

and 1932 (Canada), and whenever weather conditions were favourable he was successful in adding something to our knowledge of solar phenomena revealed during totality. His skill as a photographer, and familiarity with astronomical instruments, made him particularly valuable to every eclipse expedition of which he was a member.

While certain problems relating to the constitution of the sun can only be studied during the brief moments of total eclipse, there are many others which require for their solution the collection of observations over a long period. Among these is the relation between solar changes and terrestrial weather, to which subject Sir Norman and his son contributed some notable papers. Upon the initiative of Sir Norman, a committee for the study of such changes was appointed by the International Meteorological Committee in 1903, and Dr. Lockyer became secretary of it. Periodic plus and minus 'pulses' of rainfall in India were described by Sir Norman and Dr. Lockyer in a paper read before the Royal Society in November 1900, and were shown to be related (sometimes inversely) to similar variations at Mauritius, Cordoba (South America), the Cape of Good Hope, and other places. Attention was afterwards devoted to an examination of the variations of pressure over the Indian and other areas, and a period of 3·8 years was found in the mean variation over the whole of India and the other areas. An inverse variation was found in the pressures at Cordoba; in fact, there was a 'see-saw'. The area affected by this barometric see-saw was extended in a later paper before the Royal Society to Java, Ceylon, Mauritius and Australia.

These studies of periodic variations in the earth's meteorological elements are closely related to solar conditions. It was shown by Dr. Lockyer that, underlying the ordinary solar cycle of eleven years, there is another of greater length, namely, thirty-five years, or about three cycles of solar activity. This corresponds to Brückner's well-known climatic cycle of about thirty-five years, and thus associates weather changes on the earth with periodic variations of solar phenomena. What exactly is the relationship between the two sets of changes has yet to be determined, and the criterion of correlation coefficients has taken the place of that of curve parallels, but Dr. Lockyer's studies of the problem are still important contributions towards its solution.

Dr. Lockyer was keenly interested in aeronautics, and he made his first ascent in a balloon in 1907, with the late Hon. C. S. Rolls as pilot. For the next few years he was in the air in balloons and aeroplanes as often as his work or chance permitted, invariably accompanied by his camera and frequently with other scientific instruments, such as experimental direction finders and similar gadgets. During the Great War he was commissioned in July 1915 as a lieutenant in the Royal Naval Volunteer Reserve, attached to the Royal Naval Air Service, and two years later was promoted to the rank of lieutenant-commander. He served as commanding officer at several anti-Zeppelin stations and also in other capacities, such as intelligence officer to H.Q. Manston and Westgate R.N.A.S., ground instructor Nether-

avon (Wilts), and meteorological officer at Burnham Newton (Norfolk) and Orfordness (Suffolk). He became full major in the Royal Air Force in 1918 and was demobilized in August 1919, when he again took up his astronomical work.

Dr. Lockyer served on the Council of the Royal Astronomical Society from 1927 until 1929, and again from 1931 until the present year; he was also a vice-president of the Society in the period 1933-35. He was honorary lecturer in astronomy at University College, Exeter, but most of his active life was devoted to observational work at South Kensington and later in the Observatory founded by his father on the top of Salcombe Hill, overlooking Sidmouth. He was married, and his widow survives him, but he leaves no children to continue or extend the work which has given the name of Lockyer a permanent place in the history of astronomical science. He will, however, not only be remembered in these records, but also by a large circle of personal friends, who will long cherish his memory with affection and esteem.

Baron Axel von Klinckowström

THE death of Baron Axel von Klinckowström, which occurred in the month of May at his home, the family estate of Stafund on the island of Ekerö near Stockholm, removes one of the few remaining links with Nordenskiöld, the explorer. Klinckowström, who was born in 1867, accompanied Nordenskiöld to Spitsbergen in 1890 as a young zoologist, and in 1891 himself undertook a zoological expedition to Surinam. After his return, he devoted himself to biological research first at Stockholm and later at Würzburg under Sachs and Boveri. During these years he published a number of contributions to embryology, anatomy, variation and inheritance.

In 1895 Klinckowström was appointed University lecturer at Stockholm, and later undertook a number of expeditions to the Arctic and Antarctic. On his return he enriched the museums of Sweden by the presentation of his valuable collections. In his later years he devoted himself to bacteriological research carried out in his private laboratory at Stafund. His many-sided interests embraced poetry and the history of art, and he was well known in Sweden as a writer of books of travel and adventure. His many friends will cherish the memory of a charming personality.

E. KLENEBERGER.

WE regret to announce the following deaths:

Dr. Charles E. Johnson, director of the Roosevelt Wild Life Station at the New York State College of Forestry, on June 6, aged fifty-six years.

Prof. A. P. Karpinsky, president of the Academy of Sciences of the U.S.S.R., well known for his work in geology and palæontology, on July 14, aged eighty-nine years.

Prof. J. H. Müller, professor of chemistry of the University of Pennsylvania, an authority on the chemistry of germanium, on June 18, aged fifty-three years.