It is thus difficult to know the amount of elevation of these rocks, but about latitude 50° the base of the cretaceous must in several places have considerably exceeded 10,000 feet in altitude.

Symons's Monthly Meteorological Magazine, June.—The principal article deals with rainfall in China, with remarks by the editor, based on observations made from 1886-92, and published in various places by Dr. Doberck, of Hong Kong. The mean annual rainfall is small in the north, and increases greatly towards the south. In the Gulf of Pe-chi-li the fall is 20 inches, but reaches double that amount in the Delta of the Yang-Tse-Kiang, 58 inches at Hankow, and 68 inches at Ningpo. In Formosa it ranges from 60 to 90 inches, but at Keelung, in the north-east, it reaches 148 inches. The seasonal rainfall is shown in tables divided into six districts. Notwithstanding the proximity of most of the stations to the sea, the distribution is, generally speaking, of that type which prevails over the greater part of Asia.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 24.—"Micro-Metallography of Iron." Part I. By Thomas Andrews, F.R.S.

In the course of a research with high microscopical powers (including 300, 500, 800, 1200, and upwards to 2000 diameters) on the micro-crystalline structure of large masses of wrought iron, the author observed the following novel metallurgical facts:—

When large masses, several tons in weight, of practically pure wrought iron were allowed to slowly cool from a white heat, a secondary or subcrystallisation of the metallic iron occurred. The normal primary crystals of the iron, or those which have hitherto been regarded as constituting the ultimate structure of the metal, were found to enclose a subcrystalline formation consisting of very minute, and much smaller, crystals of pure iron also belonging to the regular order of crystallisation. These crystals sometimes manifested the hexagonal form, the predominant angle being about 120°, and often they assumed the form of simple cubes. The secondary crystals were contained within the area of the larger primary crystals.

Typical illustrations of this duplex crystallisation found in two large iron forgings are given in Figs. 1 and 2, and the relative dimensions of a number of individual crystals are given in the paper.

The results of twenty measurements of the primary crystals and twenty measurements of the secondary crystals taken on each forging are given on these tables.

The markings of the intercrystalline spaces or junctions of the secondary crystals were very clearly defined, but they were exceedingly minute. The general form, contour, and relative size of the primary and secondary crystals, as seen in section, will be noticed on reference to the accurate tracings, Figs. 1 and 2. The linear dimensions of the primary crystals would average about 0·01 inch, the linear dimensions of the secondary crystals averaging about 0·001 inch.

Judging roughly from the indications of the average micro-measurements, there would appear to be approximately 1,000,000,000 of the secondary crystals in a cubic inch of the metallic iron.

In the case of both the primary and secondary crystals the predominant well-defined angles of the facets of the crystals hovered more or less about the angle of 120°. The majority of the angle readings, made with the goniometer attached to the microscope, indicating generally a hexagonal structure on form of crystallisation. There were, however, also perfect cubical crystals observed.

The observations were made with a Ross first-class microscope. The micro-measurements afford an indication of the comparative size of the primary and secondary crystals. These measurements were carefully taken by a Jackson micrometer, and in some cases by a Ramsden screw micrometer, both accurately calibrated with a standard stage micrometer. The wrought iron forgings on which the observations were made were constituted of practically pure hammered wrought iron, the dimensions of the mass being about 10 feet long and about 12 inches square. The great length of time required for such large masses of iron to cool from a white heat appeared to facilitate the production of the crystals of the secondary formation.

The *rationale* of this duplex crystallisation has apparently been as follows:—The mass of metallic iron on cooling having reached the crystallising point at about 740° C., the periphery or skeletons of the larger or primary crystals were then formed. As the period of cooling was, however, very slow, the semi-fluid or viscous metal in the interior of these primary crystals was, on finally consolidating, apparently further broken up or subdivided

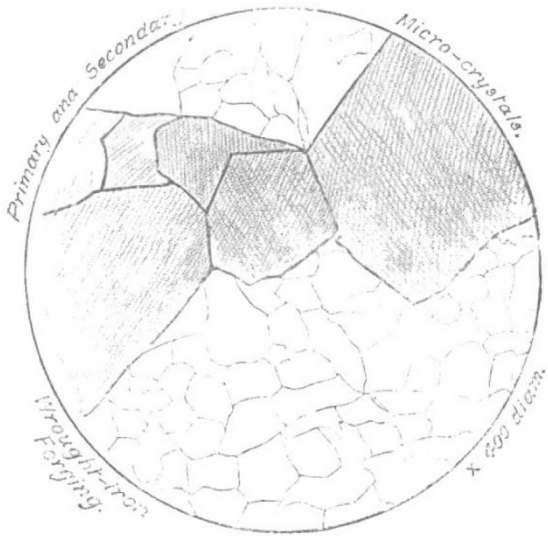


FIG. 1.

into a considerable number of smaller crystals, enclosed within the boundary or periphery of the primary crystals.

In the course of further experiments on the cooling of large masses of wrought iron, the author has also found, by the use of high power objectives, that the secondary crystals sometimes enclosed a still more minute form of crystals of pure iron, of the cubical form, which may hence be regarded as constituting a tertiary system of crystallisation in pure metallic iron. These

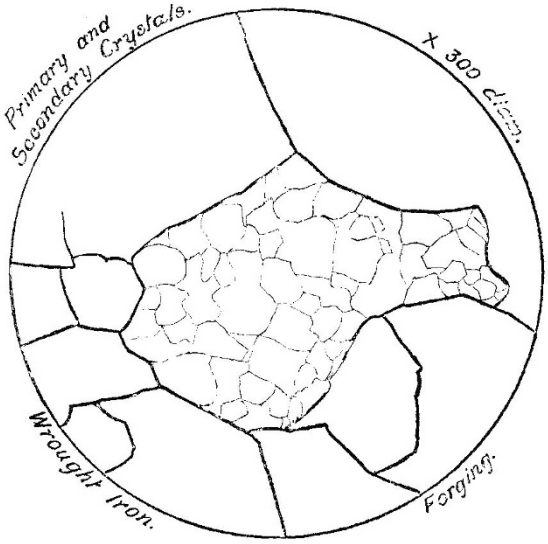


FIG. 2.

experiments therefore indicate that large masses of heated wrought iron, on cooling from above the temperature of the crystallisation of metallic iron, viz. 740° C., are capable of crystallising in three distinct modifications which may tentatively be called the primary, secondary, and tertiary system of crystallisation in iron, these various crystalline modifications being all, however, connected with the regular system of crystallisation.

The crystals of this secondary formation are not often distinctly discernible in smaller masses of metallic iron, such as rolled rods, plates, or sheets, as these in the course of manufacture rapidly cool, and are frequently manipulated during the finishing processes at temperatures below the crystallising point of wrought iron (740° C.).

The microscopical examinations were made on carefully prepared and polished samples, etched in nitric acid (1 part HNO_3, sp. gr. 1·20, and 49 parts water), and by the use of high microscopical powers ($\frac{1}{6}$-inch to $\frac{1}{16}$-inch, and other ojectives). The drawings were accurately made with the camera lucida. In each observation the etching was prolonged, under constant observation with lenses, a suitable time to develop the accurate structure of the metal.

June 13.—"On the New Gas obtained from Uraninite." Fourth Note. By J. Norman Lockyer, C.B., F.R.S.

Continued experiments on the gases obtained by heating the minerals broggerite and euxenite *in vacuo* have revealed the presence in the spectrum of an important line in the infra-red. By comparisons with the solar spectrum in the first order grating spectrum, the wave-length of the line has been approximately determined as 7065. There can be little doubt, from the observations which have been made, that this new line is coincident with a chromospheric line which occurs in Young's list, having a frequency of 100, and of which the wave-length on Rowland's scale is stated to be 7065·5.

It follows therefore that, besides the hydrogen lines, all three chromospheric lines in Young's list which have a frequency of 100 have now been recorded in the spectra of the new gas or gases obtained from minerals by the distillation method.

These are as follows:—

7065·5
5875·98
4471·8

The wave-lengths of the lines are in Rowland's scale, as given in Scheiner's "Astronomical Spectroscopy."[1] In a partial revision of his chromospheric list, Prof. Young gives the *corona* line 5316·79 as also having a frequency of 100 in the chromosphere, but, up to the present, this line has not been among those obtained in the laboratory.

"On the New Gas obtained from Uraninite." Fifth Note. By J. Norman Lockyer, C.B., F.R.S.

In a former communication I pointed out the spectroscopic evidence, furnished by the isolation of lines in certain minerals, which indicates that the complete spectrum obtained when bröggerite is submitted to the distillation method is produced by a mixture of gases.

In order to test this view, I have recently made some observations, based on the following considerations:—

(1) In a simple gas like hydrogen, when the tension of the electric current given by an induction coil is increased, by inserting first a jar, and then an air-break into the circuit, the effect is to increase the brilliancy and breadth of all the lines, the brilliancy and breadth being greatest when the longest air-break is used.

(2) Contrariwise, when we are dealing with a known compound gas; at the lowest tension we may get the complete spectrum of the compound without any trace of its constituents, and we may then, by increasing the tension, gradually bring in the lines of the constituents until, when complete dissociation is finally reached, the spectrum of the compound itself disappears.

Working on these lines, the spectrum of the spark at atmospheric pressure, passing through the gas, or gases, distilled from bröggerite, has been studied with reference to the special lines C (hydrogen), D_3, 667, and 447.

The first result is that all the lines do not vary equally, as they should do if we were dealing with a simple gas.

The second result is that at the lowest tension 667 is relatively more brilliant than the other lines; on increasing the tension, C and D_3 considerably increase their brilliancy, 667 relatively and absolutely becoming more feeble; while 447, seen easily as a narrow line at low tension, is almost broadened out into invisibility as the tension is increased in some of the tubes, or is greatly brightened as well as broadened in others (Fig. 1).

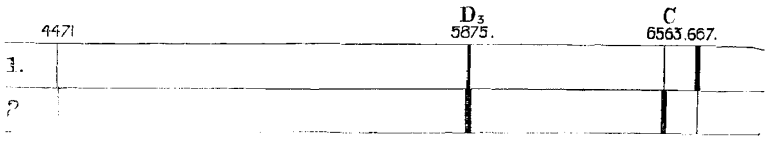


FIG. 1.—Diagram showing changes in intensities of lines brought about by varying the tension of the spark. (1) Without air-break. (2) With air-break.

The above observations were made with a battery of five Grove cells; the reduction of cells from 5 to 2 made no difference in the phenomena except in reducing their brilliancy.

Reasoning from the above observations, it seems evident that the effect of the higher tension is to break up a compound, or compounds, of which C, D_3, and 447 represent constituent elements; while, at the same time, it would appear that 667 represents a line of some compound which is simultaneously dissociated.

The unequal behaviour of the lines has been further noted in another experiment, in which the products of distillation of bröggerite were observed in a vacuum tube and photographed at various stages. After the first heating, D_3 and 4471 were seen bright, before any lines other than those of carbon and hydrogen made their appearance. With continued heating, 667, 5016, and 492 also appeared, although there was no notable increase of brightness in the yellow line; still further heating introduced additional lines 5048 and 6347.

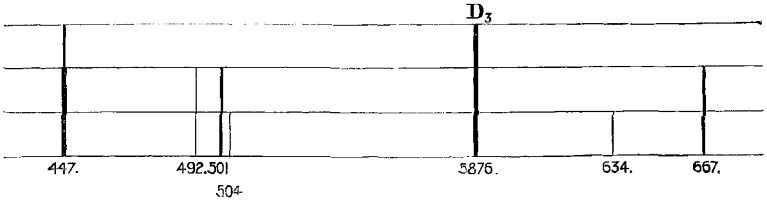


FIG. 2. Diagram showing order in which lines appear in spectrum of vacuum tube when bröggerite is heated.

These changes are represented graphically in the following diagram (Fig. 2).

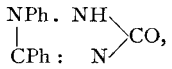
It was recorded further that the yellow line was at times dimmed, while the other lines were brightened.

"On the Origin of the Triradiate Spicules of *Leucosolenia*." By E. A. Minchin.

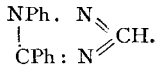
Chemical Society, June 6.—Mr. A. Vernon Harcourt, President, in the chair.—The following papers were read:—The molecular refractions of dissolved salts and acids, by J. H. Gladstone and W. Hibbert. The authors show that in many cases when a pure substance dissolves in water, an alteration of its specific refractive energy occurs.—A comparison of some properties of acetic acid and its chloro- and bromo-derivatives, by S. U. Pickering. A number of thermal and other physical properties of acetic acid, and its monochloro- and monobromo-derivatives have been quantitatively examined and compared; four distinct crystalline modifications of monochloracetic acid

[1] Frost's translation, p. 184.

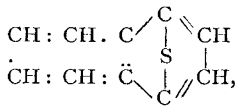
have been prepared.—ββ-Dinaphthyl and its quinones, by F. D. Chattaway. Two quinones are obtained by oxidising ββ-dinaphthyl under different conditions; from their chemical behaviour these seem to be β-naphthyl naphthoquinone, $C_{10}H_5.O.C_{10}H_7.O$ (1 : 2 : 4) and ββ-di-α-naphthoquinone, $C_{10}H_5O_2.C_{10}H_5O_2$ (1 : 2 : 4 : 1 : 2 : 4).—Action of benzaldehyde on phenylsemicarbazide, by G. Young. The interaction of benzaldehyde and phenylsemicarbazide yields a diphenyloxytriazole



which on reduction gives diphenyltriazole



—Note on the latent heat of fusion, by N. F. Deerr. Acid compounds of some natural yellow colouring matters, part 1, by A. G. Perkin and L. Pate. The yellow colouring matters, quercitin, rhamnazin, rhamnetin, luteolin, fisetin and morin form orange or scarlet crystalline compounds with some of the mineral acids; catechin and maceurin do not yield such compounds.—Action of sulphur on α-nitronaphthalene, by A. Herzfelder. On heating a mixture of sulphur and α-nitronaphthalene an amorphous substance is obtained, which probably has the constitution



and to which the name $\alpha\alpha^1$-thionaphthalene is given.

Mathematical Society, June 13.—Major MacMahon, R.A., F.R.S., President, in the chair.—Mr. G. H. Bryan, F.R.S., communicated a note on an extension of Boltzmann's minimum theorem, by Mr. S. H. Burbury, F.R.S.—Dr. J. Larmor, F.R.S., gave a brief sketch of a paper by Mr. J. Brill, entitled "On the form of the energy integral in the variable motion of a viscous incompressible fluid for the case in which the motion is two dimensional, and the case in which the motion is symmetrical about an axis."—A paper by Dr. Routh, F.R.S., on an expansion of the potential function $1/R^{\kappa-1}$ in Legendre's functions, was taken as read.—Mr. Macaulay read a paper entitled "Groups of points on curves treated by the method of residuation." The President stated that Prof. A. M. Nash, of the Presidency College, Calcutta, had died on the voyage home, for a two years' furlough, after twenty years' residence in India.

Zoological Society, June 18.—Sir W. H. Flower, K.C.B., F.R.S., President, in the chair.—Mr. J. Graham Kerr read a paper on some points in the anatomy of *Nautilus pompilius*. The author advocated the abandonment of the view that the arms in Cephalopods are pedal, and the resumption of what appeared the inherently more probable view, that they are processes of the head-region. In conclusion, the author drew attention to certain indications which appeared to point to the Amphineura, and especially to the Chitons, as being of all living Mollusca those which most nearly approximate to the ancestral form of the time when the Cephalopods diverged from the main Molluscan stem.—A communication was read from Mr. F. E. Beddard, F.R.S., and Mr. A. C. Haddon, containing an account of a collection of Nudibranchiate Mollusca recently made by the latter in Torres Straits.—Mr. Boulenger read a paper on a large collection of fishes made by Dr. C. Ternitz in the Rio Paraguay.—A communication was read from the Babu Ram Bramha Sányál, giving an account of the moulting of some Birds of Paradise in the Zoological Gardens, Calcutta.—A communication was read from Mr. O. Thomas and Colonel J. W. Yerbury, giving a description of a collection of mammals made at Aden by Colonel Yerbury in the winter of this year. It was shown that thirty-six species of mammals were now known to occur in the Aden district.—A communication was read from Mr. Edwyn C. Reed, containing a list of the Hemiptera-Heteroptera of Chili.—Mr. H. H. Druce read a paper on Bornean butterflies of the family Lycænidæ, in which he had catalogued all the species already recorded from that island, and gave descriptions of a considerable number of new species, principally from Mount Kina-Balu. Mr. Druce stated that the number of butterflies of this family previously recorded from Borneo was about 75, and that his paper contained references to about 220.—A communication was read from Dr. A. G. Butler, containing an account of a small collection of butterflies sent by Mr. R. Crawshay from the country west of Lake Nyasa. Five species were described as new to science.—Mr. J. Anderson, F.R.S., read a paper describing a collection of reptiles and batrachians made by Colonel Yerbury at Aden and its neighbourhood during the past winter.—Mr. Boulenger, F.R.S., gave an account of the reptiles and batrachians collected by Dr. A. Donaldson Smith during his recent expedition in Western Somaliland and the Galla country.

Royal Meteorological Society, June 19.—Mr. R. Inwards, President, in the chair.—Mr. R. H. Curtis read a paper on the hourly variation of sunshine at seven stations in the British Isles, which was based upon the records for the ten years 1881-90. Falmouth is decidedly the most sunny station of the seven, having a daily average amount of sunshine of 4½ hours. This amount is half an hour more than that recorded at Valencia, and three-quarters of an hour more than at Kew. Of the other four stations, Aberdeen, the most northern but at the same time a coast station, with 3·64 hours, has more than either Stonyhurst or Armagh, both inland stations; whilst Glasgow, with only 3 hours, or about a quarter of its possible amount, has the smallest record of the seven, a result to some extent due to the nearness of the observatory to the large manufacturing works with which the city of Glasgow abounds. At Valencia, Kew, Stonyhurst, and Armagh, the maximum duration is reached in May, the daily mean amount varying in the order named from 6¾ to 6 hours. At Falmouth and at the Scotch stations the increase goes on to June, when the mean duration at Falmouth reaches 7½ hours, at Aberdeen 6¼ hours, and at Glasgow 5·6 hours. January and December are the most sunless months of the year. The most prominent feature brought out at all the stations is the rapid increase in the mean hourly amount of sunshine recorded during the first few hours following sunrise, and the even more rapid falling off again just before sunset.—Mr. H. Harries read a paper on the frequency, size, and distribution of hail at sea. The author has examined a large number of ships' logs in the Meteorological Office, and finds that hail has been observed in all latitudes as far as ships go north and south of the equator, and that seamen meet with it over wide belts on the polar side of the 35th parallel.

Royal Irish Academy, June 10.—Dr. J. K. Ingram, President, in the chair.—A paper on a basaltic hill of Tertiary age in county Galway, by A. MacHenry and Prof. W. J. Sollas, F.R.S., was read (communicated by permission of the Director-General of the Geological Survey). The extensive occurrence of basaltic dykes running with a general north-west to south-east direction through the whole northern third of Ireland has been described by Sir Archibald Geikie, who, in a bold but true generalisation, has referred them to the Tertiary period. The authors bring forward evidence of a still more southern and western extension of igneous activity in Ireland during this period, basaltic rocks similar to those of Antrim being shown to occur at Bunowen, seven miles south-west of Clifden, and thus about five or six miles north of the latitude of Dublin. They form a hill rising to a height of 200 feet above the surrounding plain, which is composed of gneissose rocks, through which the basalt has been extruded. The hill trends from north to south, and is 450 yards in length. It consists of olivine bearing dolerite, and vasicular basalt containing unaltered glass, and a substance which has been described[1] as a mineral under the name of "hullite." This substance is shown not only to occur in the vesicles of the basalt as volcanic glass does in the "amygdaloids" of the Tynemouth dyke described by Teall, but also to contribute to the ground mass, where it presents all the characters of an interstitial glass. Its most remarkable character is its extremely low specific gravity (1·76), which is small even for a hydrous volcanic glass, such as this so-called mineral must be admitted to be.

PARIS.

Academy of Sciences, June 17.—M. Cornu in the chair.—The President announced to the Academy the decease of M. Verneuil, member of the Medicine and Surgery Section.—A note on the law of absorption of bands of the oxygen spectrum, by M. J. Janssen.—On the necessarily harmonic form of displacements in ocean rollers, even when the

[1] "On Hullite," by E. T. Hardman and E. Hull (*Proc.* R. I. A., Second Series, vol. iii. p. 161.)

non-linear terms of the equations of movement are not neglected, by M. J. Boussinesq.—On the combination of free nitrogen with the elements of carbon disulphide, by M. Berthelot. (See Notes, p. 202.)—A new combination of argon, its synthesis and analysis, by M. Berthelot. (See Notes, p. 202.)—Preparation and properties of pure fused molybdenum, by M. Henri Moissan. Pure fused molybdenum has been obtained by means of the electric furnace. Its properties and reactions are very fully given in the paper. Among these it is stated to have a density = 9·01, to be as malleable as iron, and capable of being filed cold or forged hot. When heated in contact with carbon, it forms a steel by cementation much harder than the pure metal. It is suggested that molybdenum may be used in the Bessemer process in place of manganese, because it furnishes a volatile oxide disengaged in the gaseous state, and any excess of the metal remaining in the iron would be as malleable as the iron itself, and similarly capable of being hardened.—Action of phenyl isocyanate on campholic, carboxylcampholic, and phthalic acids, by M. A. Haller.—Discovery of a third permanent radiation of the solar atmosphere in the gas from cleveite, by M. H. Deslandres. The line of wave-length 706·55 has been obtained in the spectrum of cleveite gas, using a very luminous tube. This corresponds to a third permanent chromospheric line, leaving now only the green line 531·66—the coronal line not obtained from terrestrial sources. The new line corresponds with a line observed in the argon spectrum by the author, employing argon prepared by means of lithium. It bears out the suggestion of Prof. Ramsay, that argon and cleveite gas contain a common constituent.—Comparative observations with declinometers of different magnetic moments, by M. Ch. Lagrange.—On the molecular transformations of chromic hydrate, by M. A. Recoura.—On some basic halogen compounds of the alkaline-earthy metals, by M. Tassilly.—Action of heat on the double alkaline nitrites of metals of the platinum group: Iridium compounds, by MM. A. Joly and E. Leidié. Among the products of the action of heat on potassium iridium nitrite, the author signalises the compounds: $6IrO_2.K_2O$, and $12IrO_2.K_2O$.—On the ammonium sodium acid tungstates, by M. L. A. Hallopeau. The compounds $16WO_3.3Na_2O.3(NH_4)_2O.22H_2O$ and $12WO_3.4Na_2O.(NH_4)_2O.25H_2O$ are described.—Rotatory powers of some amyl derivatives in the liquid and gaseous states, by MM. Ph. A. Guye and A. P. do Amaral.—On synthesised colloids and coagulation, by M. J. W. Pickering. Synthetic colloids behave, when injected into the vascular system, in a very similar manner to the nucleo-albumins.—On a new bed of "cipolin" in the rocks of the Central Plateau, by M. L. de Launay.—Glacial and fluvio-glacial deposits of the basin of the Durance, by MM. W. Kilian and A. Penck.—On the coexistence, in the basin of the Durance, of two systems of conjugate folds of different age, by M. Émile Haug.—On the Jurassic and Cretaceous systems in the Balearic Islands, by M. H. Nolan.—On the Miocene of the Novalaise Valley, by MM. J. Révil and H. Douxami.—Researches on the sugar and glycogen in lymph, by M. A. Dastre. Lymph contains an appreciable quantity (0·097 per thousand) of glycogen, obtainable by the usual methods. Glycogen is destroyed in lymph, in less than twenty-four hours, by a diastasic ferment (lymphodiastase). Rohmann has shown the existence of a ferment of this kind in lymph. The glycogen appears to be entirely carried by the solid elements, and absent from the liquid plasma. The doctrine that sugar is the circulating form of carbohydrate is thus confirmed.—Modification of the heat radiated by the skin, under the influence of continuous currents, by M. Lecercle.—Demonstration, by a new pupillometer, of the direct action of light on the iris, by M. Charles Henry.—Experimental production of generalised ganglionary lymphadenomia in a dog, by M. Pierre Delbet. The author has proved the infectious nature of this disease, and has isolated the pathogenic bacillus causing it.—On serotherapeutics in cancer, by M. Paul Gibier. Details of serum inoculation in two cases of cancer and the consequent effects.—Kildine Island and its hydrological peculiarities, by M. Venukoff.—The recent earthquakes and their periodicity, by M. Ch. V. Zenger.

BERLIN.

Meteorological Society, May 7.—Prof. Hellmann, President, in the chair.—Dr. H. Meyer spoke on most probable and mean temperatures of the air. He showed by several examples (Berlin, Nertschinsk, Alexandria) that the values of the summit of the curve of frequency and of the arithmetic mean exhibit a relationship to each other which is dependent on cloudiness, and shows diurnal and annual periodicities which are of considerable importance for the characterising of climate. The same speaker next dealt with the applicability of Lambert's formula to the calculation of the average direction of the wind. He showed that later observers had neglected Lambert's presupposition that either the velocity or pressure of the wind must be introduced into his formula, and had employed the "frequency" instead, a fact which must lead to worthless results. But even when the formula is employed in accordance with Lambert's instructions the resultant direction arrived at has no climatic significance. A lengthy discussion ensued, which the President summed up as indicating that Lambert's formula was not generally regarded as sufficing for the calculation of the average direction of the wind. Only in the case where the movements of the air lie close together for a given period, and do not differ by more than 2°, does it appear at all profitable to calculate the resultant by means of this formula.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Garden Flowers and Plants: J. Wright (Macmillan).—Longmans' School Algebra: W. S. Beard and A. Telfer (Longmans).—Bulletin of the U.S. National Museum, No. 48. A Revision of the Deltoid Moths: Dr. J. B. Smith (Washington).—Heligoland as an Ornithological Observatory: H. Gätke, translated by R. Rosenstock (Edinburgh, Douglas).—An Introduction to Chemical Crystallography: Dr. A. Fock, translated and edited by W. J. Pope (Oxford, Clarendon Press).—Leitfaden für Histiologische Untersuchungen: Dr. B. Rawitz, Zweite Auflage (Jena, Fischer).—Das Pflanzenphysiologische Praktikum: Dr. W. Detmer, Zweite Auflage (Jena, Fischer).—Untersuchungen über die Stärkekörner: Dr. A. Meyer (Jena, Fischer).—A Text-Book of the Science and Art of Bread-Making: W. Jago (Simpkin).—The Structure and Life of Birds: F. W. Headley (Macmillan). Photography Annual for 1895 (Iliffe).—Exterior and Interior Photography: F. W. Mills (Dawbarn).—La Géologie Comparée: Prof. S. Meunier (Paris, Alcan).—Mind and Motion and Monism: Dr. G. J. Romanes (Longmans).

PAMPHLETS.—Protoplasme et Noyau: Prof. J. Pérez (Bordeaux).—Ueber die Auslese in der Erdgeschichte: Dr. J. Walther (Jena, Fischer).—Walks in Belgium (30 Fleet Street).

SERIALS.—Bulletin de l'Académie Royale des Sciences, &c., de Belgique, Tome 29, Nos. 4 and 5 (Bruxelles).—American Journal of Mathematics, Vol. xvii. No. 3 (Baltimore).—Botanische Jahrbücher für Systematik, Pflanzengischichte und Pflanzengeographie, Einundzwanzigster Band, 1 and 2 Heft (Leipzig, Engelmann).—Morphologisches Jahrbuch, 22 Band, 4 Heft (Leipzig, Engelmann).—Economic Journal, June (Macmillan).—Royal Natural History, Vol. 4, Part 20 (Warne).—Travaux de la Société des Naturalistes à l'Université Imperiale de Kharkow, tome xxviii. 1893-94.—Quarterly Journal of Microscopical Science, June (Churchill).—Astrophysical Journal, June (Chicago).—Bulletin of the Geographical Club of Philadelphia, Vol. 1, No. 5 (Philadelphia).—Zeitschrift für Wissenschaftliche Zoologie, lix. Band, 3 Heft (Leipzig, Engelmann).—Longman's Magazine, July (Longmans).

CONTENTS.