

TABLE 5.—Cameron and Ramsay's experiments.

Solution.	Nature of bulb.	Amount of emanation.	Time.	Removal of Cu.	Residues.	Results.
Experiment I. Saturated solution of copper sulphate recrystallized four times.	Soda-lime glass bulb.	Cu. mm. 3	Days. 30	H ₂ S	Sodium and calcium.	Red line of lithium appeared.
Experiment II. Saturated solution of copper sulphate prepared by electrolysis.	Glass vessel.	3	30	H ₂ S	1.1 mgs	Sodium spectrum and red lithium line.
Experiment III. Saturated solution of copper nitrate prepared chemically.	Platinum vessel.	1.5	41	H ₂ S	2.48 mgs	Sodium and lithium spectra.
Experiment IV. Saturated solution of copper nitrate. (c) Extreme care was used in preparation of chemicals.	Vessels mostly of platinum and silica.	1.6	42	H ₂ S	1.67 mgs	Residual gases. NO 1.12 cc. N ₂ .84 cc. CO ₂ .27 H ₂ .44 cc. O ₂ 1.12cc. Argon sodium, and lithium spectra.
(b) Control ex. Saturated solution of copper nitrate.	Vessels of platinum and silica.	4279 mgs	Sodium strong, no lithium present.
(c) Distilled water ..	Glass bulb.	1.44	3871 mgs	N ₂ . 307 cc. CO ₂ .065 cc. CO .080 H ₂ 3.74 O ₂ 1.56cc. Brilliant neon spectrum. Sodium and potassium but no lithium.

Cameron and Ramsay have also tried passing the emanation into a lead nitrate solution, but were unable to get any spectrum of lithium. Experiment IV, which they made, was performed with all the care possible. During the first day the copper nitrate treated with the emanation became slightly cloudy, on the second day slightly green, after which the green did not become any more distinct. From this solution there was a greenish white deposit. The color of the untreated copper nitrate remained a clear blue thruout the experiment and gave no residual gas. The bulbs used were made from the same piece of glass tubing.

Cameron and Ramsay suggest that helium may result from the degradation of the large molecule of the emanation from its bombardment by the α particles; that this degradation, when alone or with oxygen, results in the lowest member of the inactive series of elements, helium. If particles of greater mass are associated with the emanation as liquid water, then the degradation is less complete and neon is produced; when the associated molecules are still more complex, as copper sulphate, then the product is argon. These writers also believe that copper is also involved in this process of degradation and is reduced to the lowest member of its group of elements, namely, lithium. Whether sodium is also produced is difficult to say on account of its presence in the glass bulb used.

The above experiments, if verified, are fundamentally of the greatest importance, and the theory of radioactivity will now take on an entirely new phase. Previously all experimental data indicated that the process of disintegration of the elements was unaffected by any known physical or chemical methods. But here we have a process of controlling this transformation. Strutt's work on the occurrence of argon, neon, and helium in the rocks goes to partly confirm the work of Cameron and Ramsay.

SUMMARY.

1. We have found that radium is a very remarkable element on account of its spontaneous emission of α , β , γ , and δ radiations.

2. It is an element that is rapidly disintegrating into products which have entirely different physical and chemical properties.

3. Radium is very widely distributed thruout the rocks of the earth, and exists in but small amounts in sea water.

4. It is quite possible that a part of the radium of the earth is of extra terrestrial origin.

5. The atmosphere contains several of the radium products.

6. Radium is a member of a family of elements which are disintegrating into a final product, lead.

7. The radium emanation evolves helium constantly.

8. Recent work indicates that under different conditions different elements are produced in the breaking down of the radium emanation. If this is true, it is quite possible that the argon, helium, and neon in the air may be due to the presence of radium.

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. FITZHUGH TALMAN, Assistant Librarian.

THE INTERNATIONAL METEOROLOGICAL COMMITTEE.

The reports of the meetings of the International Meteorological Committee—in English, French, and German—are published from six months to two years after the meetings; the English versions by the British Meteorological Office, the French usually by the Bureau Central Météorologique de France, and the German by either the Prussian Meteorological Institute, or the Zentralanstalt für Meteorologie at Vienna. We have recently received the German report of the meeting held in Paris last September.¹

The sessions began Tuesday morning, September 10, the following members of the Committee being present: Hellmann, Lancaster, Mohn, Nakamura, Palazzo, Pernter, Rykachev, Shaw, and Hildebrandsson (secretary). Messrs. Angot and Hergesell were present as guests. In the absence of Professor Mascart, Doctor Shaw, director of the British Meteorological Office, acted as presiding officer. Prof. Mascart, President of the Committee, being detained at his home in Poissy by ill-health, invited the Committee to hold one of its sessions there, and the invitation was accepted.

A letter was read from Doctor Hann, presenting to the Committee his three memoirs on the daily march of temperature in the Tropic Zone, recently published by the Vienna Academy of Sciences. General Rykachev presented the report of the committee on terrestrial magnetism and atmospheric electricity, and also announced the appointment by the International Association of Academies of a committee charged with the execution of magnetic measurements along a parallel of latitude. Doctor Hergesell presented the report of the aeronautical committee. This report included a detailed account of the upper air observations made during the "international week" of July, 1907. Reference was also made to the inauguration of several new institutions for upper-air research; e. g., the Prussian observatory at Lindenberg, the observatory of the U. S. Weather Bureau at Mount Weather, and the private observatory of M. Riabouchinsky at Koutchino, Russia. Doctor Shaw reported that the observations with pilot balloons made at Cairo, Egypt, showed the occurrence of a steady west wind above the 1,200-meter level in that locality. A special committee was appointed to investigate the system of communicating weather information to vessels in use at the Zikawei Observatory, China, with a view to its universal adoption. A recommendation that the maximum and minimum temperatures in the past twenty-four hours be included in morning weather telegrams was adopted. A proposal by Doctor Shaw, looking to the adoption of a uniform scale and projection for daily weather maps and marine meteorological charts, to correspond with the requirements of dynamic meteorology, was approved in principle, but it was not deemed feasible to secure such uniformity at present.

The afternoon session was occupied with the important question of the publication of mean or normal values from the

¹ Bericht über die Versammlung des Internationalen meteorologischen Komitees, Paris, 1907. Berlin, 1908. (Veröffentlichungen des K. Preuss. Meteorologisches Instituts, Nr. 191).

long records that now exist for a great many stations throughout the world. Such means have heretofore been published in an irregular and desultory manner, and with little regard to uniformity of epoch. The Committee voted to encourage the publication of means for each lustrum ending in '5 and '0; and a compilation of climatological data for Japan on this basis was submitted by Doctor Nakamura³. The Committee decided to call upon the directors of meteorological services for lists of the publications in which means from many-year records have appeared. Such lists were subsequently furnished and are published as an appendix to the report (Anhang XIII). They fill a long-felt want in climatological literature—notwithstanding the regrettable omission of some important countries; notably, India, the Australasian states, and the Argentine Republic!

In this connection may be mentioned a long report of the solar committee, published as an appendix to the publication under review, but not referred to in the procès-verbaux. The solar committee has called upon the meteorological services of the world for compilations of mean values of the meteorological elements from a certain number of representative stations, based on the uniform period 1881–1905; also a statement of regional rainfall for each country.

At the morning meeting of September 11 special committees were appointed to prepare new isothermal charts of the world, and to consider an interesting project of Teisserenc de Bort for promptly centralizing the reports of daily observations made at some thirty selected stations scattered over the world. The Committee decided to request the Deutsche Seewarte to enlarge the scope of its "Dekadenberichte" so as to include the intertropical regions of the Atlantic Ocean.

At the afternoon meeting wireless telegraphy was discussed and a new committee on weather telegraphy, with especial reference to wireless telegraphy, was appointed. Doctor Shaw presented a statement showing that at a maximum cost of £1,000 a year the effective range of the European daily weather maps could be extended by means of wireless messages to the meridian of 15° or 20° W. of Greenwich. At the instance of Doctor Hildebrandsson it was decided to urge the meteorological services to establish stations in the neighborhood of the "action centers" of the atmosphere.

On the morning of the 12th a special session was held at Professor Mascart's home in Poissy, some twelve miles from Paris, and on this occasion Professor Mascart took leave of his colleagues, having resigned from the Committee in consequence of his retirement from the directorship of the meteorological service of France. Doctor Shaw expressed the profound regret of the Committee at the loss of its president, who had conducted its affairs with distinguished success for fourteen years.

The final session was held the same afternoon in Paris. A code of rules governing the international organization of meteorology was adopted provisionally, pending ratification by the next International Meteorological Conference. Doctor Shaw was unanimously elected president of the Committee in succession to Professor Mascart, and the following were elected members of the Committee, to fill vacancies: Angot, Hamberg, Maurer, Stupart. Doctor Hildebrandsson resigned from the Committee, and Doctor Hellmann, director of the Prussian Meteorological Institute, was elected to succeed him as secretary. A report of the committee on solar radiation was received from Professor Ångström, stating that some thirty observatories in different parts of the world were now using his electric compensation pyrheliometer; also outlining a project for the comparison of instruments. At the same time

Professor Ångström tendered his resignation from the committee on radiation on account of ill health, and Doctor Pernter was chosen to succeed him, temporarily, as chairman. The last act of the meeting was the adoption of a suggestion of General Rykachev that portraits of all the members of the Committee be collected in an album and presented to the retiring president, Professor Mascart.

Taking account of the deaths that have occurred since the Paris meeting the membership of the International Meteorological Committee now stands as follows:

Prof. Dr. Alfred Angot, Directeur du Bureau Central Météorologique de France, Paris; Commandante Francisco S. Chaves, Director do Serviço Meteorologico dos Açores, Ponta Delgada, Azores; Gualterio G. Davis, Director de la Oficina Meteorológica Argentina, Buenos Aires; Dr. H. E. Hamberg, Direktor der Meteorologischen Centralanstalt, Stockholm, Sweden; Geh. Regierungsrat Prof. Dr. G. Hellmann, Direktor des Preussischen Meteorologischen Instituts, Berlin; St. C. Hepites, Directeur supérieur honoraire de l'Institut Météorologique de Roumanie, Bucharest, Roumania; Dr. J. Maurer, Direktor der Schweizerischen Meteorologischen Centralanstalt, Zürich, Switzerland; Prof. Dr. H. Mohn, Direktor des Meteorologischen Instituts, Christiania, Norway; Prof. Willis L. Moore, Chief of the United States Weather Bureau, Washington; K. Nakamura, Director of the Central Meteorological Observatory, Tokyo, Japan; Prof. Dr. Luigi Palazzo, Direttore dell'Ufficio Centrale di Meteorologia e di Geodinamica, Rome; Hofrat Prof. Dr. J. M. Pernter, Direktor der Zentralanstalt für Meteorologie und Geodynamik, Vienna; Maj.-Gen. M. Rykachev, Director of the Central Physical Observatory, St. Petersburg; Dr. W. N. Shaw, Director of the Meteorological Office, London; R. F. Stupart, Director of the Meteorological Service of Canada, Toronto.

CHANGES IN "DAS WETTER."

The monthly meteorological journal, *Das Wetter*, has enlarged its scope by inaugurating a department devoted to the new Public Weather Service of Germany, in which the observers of that service will be at liberty to express their views, offer suggestions, and report experiences of meteorological interest, much as the "British Rainfall" observers do in the columns of Symons's *Meteorological Magazine*. The new department will be under the editorship of Prof. R. Börnstein.

Das Wetter has for a number of years been, in a sense, subsidized by the Prussian Meteorological Institute, i. e., the Institute subscribes for a large number of copies for presentation to its voluntary observers. Now an arrangement has been made whereby the meteorologists of the Institute are to collaborate more generally than heretofore in the production of the journal, which thus assumes a quasi-official character, denoted by the addition of "Mit Unterstützung des Königlich Preussischen Meteorologischen Instituts" to its title.

A NEW WEATHER MAP FROM AUSTRALIA.

Commonwealth meteorology having become *fait accompli* in Australia, Australasia once more boasts a daily weather map, which dates from January 1, 1908. The area embraced is nearly the same as that of the large maps formerly published at Sydney and Brisbane, with the addition, however, of some noteworthy stations in outlying islands. A small inset is provided for the report from Cocos Island (latitude 12° 5' S., longitude 96° 54' E.), which lies beyond the limits of the general map. The size of the map is somewhat less than twice that of a page of the *MONTHLY WEATHER REVIEW*.

The data charted are barometric pressure, state of the sky, direction of the wind, state of the sea, occurrence of thunderstorms, and occurrence, but not amount, of rainfall. Temperature statistics are not included.

SIR JOHN ELIOT.

Several meteorologists of the first rank have past away within the last twelvemonth, but none whose loss will be more

³ Results of the meteorological observations made in Japan for each period of five years since 1876, and for the 10, 15, 20, 25, 30 years ending in 1905; published by the Central Meteorological Observatory, Tokio, in 1906.

keenly felt than that of Sir John Eliot, K. C. I. E., F. R. S., the great authority on the meteorology of India, who died suddenly at his home, Bon Porto, Cavalaire, in the south of France, March 18, 1908.

He was born at Lamesley, Durham, in 1839, and took a degree at Cambridge in 1869, winning special honors in mathematics. On leaving the university he proceeded at once to India, where he taught mathematics successively at Rurki and Allahabad. In 1874 he was appointed professor of physical science at the Presidency College, Calcutta, and also meteorological reporter to the government of Bengal. In 1886 he became meteorological reporter to the government of India, on the retirement of Mr. Blanford, and held this post until his own retirement in 1903.

During his régime the number of meteorological observatories in India was nearly doubled, a uniform system of marine storm warnings was adopted, flood warnings were inaugurated, the work of collecting meteorological information relating to the Indian seas was largely extended, a solar physics observatory was established at Kodaikanal for the systematic study of solar changes and their correlation with the larger features of Indian meteorology, and seasonal forecasts of rainfall were undertaken, in an experimental way, in response to the immense need felt for such information by the Indian agriculturists; these being the first long-range forecasts issued by an official weather service and based upon generally admitted scientific principles.

Sir John Eliot's contributions to Indian meteorology by no means ceased with his retirement from official life. The most recent numbers of the Indian Meteorological Memoirs, published only last year, were from his pen; and in 1906 appeared the great work which may be regarded as the roof and crown of his scientific career—the "Climatological Atlas of India." A companion volume, "Handbook of the Meteorology of India," was to have been ready for publication shortly, and he was engaged upon this only two days before his death. He was an active member of the International Meteorological Committee, retaining his membership after his retirement from the Indian service in 1903, at the urgent request of the committee, in exception to the rule that the personnel of the committee shall be limited to the directors of meteorological services. He was also secretary of the International Solar Commission.

Of all Eliot's scientific achievements perhaps that which most interested meteorologists in America was the great impulse that he gave to correlative meteorology on a world-wide scale—"world meteorology"—whether viewed as a subject complete in itself, or as a chapter in cosmical physics. His address as chairman of the subsection of cosmical physics at the Cambridge meeting of the British Association, in 1904, may be said to mark an epoch in meteorological opinion; and his suggestive papers on the meteorology of large areas of the earth's surface during the period 1892-1902¹ are the expression of similar views in a more concrete form. It is said that he was looking forward to attending the meeting of British meteorologists to be held in Ottawa next summer—an enterprise for which he himself was probably in a large measure responsible.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them. Anonymous publications are indicated by a —.

¹ Broad Views, Vol. I, March, 1904, and Indian Meteorological Memoirs, Vol. XVI, pt. 2.

American climatological association.

Transactions. v. 23. Philadelphia. 1907. xxxii, 330 p. 8°.

Austria. K. k. hydrographisches Zentralbureau.

Der Gewitterregen des 17. Juli 1907 im Nordwesten von Wien. Wien. 1908. 8 p. 8°. (Sonderabdruck aus der "Oesterr. Wochenschrift für den öffentl. Baudienst," Heft 41, 1907.)

Bach, Hugo.

Das Klima von Davos nach dem Beobachtungsmaterial der eidgenössischen meteorologischen Station in Davos. Zürich. 1907. 105 p. 8°. (Nouveaux mémoires de la Société Helvétique des sciences naturelles. Bd. 42, Abh. 1.)

Bemporad, A.

... L'assorbimento selettivo dell'atmosfera terrestre sulla luce degli astri. Roma. 1905. 109 p. 4°. (Reale accademia dei Lincei. Anno 301, 1904.)

Blanco Juste, Rafael.

Elementos de fisica y nociones de meteorologia... Parte primera. Madrid. 1906. 280 p. 8°.

Canada. Meteorological service.

Report of the Meteorological service of Canada... 1905. Ottawa. 1907. xix, 418 p. 4°.

Carnegie institution of Washington.

Year book. No. 6, 1907. Washington. 1908. vii, 242 p. 4°.

Colorado. Agricultural experiment station.

Climate of Colorado; temperature, 21 years' record at Fort Collins. 1908.

Costa, B. C. Cincinnato da, and Castro, D. Luiz.

Le Portugal au point de vue agricole. Lisbonne. 1900. xxxviii, 965 p. 8°.

Eredia, Filippo.

I venti in Italia. Roma. 1907. 8°. (Estratti dal Bollettino della Società aeronautica Italiana.)

Everdingen, E. van.

... Relations between mortality of infants and high temperatures. (Koninklijke akademie van wetenschappen te Amsterdam.) Repr. from Proc. of the meeting of Saturday Oct. 26, 1907. 13 p. 4°.

Félice, Raoul de.

La Basse-Normandie. Paris. 1907. 590 p. 8°.

Geneva. Observatoire.

Observations météorologiques faites aux fortifications de Saint-Maurice. 1906. Genève. 1907. 56 p. 8°.

Résumé météorologique de l'année 1906 pour Genève et le Grand Saint-Bernard. Genève. 1907. 109 p. 8°.

Geographisches Jahrbuch.

Gotha. 1907. xiv, 397 p. 8°.

Germany. Deutsche Seewarte.

Deutsches meteorologisches Jahrbuch für 1906. Hamburg. 1907. vi, 200 p. 8°.

29^{er} Jahresbericht... 1906. Hamburg. 1907. iv, 49 p. 4°.

Great Britain. Meteorological office.

Meteorological observations at stations of the second order for the year 1903. Edinburgh. 1908. xiv, 169 p. 8°.

Hongkong observatory.

China coast meteorological register. 1907. n. p. 8°.

Houston, Edwin J.

The wonder book of the atmosphere. New York. 1907. x, 326 p. 12°.

Huntington, Ellsworth.

The pulse of Asia; a journey in central Asia illustrating the geographic basis of history. Boston. 1907. xxi, 415 p. 8°.

Johnson, Kenneth S.

Mean monthly and annual relative humidity charts of the United States. Cape Town. 1907. p. 161-168. 8°. (From the report of the South African association for the advancement of science, 1906.)

Kassner, —.

Die Witterung im Sommer 1907 und ihr Einfluss auf den landwirtschaftlichen Betrieb. (Sonderabdruck aus dem Jahrbuch der Deutschen Landwirtschafts-Gesellschaft. Band 22. p. 765-776. 8°.)

Kayser, E.

Wolkenhöhenmessungen. (Sonderabdruck aus dem Schriften der Naturforschenden Gesellschaft in Danzig. N. F. Band 9. Heft 1. 1895.)

Keeling, B. F. E.

The climate of Abbassia near Cairo. Cairo. 1907. 61 p. 4°.

Krümmel, Otto.

... Handbuch der Ozeanographie. Bd. 1. Stuttgart. 1907. xv, 525 p. 8°.

Lehmann, Alfr. and Pedersen, R. H.

Das Wetter und unsere Arbeit; experimentelle Untersuchungen über den Einfluss der meteorologischen Faktoren auf die körperliche und seelische Arbeitsfähigkeit. Leipzig. 1907. p. 99-202. 8°. (Sammlung von Abhandlungen zur psychologischen Pädagogik aus dem Archiv für die Gesamte Psychologie. 2. Bd. 2 Heft.)

Lisbon. Observatorio do Infante D. Luiz.

Annaes. v. 40-43, 1902-1905. Lisboa. 1904-1907. 8°.

Annaes. Observações dos postos meteorológicos. 1902-1905. Lisboa. 1906-7. 4°.