the nucleus are λ 555, 514, and 472. The fourth band is made up of the lines λ 440, 434, and 432, and the wave-length of the fifth is λ 423. The sixth band he finds to be composed of the lines λ 410, 407, 405, 404, and 402, while 388 he gives as the wave-length of the seventh band. By using a prismatic camera, the spectrum of the comet's tail has also been secured, but because of its faintness only monochromatic images of the tail in the three visible bands were

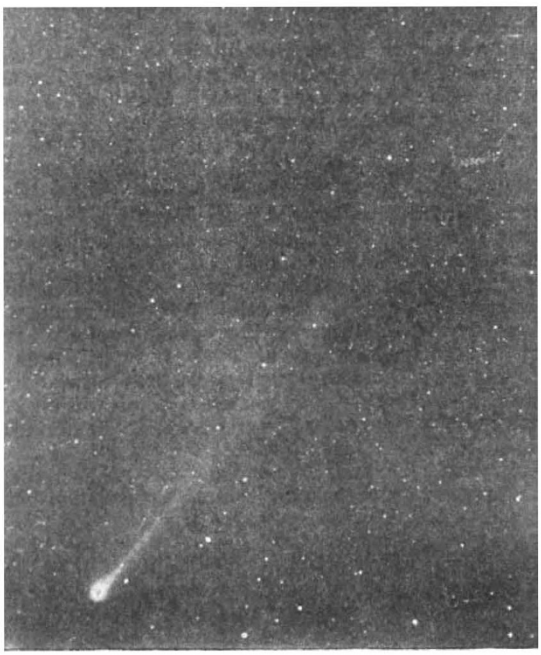

FIG. 1.—Brooks's Comet as photographed on September 28 at the Madrid Observatory with an exposure of 1¼ hours.

recorded. The whole length of the spectrum indicates the presence of a faint continuous spectrum. This spectrum was secured on the night of September 26 with an exposure of two hours (9h. to 11h. G.M.T.). Besides a paper print of this spectrum, a drawing with a scale of wave-lengths also accompanies the communication. This drawing is reproduced here (Fig. 2), but the violet has been placed on the left-hand side to conform with the general adopted procedure.

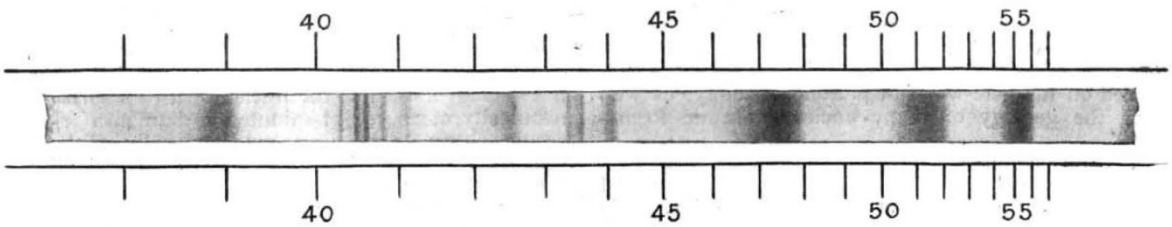

FIG. 2.—Spectrum of Brooks's Comet drawn from a photograph taken at the Madrid Observatory.

The writer has made a comparison of this spectrum with that which was taken of comet 1907*d* (Daniel) by Prof. Campbell. While the latter spectrum is on a very much larger scale and rich in detail, it is seen nevertheless that both are very closely identical when allowance is made for the smaller scale. As Daniel's comet was stated by Campbell to show no radiations other than those due to carbon or carbon compounds, the chief carbon bands being strongly developed, it is very probable that the Madrid spectrum represents bands and lines of the same substances. No doubt in the near future spectrum observations, both photographic and visual, made at other institutions, will be soon forthcoming, so it will be interesting to see if the same explanation of the origin of the bands is corroborated.

W. J. S. LOCKYER.

CONFERENCE ON THE THEORY OF RADIATION.

A VERY successful meeting was held in Brussels from October 29 to November 4, to discuss the present position of the theories of radiation and of molecular theory in general. The following were present at the meeting:—Profs. H. A. Lorentz, Kamerlingh Onnes, W. Nernst, M. Planck, Rubens, Sommerfeld, W. Wien, Warburg, Brillouin, Mme. Curie, Langevin, Perrin, Poincaré, Einstein, Hasenöhrl, Martin Knusden, J. H. Jeans, and Rutherford, while Dr. Goldschmidt, of Brussels, Dr. de Broglie, of Paris, and Dr. Lindemann, of Berlin, acted as secretaries.

The inception of this "conseil scientifique" was due to Mr. Ernest Solvay, of Brussels, who very generously offered to defray the expenses of the conference and the cost of publication of the papers and discussions contributed at the meeting. The members were the guests of Mr. Solvay at the Hotel Metropole, and with the exception of one meeting at the Physiological Institute, founded by Mr. Solvay, the meetings took place in one of the reception-rooms of the hotel. The arrangements of the meeting were under the charge of Dr. Goldschmidt, who was indefatigable in looking after the comfort of the visitors. Prof. H. A. Lorentz was president of the "conseil scientifique," and the success of the meeting was due in large measure to his able management.

The following papers were read before the congress:—Sur l'application au rayonnement du théorème de l'équipartition de l'énergie, by Prof. H. A. Lorentz; a short communication in the form of a letter from Lord Rayleigh; the kinetic theory of specific heats, by Prof. J. H. Jeans; die Gesetze der Wärmestrahlung und die Hypothese der elementaren Wirkungsquanten, by Prof. Max Planck; die Bedeutung des Wirkungsquantums für unperiodische Molekularprozesse in der Physik, by Prof. Sommerfeld; zum gegenwärtigen Stande des Problems der spezifischen Wärme, by Prof. Einstein; Anwendung der Quantentheorie auf eine Reihe physikalisch-chemische Probleme, by Prof. Nernst; les preuves de la Réalité Moléculaire, by Prof. Perrin; die kinetische Theorie der ideale Gase und die Versuchsresultate, by Prof. Knusden.

A vigorous discussion took place on each of these papers, an abstract of which will ultimately be published. Special interest was taken in the papers deal-

ing with the question of specific heats. Prof. Nernst gave an interesting account of the experiments upon the variation of specific heat with temperature down to low temperatures and of their explanation in terms of the "quantum" theory proposed by Prof. Einstein.

The meeting took place under unusually pleasant social conditions, for all the members were staying at the same hotel and dined together. The interchange of views on many problems of modern physics was a feature of the occasion, and led to a much clearer understanding of the points at issue.

At the close of the meetings, Mr. Solvay invited the conference to meet again in Brussels in 1913.

E. RUTHERFORD.

SIR SAMUEL WILKS, BART., F.R.S.

SIR SAMUEL WILKS, at the time of his death, on November 8, the senior fellow of the Royal College of Physicians of London, was born at Camberwell on June 2, 1824. He was the second son of Joseph Barber Wilks, treasurer to the East India Company, who himself had many ancestors in the service of that company. He was educated at Aldenham. In 1840 he was apprenticed to a family doctor at Camberwell, Mr. Richard Prior, whose widow he subsequently married. He began to attend lectures at Guy's Hospital in 1841, and took the M.D. London in 1850. He earned many distinctions at the University. In 1856 he became a fellow of the College of Physicians, and assistant physician to Guy's Hospital, in 1867 full physician; in 1870 he obtained his F.R.S., and in 1897 his baronetcy. He was president of the Royal College of Physicians from 1896 to 1899, and he was a governor of Guy's Hospital.

Wilks began work at a period when most doctors were satisfied with vague words that meant little; hence his desire to know the causes of things was at that time remarkable, and led him to be the first to make systematic post-mortem examinations whenever he could. When he gave up his work in the post-mortem room, he had made more post-mortem examinations than anyone alive except Virchow. In the course of these he found that syphilis could affect internal organs. As now we know that several internal diseases are due to it, this was a most important discovery. The original paper, entitled "On the Syphilitic Affections of Internal Organs," was published in the "Guy's Hospital Reports" for 1863. Of it in later years Wilks wrote, "I regard this as the most noteworthy and original article it has been my good fortune to write."

He was a great observer, and was the first to point out that excess of alcohol causes paralysis of the limbs, and that atrophic lines may form on the skin apart from stretching of it; he described and named the condition of the knuckles called "verruca necrogenica," and under the name of arterial pyæmia he described what is now known as malignant endocarditis; also he did much to establish firmly that Bright's disease, Addison's disease, and Hodgkin's disease were distinct entities. The last he discovered independently, but found that Hodgkin had given an account of some examples of it, and accordingly Wilks gave the name Hodgkin's disease to it.

All Wilks's investigations were done at Guy's Hospital, and he greatly added to the reputation of its medical school. His strong personality and his enthusiasm for the advancement of medical knowledge made him much beloved by students, and by his influence many were stimulated to take an interest in their work as an intellectual pursuit. He was always the champion of investigators, and was one of the most energetic in forming the Society for the Advancement of Medicine by Research. His mind was extraordinarily active even when well advanced in years. He did not retire until he was seventy-seven years of age, and then, when he went to live at Hampstead, he was, at the age of more than eighty, president of the Hampstead Scientific Society, and read papers before it.

His "Pathological Anatomy," first published in 1869, has gone through three editions. It has become one of the medical classics, and is still the best book on the subjects of which it treats. It has been well said that if you think you have discovered a new fact in morbid anatomy, you will find it was observed by Wilks and is mentioned in his book. Students were so much attracted by the matter of his lectures that at their request they were published, and form his two other books, "Diseases of the Nervous System" and "Specific Fevers and Diseases of the Chest."

W. H. W.

MR. JOHN BROWN, F.R.S.

THE death of Mr. John Brown, which, as announced in last week's issue, occurred at Belfast on November 1, removes one who was a scientific amateur in the best sense of that term, and whose enthusiasm bore fruit in much solid work in the department of physics in which he was specially interested.

Born in 1850, the son of a prominent linen merchant, in the north of Ireland, Mr. Brown, after a very short experience of business life, retired from the firm which bears his father's name in order to devote himself entirely to the scientific and engineering pursuits for which his bent had been clearly shown from boyhood. He soon became absorbed in electrical matters, particularly in the question of Volta contact electricity, about which then and since so much controversy has been carried on. His first paper on the subject was published in *The Philosophical Magazine* in 1878, and was followed by a series of others in which he detailed the results of his experiments and lent important support to the chemical theory of these phenomena. The work was done largely by means of home-made apparatus, and gave evidence of experimental ingenuity and carefulness of a high order. He maintained that the effects were due to films of condensed vapour or gas on the surface of the metals, and regarded the pair of metals in contact as equivalent to a voltaic cell, divided in the electrolyte, and having the amount of electrolyte reduced until only an invisible film remains on each plate. In support of this theory he tried the effect of surrounding the metals by different gases, and obtained variations in the value of the potential difference, the proper interpretation of which was a matter of some controversy.

Mr. Brown was elected a fellow of the Royal Society in 1902, and in the following year he published what proved to be his last contribution to the voltaic question. In this he claimed to have got rid of the gaseous films by heating the plates to a high temperature in a bath of petroleum, when the difference of potential was found to disappear. Before his death he had planned to repeat this crucial experiment with additional precautions during the present winter.

His other publications of pure scientific interest were in connection with the allied question of electrolytic conduction. On this he took up a position strongly hostile to the modern developments of the dissociation hypothesis.

Mr. Brown was much interested in mechanical and engineering matters, especially in connection with motor engineering, on which he did some pioneering