News and Views

Sunspots and Wireless Fade-Outs

ATTENTION may be directed to a coincidence between a fade-out reported by the B.B.C. as having taken place between 16^h50^m and 17^h00^m U.T. on April 8, 1936, and a large sunspot, just visible to the naked eye, which was observed crossing the central meridian of the sun at about that time. It should, of course, be understood that there is not a one-to-one correspondence between fade-outs and sunspots, any more than there is between large terrestrial magnetic storms and large sunspots. An extremely useful report entitled "Quatrième Rapport de la Commission pour l'Etude des Relations Entre les Phénomènes Solaires et Terrestres" has recently been issued by the Conseil International des Unions Scientifiques, which gives a number of short articles dealing with relations between various pairs of solar and terrestrial phenomena. The subject is an extremely tangled one, as both magnetic storms and wireless phenomena show some correlation with the solar rotation period, without showing a strict one-to-one correspondence with any recognisable solar feature. It will be remembered that Greaves and Newton found a stronger correlation between the strongest storms and spots than they found between moderate magnetic storms and moderate spots. The magnetic activity shows, as is well known, in addition to the 11-year sunspot period, a well-marked twenty-seven day recurrence (the period being that of the solar rotation) as do, of course, the spot numbers, but a period of intense magnetic activity is not necessarily one of marked spot activity.

A CONNEXION between radio fade-outs and eruptions of bright hydrogen has been looked for recently. For example, a fade-out in the United States on August 30, 1935, coincided with the central passage of a bright hydrogen eruption, both being repeated on October 24, but as R. S. Richardson remarks, it must be emphasised that Mt. Wilson Observatory has photographs of much larger and more brilliant outbursts with no apparent terrestrial effects. A recent coincidence of this nature was described at the February meeting of the British Astronomical Association, but Mr. Greaves emphasised the necessity of accumulating data rather than attempting to establish a correlation on a few such coincidences. The disturbances in the magnetic elements and the fade-outs are alike attributed to changes in the ionosphere, and it is now supposed, following the results of the 1932 eclipse, that the earth's upper atmosphere is ionised by ultra-violet radiation from the sun; indeed, in order to account for certain features of the ionosphere, Prof. M. N. Saha, at a recent meeting of the Royal Astronomical Society, offered the suggestion that the lines in the extreme ultra-violet solar spectrum (of wave-length about 1000 A.) are emission lines and not absorption lines. If the ionosphere is only affected by very short wave-lengths, the correlation lies between terrestrial phenomena and *extreme* ultra-violet solar activity, the latter being unfortunately unobservable, as the ozone layers cut off this region of the solar spectrum before it reaches the surface of the earth. As to the detail of Saha's suggestions, whether the far ultra-violet lines are emission lines or not (it is hoped to test this matter by observations made in balloons at a height of 30 km.) the facts so far as they are known, particularly the 27-day recurrence of the fade-outs and magnetic activity, suggest very strongly a connexion between terrestrial activity and the far ultra-violet activity, the correlations between terrestrial activity and other solar phenomena being of a secondary character.

England to South Africa Flights

MRS. MOLLISON completed her flight from Cape Town to London by the East Coast route (see NATURE, May 16, p. 821) on May 15, when she landed at Croydon at 1.36 p.m.; her time for the flight was 4 days 16 hours 17 minutes, which is more than a day and a half better than the previous record. The time for flying from England to southernmost Africa and back has thus been reduced to eleven days, three of which were given to rest in Cape Town. This flight, in a Percival 'Gull' aeroplane with a De Havilland 'Gipsy Six' engine, inspires an interesting examination of the technical development of air travel since the first flight between London and South Africa was accomplished. The pioneer flight was made by Wing-Commander H. A. Van Ryneveldt in a Vickers Vimy, two Rolls Royce engines of total 750 horse-power, taking 45 days, early in 1920. The increase of speed that primarily has made this possible comes from progress in aerodynamic design in reducing resistance that absorbs horse-power in overcoming it, and improvements in engine design, both in efficiency giving low fuel consumption and reduction of weight per horse-power. Thus, it has been possible to increase the air endurance of the average aeroplane, giving longer flight stages between stops for refuelling.

IMPROVEMENTS in instruments, radio direction finding equipment and such aids to navigation have helped in keeping the pilot to the shortest distance between the landing places, thus avoiding time wasted through losing the way, particularly after dark. In this case the development of ground organisation has played an equally important part. Facilities for refuelling, general servicing of the machine and such attentions, now normally available all along the route, have further helped to avoid delays. This does not, of course, detract from the magnificent feat of endurance, both physical and mental, of Mrs. Mollison. The actual time record for this route was made

by Squadron Leader Gayford and Flight-Lieut. Nicholetts in a Fairey monoplane, with a Napier engine, in February 1933. This flight finished at Walvis Bay, only just short of Cape Town, taking 2 days 9 hours 25 minutes. This machine was specially built and equipped for experimental long-distance non-stop flights, and was not entirely a practicable proposition for average everyday flying.

Science in a Changing World

THE Friday evening discourse at the Royal Institution on May 22 was delivered by Sir Richard Gregory, editor of this journal, who took as his subject "Science in a Changing World". Every week the correspondence columns of NATURE include announcements of new experiments and observations carried out by the authors in various parts of the world. Since its foundation by Sir Norman Lockyer in 1869, this journal has been the recognised medium for recording such advances in natural knowledge and for the discussion of scientific questions raised by them. Each volume of the hundred and thirty-six which have been published contains noteworthy communications of this kind, and a few of them were mentioned in the discourse. A new era in the history of physical science began just forty years ago. Within a few months, the discoveries were announced of argon, helium, X-rays and radioactivity. It was in the columns of NATURE that Lord Rayleigh first directed attention to the differences of density between nitrogen obtained from the air and from chemical sources which led to the announcement in 1895 of the discovery of argon. Sir William Ramsay also announced there his extraction of helium from the mineral cleveite—twenty-seven years after it had been found by Sir Norman Lockyer in the sun.

THE first translation into English of Röntgen's paper "On a New Kind of Rays" was published in this journal, and also the first suggestion that cathode rays offered the most promising means of producing distant optical vision—now called television. It was in 1908 that Mr. A. A. Campbell Swinton described how cathode ray tubes might be used for this purpose; and his device has now been successfully developed for the transmission and reception of television programmes, such as will shortly be available from Alexandra Palace. Many scientific discoveries, however, have not added to the amenities of life but to its degradation. Sir Richard Gregory urged, therefore, that it has become the duty of men of science to adjust themselves to the conditions of a changing world, and to take an active part in promoting worthy uses of scientific discoveries and preventing the application of new forces to purposes of destruction.

Freud and the Anthropologist

To mark the occasion of Sigmund Freud's eightieth birthday on May 6, Dr. Géza Róheim, perhaps the most distinguished, and certainly the most experienced exponent of the application of Freud's theories to field investigation in anthropology, evaluates in *Man* of May his master's contribution to the principles of research among primitive peoples. It is interesting to note that Dr. Róheim, pointing to the fact that the anthropologist's criticism of Freud has been directed mainly against his version of the 'primitive horde' or Cyclopean family, does not himself believe that psycho-analytic anthropology stands or falls with this view of human origins. This is explained in part by Dr. Róheim's general position. Not only does he hold that Freud's minor papers would explain certain problems to the anthropologist, if the anthropologist would only grasp these explanations; but also he maintains that the real significance of Freud for the anthropologist does not lie in his contributions to anthropology. The explanation of the apparent paradox is that he stresses Freud's technique as his greatest contribution to the science. In the employment of psycho-analysis he has elaborated a method to explain personality. If, as is now admitted on an overwhelming mass of evidence, this method is valid as applied to Europeans, we must believe a priori that it is applicable at least as a method of investigation to savages, the fundamental psychological unity of mankind being taken for granted. Further, he goes on to point out, as a matter of practice it has been abundantly demonstrated that the dreams of primitive people can be analysed according to the same method and with the same results as the dreams of Europeans. Finally, perhaps the most important point in relation to understanding of the method, Dr. Róheim indicates in response to criticism from the 'functional' school, how and in what sense the term 'neurosis' is not merely individual, but is to be taken as applicable to the group.

U.S. National Academy of Sciences: New Members

THE following have recently been elected to the U.S. National Academy of Sciences: Prof. Leo H. Baekeland, honorary professor of chemical engineering in Columbia University; Prof. Eliot Blackwelder, professor of geology in Stanford University; Prof. I. S. Bowen, professor of physics in the California Institute of Technology; Dr. Wallace H. Carothers, research chemist in E. I. du Pont de Nemours and Co.; Prof. Alexander Forbes, associate professor of physiology in Harvard University; Prof. W. F. Giauque, associate professor of physical chemistry in the University of California; Prof. Clark L. Hull, professor of psychology in Yale University; Prof. Edwin O. Jordan, chairman of the Department of Bacteriology at the University of Chicago; Dr. A. V. Kidder, chairman of the Division of Historical Research of the Carnegie Institution; Prof. Warren H. Lewis, research associate of the Carnegie Institution and professor of physiological anatomy in Johns Hopkins University; Prof. Robert S. Mulliken, professor of physics in the University of Chicago; Prof. W. C. Rose, professor of physiological chemistry in the University of Illinois; Prof. Edmund W. Sinnott, professor of botany in Columbia University; Prof. J. L. Walsh, associate professor of mathematics in Harvard University; Dr. Orville Wright, known for his pioneer work on the aeroplane.