

suggested by natural phenomena. His theoretical ability, which was combined with a good amount of common sense, was so much more remarkable as he was largely a self-educated man, having risen from the position of an aid in a mechanical factory to being the assistant and collaborator of scientists like Svante Arrhenius, Otto Pettersson and Vilhelm Bjerknes."

Meteorologists in England who knew Sandström either personally or through his writings will join with their colleagues in Sweden in mourning the loss of a great pioneer.

E. GOLD

WE regret to announce the following deaths :

Prof. Louis Cobbet, formerly professor of pathology in the University of Sheffield, on March 10, aged eighty-five.

Major M. W. K. Connolly, an authority on the land mollusca of Africa, on February 26.

Prof. Llewelyn G. Owen, formerly professor of mathematics in the University of Rangoon, on February 23.

Mr. H. A. S. Wortley, principal of University College, Nottingham, on February 21, aged sixty-one.

NEWS and VIEWS

A Giant Sunspot

A GIANT sunspot group, one of the largest on record, crossed the sun's disk between March 3 and 17, with central meridian passage on March 10.2. Excepting one or two days, the prevailing cloudy skies gave little opportunity for detailed observations, but the following facts may be given. The maximum area of the group, consisting mainly of a pair of great spots, was 4,300 millionths of the sun's visible hemisphere. This exceptionally large area is less than that of the February 1946 spot (4,900 millionths) but greater than that of the July 1946 spot (3,950 millionths). The average area during disk passage of the present spot may, however, be less than that of the July spot (3,750) and is certainly less than that of the February spot (4,400 millionths). Two geomagnetic disturbances, not of great intensity, occurred while the present spot crossed the disk, namely, March 8-9 and March 15-16. Their provisional ranges at Abinger kindly communicated by the Astronomer Royal were

	<i>D</i>	<i>H</i>	<i>V</i>
1st storm	60'	270 γ	220 γ
2nd storm	30	150	120

The latitude of the spot group was 22° south, but the tilt of the sun's equator at this epoch of the year brought the group to within 15° of the centre of the disk at central meridian passage. Yet no great magnetic storm occurred about one day after central meridian passage, for which statistical results suggested a high probability. It is significant, however, that radio fade-out data, at any rate in Greenwich daylight hours, indicated that no intense solar flare (like those of February 6 and July 25, 1946) occurred when the spot was within the central half of the sun's surface turned towards the earth. Practically on the same solar meridian as the recent spot was another naked-eye group in latitude 13° north, and with maximum area about 1,400 millionths.

Effect of the Moon on Radio Wave Propagation

FROM time to time, some observational evidence has been forthcoming suggesting that the strength of signals received from radio transmitting stations over fixed paths is under certain conditions dependent upon the position of the moon at the time of observation. In particular, H. T. Stetson has investigated this matter, and in 1944 (*Terr. Mag. and Atmos. Elec.*, 49, 9) described the results of the analysis of some eight years measurements taken at Boston on the strength of signals received from the Chicago broadcasting station. Contrary to his expectations,

the evidence strongly indicated that the strength of the signals was dependent upon the age of the moon, although the effect was of a complex nature. It will also be recalled that in a paper published in 1939 (*Proc. Roy. Soc., A*, 171, 171), E. V. Appleton and K. Weekes showed the existence of a lunar tide effect in the height of Region *E* of the ionosphere. The tide was found to be semi-diurnal, with an amplitude variation of about ± 1 km. If these results are interpreted according to the simple theory of the formation of the ionized regions, they indicate a relative air-pressure oscillation several thousand times the measured relative pressure oscillation at ground level.

In a recent communication to the Editors, Mr. P. A. de G. Howell, 77 Glandovey Road, Fendalton, Christchurch, N.W., New Zealand, claims to have observed during 1938-39 and 1944-45, a correlation between the variation in long-distance transmission conditions at short wave-lengths and the phases of the moon. It was observed that there was a minimum of background noise and high signal strength with little tendency to fade for about two or three days on either side of full phase, these conditions changing to a maximum of noise with poor signals and fading around the time of new moon. The cycle of occurrences is easily confused with those associated with the solar period of similar duration, with which, however, it moves in and out of phase as the months progress. While both Dr. Stetson and Mr. Howell suggest that the effects are the result of changes in ionization in the earth's upper atmosphere, it is clear that the whole subject requires further investigation before definite conclusions can be reached as to the cause of the effect.

Population Trends and the World's Resources

DR. C. L. BERTRAM has presented in a minimum compass the main known facts of the relationship of population and human needs to the availability of animal and vegetable raw materials and foodstuffs (*Geogr. J.*, 107, Nos. 5 and 6, May-June 1946). He accepts Carr-Saunders' estimates that the world's population has increased fourfold in the last three hundred years—from 545 million in 1650 to 2,057 million in 1933. Only Africa (100 million to 145 million) has failed to take part in this remarkable increase. Although probably three quarters of the world's people are farmers or their dependants, the majority of these do not get sufficient food to maintain health. Seventy-five per cent of Asia's 1,150 million people have a diet far below the standard for health: even the best-nourished countries, such as

Britain and the United States, had 20–30 per cent of the people suffering from malnutritional diseases before the War. The near-famine conditions now faced by the world are nothing new, but shortages are affecting those who, by their advantageous economic position, had previously been virtually immune from even the fear of famine.

Britain imports the largest quantity of food of any country in the world—in some cases as much in normal times as two thirds of the total of a given commodity entering into the world trade. If exporters are no longer compelled by economic needs to sell the food they badly need themselves, then the position is indeed difficult for the importers. The world position has been aggravated by that greatest scourge ever known to man—soil erosion—and the irrational over-exploitation of forests, fisheries and grasslands. The plea is made for policies based on real knowledge and quantitative data rather than half-knowledge or guess-work.

'Wellcome' Photographic Year Book

THE well-known 'Wellcome' Exposure Calculator, Handbook and Diary, published by Burroughs Wellcome and Co., has appeared in a modified form as the 'Wellcome' Photographic Year Book. The contents are similar, and those who made use of the original publication before the War will remember that it consists essentially of a diary, a number of pages ruled for recording the essentials of photographic exposures, a fund of useful photographic information, and a very useful exposure calculator. Used in conjunction with the illustrated examples of different types of subject, the calculator is one of the best of its kind. On the back of the exposure calculator, also in disk form, is a depth of field calculator with which the depth of field can be obtained for lenses of various apertures and focal lengths. The keen photographer will find the Year Book a valuable asset for the pocket.

Frank B. Jewett Fellowships: Awards

THE American Telephone and Telegraph Company, which founded the Frank B. Jewett fellowships for research in the physical sciences three years ago to commemorate the retirement of its eminent vice-president in charge of development and research, has announced seven awards for 1947–48. The purpose of the fellowships is to stimulate and assist research in the fundamental physical sciences, and particularly to provide the holders with opportunities for individual growth and development as creative scientific workers. The awards carry an annual stipend of 3,000 dollars to the holder and 1,500 dollars to the institution at which the recipient elects to do research. The awards are designedly post-doctorate, and only those who have recently received their doctorates or who are about to receive them are normally considered.

The awards for 1947–48 have been made to: (1) Dr. Martin G. Ettliger (University of Texas and Harvard University), at present investigating the chemistry of cyclopropane and dicyclobutane derivatives at the California Institute of Technology as a Jewett Fellow for 1946–47; he intends to continue his present research studies. (2) Wallace D. Hayes (California Institute of Technology), who proposes to investigate problems of transonic and supersonic fluid flow. (3) Paul Olum (Harvard and Princeton Universities); he is to carry out research in algebraic topology. (4) Aadne Ore (University of Oslo), at

present an F. E. Loomis Fellow at Yale University; he will work on the theory of combinations of electrons and positrons. (5) Dr. Alfred Schild (University of Toronto and the Carnegie Institute of Technology); he will study relativistic field theories in quantum mechanics. (6) Dr. Robert L. Scott (Harvard and Princeton Universities), at present Jewett Fellow, engaged in research in chemistry at the University of California; he is to continue his studies of the thermodynamics of solutions. (7) Edwin H. Spanier (Universities of Minnesota and Michigan), at present a Rackham Predoctoral Fellow at the University of Michigan; he will engage in research in the homotopy classification of continuous mappings.

British Iron and Steel Research Association: Appointments

MR. R. H. MYERS has been appointed head of the Steel Making Division of the British Iron and Steel Research Association and Dr. A. H. Leckie has been appointed deputy head. Mr. Myers studied under Profs. J. O. Arnold and A. MacWilliam at Sheffield, and, after a post-graduate course of one year, started his industrial career with the Midland Iron Company. Since 1930 he has been associated with research in the steel industry, as open-hearth officer to the Iron and Steel Industrial Research Council, in addition playing an active part in the Corrosion and Heterogeneity Committees set up jointly by the Research Council and the Iron and Steel Institute.

Dr. A. H. Leckie studied chemistry at University College, London, under Profs. F. G. Donnan and C. K. Ingold. After graduating, he was engaged in research for several years on molecular spectroscopy. In 1937 he joined the Technical Department of the British Iron and Steel Federation and was engaged on research on iron and steel works plant and principally on open-hearth furnaces. Dr. Leckie joined the British Iron and Steel Research Association, when that body took over the work of the Federation's Technical Department, and is in general charge of research work on furnace design and operation.

Radiocommunication Convention

THE Institution of Electrical Engineers is holding a Radiocommunication Convention during March 25–28, at which some seventy papers will be presented dealing particularly with war-time activities in this field and their resulting application to future peace-time development. The Convention will be opened on March 25 by Sir Stafford Cripps, President of the Board of Trade, after which Sir Stanley Angwin will give a lecture on "Telecommunications in War" On March 26 four meetings will be held dealing in turn with long-distance point-to-point communication, naval, military and aeronautical communication, and the special features of pulse modulation in communication systems. The subject of short distance communication will be dealt with during the following morning, while the afternoon and evening sessions of March 27 will be devoted to direction-finding and war-time broadcasting respectively. On the morning of March 28, Sir Edward Appleton will open the session on propagation with a paper entitled "The Investigation and Forecasting of Ionospheric Conditions". The afternoon of the same day will be devoted to radio components, and in the evening, Sir Clifford Paterson will conclude with a review of the Convention and the future trends of development indicated by the papers and discussions. At an