

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 $\gamma$	220 $\gamma$
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  $\pm 1$  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