonia from the alkalized extract.

In the following form these objections do not exist, and the dose of conia can be readily graduated :—

Conia, 1 grain.

Alcohol, $1\frac{1}{2}$ fluid drachm. Dissolve the conia in ʒss of the alcohol, and add the remainder mixed with the water.

Water, $2\frac{1}{2}$ fluid drachms.

20 minims contain $\frac{1}{12}$ of a grain of conia.

78, *Upper Berkeley St.*, *W.*, *April* 21, 1867.

CONTINUATION OF ACCOUNT OF CRYPTOPIA.

BY T. AND H. SMITH.

The analysis of Cryptopia will be considered a valuable addition to the paper published in April on that alkaloid. Through the kindness of our friend Dr. Cook, Demonstrator of Chemistry, King's College, we are enabled to subjoin the following analytical results:—

ANALYSIS OF CRYPTOPIA.

$C = 12. \quad O = 16.$

The alkaloid, dried first under the air-pump for some hours, and then in a water-bath kept at a temperature of 212° F., lost no weight.

I. 3·25 grs., burnt with oxide of copper, with a layer of metallic copper turnings in front, gave 8·33 CO_2 and 1·98 H_2O, equal to 70·00 per cent. C and 6·77 per cent. H.

II. 4·7 grs., burnt in the same manner, gave 12·08 CO_2 and 2·88 H_2O, equal to 70·2 per cent. C and 6·8 per cent. H.

III. 5·32 grs., burnt in a similar manner, gave 13·56 CO_2 and 3·15 H_2O, equal to 69·5 per cent. C and 6·76 H.

IV. 5·45 grs. alkaloid, when burnt with soda-lime, and the ammonia absorbed by standard acid, which contained 20·96 grs. SO_3 per 1000 fluid measures, were found to have neutralized an amount of acid equal to 28 measures = ·2054 N = 3·77 per cent. N.

V. 5·9 grs., treated in a similar manner, were found to have neutralized acid equal to 30 measures = ·22 N = 3·73 per cent. N.

The above figures indicate the formula ($C_{23}H_{25}NO_5$).

	Theory.		Experiments.				
	Eq.	Per cent.	I.	II.	III.	IV.	V.
C_{23}	276	70·00	70·00	70·20	69·5		
H_{25}	25	6·33	6·77	6·8	6·76		
N	14	3·50				3·77	3·73
O_5	80	20·17					
	395	100·00					

* Bertrand, op. cit. p. 306.

ANALYSES OF CHLORIDES.

Cryptopia appears to form two combinations with HCl, one $C_{23}H_{25}NO_5$ $2HCl$, $6H_2O$; and the other, $C_{23}H_{25}NO_5$ HCl, $5H_2O$.

Bichloride.—Water of Crystallization.

16·8 grs. lost on drying at 212° F., 2·9 grs., on further drying at 240° F. for three hours, the total loss was 3·15 grs. = 18·7 per cent. water.

Chlorine.

7·7 grs. crystals of chloride, when burnt with lime, and the solution of the contents of the tube in nitric acid, precipitated by nitrate of silver, gave 3·92 chloride, equal to ·97 chlorine = 12·6 per cent. chlorine.

	Theory.		Experiment.	
	Eq.	Per cent.	I.	II.
$C_{23}H_{27}NO_5$	397			
$2Cl$	71	12·32	12·6	
$6H_2O$	108	18·7		18·7
	576			

Protochloride.—Water of Crystallization.

16·99 grs. dried for some hours, at 240° F., lost 2·8 grs. = 16·47 per cent. water.

Chlorine.

I. 5·51 grs. of the crystals, when burnt with lime, and the dissolved chloride precipitated by nitrate of silver, yielded 1·65 chloride of silver = ·408 Cl = 7·4 per cent.

II. 7·36 crystals gave 2·12 chloride of silver = 7·1 per cent. Cl.

III. 4·4 grs. of the dried chloride, equal to 5·267 grs. of the crystals, yielded, when treated in a similar manner 1·415 chloride of silver = ·35 Cl = 6·64 per cent. in the crystals.

	Theory.		Experiments.			
	Eq.	Per cent.	I.	II.	III.	IV.
$C_{23}H_{26}NO_5$	396					
Cl	35·5	6·8		7·4	7·1	6·64
$5H_2O$	90	17·2	16·47			
	521·5					

Platinum Salt.

Prepared by adding an excess of bichloride of platinum to a dilute HCl solution of the chlorides.

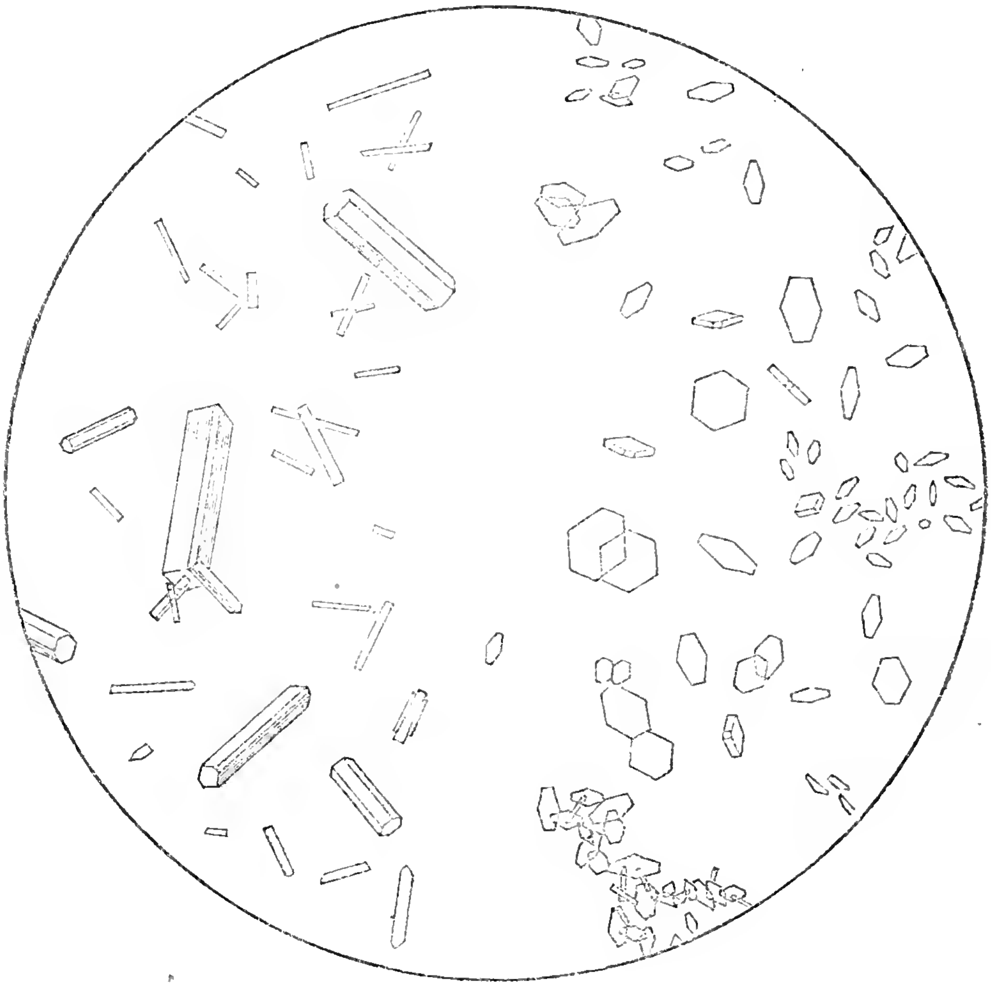
I. 5·09 grs., when burnt, yielded 0·84 gr. metallic platinum = 16·5 per cent.

II. 5·16 grs., when burnt, yielded 0·86 gr. metallic platinum, equal to 16·66 per cent.

The amount of platinum per cent. in the salt of the composition $(C_{23}H_{25}NO_5HCl)_2PtCl_4$ should be 16·4.

To our friend Mr. Brady, of Newcastle, our thanks are due for the accompanying diagram and description of the crystalline forms assumed by cryptopia.

"The alkaloid itself has much better defined crystalline forms than any of its compounds. Its primary form is a hexagonal prism, and it is obtained in this condition if crystallized slowly in a tube from its alcoholic solution. But if a warm alcoholic solution be allowed to evaporate on a slip of glass, it takes the shape of very thin hexagonal plates, the minute crystals resembling uric-acid lozenges. I send you a sketch, drawn accurately, × 150 diameters. The nitrate,



CRYPTOPIA, 150 diam.

sulphate, hydrochlorate, and acetate are much more difficult to determine the forms of. I have only obtained them as bundles of minute needles, even with high powers I cannot make out anything more. They mostly are packed into masses so closely as to appear merely striated with fibrous brush-like ends. Occasionally they may be seen in stellate groups. The hydrochlorate, which you sent on glass,* is of this stellate form, but the characters of the individual crystals are undeterminable.

"I could have wished to have sent you more positive details and fuller, concerning this interesting substance, but it is satisfactory at least to find that in one of its characteristic forms it might be identified amongst the other opium alkaloids by means of the microscope."

ON THE SUBLIMATION OF THE ALKALOIDS.

BY WILLIAM A. GUY, M.B., F.R.S., F.R.C.P.,
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I.

In the year 1864, Dr. A. Helwig, of Mayence, first proposed the sublimation

* The crystals, here referred to by Mr. Brady, were a portion of what we have inferred, in

of the alkaloids as a test and diagnostic,* and more recently (in 1865†) he published a work, in large 8vo, of which the greater part is devoted to the tests for the poisonous alkaloids—morphia, strychnia, brucia, veratria, atropia, aconitine, solanine, digitaline, conia, and nicotia. In the case of the fixed alkaloids, the results of sublimation and the reactions of the sublimates are minutely described. The work contains carefully prepared tables of the reactions, and is enriched by no less than sixty-four micro-photographs, of which thirty-eight represent the crystalline forms of the alkaloids and their salts with various reagents, and fourteen are devoted to sublimates and their reactions.

Dr. Helwig states that the idea of submitting the alkaloids to sublimation first suggested itself to him as a natural extension of a method so successful in detecting and identifying minute quantities of arsenious acid and corrosive sublimate; and he lays claim to originality, inasmuch as he does not find the sublimation of the alkaloids described in any handbook of chemistry or forensic medicine, even the most recent. This claim to originality is, I believe, fully justified, though probably every manufacturing chemist must have recognized the fact that some at least of the alkaloids are sublimed by heat, and experimenters on the small scale must have observed that the alkaloids, as a class, after melting, and before depositing carbon, give out a more or less dense vapour or smoke, which, if allowed to settle on a cool surface, might possibly present, under the microscope, characteristic appearances.

This new application of the test of sublimation suggested itself to Dr. Helwig after becoming acquainted with the simple methods of obtaining sublimates of arsenic and mercury on flat surfaces, with a view to microscopic and chemical examination, which I proposed in the year 1858.‡ His own method of procedure with the alkaloids is as follows:—In a piece of platinum-foil of moderate thickness, a small cup-like hollow is formed; in this a minute quantity of the alkaloid is placed, and over it a microscopic slide (*Objectträger*). This simple apparatus being placed on a suitable support, the flame of a spirit-lamp is cautiously applied until the alkaloid melts, from which point of time the sublimate begins to form on the glass slide.

Now, this mode of procedure is obviously open to objection. The successive changes that take place in the alkaloid—the discoloration, the liquefaction, the deposit of carbon, either on the spot (as happens with some alkaloids) or over a wide surface traversed by the liquid (as is the case with others)—cannot be distinctly seen, and some diagnostic marks of the alkaloids as a class, and among themselves, are thus lost. Nor, again, can the formation of the sublimate itself be seen and watched, as it should be if we would obtain satisfactory results. There is also some risk in this sudden mode of applying heat, of causing the glass, which should receive the sublimate, to break.

The method of procedure to which I should give the preference is the following:—Provide small crucible covers or slabs, or fragments of white porcelain, a few microscopic cell-glasses, with a thickness of about one-eighth of an inch, and a diameter of circle of about two-thirds of an inch, and disks of window-

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our account of Cryptopia in the Pharmaceutical Journal of April, to be a mixed muriate of Cryptopia and Thebaia.

* Fresenius's 'Vierteljahrschrift für analytische Chemie,' 1864, i.

† 'Das Mikroskop in der Toxikologie. Beiträge zur mikroskopischen und mikrochemischen Diagnostik der wichtigsten Metall- und Pflanzengifte, für Gerichtsärzte, gerichtliche Chemiker und Pharmaceuten, mit einem Atlas photographirter mikroskopischer Präparate. Von Dr. A. Helwig, pract. Arzte und Grossherzoglich-Hessischem Kreiswundarzte in Mainz. 1865.

‡ "On the Production and Identification of Crystals of Arsenious Acid and Crusts of Metallic Arsenic" (Beale's 'Archives of Medicine,' no. iii., 1858); also "On the Microscopic Characters of the Crystals of Arsenious Acid" ('Journal of the Microscopic Society, 1861,' and 'Principles of Forensic Medicine,' 2nd edit., 1861, p. 372).

glass about the size of a shilling. Place the porcelain slab on the ring of a retort-holder or other convenient support, then the glass cell, and upon the porcelain, in the centre of the cell, a minute portion of the alkaloid or other white powder, or crystal reduced to powder. Then pass the clean glass disk through the flame of the spirit-lamp till the moisture is driven off, and adjust it with the forceps over the glass ring. Now apply the flame of the spirit-lamp to the porcelain, underneath the powder or crystal, and continue the heat till the powder undergoes its characteristic change and gives off vapour. Watch the deposit of this vapour on the glass disk, and remove the spirit-lamp either directly or after a short interval, as experience may determine.

These are my reasons for recommending this mode of procedure in preference to that advocated by Dr. Helwig:—By employing a flat white slab of porcelain, the heat of the lamp is applied gradually, and every change of consistence, colour, and position which the powder undergoes is easily observed. The ring of glass, as compared with a ring of metal, has the advantage of conducting the heat from the surface of the porcelain to the glass disk so slowly as to guard effectually against the danger of breaking, and if the powder after melting changes its place, the glass ring, with the disk upon it, is easily shifted. The disk of window-glass is very convenient both for the experiment itself and for the subsequent application of liquid tests. It will also bear a moderate heat, if required. The disks, however, are not essential; their chief recommendation is the facility they afford of multiplying experiments. The common glass slide, or a slip of window-glass (as being less liable to scratch, and bearing heat better than plate-glass) may be substituted when only a few experiments are intended to be made.* An oblong slab of wood, somewhat larger than the microscopic slide, with a circular aperture and ledge to support the glass disk, enable us to examine the sublimate under the microscope, and a similar piece of thick cardboard, with a hole punched in the centre of it, serves for the mounting of the preparation.†

By this mode of procedure I have obtained sublimates of veratria and solanine, which correspond closely with the descriptions and photographs given by Helwig; but, in the case of strychnia and morphia, I have got very distinct and extremely beautiful crystalline sublimates (not exceptional, but as the rule) where he has failed;‡ and though I am not yet prepared to assert positively that the strychnia and morphia sublimates can always be distinguished by their crystalline forms alone, I am able to correct the statements contained in the following passages:—

"It (the sublimate of morphia) consists of perfectly homogeneous spots of round, very sharply defined granules, closely packed together, which, when magnified a hundred and sixty times, are transparent, but among which no trace of a crystalline formation can be discovered (p. 9);" and "Examined microscopically, a sublimate of strychnia is not to be distinguished from a sublimate of morphia; precisely the same spots of round transparent granules, without trace of crystalline formation (p. 21)."

My object, in the present communication, is to draw attention to a new method of procedure, which, even if it should fail to realize the sanguine expectations of Dr. Helwig, will certainly deserve and receive the attention of the

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* As the disks of glass can only be conveniently cut by a revolving diamond, which few glaziers possess, it may be well to mention that they may be procured of Mr. Eade, 130, High Holborn, at a cost of two shillings the gross.

† When dealing with larger quantities (such as a grain or more) of the alkaloids, the short specimen tube may be substituted for the porcelain and microscopic cell-glass. But the results are far from satisfactory; and it would certainly be better to sublime successive small portions of a hundredth of a grain or less, from the porcelain.

‡ I have also obtained very fine crystalline sublimates from the new alkaloid Cryptopia.

micro-chemist and microscopist, on account of the simplicity and delicacy of the process, and the beauty of the results which it yields, directly in the sublimates themselves, and remotely in the effect of reagents upon them. The few specimens of the sublimates of strychnia, morphia, solanine, and cryptopia, and of their reactions, which were shown at the late *soirée* of the Pharmaceutical Society will, I think, justify this expectation.

I hope to be able to resume this subject on an early occasion, and to indicate more precisely the advantages which we may expect to derive from the use of this method.

THE CODEX AND THE BRITISH PHARMACOPŒIA.

BY A. F. HASELDEN.

(*Continued from p.* 636.)

THE PHARMACOPŒIA.

The portion, called Pharmacopœia, containing the preparations of the Codex, is not arranged alphabetically, but methodically, as in former editions both of the Codex and the London Pharmacopœia, whereby substances, though differing in name but resembling each other in character, are placed in close proximity. In the revised edition of the British Pharmacopœia the arrangement is still alphabetical, the Materia Medica and preparations being intermingled.

There are two classes of products contained in the Codex Pharm., namely, those which consist of simple medicaments, furnished by the science of chemistry, and those which are of a compound nature, produced by the admixture of various substances; the chemicals take precedence, and the galenicals follow. Each preparation is numbered, reaching from No. 1 to 862; by this arrangement, if in preparing one article another is referred to as to any part of the process, it is done by the number; thus, in preparing the solution of hypochlorite of soda, No. 106, a portion of the work is to be performed as directed in No. 105. This part of the work is divided into chapters, and I proceed at once to—

CHAPTER I.

SIMPLE BODIES.

The number of these given in the Codex is not large; they are oxygen, sulphur sublimed and washed, precipitated sulphur, chlorine in solution, chlorine fumigation, vegetable charcoal, purified silver, iron filings, levigated iron filings, reduced iron, grain tin, powdered tin, purified bismuth, purified antimony, and pure mercury.

The equivalent weights are given in accordance with the old system, thus, oxygen = 8, not 16; sulphur = 16, not 32; carbon = 6, not 12; iron = 28, not 56; tin = 59, not 118; mercury = 100, and not 200. I shall give the names and synonyms as Codex generally, any deviation will be easily recognized, and a few only of the preparations will be selected.

OXYGÈNE. O = 8.

1. OXYGÈNE GAZEUX.

Gaz Oxygenium.

Oxygen gas is made in the ordinary way from chlorate of potash, without the presence of oxide of manganese.

SOUFRE. S = 16.

2. FLEUR DE SOUFRE LAVÉE*.

Sulfur Sublimatum et Lotum.

This is sublimed sulphur, made into a paste with a small quantity of water, then well diluted and washed with boiling distilled water until the water ceases to redden litmus paper, then drained and dried; it is a well-known article of English pharmacy, but not in the P. B.

3. SOUFRE PRÉCIPITÉ.

MAGISTÈRE DE SOUFRE.

Sulfur Præcipitatum.

Fleur de soufre . . . cent grammes,	100.	Flower of sulphur, one hundred grammes.		
Chaux éteinte . . trois cent ,,	300.	Slaked lime . . three ,,		,,
Eau commune . . mille ,,	1000.	Plain water . . one thousand		,,
Acide chlorhydrique	Q. S.	Hydrochloric acid, a sufficiency.		

This will show the general arrangement of the quantities ordered for any preparation, and the fact of those quantities being expressed in words and figures, thereby diminishing the chances of error as to quantity. It will be observed that the amount of lime is much larger than ordered in the P. B.; the *modus operandi* is virtually the same, the directions in the Codex being a little fuller and more explicit.

CARBONE. C = 6.

6. CHARBON VÉGÉTAL.

Carbo e ligno.

Vegetable or wood-charcoal.—Take fragments of white wood, light and not resinous, any quantity, which introduce into a sufficiently capacious earthen crucible; fill up the spaces left between them with ordinary charcoal, in powder, and add sufficient of this substance to form a bed of two or three centimetres above the highest point of the pieces of wood, then put on the cover of the crucible and gradually raise the temperature to a red heat; keep up the heat until a small piece of the charcoal being detached from the mass, for trial, no longer colours sensibly a boiling solution of caustic potash, allow the crucible to cool; take out the fragments of carbonized wood, and free them by means of a light brush from the charcoal dust which covers them. Well prepared wood-charcoal, put into a test-tube and strongly heated, does not give off any trace of empyreumatic matter. Speaking of wood-charcoal, the P. B. says, wood charred by exposure to a red heat without access of air. Vegetable charcoal has lately been much extolled as a remedy for faulty digestion and for gouty subjects.

CHAPTER II.

MINERAL ACIDS.

The following are included in this Chapter:—Purified sulphuric acid, dilute sulphuric acid, alcoholic sulphuric acid, nitric acid, alcoholic nitric acid, phosphoric acid, boric or boracic acid, hydrosulphuric, hydrochloric, nitromuriatic, cyanhydric or prussic, carbonic, and chromic acid.

ACIDE SULFURIQUE. $SO_3 = 40$.

16. ACIDE SULFURIQUE PURIFIÉ*.

Acidum Sulfuricum Purum. $SO_3HO = 49$.

Purified sulphuric acid is directed to be prepared in a manner similar to that of the P. B. 1864, the retort should be of the capacity of a litre (thirty-five ounces) in operating upon one thousand grammes by weight of sulphuric acid, and, should larger quantities be required, the employment of several retorts rather than a larger one is recommended. The reader is referred to Professor Redwood's able remarks upon sulphuric acid in the Pharmaceutical Journal.

17. Acide Sulfurique Dilué*.

Acidum Sulfuricum Dilutum. Dilute Sulphuric Acid.

Translation.

Purified sulphuric acid, 1·84	One hundred grammes, 100.
Distilled water	Nine „ „ 900.

Put the water into a bottle, and, by degrees, mix with it the sulphuric acid, agitating continually to equalize the heat: care should be taken not to pour the water upon the acid, the heat developed at the point of contact being able to occasion the fracture of the vessel. This solution contains one-tenth of its weight of concentrated sulphuric acid.

At the very starting-point of anything like a pharmaceutical preparation or mixture, one is induced to exclaim, behold the convenience of the decimal system; see how easy to make the calculation and remember it,—one in ten by weight; whereas in the P. B. the proportions are by measure, three of acid to thirty-five of water,—making thirty-eight,—no even quantity, one part by measure in twelve and a fraction; if required to know the proportion by weight, it must be worked out, but turn to the next and one's ardour is somewhat damped.

18. Acide Sulfurique Alcoolisé*.

Eau de Rabel, Acidum Sulfuricum Alcoolisatum. Alcoholic Sulphuric Acid.

Purified sulphuric acid, 1·84	One hundred grammes, 100.
Alcohol, 90°	Three „ „ 300.
Red-poppy petals	Four grammes . . . 4.

In this product there is no longer the *simplicity* of the decimal system, the combining proportion of acid being one in four, not one in five, ten, fifteen, twenty, or a hundred. This preparation might at first appear to be synonymous with the acidum sulphuricum aromaticum of the P. B., but it is not so, as it contains no aromatics and is much stronger of acid.

20. Acide Nitrique Alcoolisé*.

Esprit de Nitre Dulcifié. Acidum Nitricum Alcoolisatum. Dulcified Spirit of Nitre. Alcoholic Nitric Acid.

Nitric Acid, 1·31	One hundred grammes, 100.
Alcohol, 90°	Three do. do. 300.

Pour gradually the nitric acid upon the spirit which has been previously put into a stoppered bottle; open it occasionally during two or three days to allow the escape of gas developed by the chemical action; keep it for use. To prepare one hundred grammes of nitric acid, 1·31, mix 71 gr. 5 of officinal nitric acid at 1·42 with 28 gr. 5 of distilled water. This preparation is evidently intended to take the place of spiritus ætheris nitrosi; its properties are stimulant and diuretic.

21. Acide Phosphorique. $PhO_5 = 71$.

Acide Phosphorique Officinal. Acidum Phosphoricum Officinale.

$PhO_5,3HO + aq.$

Phosphorus	Ten grammes . . 10.
Officinal nitric acid, at 1·42	Sixty grammes . 60.
Distilled water	Thirty grammes . 30.

Put the mixture of nitric acid and water, having a density of 1·28, into a glass retort, furnished with a glass-stoppered tube, place the retort upon a furnace, and adapt to it a tubulated flask or receiver, to which is adjusted a long tube to allow the escape of uncondensed vapours. The phosphorus being then cut into pieces of a gramme or more, introduce one of these pieces into the acid mixture through the tube into the retort, and heat gently until it is decomposed and dissolved; throw in then, by means of a pair of pliers, another piece of phosphorus, taking care to close quickly the tube, and so continue until the whole of the phosphorus has been submitted to the action of the nitric acid and has completely disappeared in the liquid. Each time that a fresh piece of phosphorus is introduced, effervescence occurs; the fire should be slackened if it is found too strong. When all the phosphorus has thus been disposed of, the liquid which has passed over into the receiver is to be returned to the retort, and then a second distillation is to take place, the effect of which is to complete the action of the nitric acid and to ensure the entire transformation of the phosphorus into phosphoric acid: then withdraw the liquid from the retort, and concentrate it in a platinum capsule, to the consistence of thick syrup, so as to drive off all the nitric acid; the residue is then diluted with water, so that the solution shall mark 1,45 of the densimeter. It is in this concentrated state that phosphoric acid is employed for medical use. This acid is much stronger than the acid of the P. B., which has a density 1·08. Whilst it is difficult to see the advantage of having so strong an acid, one cannot fail to appreciate the completeness of the directions.

24. Eau Régale.

Acide Nitro-muriatique. Aqua regalis. Nitromuriatic Acid.

This is a strong acid, and for pharmaceutical or medicinal purposes much less convenient than the dilute acid of the P. B.

Acide Cyanhydrique. HCy=27.

26. Acide Prussique Médicinal*.

Acidum Cyanhydricum Aquâ Solutum. Medicinal Prussic Acid. Cyanhydric Acid dissolved in Water.

Cyanide of Mercury	One hundred grammes,	100
Hydrochlorate of Ammonia	Forty-five grammes .	45.
Hydrochloric Acid at 1·17	Ninety grammes . .	90.

In making this acid the form by which it is prepared resembles that of Gay-Lussac, the resulting product being much stronger than that of the P. B., containing 10 per cent. of real acid against two; from a medicinal and dispensing point of view, it is difficult to discover the advantage of having so strong a preparation; on the contrary, it seems to be an evident disadvantage, more poisonous, more likely to be decomposed, and requiring further dilution before it can be dispensed with convenience or comfort.

The following observations are from the Codex:—The cyanhydric or hydrocyanic acid is excessively destructive or poisonous. It is very volatile and very liable to change. It should be preserved in stoppered bottles, and sheltered from the light. As in spite of these precautions it changes soon enough, it is indispensable that it should be tested from time to time, and that it should be renewed when no longer of the strength indicated.

CHAPTER III.

METALLIC OXIDES.

Crystallized oxide of antimony, precipitated oxide of antimony, washed diaphoretic antimony or potassic superstibiate (this does not represent our tartar emetic), hydrated antimonic acid, red oxide of mercury, red oxide of iron, safran de mars apéritif, or hydrated oxide of iron, hydrated peroxide of iron, black oxide of iron, oxide of zinc by the dry and moist process, calcined magnesia or magnesic oxide, hydrate of magnesia, quicklime, lime-water, caustic potash, pure potash, poudre de Vienne or caustic potash with lime, solution of caustic soda, and liquid ammonia are contained in this chapter.

It is not necessary to extend very much the remarks upon some of these oxides; the crystallized oxide of antimony prepared by burning metallic antimony at the bottom of a large red-hot crucible is not met with in English pharmacy; the precipitated oxide of antimony corresponds with the oxide of the P. B., carbonate of potash being used instead of soda; the washed diaphoretic antimony does not represent our tartarized or tartarated antimony. The diaphoretic antimony should be perfectly white. It consists (says the Codex) in 100 parts, of antimonic acid 76·99, potash 10·70, and water 12·31.

Oxyde de Mercure. $HgO = 108$.

33. Oxyde Rouge de Mercure*.

Deutoxyde de Mercure, Bioxyde de Mercure, Précipité Rouge. Oxydum Hydrargyricum. Mercuric Oxide, Red Oxide of Mercury.

Pure Mercury	One thousand grammes . . .	1000.
Nitric Acid, 1·42	Seven hundred and fifty grammes,	750.
Distilled water	Two hundred and fifty	250.

Introduce the mercury into a flat-bottomed matrass, pour upon it the acid and water previously mixed, and place the matrass upon a warm sand-bath, so that the metal may be entirely dissolved; gradually raise the heat so as to evaporate the liquid; when the nitrate of mercury has become dry, raise the temperature so as to decompose it; maintain the heat sufficiently long that the decomposition may be perfect, and that nitrous vapours are no longer set free. Let it cool slowly, take out the oxide, which is of a beautiful orange-red, and keep in a closed vessel protected from the light. When the temperature is raised too much or the heat is too prolonged, the oxide is converted into oxygen and mercury; when, on the contrary, sufficient heat has not been used so as to decompose all the nitric acid, an oxide is obtained mixed with subnitrate of mercury, this second inconvenience should be more carefully guarded against than the first.

When oxide of mercury is prepared in the wet way by precipitating a salt of the binoxide of mercury by potash, an oxide is obtained of a yellow colour, having the same composition as the former but differing in many other respects. Thus, it is most readily attacked by chlorine, it combines with oxalic acid in the cold, whilst the red oxide is not affected by this acid; also it unites readily with ammonia, whilst the red oxide combines with extreme slowness. Unless ordered to the contrary, the red oxide should always be supplied.

In the P. B. process for the red oxide of mercury, only half the mercury is dissolved at first in the acid and water, which is to be heated until a dry salt is obtained; with this the remaining mercury is to be well mixed by trituration, and then heated in a porcelain capsule with repeated stirring until acid vapours cease to be evolved. There is a triteness about the P. B. directions not possessed by the Codex.

35. Safran de Mars Apéritif*.

Oxyde de Fer Hydraté.

Oxydum Ferricum Aquâ mediante paratum. Hydrated Oxide of Iron. Ferric Oxide prepared by aid of water.

This is prepared by mixing solutions of sulphate of iron and carbonate of soda, washing and drying the precipitate known as carbonate of iron, and sesquioxide of the P. Lond.

36. Peroxyde de Fer Hydraté*.
Hydras Ferricus. Ferric Hydrate.
$Fe_2O_3+aq.$
Hydrated Peroxide of Iron.

Prepared by adding a diluted solution of the perchloride of iron to ammonia, and washing the precipitate, which is to be preserved covered, with distilled water, and in a place the temperature of which should not be below +12°.

The effect of the hydrated peroxide of iron as an antidote for arsenic is more certain when the hydrate is freshly prepared.

(*To be continued.*)

ON A NEW GAS STOVE.

BY HENRY DEANE, F.L.S.

Having for many years been much inconvenienced for want of a suitable gas stove to meet the ordinary requirements of my business, I was induced some few years back to turn my attention to the subject, and the ultimate result is the stove now before the meeting. The contrivances that I have seen have all had the great inconvenience of having no other means of regulating the application of heat but by raising and depressing the flame, a range far too limited to be generally useful.

I was led to contrive the present form after seeing how a small quantity of ignited charcoal was made to do a great deal of work in a French kitchen, the heat being applied not only to the bottoms of their vessels, but made to do duty on the sides also. In the ordinary mode of applying gas to the boiling of water, the action of the flame is confined almost entirely to the bottom of the containing vessel; but in this stove, as in the French cooking apparatus, arrangement is made whereby all parts of the vessel may be subjected to the heating influence, which, moreover, is under such control, that almost any kind of cooking can be carried on with great facility. Thus, decoctions from half a pint to one or two gallons can be made and kept boiling or simmering, or merely macerating at a temperature considerably below the boiling-point of water.

I do not suppose it is the cheapest or most perfect in construction that could be devised, but I have found it useful and economical, and well adapted to meet the exigencies of many pharmaceutical establishments not conducted on a large scale. The great advantage appearing to be, that without occupying much space a good fire can be ignited or extinguished at a moment's notice, and with a moderate consumption of gas. The largest quantity it is capable of consuming per hour being from twenty to twenty-five cubic feet, costing from one penny to three-halfpence; in many cases the cost would not exceed a farthing per hour; but of course the rate of consumption will greatly depend on the care and intelligence exercised by the operator.

The stove consists of a stoneware cylinder, ten inches in diameter and seven inches deep, covered with an iron jacket, and supported on three legs, contrived by means of screws to give a range of elevation or depression of about two inches. In the sides are two sets of holes for pegs, on which a support for the vessel in use can be adjusted to the required height above the flame. Another support is also made of somewhat wider dimensions, to rest, when required, on the top of the stoneware cylinder. On the top of this may rest a hood, which has been found convenient for confining the flame to certain vessels when a greater heat is required, as in the case of subliming perchloride of iron.

Fig. 3.

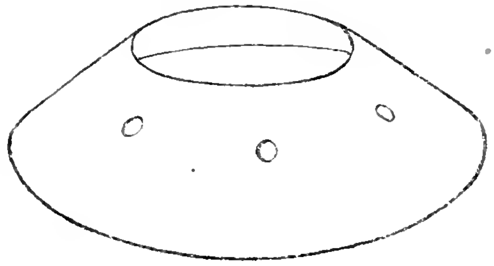


Fig. 1.

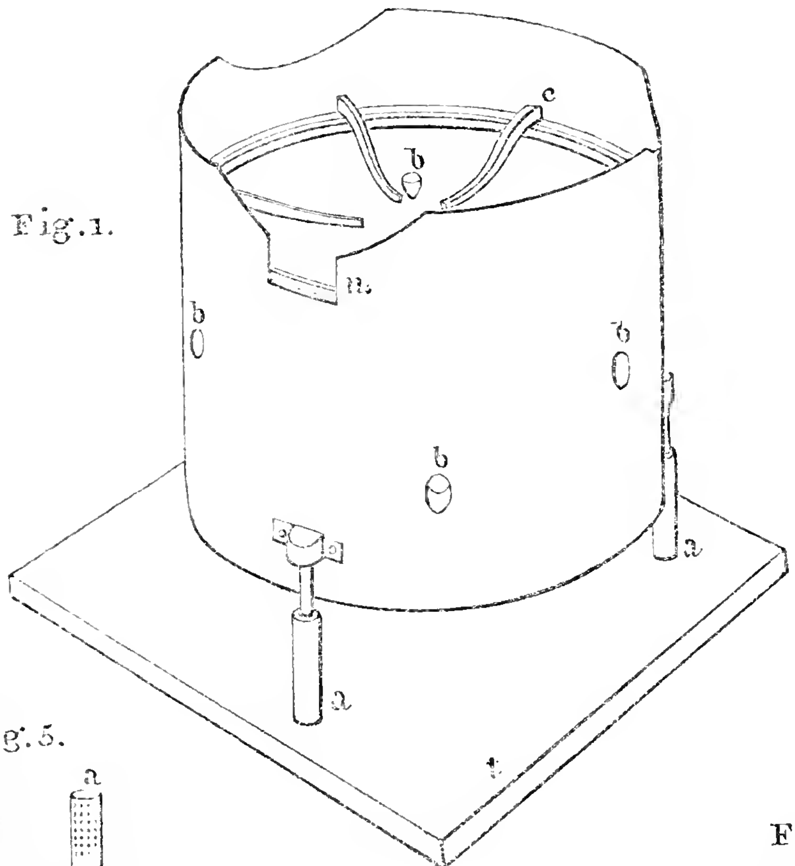


Fig. 5.

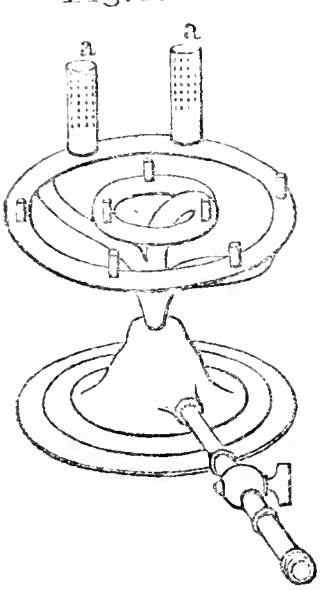


Fig. 4.

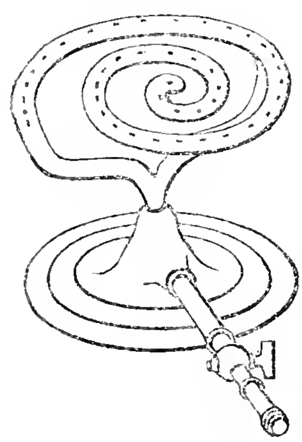
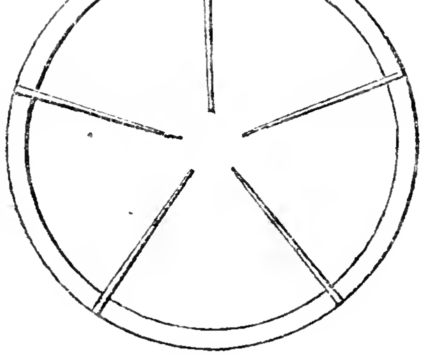


Fig. 2.



The burners employed have been of two kinds,—one, a helical coil of iron tube with holes drilled in the upper surface, which answers perfectly for heating water or making decoctions from half a pint to half a gallon. The other is constructed to carry a number of atmopyres, which gives great heating power, without smoke, and with which a two gallon plaster pan can be worked, and some other operations readily performed. It is with this burner the hood would be employed. As considerable heat is radiated downwards, as well as in other directions, when the atmopyres are used, it is desirable to place a large tile or other incombustible bad conductor of heat under the stove when in use.

Other forms of burners may be employed, to suit the judgment, skill, or experience of operators; but to determine with certainty the most efficient and, at the same time, the most economical form of burner for the greatest number of operations remains to be worked out by a series of careful experiments, which I have not had the opportunity of trying.

Fig. 1. The stove, supported on a tile, *t*; *a a*, the screw legs; *b b b b*, the holes for supporting pegs; *c*, the upper moveable support resting on the top of the stoneware cylinder; *n*, notch for handle of saucepan.

2. The lower moveable support.

3. The hood.

4. The burner, with simple jets.

5. The burner to be used with atmopyres, two of which, *a a*, are represented in their places.

NOTES ON THE NEW EDITION OF THE BRITISH PHARMACOPŒIA.

The new Pharmacopœia has been so very favourably reviewed by all the medical journals that any criticism on the part of the Pharmaceutist would seem to betray a feeling of spite, and determination to find fault; but, after all, the chemist is really the one to discover any little flaw, and most assuredly the one to appreciate any improvement,—his everyday work compelling him necessarily to become acquainted with all the working details of his Pharmacopœia.

Even at first sight, the book recommends itself by its handiness, its arrangement, and the simplicity and plainness of its instruction. The most benighted individual amongst us could hardly fail to succeed in the production of any preparation contained therein, provided he simply followed its guidings.

A more careful scrutiny of the contents reveals the reappearance of some old friends, and the introduction of many new names. Of our old friends, we can say nothing but give them a hearty welcome, and of the new ones, it is at present too soon to give any very decided opinion.

The inhalations and glycerines may be very useful, but as most physicians have their own formulæ for these, it is just possible they may not come into very general use; still, a definite formula to fall back upon in an emergency is a very desirable thing.

The introduction of liq. bismuthi is an acquisition, but why omit chlorodyne? The latter is prescribed quite as much as the former. Is there any intelligible reason why Mr. Schacht's really clever and happy idea should receive so much attention, and the "not quite so clever" but decidedly quackish chlorodyne be ignored?

Chlorodyne has now, by reason of its universal use, become a necessity, and the omission of any formula, bearing even the remotest resemblance to it, is very much to be regretted. Secret remedies should be discouraged as much as possible.

Lin. sinapis comp. seems to be a very efficient stimulant, but rather a curious mixture; it reads more like the production of one under the influence of "nightmare" than anything else. We have a preparation, in local use here under the name of tinct. sinapis comp., far more rational, consisting of

Sem. Sinapis Nigr.
Rad. Armoraciæ
Cort. Mezerei
Spt. V. T.

Is not the tincture of arnica prepared from flowers preferable, as an external application, to that prepared from root? My own practical experience says, yes. Root is ordered in the new Pharmacopœia.

Tincture of sumbul is a very desirable addition, and so would have been the ethereal tincture, had it been so fortunate as to gain admittance, the latter being by far the better preparation of the two.

Fabæ physostigmatis and their extract may be fairly suspected of having a "friend at court." They are doubtless very excellent remedial agents, but certainly not yet sufficiently popular to claim a place in the Pharmacopœia.

The cataplasmata are so very rarely prescribed that one feels surprised to see them again; however, they do no harm.

One very curious fact is the absence of an aperient pill without aloes; surely, if only in charity to the very numerous hæmorrhoidal patients, something might have been devised, say, equal weights of ext. coloc. simpl., ext. jalapæ (or ext. rhei), and ext. hyoscyami.

Soda-water would have been better left to Schweppe or Webb, or other well-known makers.

The most important changes are those of name and strength, and very fortunately these are few in number. Of course our poor old friend calomel, and his elder brother, corrosive sublimate, have undergone another, and let us hope a final metamorphosis. Oh! if Ovid had only lived in our day, there would here have been at least fifty more lines for him! However, as subchloride and perchloride of mercury are the really true names respectively of calomel and corrosive sublimate, every one will be pleased to see them so labelled. Dr. Odling, in his lectures on Animal Chemistry, delivered before the Royal College of Physicians, says, "The formula for corrosive sublimate, $HgCl_2$, in the old Pharmacopœia, is right, while that in the British Pharmacopœia (1864), $HgCl$, is indisputably wrong. In the present state of knowledge, the matter no longer admits of any doubt."* There is no other alteration of name which can possibly lead to serious results.

The principal alterations of strength are the solutions of morphia, now assimilated to the E. and D. formulæ, viz. half a grain in a fluid drachm, or half the strength of P. L. Liq. arsen. hydrochlor. now has nearly three times the strength of P.L., and is made to contain an equal amount of arsenious acid to liq. arsenicalis.

Tincture of aconite has now one-third the strength of P. L.

Tincture of belladonna has now one-half the strength of P. L.

Lin. opii has double quantity of tincture of opium.

These, then, are the chief alterations, to be borne in mind both by physicians and dispensers; they are certainly important and serious, but the immense advantage in having standard and uniform formulæ throughout the kingdom, for such powerful remedies as these, far outweighs any little inconvenience that may at first arise from the change.

Our sons will hardly believe, that so late as 1867, it was possible to have the same prescription dispensed in England and Scotland in two distinct ways,—in

* Lectures on Animal Chemistry, delivered at the Royal College of Physicians, by W. Odling, M.B., F.R.S. Longman and Co., 1866.

one case, *e.g.* liq. morphiæ, twice the strength of the other, and this, too, in a very powerful remedy.

On the whole, the present Pharmacopœia of 1867 must be considered as an immense improvement upon all that has gone before, and will doubtless become the text-book for many years to come. Professor Redwood and Mr. Warington may well feel proud of their offspring, for it is undoubtedly the most rational and practical production we, in Britain at any rate, have had the good fortune to be possessed of, since Pharmacopœias were first compiled, and nothing now remains but to set to work, and as soon as possible make ourselves thoroughly at home with it; and the sooner physicians fall in with it the better for all.

To our local physicians we have proposed the first of June as the date after which all prescriptions will be dispensed according to this Pharmacopœia, unless especially stated to the contrary.

EDWARD SMITH.

8, *The Strand, Torquay, May* 15, 1867.

NOTES ON THE NEW EDITION OF THE BRITISH PHARMACOPŒIA.

BY B. S. PROCTOR.

There are so many little points of detail which go to make up the total of any important work that it is scarcely possible to have all duly considered and attended to till it has been repeatedly criticized from all points of view, and repeated efforts made to remedy such defects as a course of practical experience renders evident. In justice to the editors of the New British Pharmacopœia, it must be admitted that no undertaking requires more care and circumspection than that which they have now brought to so favourable an issue. While the work is under the scrutiny of a thousand critical eyes, I think it desirable to draw the attention of my pharmaceutical brethren to a series of questions which arose in my mind as I looked over the proof copy some weeks ago. The same questions, together with some others (which it is unnecessary to repeat, as they have met with a practical answer in the corrected copy now before us), were submitted to the committee of publication during the final revision of their work. At that time it was perhaps thought too late to make changes for which there was not an urgent necessity, and too late also for those which involved any deliberate consideration. But if there is anything like uniformity of opinion upon points which involve no more serious consideration than the convenience of pharmaceutists and a uniformity between law and custom, or between domestic and professional remedies, these points will doubtless receive attention at a future time.

Confect. Sennæ.—There is an ambiguity in the direction for the use of tamarind and cassia pulp. Tamarind is defined to be "pulp of the fruit," but among its characters it is stated to contain fibres and seeds. When nine ounces of tamarind are ordered in the formula, is it to be nine ounces of pulp or nine ounces pulp, seeds, and fibres? The same may be asked regarding cassia pulp, which they say "usually contains the seeds and dissepiments," but they apparently leave it to the choice of the pharmaceutist to weigh the nine ounces with or without these impurities.

Decocta.—Decoctions should in all cases have a definite time to boil, and a definite quantity to be produced. The time is not definite in dec. granati. The product is not definite in dec. hordei.

Extr. Sarsæ Liquidum.—In this preparation f ʒi equals two drams of the root. In the decoction f ℥i equals one dram of the root. Would it not be better to make f ʒi of the liquid extract equal to ʒi of the root and f ℥i of the decoction? Would it not also be desirable to make officinal the "liq. sarsæ co." of which there is probably a hundred times as much used as of any other preparation of sarsaparilla? Also, would it not be better to use dried licorice root in these preparations rather than the fresh, which is not always to be had in good condition?

Extr. Coloc. Co.—Would not this be both more uniform and more convenient—if evaporated to dryness and powdered,—a proceeding which is largely adopted in practice, and which is sanctioned in the case of the extr. of aloes, and of logwood?

Ess. Anisi, Ess. Menthæ, Spir. Menthæ.—Is there any good ground for altering the strength of the essences of anise and mint? The strength at present in use, and which has been in use for many years, though only recently made officinal, appears perfectly convenient and well understood. The dose of the altered form is surely over-stated. What is a dose of the oil of mint? Under ess. menthæ it is $\frac{1}{5}$ of 10 to 20 minims, *i.e.* 2 to 4 minims *of the oil.* Under spir. menthæ it is $\frac{1}{50}$ of 30 to 60 minims. *i.e.* $\frac{6}{10}$ to $\frac{12}{10}$ of a minim of the oil.

Ferri Sulphas Granulata.—Is not pure sulphate of iron in crystals more desirable than this fancy article?

Liq. Ammoniæ Acetatis.—I am glad to see this preparation in something like its old form. The proof copy of the work contained also a formula for liq. ammoniæ acetatis fortior, of about five times the strength of the present, which is now erased. Would it not have been useful to give a formula for a strong solution, f ʒi of which would equal f ℥i of the present? Such a solution is in common use, and keeps better than the weaker preparation.

Mist. Cretæ, Mist. Guaiac.—The object of the gum arabic in these preparations is no doubt to prevent the rapid subsidence of the powders, but the quantity ordered is much too small to be efficacious. A better form is to use gum tragacanth, a small quantity of which is much more effectual, say—

Take of Chalk $\frac{1}{4}$ ounce.
Sugar $\frac{1}{4}$ ounce.
Powd. gum tragacanth 20 grains.
Rub together and add gradually—
Cinnamon water 8 ounces.

Mixtures made according to this form settle more slowly and are more readily remixed by agitation.

Mist. Sennæ Co.—It is convenient to have this mixture made in the proportion of 5 ounces of sulphate of magnesia in a pint, as the quantity in each draught is then more easily regulated, thus—

The draughts . .	f ℥i . .	f ℥iss . .	f ℥ii
Contain	ʒii . .	ʒiii . .	ʒiv

Pil. Coloc. Co.—Might not the sulphate of potash be advantageously changed for soap, to promote the solution of the scammony and aloes?

Pil. Assafœtidæ Co.—The myrrh does not readily combine with the other gums by fusion unless first powdered. If we are supposed to use our discretion in a case of this kind, are we also to be allowed to dry and powder, or to melt and strain the assafœtida and galbanum? They so generally contain impurities which unfit them for use without some such preparation, and are so much injured by the ordinary processes of preparation, from the loss of volatile oil, that an improvement in the process seems desirable. Assafœtida and galbanum may be powdered without any material loss of volatile matter, if they are first beaten in a warm mortar with one-tenth of their weight of magnesia. On cooling they are friable, and the powder produced has the full odour—not ten per cent. weaker from the presence of the magnesia, but probably twenty per cent. stronger from being less injured than by the ordinary processes.

Scammony Resin.—Would it not be well to sanction the use of scammony resin in all preparations in which scammony is used? The fact that it is ordered in compound extract of colocynth, the most important of all the scammony preparations, is an acknowledgment of its value. And the characters given of the natural product acknowledge that *it* is never free from impurities, varying from ten to twenty per cent. in legitimate samples, and well known frequently to exceed that in an enormous degree in the ordinary commercial article.

Sodæ Carb. Sicc.—Is not this better prepared by calcining the bicarbonate?

Tinct. Quinæ.—Would it not be improved by the addition of a small quantity of acid, say one minim of dilute sulphuric acid to each grain of the sulphate? If the quinine is entirely dissolved by the aid of heat, it is partially deposited again in cold weather, unless there is a little acid present.

Trochisci.—I am glad to see that troch. ipecac. has been reduced from 1 grain each, which was the strength in the proof copy, to $\frac{1}{4}$ grain; but would it not have been better to make the morph. and ipecac. lozenges contain $\frac{1}{4}$ grain ipecac. also, and say $\frac{1}{16}$ of morphia instead of $\frac{1}{12}$ and $\frac{1}{36}$ of a grain, as they now respectively contain?

Ung. Iodi.—Is not water better than spirit for dissolving the iodide and iodine in the preparation of this ointment?

Ung. Sulphuris Iodidi.—This ointment is improved by the addition of a little iodide of potassium and water, which should be rubbed with the iodide of sulphur before adding the lard.

SULPHURIC ACID IN SHERRY WINE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Having had some sherry wine brought me to test, I found much of the free acid in it due to the presence of sulphuric acid, about 1 gr. of the acid to $1\frac{1}{2}$ oz. of the wine; and, as I found this acid in five other sherries, varying in price from 20*s.* to 56*s.* per dozen, I am inclined to believe all sherries contain it, and as it is an acid foreign to the grape, its presence may, I think, be accounted for by it being apparently necessary in wine countries, after the wine has been freed from the lees, by being racked into a clean cask, in order to prevent a renewal of the fermentation, to subject it to the operation of sulphuring, and should the fermentation still continue, the sulphuring must be renewed as often as is necessary. Sometimes must, strongly impregnated with sulphurous acid gas, is added to the wine, and answers the same purpose. As I am not aware that in analyses of sherry wine the presence of sulphuric acid has been noticed, and being a wine used for several preparations in the Pharmacopœia, I have been induced to send this communication to you, and will thank you (if you think it worthy) to insert it in next month's Journal.

I am, Sir, yours obediently,

HENRY LONG.

Croydon, May 17, 1867.

[The presence of sulphuric acid in sherry is due to the use of sulphate of lime in the manufacture of the wine, a practice which is almost universally adopted. —ED. PH. J.]

CASE FOR A BENEVOLENT FUND.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I beg to acknowledge the receipt of the following subscriptions in answer to my appeal on behalf of a family left destitute by the death of the father, who had been a member for a long period, but was not so at the time of his decease.

Further aid would be most acceptable.

Yours respectfully,
WM. SOUTHALL.

Birmingham, May 9th, 1867.

Thos. Harvey, Leeds	£2	0	0	W. Warner, Piccadilly	£0	5	0
J. Watts, Esq., London	1	0	0	C. T. Palmer, Birmingham	0	5	0
A Friend	0	5	0	R. D. Commans, Bath	0	5	0
T. H. Hills, Esq., Oxford Street	1	1	0	A. Bishop, London	1	1	0
W. H. Smith, Walworth	0	5	0				

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

Poisoning from Nicotine.

A patient was brought to the General Hospital in Vienna, in the wards under Professor Oppolzer's care, in what seemed to be a tetanic condition, having been found so on his bed, when he had lain down to rest a short time. He was senseless, but after the injection of $\frac{1}{4}$ gr. of morphia in solution, in about an hour he began to move his head and gradually his body, without, however, coming to consciousness. An enema of water and vinegar was then administered, when vomiting ensued, and with a small amount of greenish fluid, eight or ten small pieces of tobacco leaves were ejected.

The patient recovered, and said that he had been in the habit of chewing an ordinary cigar, and had lain down with some of the leaves in his mouth. Albumen was found in the urine, the next day after admission, but none subsequently. The patient left the hospital on the seventh day after admission.—*American Medical Record.*

Beetroot Sugar.

M. Robert de Seclawitz has invented a method which presents more than usual novelty. Instead of compression, he depends upon diffusion for the extraction of the saccharine juice. The beetroots are not rasped into pulp, but cut up into slices about an eighth of an inch in thickness. The juice is then drawn from these slices by means of water in a series of cylinders called diffusers, and the extraction of the sugar is said to be more complete than by any other known method. The temperature found to be most favourable for the operation is said to be 50° C., or 122° Fahr.; at this heat no swelling of the pectose takes place in the intercellular portion of the roots so as to present an obstacle to the solution of the sugar in the cells. The pectose itself is not rendered soluble, except to a very small extent, only just where the cells have been actually cut or broken by the slicing. Another advantage attributed to the new method is the greater relative value of the residue; the azotized substances which form so important a part of the nutrition of animals remain almost entirely in the residue, very little indeed passing off with the syrup. Consequently, also, the juice is much purer; it contains no more salts than that obtained by means of simple pressure, and very much less than when maceration is employed, and less organic matter than when any other method is employed. These advantages seem to proceed naturally from the mode adopted by M. de Seclawitz, as a low temperature and the absence of force must certainly favour the purity of the juice obtained, but it is not stated whether the sugar obtained is larger in proportion as well as purer in quality. At all events, this new mode of extraction deserves the attention not only of sugar-makers, but of all whose operations include the extraction of vegetable juices.—*The Grocer.*

Australian Spinach.

At the commencement of last year, Mr. Ramel, who introduced into the French colony of Algiers the *Eucalyptus globulus*, received from Australia a new vegetable. His friend Dr. Mueller, of Melbourne, had it sent to him as a substitute for Spinach; it is superior in every respect to that vegetable, easier of cultivation, and of an enormous and rapid growth, less subject to run to seed, and also of better flavour. He called the plant New Queensland Spinach. The New Australian Spinach is, however, a better name. It belongs to a group in which is comprised our common Spinach; it answers botanically to the *Chenopodium auricomum* of Lindley, who described it in a few words in Mitchel's 'Journal on Tropical Australia.' It grows abundantly in the east part, following the course of the river Narrau, and it is again found in Queensland. The *Chenopodimum auricomum* is an annual, with a long stalk rising to a metre. In its general appearance it resembles *Chenopodium hybridum*, that troublesome weed which overruns our fields, excepting in certain points, especially in the inflorescence, which differs. The stalk is erect, robust, angular, fluted, streaked with a violet kind of red. As regards the eatable qualities of the plant, we have recently gathered an abundant harvest of leaves from two or three plants growing in our garden. These leaves were put into boiling water to bleach them, and they were then cooked as an ordinary of dish Spinach, with this difference in favour of the new plant, that there was no occasion to take away the threads which are so disagreeable in Chicory, Sorrel, and ordinary Spinach. We partook of this dish with relish: the flavour, analogous to Spinach, had something in it more refined, less grassy in taste. The cultivation is easy: sow the seed in April in a well-manured bed, for the plant is greedy; water it. The leaves may be gathered from the time the plant attains 50 centimetres in height. They grow up again quickly. In less than eight days afterwards another gathering may take place, and so on to the end of the year.—*Journal de la Ferme et des Maisons de Campagne.*

Food Value of the Potato.

Dr. E. Smith says ('Practical Dietary') that there is probably no other vegetable food, except wheaten bread, of which so much can be fairly said in its favour. Its merits, however, vary much with the kind of "seed," the period of maturity, and the soil in which they are grown. That kind should be preferred which becomes mealy on boiling, and which, when well cooked, can be thoroughly crushed with the finger. The potato which is known as "waxy," and those which remain somewhat hard when boiled, do not digest so readily as the mealy kind, but for that very reason they are said to be more satisfying. . . . It is not material in reference to nourishment, whether the potato be boiled or roasted, since in both methods it should be well cooked. In point of economy and convenience, however, it has been found better to boil than to roast them; for whilst the loss in boiling upon 1 lb. of potatoes scarcely exceeds half an ounce, that in the most careful roasting is 2 oz. to 3 oz. It is also more economical to cook them in their skins, and to peel them immediately before they are eaten; but this is not very convenient in many families, and the colour of the potato is not quite so agreeable as that of those which have been boiled after peeling. When they are peeled before boiling, and particularly when they are small, and the operation is performed carelessly, from one-third to one-fourth of the whole weight of the potato is lost, and if there be no pig to eat the peelings the whole is wasted; whilst the weight of the peel which is removed after boiling would not amount to more than 1 oz. in the pound. When potatoes have been roasted, the loss in weight from the skin and drying is more than one-fourth of the weight before cooking. An average sample of potato, after it has been peeled, contains 11 per cent. of carbon and 0·35 per cent. of nitrogen; and hence in each pound there are 770 grains of carbon and 24 grains of nitrogen, and it is greatly inferior to bread. The economy of its use depends upon its cost, so that in times when potatoes are sold at $\frac{3}{4}$*d.* and 1*d.* per lb. they are a very dear food as compared with household flour, whilst they are a very cheap food when produced by the labourer at the cost of the "seed" and the rent of land. Thus, at $\frac{3}{4}$*d.* per lb., only 1024 grains of carbon and 32 grains of nitrogen will be obtained for 1*d.*; when the cost is 1*d.* per lb., the quantities will be reduced to 770 grains and 24 grains. When the labourer, however, can obtain 50 bushels of potatoes from a quarter of an acre of land, at a cost of about 30*s.* for seed and rent, he will have more than 7 lb. of potatoes for 1*d.*, and the quantity of carbon and nitrogen thus obtained for that sum be 5770 grains and 200 grains. If, however, he were to sell a large part of his crop at the market price, he could procure with the money thus obtained far more nutriment in the form of flour than would have been derived from that portion of his potatoes. The weight of potatoes which alone would supply the daily nutriment required by a man would be about 6 lb. in reference to the carbon, and 8 lb. in reference to the nitrogen; but when a labourer in the west of Ireland lives upon this food he is allowed 10½ lb. daily, besides a large supply of buttermilk; and as both of these kinds of food are cheap in that locality, the proceeding is even then an economical one.

Australian Leeches.

A Melbourne journal says that this branch of trade has grown to pretty extensive proportions, both as to the number collected and the distances to which they are forwarded. The trade is principally carried on in connection with the operations of the Murray River Fishing Company, the fishermen employed by the company turning their attention, at seasons unfavourable to the fishery, to the collection of leeches. From 150,000 to 250,000 leeches are sometimes collected in one of the trips of the company's steamer. They are then packed and conveyed to Melbourne, where a large proportion of them are put up for transmission abroad. Large numbers of them are sent to London and Paris, where, it is stated, they are preferred to leeches brought from any other place; but the principal outlet for the export is America, where the demand is always great, from the absence or rarity of the proper kind of leech throughout the whole of that great continent. The shipments of the company are made to San Francisco, Panama, and New York, whence they become distributed in all directions. The export from this colony appears likely to be a remunerative business for some years. The company referred to anticipates that from two to three millions of leeches will pass through their hands this season.

BOOKS RECEIVED.

Chemical Notes for the Lecture Room, specially arranged for the London University Matriculation Class. By Dr. Wood, F.C.S. London: W. H. Warr and Co., Featherstone Buildings, Holborn. 1867.

On a New Process for Preparing Meat for Weak Stomachs. By W. Marcet, M.D., F.R.S. London: John Churchill and Sons, New Burlington Street. 1867.

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.

Want of space compels us to omit several communications this month on the question of the Pharmacy Bill; our correspondents express various opinions, but as the provisions of the Bill have been discussed and approved in general meeting, our inability to insert these letters will be of the less consequence.

F. M. (Sheffield).—See page 679 of our last number.

Pyroxylin.—Mr. Fletcher suggests that in making pyroxylin by the process of the Pharmacopœia, the heat of a water-bath may cause explosion of the cotton, and that a lower temperature than that of boiling water should be applied towards the end of the drying process. This precaution would be necessary in making the explosive pyroxylin used as gun-cotton, but the pyroxylin of the Pharmacopœia, which is soluble in a mixture of ether and spirit, is much less explosive than gun-cotton, and we have never known an instance of its igniting at the heat of a water-bath.

Ficus Coccus wishes to know how to dissolve white shellac in naphtha. Shellac, after it has been bleached with chlorine, very soon passes by exposure to air into a condition in which it is insoluble in spirit and also in naphtha. When this change has taken place, we know of no means of restoring its solubility.

J. W. C. wishes to know what the black composition used for filling the letters cut in a white marble slab is composed of.

"*Assistant.*"—An assistant in the position described by our correspondent would be excluded by the provisions of the proposed Pharmacy Bill.

M. P. S. (Halifax).—The label in question would render the article liable, either to the Wine Licence, or to the Patent Medicine Duty.

W. W. J. (Brecon) wishes for a formula for "Quinine Hair Wash." The other question was answered in our last number, p. 679.

W. C. (Norwich) wishes (1) for a formula for "Bloom of Roses for the Complexion." (2) For the mode of making granular effervescing salts, see Vol. I. (2nd Series), page 301.

"*W. H.*"—*Walnut Pomade.*—Take of extract of walnut leaves, ℥iij; lard, ℥iv; oil of bergamot, 1 drop; mix.

Communications are acknowledged from Mr. Mumbray, Mr. Betty, Mr. Fryer, Mr. J. Thompson, Mr. Davies, Mr. B. S. Proctor, Mr. Mills, Mr. Deighton, "A Suburban M. P. S.," and "Medicus."

Wanted, the July number of this Journal, 1865. Full price will be given on delivery to Elias Bremridge, 17, Bloomsbury Square.

Errata *in May number*, 1867.—P. 637, Sirop Daicode, *read* Sirop Diacode. The special mode, *read* The mode. P. 639, That a Pharmacopœia, *read* Thus a Pharmacopœia. P. 640, demaracation, *read* demarcation.

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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END OF VOL. VIII.

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