

The following interesting abnormality has, however, been encountered. On six occasions between July 8 and August 1 we found that as the frequency was increased beyond the point where reflections from both layers were returned, the *F* echo completely disappeared, leaving the *E* echo still in evidence. The *E* layer was not penetrated until a considerably higher frequency had been reached. (In two tests, indeed, the critical penetration frequency for this persistent *E* layer was greater than 9.65 megahertz.) This is, of course, a complete reversal of ordinary experience. Usually *E* echoes very soon cease to appear as the frequency is increased beyond the point of lower layer penetration.

A good example of this disappearance of *F* echoes is shown in Fig. 1, wherein the regions from which the energy is returned are indicated by the conventional symbols. A close examination of the actual photographic records confirms our belief that the upper curve and the lower two curves represent signals returned from different regions.

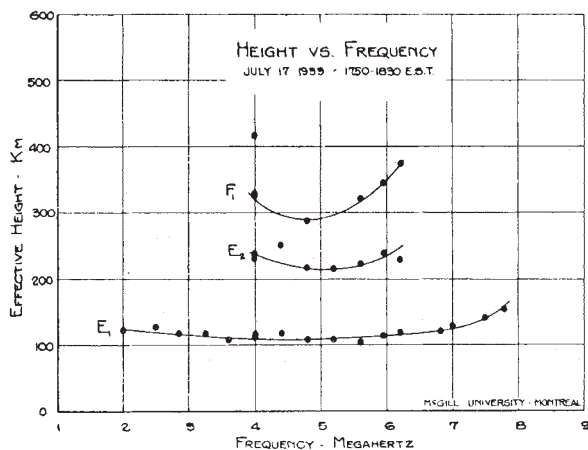


FIG. 1.

Occasionally echoes were received from the intermediate region, while at other times the two layers appeared to merge, giving a practically continuous distribution of heights, with no clearly defined line of demarcation. This phenomenon is also found in unpublished records obtained in Ontario during the week of the August 1932 eclipse.

In the present series of tests the method of Breit and Tuve has been employed, the transmitting and receiving stations being separated by 3.5 km. No means of checking polarisation was available. During this season there have been decidedly more thunderstorms than is customary in the district, but so far no correspondence has been traced between unusual echo phenomena and storms in progress in the vicinity. We recognise, however, that, as pointed out by Appleton and Naismith¹, it may be necessary to make a statistical analysis of storms in a much larger neighbourhood to establish a connexion. Magnetic data are now under examination for evidences of correlation.

¹ *Proc. Phys. Soc.*, 45, 389, May 1, 1933.

Blood Groups and Racial Relationships

PROF. R. RUGGLES GATES described in a paper read on September 8 at Leicester before Section H (Anthropology) of the British Association the results of his recent work on the blood groups of the coastal Indians of British Columbia. Of 300 individuals tested, 14 per cent were *A* and the remainder *O* with the exception of two individuals who were *B*, a result which seems to indicate that before intermixture with white blood occurred, these Indians, like those in other parts of North and South America, were originally all *O*. The present populations of north-eastern Asia now have a high percentage of *B* as well as *A*, hence the emigration from Asia to America must have ceased before the populations in Asia from which the Indians were derived became impregnated with *A* or *B*.

'Peripheral' peoples such as the Australian natives, the Maori, the Bushmen of South Africa and the Lapps of northern Europe have *A*, but no *B* except in cases of racial crossing. Among 400,000 individuals tested in all parts of the world, the pan-human blood grouping is 37 per cent *O*, 38 per cent *A*, 18 per cent *B*, 7 per cent *AB*, *A* thus being older and more widespread than *B*. Both have spread through the human race by repeated mutations as well as by crossing and migration of races. Since the American Indians may be regarded as more advanced than the Australian aborigines and the Bushmen, who have *A*, and since they are believed to have entered North America in relatively recent times, there appears to be some difficulty in explaining the absence of both *A* and *B* from pure-blooded Amerindians.

Prof. Ruggles Gates offered the following as a possible solution. A fringe of islands and archipelagoes stretches down the eastern Asiatic coast from Sakhalin through Japan, Formosa and the Philippines to Borneo. Hrdlička has pointed out that some of the native tribes in these islands closely resemble the American Indians. The islands have afforded a considerable degree of isolation from the continent: people such as the Gilyaks of Sakhalin and the Tso of Formosa have relatively low percentages of *A* and *B*. They possibly represent remnants of a race originally *O*, from which the Amerindians were derived, and have since been altered in varying degrees by infiltration from the continent of Asia of peoples having *A* and *B*.

University and Educational Intelligence

A COURSE of twenty-four University Extension lectures on "Man and the Physical World" will be given by Dr. A. C. R. Wakeman at Gresham College, Basinghall Street, E.C.2, on Wednesdays at 7.30 commencing on October 4. The course will be divided into two parts, namely, "History of the Advance of Physical Science" (October 4-December 20) and "Common Physical Phenomena in their Relation to Man" (January 10-April 11). Further particulars of this and other courses can be obtained from the University Extension Registrar, University of London, South Kensington, London, S.W.7.

EDUCATION in India in 1930-31 is briefly reviewed by the Educational Commissioner with the Government of India in a pamphlet recently issued from

the Central Publication Branch, Calcutta (pp. 82, 2s. 6d.). Statistics of enrolment of students show that the rate of expansion was much slower than in past years, whilst in the higher stages (post-secondary education) there was a decrease by 5 per cent, from 83,334 to 79,225. The prevailing financial stringency and economic depression coupled with the laxity of discipline engendered by the civil disobedience movement are mentioned in this connexion. The number of females under instruction, 2,375,593, shows an increase in all stages and now represents 1.8 per cent of the total female population, whilst for males the corresponding percentage is 7.36. The standard of instruction in the secondary stages is said to be slowly rising, at any rate in Government institutions. The use of the vernacular as the medium of instruction and examination is increasing and inspectors complain that since the change of medium was introduced the standard of written and spoken English has deteriorated. As regards primary schools, the most striking feature of the returns is the extent of wastage, especially in the first year, the number of pupils in class 2 being 2,124,478 as compared with 5,266,579 in class 1. The need of a clearing house for educational ideas and a medium for the diffusion throughout India of new methods has been felt since the abolition in 1923 of the Central Advisory Board of Education and Bureau of Education, and the Government has decided to revive them as soon as financial conditions improve. The report is disfigured by surprising clerical errors in the summary of statistics of education in rural areas on p. 3.

LONDON'S evening lectures and classes for teachers form an important part of its educational system, being designed to bring teachers into touch with the latest developments in educational methods, to give them opportunities of hearing leading authorities in various branches of learning and on current questions of importance. The London County Council's recently published handbook of its lectures and classes for teachers for the session 1933-34 gives particulars of 83 evening courses, most of which have a direct bearing on the problem of adapting instruction in the schools to the task of direct preparation and training for work and leisure under present-day, and probable future, industrial and social conditions. The pamphlet also gives useful publicity to courses, specially suitable for teachers, held by the University Extension Committee of the University Extension and Tutorial Classes Council of the University of London, and particulars of some daytime courses in physical education. Among the L.C.C. courses of outstanding interest are the following: on design in applied art and in pictorial art, by Dr. Roger Fry, Slade professor of fine art in the University of Cambridge; the Cizek method—its principles and application in the technical training of selected and unselected children respectively and adults, by Miss A. Philip Smith; physiology and hygiene for teachers in senior schools, by Prof. Winifred Cullis; international economics for the layman, by Sir Norman Angell; problems in human geography, by Prof. C. B. Fawcett; the League of Nations, by Mr. Wickham Steed; the European situation, by Dr. G. P. Gooch. It is noteworthy that no less than twenty of the courses fall within the category of art and handicraft. The science courses are characterised by an obvious design on the part of those who framed them to broaden and vitalise instruction in science.

Calendar of Nature Topics

Harvest Moon

In consequence of its orbital motion round the earth, the moon rises and sets later each day. The average difference from day to day is about 48 minutes, but owing to the difference of about five degrees between the plane of the moon's orbit and that of the earth's equator, the intervals between the times of rising from one day to the next, and between the times of setting, vary widely. Near the autumnal equinox the difference between the times of successive risings may be less than 15 minutes for several days about full moon. In 1933, for example, the moon is full on October 3 and the time of rising changes only from 4.33 p.m. (G.M.T.) on September 30 to 5.23 p.m. on October 4. This phenomenon is known as the 'Harvest Moon', because in early times it was believed to have been specially ordained to facilitate the gathering of the crops, but the name is probably associated also with the optical illusion which causes the rising full moon, seen near the horizon through the slight mistiness characteristic of fine weather in autumn, to appear unusually large, a symbol of plenty.

October Rains

In a normal year, the end of summer in England sees the soil moisture depleted by evaporation and the demands of crops or other vegetation. During the present century, September has been generally dry, and the replenishment of the underground supplies begins with the heavy rains of October. Although in this month cyclonic depressions are not quite so numerous or intense as in winter, the south-westerly winds associated with them are heavily charged with moisture from the Atlantic, which still retains much of the heat of summer, and the 'cyclonic rainfall' associated with these depressions makes October the rainiest month over the greater part of England. The only exceptions are mountain districts, where the stronger winds of winter give a heavy 'orographic' rainfall in December, and a few low-lying places in the east or Midlands where thunderstorms give a maximum rainfall in July or August.

Beetles and St. John's Wort

Beginning in September and continuing until February, individuals of the St. John's wort beetle (*Chrysomela hyperici*) lay their eggs upon the young under-shoots of the plant after which they are named. The eggs hatch in spring and early summer, and the larvæ, like the adults, which appear about July, feed ravenously upon the plant upon which they were born.

This restricted diet has been the reason for the selection of *C. hyperici* and its congeners *C. varians* and *C. brunsvicensis*, in an attempt to control one of the serious pests of Australian grazings. The pest began, as so many begin, in an unforeseen and innocent way. About 1880 a German lady obtained from her fatherland seeds of St. John's wort (*Hypericum perforatum* var. *angustifolium*), and planted them in her garden near Bright. From the garden the plant invaded and flourished upon the adjacent racecourse. The racecourse became the source of much evil. By