



SATURDAY, SEPTEMBER 1, 1928.

CONTENTS.

	PAGE
Broadcasting and the School	301
The Structure of Mongolia. By J. W. G.	303
Riddles in Evolution. By A. D. P.	304
Historical Optics and the Microscope. By Dr. James Weir French	306
Modern Investigations in Materials	307
Our Bookshelf	307
Letters to the Editor :	
Progressive Lightning.—Prof. C. V. Boys, F.R.S. On Co-ordinated Biological Research.—Dr. J. H. Orton	310
Displacement of Liquids in Capillaries.—J. L. Shereshefsky	312
Wave-length Shifts in Scattered Light.—Dr. Arthur Edward Ruark	312
The Nierenstein Reaction.—Dr. M. Nierenstein . The NH Band and the Dissociation Energy of Nitrogen.—Dr. E. Gaviola	313
The Instability of a Single Vortex-Row.—Sir C. S. Sherrington, O.M., G.B.E., F.R.S.	314
X-Ray Studies on the Nitrides of Iron.—Gunnar Hägg	314
The Crystal Structure of Solid Mercury.—M. Wolf . Continued Self-Pollination in Cotton.—G. L. Kottur	314
Some Recent Work on the Light of the Night Sky. By Right Hon. Lord Rayleigh, F.R.S.	315
The Centenary of James B. Neilson's Invention of Hot-Blast in Iron Smelting. By Prof. William A. Bone, F.R.S.	317
The Glasgow Meeting of the British Association	320
Obituary :	
Dr. Charles Chree, F.R.S. By A. R.	321
Baron Anatole von Hügel. By Dr. A. C. Haddon, F.R.S.	322
Prof. F. S. Carey. By J. P.	323
News and Views	324
Our Astronomical Column	327
Research Items	328
Timber Research	331
The Scott Polar Research Institute. By Dr. H. R. Mill	332
University and Educational Intelligence	333
Calendar of Customs and Festivals	334
Societies and Academies	335
Official Publications Received	335
Diary of Societies	335

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Broadcasting and the School.

EDUCATION has a conservative and a progressive meaning. There are some who regard it mainly as a means for preserving civilisation, and there are others who would emphasise its function in preparing each generation to understand and to solve the problems of a more abundant and complicated world. The attainment of both aims is facilitated by the provision of apparatus, materials, and methods. Books, pictures, museums, laboratories, and workshops are available on a more lavish scale than ever before, and new devices for acquiring knowledge or skill are continually tested and applied.

Probably the most important educational experiment of the last ten years has been that of broadcasts to schools, and none has created more divergent opinions. On one hand, it has been hailed with enthusiasm as a means of widening the outlook and stimulating the interest of the pupils. On the other, it has been condemned as an unsuitable medium possessing no advantage over, and generally inferior to, personal instruction by a teacher. Both of these contain an element of truth. They are opinions which are based on objective and subjective facts. Objectively, the matter transmitted may be unsuitable, the speaker's method of delivery may be defective, reception may leave much to be desired. Subjectively, the teacher may belong to the group which welcomes external aid, or to the group which resents it.

The precise value and the limitations of the new medium in schools could only be ascertained by an investigation on scientific lines. A grant from the Carnegie United Kingdom Trust enabled such an investigation to be undertaken in Kent in 1927, and the report¹ which has now been issued is a remarkably interesting document. The schools were all elementary schools, and were selected in such a way as to represent a wide variety of conditions. They included boys', girls', and mixed schools, small rural, semi-rural, and large town schools. In regard to secondary schools and adult education, the experiments were only tentative, and are being continued.

The experiments were carefully planned. Each set lasted for a term. Three conferences were held, and these were attended by representatives of the teachers, of the Kent Education Committee, and of the B.B.C., and by H.M. Inspectors for the area. A 'Report Form' was sent out at the end of the

¹ "Educational Broadcasting," published by the Carnegie United Kingdom Trustees, Dunfermline, 1928.

first term; a '1st questionnaire' at the end of the second term, and a '2nd questionnaire' at the end of the third term. The questions varied with the course, and those in the second questionnaire were varied slightly, as the result of experience or in view of the stage of the experiment, from those in the first. The answers were given in the form of 'Yes,' 'No,' or 'No information,' 'No opinion.' Great care was taken to avoid the answers 'Yes' or 'No' upon inadequate evidence or absence of conviction.

The chief positive value of the investigation lies in the gradual elimination of the objective imperfections which occur both at the transmission and reception ends. Much attention was devoted to the choice of subject, method of presentation, and voice and delivery of the lecturer, and it was found that a knowledge of school conditions and some experience in teaching were most desirable. No child will listen patiently to a speaker merely because he has attained distinction in some (to the child) remote sphere of intellectual activity. The lecturer must be an expert only in the sense that he can convey information or stimulate interest that cannot be obtained or aroused in the same degree by the ordinary methods in school. This means that he must know his subject, but it is more important that he should possess a transmittable voice and personality than that he should have made additions to knowledge. That is the blunt truth where young people are concerned. Older people will suffer much to feel themselves in touch with greatness. Young people will not; and the report wisely remarks that:

"A professor of mediaeval literature is called an expert: so is the driver of an express train. Sam Weller's knowledge of London was extensive and peculiar; he, too, was an expert."

At the receiving end it was found that possession of a good set was insufficient unless it was properly maintained. At the end of the first term, only 29 sets out of 44 were yielding good results. The B.B.C. then appointed two resident engineers at Maidstone and Canterbury, and made arrangements for technical assistance in other districts. At the beginning of the third term, 37 sets out of 55 were working satisfactorily, but by the end of the term only three were defective. It is interesting to note that in 17 out of the 18 sets not working properly at the beginning of the term, the fault lay in neglected batteries.

The subjective factor can never be eliminated entirely. However sympathetic a teacher may be towards wireless instruction, his interest in subjects

is neither uniform nor universal. But by spreading the experiments over a number of subjects and a number of schools the differences probably cancel out; and by avoiding a 'forced' opinion for or against, the Committee obtained judgments which may be regarded as sufficiently detached to be of real value. The actual results upon the pupils are not measurable on any scale, and are rarely capable of expression in exact terms. They are opinions based on careful observation, and they are put forward in the report with so much moderation that they command respect.

The objective imperfections were so far reduced during the year that, in the case of some talks, the favourable opinion was almost unanimous. The general opinion of the teachers was

"That the Broadcast lessons (a) imparted a knowledge of facts; (b) stimulated interest in ways which could be definitely observed; (c) created impressions as durable as those produced by their ordinary lessons; (d) did not encourage inattention; (e) were particularly stimulating to clever children; (f) supplied views and information which the teachers themselves could not have supplied; (g) gave them fresh ideas for lessons; (h) interested some parents in the work that their children did in school."

On the other hand, "all the courses were not uniformly successful." The teacher should "have some knowledge of the subjects treated," and success depends very largely on "co-operation between the teacher and lecturer."

There is one aspect of school broadcasts that seems scarcely to have received sufficient attention. That is the influence on the teacher, and, through him, on the pupils. If the lecturer "supplied views and information which the teachers themselves could not have supplied," and if "he gave them fresh ideas for lessons," he is surely rendering a very direct service to formal education. It is relatively easy for the specialist teacher in a large urban school with a public library close at hand, to say contemptuously that he is in no need of external aid. But the case of a village school of forty children with two women teachers is different, and the danger that the teaching may become stereotyped and dull is greater. For this and other reasons we take the view that the greater part of the value of the radio lesson is indirect: that it operates, through the teacher, at times when the lecturer is silent and the voice of the loud speaker is stilled.

It will be obvious that the report is entirely favourable to school broadcasting, providing certain conditions are fulfilled. The practice has come into use, and it has come to stay. By August 1926,

before these experiments began, "nearly 2000 schools had notified the B.B.C. that they were making use of the school broadcasts." This total has been reached in less than three years. The foreword to the report, which bears the signature of the director of education for the County of Kent, begins with these words :

"Every Monday afternoon at half-past two the Director-General of the British Broadcasting Corporation, after the manner of the well-known French Minister of Education, can take out his watch and say : 'At this moment 70,000 children are taking a wireless History lesson ; Music on Tuesday, English on Wednesday, and so on through the week.' Two years ago he could have claimed 20,000 pupils. Two years hence he may be dealing with 200,000. In ten years, who can say how many boys and girls will have come under his influence ?"

While declining the invitation to tread the perilous path of prophecy, we desire to congratulate those who undertook, or assisted in, the investigation on the accomplishment of a valuable piece of work.

The Structure of Mongolia.

Geology of Mongolia : a Reconnaissance Report based on the Investigations of the Years 1922-23. By Prof. Charles P. Berkey and Frederick K. Morris. (Central Asiatic Expeditions : Natural History of Central Asia, Vol. 2.) Pp. xxxi + 475 + 44 plates + 6 maps. (New York : American Museum of Natural History ; G. P. Putnam's Sons, Ltd. ; London : G. P. Putnam's Sons, Ltd., 1927.) 10 dollars.

A GOBI, which according to Howorth is the Mongol word for the stony or sandy desert, is explained by the authors of this monograph as an open plain on the floor of a basin. The geology of the Gobis, in that sense, is rarely on first appearance attractive ; but they often yield fossils of exceptional interest, because the remains of extinct land animals have been buried in the deposits on their floors. Prof. H. F. Osborn made the sound prediction that north central Asia would be found to have been an important centre in the evolution of the higher vertebrates, and an expedition on a grand scale was organised by Mr. Roy Andrews to collect the fossils which would be expected on this hypothesis. The expedition, as is well known, obtained a rich haul of fossil vertebrates—its most sensational discovery being the nests with the eggs of dinosaurs.

This large and richly illustrated volume by Prof.

No. 3070, Vol. 122]

Berkey and Mr. F. K. Morris reports the results of the expedition in the field of stratigraphical geology. The palæontological collections are to be described in later volumes. The geological results are important, as they reveal the structure of a little-known part of east central Asia. The area explored is north-west of Peking from Kalgan across central Mongolia to Urga and to the south-west of that town. Most of the volume is occupied by the geological descriptions and sections of the long routes traversed by the expedition. These details are followed by general discussions of the geological results, of the geographical processes observed, and of the relations of the work to the geology of northern Asia.

Prof. Berkey and Mr. Morris have proved that the whole area rests on a platform of pre-Palæozoic rocks, which are divided into the three usual types : the lowest is a fundamental series of coarse gneisses, schists, and crystalline limestones, which in other parts of China is called the Tai Shan system ; next is a series of quartzites, schists, phyllites, and limestones, similar to the rocks that in central China Bailey Willis called the Wu Tai system ; the third division, the Nankou system of Richtofen and the Sinian of Grabau, includes slates, graywackes, and sandstones. This foundation was invaded by a great mass of granite. Then followed a long gap, as the Lower and Middle Palæozoic, which are well represented in southern China and Yunnan, are absent. The Carboniferous and Permian Systems are represented by marine deposits, which were followed, after long interval, by a thick series of continental Jurassic deposits, which, like the older rocks, have been folded. Then, after another gap, occurs a long succession of Cretaceous and Kainozoic beds, which are all thin, are richly fossiliferous, and are nearly horizontal. Many of the fossils show that during their existence there was an easy land passage between eastern Asia and western America.

The pre-Palæozoic platform is seamed with dykes, but the later stages of central Mongolia contain only little evidence of volcanic activity. Wide sheets of basalt on its borders range in time from the Lower Oligocene to the late Pliocene, and Mushketov has described a volcanic cone with a still preserved crater. Messrs. Berkey and Morris discovered some lavas and an interesting series of fused rocks near Mount Tuerin, which they describe as volcanic vents made by the fusion of the overlying sediments by superheated volcanic gases. They describe these rocks as the most striking experience of vulcanism seen in the Gobi region