

NEWS AND VIEWS

Sunspot and Magnetic Storm of September 18-20

THE largest group of sunspots since January 1940 crossed the sun's disk between September 10 and 23. The group was a complex stream of spots some 150,000 miles in length, and its maximum area exceeded 2,000 millionths of the sun's hemisphere, or about 2,300 millions of square miles. At central meridian passage on September 16.8, the centre of the group passed within 4° of the centre of the sun's disk. Thus the earth was in a favourable position to be affected by a corpuscular stream that might be shot out from this disturbed region within a day or two of September 16.8. Statistical data of sunspots and magnetic storms show that out of every ten spot-groups of great size (1,500 millionths of the sun's hemisphere or greater), seven groups are associated near the time of their central meridian passage with a magnetic storm, the mean position of the group at the time of the commencement of the storm being about one day past the central meridian (see the *Observatory*, 62, 319; 1939). A valuable criterion of especially active spot groups is the occurrence of brilliant chromospheric eruptions, or 'solar flares' (*loc. cit.*, p. 321), which may be observed in monochromatic light at certain wavelengths only—the solar spectrum lines generally used being *C* for visual observations and *H* and *K* for photographic records.

In the present case, a brilliant eruption was observed at Greenwich on September 17 at 8½h. U.T., this being associated with an ionospheric irruption (fade-out). About 20 hours later, a magnetic disturbance began; this developed into a great storm which proclaimed itself by disturbance on radio circuits and by displays of the aurora borealis. As recorded at Abinger, a first climax of disturbance was shown by the magnetic traces between 7h. 2m. and 7h. 6m. on September 18, but the maximum of the storm as a whole was reached at about 0h. on September 19. The total ranges recorded throughout were: $120'$ in declination, $1,250 \gamma$ in horizontal force and more than $1,100 \gamma$ in vertical force. This storm is one of the most intense of the present solar cycle, other notable storms being those of January 25-26, 1938, April 16, 1938, March 24-25, 1940, and March 1, 1941. The maximum of sunspot frequency occurred in 1937-38.

Hermann Nothnagel (1841-1905)

PROF. HERMANN NOTHNAGEL, one of the most eminent research workers and clinicians in the second half of the nineteenth century, was born at Alt-Lietzgeröche in Brandenburg on September 28, 1841, the son of a medical man. After holding the chair of pharmacology at Freiburg in 1872 and that of special pathology and therapeutics at Jena in 1874, he was appointed professor of medicine at Vienna in 1883, and held this post until his death. Besides numerous valuable publications on neurology and pharmacology, many of which were translated into English, French, Italian, Portuguese and Polish, he

edited a system of special pathology and treatment in twenty-four volumes (1894-1905), to which he contributed a classical monograph on diseases of the intestine and peritonum. In conjunction with von Leyden he founded the *Zeitschrift für Klinische Medizin* in 1880, and was the founder and first president of the Vienna Society for Internal Medicine. He died on July 7, 1905.

Grass as Human Food

IN NATURE of July 19, p. 90, this problem was discussed briefly with special reference to an interesting pamphlet "Eating for Victory" by Mr. J. R. B. Branson, and it was pointed out that the main objection to the inclusion of grass in the human diet lies in its high content of cellulose. Mr. Branson has suggested to us that the danger from this source has been unduly emphasized. He recalls that in a paper read before the British Association in 1937, Dr. R. E. Slade stated that the dry matter in the leaf of the grass plant consists largely of soluble carbohydrates and proteins, together with minerals and vitamins, and that it is not until the plant begins to ripen that the carbohydrates change to cellulose and the protein moves from the leaf into the flower and seed. Moreover, according to data provided by Dr. H. E. Woodman, the dry matter of newly grown grass-leaf such as one gets in lawn-mowings, contains as much as 26.5 per cent of protein, 44.5 per cent of carbohydrate and 5.5 per cent of oil, making a total of 76.5 per cent of digestible matter.

The presence of valuable nutrients in young grass will not be denied, but the cellulose content of the remaining 23.5 per cent makes it questionable how much young grass, if indeed any, can be safely eaten over prolonged periods by the average human subject. The physical state of the cellulose, which is in long fibres liable to become bound into large obstructive masses, must be borne in mind. It would seem dangerous, therefore, to advocate the use of grass as an ordinary article of diet without the evidence of extensive scientific experiments as to the amount which can be safely ingested without overloading the excretory powers of the intestines.

Sound Integrating Machine

EXPLORING the sound field around a small source such as a bell or loud-speaker is usually a laborious and time-consuming task because it involves making many measurements in all directions around the radiating source. In the *Bell Laboratories Record* of July it is shown how this effort can be avoided by doing the work automatically with a sound-integrating machine. The apparatus to be tested is rotated on a turn-table while a small condenser microphone, which is mounted on the end of an arm, is swept backwards and forwards over it. This arm is oscillated in a vertical plane through an angle of 180° by a cam which moves it progressively more slowly as it approaches the ends of its excursion, so that equal

radiating areas are traversed in equal times. The output of the microphone is amplified and applied to an analyser to determine the sound intensity in different frequency bands. A meter reading gives the average intensity of the sound in a selected band: and multiplication by a factor, involving the area of a hemisphere the radius of which is the length of microphone arm, gives the total power radiated in that particular band. This integrator measures sound outputs in about one fiftieth of the time previously required to make separate observations at many points about the source. It has been used extensively in developing telephone set housings.

Electrical Demonstration Equipment

IN the *Bell Laboratories Record* of July a description is given by C. D. Hanscom of a variety of equipment which has recently been assembled by the Bell System for use in public lectures. One of the most unusual demonstrations is a Rochelle salt crystal which flashes a neon lamp when hit with a gavel. This illustrates how a change in mechanical dimensions caused by the blow generates momentary voltages of considerable magnitude by the piezoelectric effect. A bar of steel (a permanent magnet) floating in mid-air demonstrates the power of modern magnets. A permanent magnet concealed in the base of the apparatus repels the bar, holding it up against the force of gravity; a full packet of cigarettes can be supported in addition to the bar. There are also in the collection permalloy rods which are so permeable that they are magnetized by the earth's field, when held pointing north at or near the angle of declination. This is demonstrated by their ability to attract and hold short pieces of permalloy tape.

Decreased size of loading coils, made possible by research on magnetic alloys, is illustrated by a display board on which are mounted a coil with an iron-dust core, a much smaller coil of equal efficiency with a permalloy core, and a still smaller one with the same electrical characteristic, the core of which is molybdenum permalloy. Samples of the 2121-pair cable for exchange areas are included; also a piece of the Minneapolis-Stevens Point coaxial cable which transmits frequencies of several million vibrations per second. A replica of Bell's original telephone is usually included with the exhibits.

Photography in Stellar Astronomy

A RADIO talk by the late Dr. Annie J. Cannon, entitled "The Story of Starlight", delivered on January 18 last, from Harvard Observatory, appears in the *Telescope* of May-June. A short description is given of the developments in spectroscopy since 1666 when Newton bought a crude prism at a country fair, "to try therewith the phenomena of colour". It is remarkable that two hundred years elapsed before Newton's work was carried to fruition, but when the potentialities in the study of spectra were realized, there was joy in being an astronomer. As Sir William Huggins remarked, "Those were the days when there was something worth while to do in

astronomy". Dr. Cannon gives a brief account of photographic developments with special reference to the work of Harvard, where there are half a million negatives, which may be likened to a library of first and only editions, the whole forming the sole record of events observed in the stellar universe during the last half-century. The brief survey includes the important discovery of Miss Leavitt on the relation between the period of pulsation of a Cepheid variable star and its candle-power—a discovery which provides the data for determining the distances of these stars. This radio talk will be read with interest by the amateur astronomer.

Nature Study for Evacuees

THE Universities' Federation for Animal Welfare (U.F.A.W.) has issued two further useful and informative lectures for delivery to evacuee children, namely "British Snakes and Lizards", by Dr. R. C. Blackie, curator of Exeter Museum, and "Frogs and Toads", by E. M. Stevenson, lecturer in biology, University College, Exeter. The lectures are printed as brochures and accompanied by photographic plates for illustration and will help to solve a very pressing problem with many town teachers inexperienced of the countryside where they are now evacuated with their inquiring pupils. In a similar way, the various branches of the Workers' Educational Association have included nature study, biology, botany and kindred subjects in their programme of lecture courses for the coming winter. The West Lancashire and Cheshire Branch of the W.E.A., for example, is arranging nature study courses this winter at the University of Liverpool, Neston Library, Runcorn Technical Institute, Southport Technical Institute and probably Maghull Library, with a special appeal to teachers, and biology classes at the University and some of the branch towns. Attention has been given to nature study at the large Colomen-dey school camp, North Wales, but in most parts of the country considerable help in this subject is still required by town teachers in care of evacuees but handicapped by the limitations of their own experience of field natural history, which differs so radically from laboratory biology. A "Junior Naturalists' Society" has been formed by F. Stodart at Longfield, Kent, and much help is being given by local branches of the British Empire Naturalists' Association.

Bug Infestation

IN his latest annual report Sir Alexander Macgregor, medical officer of health for Glasgow, states that the total number of houses in that city in which bed bugs were found in 1939 was 309, or 2.1 per cent, as compared with 3.1 per cent in 1938. In 79 houses, or 0.5 per cent only, a "trace" of bed bugs was found, as compared with 0.9 per cent in 1938. In this group only old hatched eggs were found, but no living bugs or eggs were detected in beds or furniture, pictures or household belongings. In 62 houses, or 0.4 per cent compared with 0.5 per cent in 1938, a medium degree of infestation was found, that is, living bugs or eggs were present, but not in the