

ABSTRACTS OF THE PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

No. 6.

 Session 1884-85.

March 30th, 1885.—Annual General Meeting. Dr. W. H. Perkin, F.R.S., President, in the Chair.

The President read an address, of which the following is a brief abstract:—

The number of Fellows is now 1,360, being an increase of 34 since March 31st, 1884. The losses have been exceptionally heavy, 4 Honorary Foreign Members, Victor Dessaignes, Adolph Wurtz, Jean Baptiste Dumas, and Hermann Kolbe having died during the year, besides 18 Fellows: G. D. Atkinson, Adrian Blaikie, James Forrest, Robert Harvey, J. W. Hudson, F. M. Jennings, Robert Jones, M. J. Lansdell, James Napier, H. B. Pritchard, T. K. Rogers, Juwansnigji Jarwatsnigje, R. Angus Smith, J. L. Shuter, Sidney Gilchrist Thomas, A. Voelcker, Henry Watts, and G. W. Wigner. 32 Fellows have either withdrawn or have been struck off the list as being in arrear of their subscriptions.

After speaking of the great loss which the Society had experienced in Mr. Watts, the President referred to the appointment of Mr. C. E. Groves, F.R.S., as Editor; of Mr. A. J. Greenaway, as Sub-Editor; and Dr. L. T. Thorne, as Librarian.

Very considerable additions have been made to the Library, and the thanks of the Society are due to Fellows who have responded to the appeal for copies of old editions to complete series of standard works. The Library is increasing so fast that additional accommodation will soon be a necessity. It is expected that the complete subject catalogue will be issued before long.

Reference was next made to the Society's new publication, the "Abstracts of Proceedings," and to the Reception held by the President and Council; a second Reception will be held later in the session.

The chief chemical work of the year was then passed in review.

Last year, the President referred in his address to the comparatively small amount of original work which was being prosecuted in this country, notwithstanding the increased number of laboratories, and the greater facilities which were offered for the encouragement of research. The number of papers brought before the Society during the year is 67, but although the number has not increased, if the papers themselves be examined, it will be found, the President thinks, that the amount of work done is somewhat larger, though certainly not so large as it should be. It is to be hoped that the spirit of research will be stimulated in the laboratories of the kingdom, and that men may be turned out who are not only more or less qualified analysts, but thorough chemists. "Let us not," said the President, "be content with looking back with pride to what our ancestors have done, but let us follow their example."

It was then moved by Dr. GLADSTONE, and seconded by Sir F. A. ABEL, that the best thanks of the meeting be given to the President for his address, and that he be requested to allow it to be printed. This resolution was unanimously accepted, and the President returned his thanks.

Dr. RUSSELL, the Treasurer, then read his report:—The income of the Society for the year was about £3,569, the expenditure £3,283, leaving a balance of only £286; about £2,198 had been expended on account of the Journal, and about £440 on account of the Library.

Mr. MOND proposed, and Mr. MAKINS seconded, a vote of thanks to the Treasurer, to which Dr. RUSSELL replied.

Mr. FRISWELL proposed, and Mr. G. S. JOHNSON seconded, a vote of thanks to the Auditors, Mr. Makins, Mr. R. H. Davies, and Dr. P. F. Frankland. Mr. MAKINS replied.

A vote of thanks to the Officers and Council was then proposed by Mr. WARINGTON, seconded by Mr. RILEY, and replied to by Dr. ARMSTRONG.

Mr. TYRER proposed, and Dr. JAPP seconded, a vote of thanks to the Editor, Sub-Editor, Abstractors, and Librarian. Mr. GREENAWAY replied.

Dr. Plympton and Mr. E. W. Voelcker were appointed scrutineers, and a Ballot having been held, the following were declared elected as Officers and Council for the ensuing year:—

President: Dr. Hugo Müller.

Vice-Presidents who have filled the office of President: Sir F. Abel, Dr. Warren De la Rue, Prof. Frankland, Dr. J. H. Gilbert, Dr. J. H. Gladstone, Dr. A. W. Hofmann, Prof. Odling, Dr. W. H. Perkin, Sir Lyon Playfair, Sir Henry Roscoe, and Prof. A. W. Williamson.

Vice-Presidents : Mr. W. Crookes, Prof. G. D. Liveing, Dr. Schunck, Prof. T. E. Thorpe, Dr. Tilden, and Mr. Walter Weldon.

Secretaries : Dr. H. E. Armstrong and Mr. John M. Thomson.

Foreign Secretary : Dr. F. R. Japp.

Treasurer : Dr. W. J. Russell.

Ordinary Members of Council : Dr. E. Atkinson, Mr. H. T. Brown, Dr. Carnelley, Mr. Carteighe, Dr. F. Clowes, Mr. A. E. Fletcher, Prof. G. C. Foster, Mr. Friswell, Mr. Meldola, Dr. Messel, Mr. Ludwig Mond, and Mr. C. O'Sullivan.

April 2nd, 1885.—Dr. H. Müller, F.R.S., President, in the Chair.

Certificates were read for the first time in favour of Messrs. Edward Grindle Hogg, Sandringham Gardens, Ealing ; F. R. Mallet, Calcutta ; John A. Tate, 33, Selborne Street, Liverpool.

The following papers were read :—

24. "On the Formation of Hyponitrites from Nitric Oxide." By Prof. Divers and T. Haga.

An alkaline solution of potassium stannite slowly absorbs nitric oxide, and when treated with silver nitrate gives a precipitate from which by treatment with nitric acid and ammonia, silver hyponitrite can be obtained in small quantity. Potassium stannite in alkaline solution has no action on nitrites and nitrates. Ferrous hydroxide treated with strong solution of alkali, becomes dense, pulverulent, and pale grey, and in taking up oxygen does not form any black hydroxide as an intermediate product. Ferrous hydroxide mixed with potassium hydroxide solution, converts nitric oxide, and also nitrites, into ammonia. It has no action upon nitrates in presence of much potassium hydroxide.

25. "On the Existence of Barium and Lead Nitrososulphates." By Prof. E. Divers and T. Haga.

Barium nitrososulphate can be precipitated from an alkali nitrososulphate by barium hydroxide if concentrated solutions are used. It is soluble in water, and decomposed by acids. Lead nitrososulphate mixed with hydroxide is precipitated from a nitrososulphate solution by adding basic acetate of lead to it.

Before this, attempts to form other nitrososulphates than those of the alkalis have proved unsuccessful.

36. "Notes on Fractional Distillation in a Current of Steam." By Dr. M. G. Lazarus.

Difficulty having been experienced in the separation of iodothiolen and iodothioxen from toluene and xylene respectively, owing to the two former compounds being almost totally decomposed on distillation even under reduced pressure, experiments were made to ascertain whether a separation could be effected by distilling in a current of steam. Mixtures of benzene and toluene, benzene and nitrobenzene, toluene and nitrobenzene, toluene and xylene, benzene and carbon bisulphide, turpentine and nitrobenzene, and aniline and nitrobenzene were employed. A perfect separation could not in every case be effected, but the results are so far satisfactory as to render the method of practical use, and it was found that pure iodothiolen and iodothioxen could be obtained by it.

DISCUSSION.

Dr. PERKIN remarked that if he understood the authors' remarks correctly, the methods employed would yield the best results with mixtures of liquids differing considerably in their densities, and stated that this had been his own experience.

The PRESIDENT stated that his experience had been similar to that found by Dr. Perkin.

27. "Derivatives of Taurine." Part I. By J. W. James.

The author has investigated the action of mono-, di-, and tri-amines on the corresponding salts of β -chloroethanesulphonic acid, and in this way prepared mono-, di-, and tri-substituted derivatives of taurine (β -amidoethylsulphonic acid).

The method consists in heating the substituted ammonium salt of the acid with the calculated quantity of amine in a closed tube for ten hours at 160° , when the taurine-derivative is formed, mixed with the hydrochloride of the base. For mono- and di-derivatives the following method was employed in separating the hydrochloride. The contents of the tube were treated with an excess of barium hydrate, and steam was passed in until all the amine had distilled off. The barium was then removed by pouring the boiling solution into the calculated quantity of boiling dilute sulphuric acid; after filtering from BaSO_4 , the solution was evaporated, leaving the substituted taurine.

Trimethyltaurine being easily decomposed by dilute solution of alkalis, barium hydrate could not be employed; it was, however, readily obtained in a state of purity by boiling the mixture of tri-

methyltaurine and trimethylammonium chloride with strong alcohol, which dissolved only the chloride.

In this manner *ethyl-, allyl-, phenyl-, dimethyl-, diethyl-, methyl-phenyl-,* and *trimethyl-taurines* have been prepared. They are beautifully crystalline substances, all of which dissolve in water and alcohol, with the exception of trimethyltaurine, which is insoluble in the latter liquid.

The di-substituted taurines are of special interest, as corresponding compounds in the carboxyl series are not known. The mono- and di-taurines form no compounds with acids or platinum chloride, and in this respect are sharply distinguished from the corresponding derivatives of amido-acetic and propionic acids. The mono- and di-derivatives have an acid reaction (J. Lang, *Bull. Soc. Chim.* [2], **25**, 80). Trimethyltaurine is perfectly neutral to litmus.

The action of cyanamide has also been studied, and phenyltaurocyamine and dimethyltaurocyamine have been prepared. They are crystalline substances, soluble in water.

DISCUSSION.

The President remarked that as we have in taurin, or amidethylsulphonic acid, the basic and acid properties so nearly balanced, it might have been expected that by a farther introduction of alcohol radicles the alkaline character would become more pronounced. According to the results of the author, however, this does not appear to be the case.

28. "On the Preparation of Ethylene Chlorothiocyanate and β -Chlorethanesulphonic Acid." By J. W. James.

It is found that a much better yield of the thiocyanate is obtained by distilling the product of the action of potassium thiocyanate on ethylene chlorobromide under reduced pressure.

Pure chlorethanesulphonic acid can only be prepared by treating the barium salt with sulphuric acid; even when very dilute solutions of the lead salt are treated with sulphuretted hydrogen, some lead always remains dissolved.

29. "The Orthovanadates of Sodium and their Analogues." By Harry Baker, Berkeley Fellow, Owens College.

Though vanadium belongs to the phosphorus, arsenic, niobium, and tantalum-group of elements, the number of points of resemblance between their compounds is not very great; and indeed Mendelejeff remarks that the analogues of vanadium are titanium and chromium, and niobium and tantalum, to which latter it shows greater resem-

blance than to phosphorus; and Rammelsberg, after examining numerous vanadates, concludes that they cannot be compared with the phosphates. In a previous paper to this Society I described certain unsuccessful experiments which had for their object the preparation of fluoxyvanadates isomorphous with the flnoxyniobates. In order to trace the resemblance between the vanadates, phosphates, and arsenates, it is evidently necessary to confine attention to the tribasic ortho-salts, since acid ortho-vanadates cannot be prepared, and on the other hand the pyro- and meta-arsenates are not known in the crystalline state. The only tribasic orthovanadates, phosphates or arsenates soluble in water, are those of the two alkalis sodium and potassium, and of these only sodium is available, since the potassium salts crystallise with great difficulty. A careful examination of the sodium vanadates was therefore undertaken with the view of comparison, and with good success; for out of the four hydrates of the above salt described in this communication, viz.—

- (1.) $\text{Na}_3\text{VO}_4 \cdot 12\text{H}_2\text{O}$, hexagonal prisms,
- (2.) $\text{Na}_3\text{VO}_4 \cdot 10\text{H}_2\text{O}$, rhombic dodecahedra,
- (3.) $\text{Na}_3\text{VO}_4 \cdot 10\text{H}_2\text{O}$, hexagonal plates,
- (4.) $\text{Na}_3\text{VO}_4 \cdot 8(?)\text{H}_2\text{O}$, rhombic plates,

salts exist in the phosphorus and arsenic series exactly corresponding to three of the vanadates, viz., Nos. 1, 2, and 4. Double salts of sodium phosphate with sodium fluoride have several times been described, which *all* crystallise in regular octohedra, though remarkably different compositions are ascribed to them. These descriptions, however, all apply to one and the same body, and it is shown in the paper that to this there are exactly corresponding salts containing in place of phosphorus, arsenic and vanadium, thus: $2\text{Na}_3\text{VO}_4 \cdot \text{NaF} \cdot 19\text{H}_2\text{O}$. From these experiments the conclusion is evident that the salts of vanadic acid are not, as would appear, entirely different to those formed by phosphoric and arsenic acids, but do exactly resemble them in those cases where corresponding members are known.

DISCUSSION.

The President thought that the arguments brought forward by Mendelejeff and also by Rammelsberg in favour of placing vanadium along with molybdenum and chromium, seem hardly strong enough to assail the position which Roscoe's researches have assigned to it in the periodic system, and according to which it is classed along with phosphorus and arsenic. The results of the author's researches seem to afford a farther confirmation; and, indeed, no other proof appears in this respect so convincing as the comparison of the three minerals—pyromorphite, mimetosite, and vanadinite.

ADDITIONS TO THE LIBRARY.

Donations.

The New Chemistry. By J. P. Cooke. Revised edition: New York, 1884: from the Author.

Chimie Organique: par C. Schorlemmer; traduit par A. Claparède. Paris, 1885: from Prof. Schorlemmer.

International Electric and Gas Exhibition at the Crystal Palace, 1882-3. Report on the Gas Section; 2 vols.; London, 1884: from the Gas Institute.

The Alkali-makers' Pocket Book. By George Lunge and F. Hurter; London, 1884: from the Publishers.

By Purchase.

Researches on Magnetism. By Baron v. Reichenbach.

Mineralogy. By R. Jameson. 3 vols.

Elements of Mineralogy. By J. Nicol.

Die Metéorite. By P. Partsch.

Mineralogist's Directory. By T. M. Hall.

Manual of Mineralogy. By J. Nicol.

Manual of Mineralogy. By J. D. Dana.

Mineralogy and Geology. By T. Thomson.

Electricity and Magnetism. By J. Cuthbertson.

Lectures on Electricity. By H. M. Noad.

Heat a Mode of Motion. By J. Tyndall.

Special Loan Collection, 1876: Catalogue.

Admiralty Manual of Scientific Enquiry.

Electric Illumination. By J. Dredge: London, 1885.

Strecker's Text-book of Organic Chemistry. By Johannes Wislicenus; translated and edited by W. R. Hodgkinson and A. J. Greenaway: London, 1881.

A Handbook of Organic Chemistry. By William Gregory: London, 1852.

Religio Chemicæ. By George Wilson: London, 1862.

The Urine in Health and Disease. By A. H. Hassall: London, 1863.

Chemistry of Agriculture and Physiology. By J. v. Liebig: London, 1843.

Bread Analysis. By J. A. Wanklyn and W. J. Cooper: London, 1881.

Manual of the Metalloids. By J. Apjohn: London, 1864.

Familiar Letters on Chemistry. By J. v. Liebig: London, 1851.

Rural Chemistry. By E. Solly: London, 1846.

Méthode de Nomenclature Chimique. Par MM. Hassenfratz et Adet: Paris, 1787.

Chimie Moderne. Par Ad. Wurtz: Paris, 1879.

Abstracts of Lectures delivered at the Royal Institution. By William Odling.

Elementary Chemistry. By H. M. Hart: London, 1870.

Das Cyan und seine anorganischen Verbindungen nebst dem Mellon. By O. B. Kühn: Leipzig, 1863.

Metals. By C. L. Bloxam: London, 1870.

Éléments de Physique et de Météorologie. Par M. Pouillet: Paris, 1837.

The Industrial Resources of the Tyne, Wear, and Tees. Edited by Sir W. G. Armstrong, I. L. Bell, J. Taylor, and Dr. Richardson: Newcastle-on-Tyne, 1864.

Telegraphy. By W. H. Preece and J. Sievewright: London, 1876.

NOTICE TO AUTHORS OF PAPERS.

To facilitate the preparation of these "Abstracts of Proceedings," all authors are requested to furnish abstracts of their communications, and to send their papers so that they may be in the hands of the Secretaries, if possible, on the Monday before the day of meeting.

Titles of Papers of interest to Chemists recently read before Societies in the United Kingdom:—

"Observations on Variations of the Electromotive Force between Metals at High Temperatures in Fused Salts." By Thos. Andrews.

Royal Society of London, March 26th.

"On the Seat of Electromotive Force in a Voltaic Cell." By Prof. O. G. Lodge.

Society of Telegraph Engineers, March 26th.

The next Meeting of the Society will be held on Thursday, April 16th, when there will be a ballot for the election of Fellows.

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