

line radiation does not bring the oxygen atoms involved to their ground-state; it instead brings them to the lowest excited state. In final passage from this state, radiation may be emitted corresponding to certain red lines. These have now been found both in the night sky and auroral spectra. It is possible that the forbidden lines of atomic nitrogen are also present.

More recently, in 1938, there came from France the astonishing news that sodium occurs in the high atmosphere in the free atomic form. Proof for this was provided by the identification of its characteristic yellow line (or rather doublet).

In addition to the atomic lines a large number of bands appear. Those in the spectra of auroras can be ascribed mainly to neutral and singly ionized molecular nitrogen. Much work has yet to be done on the interpretation of the night sky spectrum; but it seems probable that the principal contribution to the visible region is from neutral molecular nitrogen, and the principal contribution to the ultra-violet region is from neutral molecular oxygen: the bands of singly ionized molecular nitrogen seem to be normally absent. An interesting discovery, made in 1942 by Herman, Herman and Gauzit, is a remarkably strong emission in the infra-red region: its identification is still in doubt.

A growing number of highly skilled observers have been drawn into this branch of research and have obtained many unexpected and varied results. These have aroused the interest of geophysicists, astrophysicists, laboratory spectroscopists, theoretical physicists, radio scientists, chemists, and mathematicians. One manifestation of this interest was an international conference on the "Emission Spectra of the Night Sky and Auroras" organised under the auspices of the Gassiot Committee of the Royal Society and held in the Society's rooms at Burlington House, London, during July 7-10.

The Gassiot Committee is charged with the supervision and planning of a long-term programme of research on the radiation in the atmosphere and on related phenomena. This commitment was undertaken at the request of the Air Ministry (on the advice of the Meteorological Research Committee). Financial aid is given by the Ministry. The initiative in proposing the conference was taken by Prof. H. S. W. Massey, chairman of one of the sub-committees appointed by the Gassiot Committee to deal with different sections of the general programme.

The conference was attended by guests from Belgium, France, Norway, Sweden and the United States, and by many from the British Isles. Russian scientific workers have done much work in the field concerned, but none was able to be present: the Embassy, however, sent an observer. The papers read at the conference will be published by the Physical Society in the next issue of its "Report on Progress in Physics". Here only an outline of the ground covered will be attempted.

The best recent observations of the night sky spectrum have been made in France and the United States. Papers describing the results were contributed by G. Dejardin, J. Dufay, Teheng Mao-Lin, A. and E. Vassy, R. Grandmontagne, C. T. Elvey and E. O. Hulburt. There was considerable discussion of the altitude of the luminous region, which is still very uncertain. Much attention was given to the special character of the spectrum at twilight, when the negative bands of nitrogen, the red lines of oxygen, the yellow doublet of sodium and possibly other

components are enhanced. A. Kastler described work by J. Bricard and himself on the polarization of the light of various atomic lines using a very simple polariscope due to Savart and improved by Lyot. The green oxygen line was found to show less than 3 per cent polarization—a result to be expected from theory, but contradicted by recent measurements in the U.S.S.R. D. Barbier, R. W. B. Pearse and others discussed the identification of the spectral components. A great deal of time was devoted to the complex and fascinating task of explaining the cause of the emission. D. R. Bates, H. S. W. Massey, and M. Nicolet contributed papers relating to this problem. It seems probable that the emission is due in part to the dispersion of the energy stored up by the dissociated oxygen (and perhaps also nitrogen) formed during the day: recombination of the charged particles in the ionosphere will play a minor part. Consideration has also to be given to the suggestion that incident particles may have to be invoked to explain such effects as the irregularity of the light. Much remains to be elucidated. P. M. S. Blackett presented an interesting paper on the possibility of cosmic rays making an observable contribution to the continuum through Cerenkov radiation.

Recent observational work on auroras was reported by G. Kvitte (on behalf of L. Vegard) and by R. Bernard. Confirmation was given to the suggestion that hydrogen and helium may be present. An important new analysis of the spectrum was given by M. Nicolet. K. G. Emeléus read a paper sent by J. Kaplan describing laboratory experiments on the reproduction of the characteristic emissions.

It is generally accepted that auroras are due to the action (direct or indirect) of charged particles guided pole-wards by the earth's magnetic field. However, the nature, origin and energy of these is still the subject of controversy. Widely different views were expounded in papers by H. Alfvén, S. Chapman, and F. Hoyle.

One session of the conference was devoted to a discussion, led by R. W. Ditchburn, on the instruments and techniques of observation. E. O. Hulburt gave a valuable account of the work being done in the United States on the exploration of the upper atmosphere by means of rockets.

S. CHAPMAN
D. R. BATES

OBITUARY

Prof. J. Perner

THE death occurred at Prague, on June 9, of Dr. Jaroslav Perner, professor of palaeontology at the Charles University. Born at Tyneč-nad-Labem on March 28, 1869, Perner claimed to be a pupil of the French geologist, Joachim Barrande (1799-1883), in whose footsteps he followed by continuing the investigation of the fossil fauna of the Silurian and Devonian rocks of middle Bohemia. His studies were incorporated in various publications, including "Système silurien du centre de la Bohême" and a work of four volumes entitled "Etudes sur les graptolites de Bohême". Most of his other publications were in Czech or German.

Early in life Perner came to England and spent a period in the 'nineties at Mason College (afterwards the University of Birmingham) working under the late Prof. Charles Lapworth. J. G. F. D.