

report or paper would only be supplied to order. The author would, however, also provide a summary abstract, say, two hundred words in length, which after editing, if required, would be reproduced by the most suitable means and the abstract would be included in a weekly or monthly journal issued to all scientific workers desiring information in that particular field.

THIS scheme does not discuss the fundamental difficulty of overlapping, but obviously presupposes that one abstract could serve the needs of several related branches of science or industry. It also proposes to deal with the difficulty of indexing scientific literature by assembling all the necessary subject cards for each published article or report and using an adequate numerical classification together with mechanical finding and sorting devices, thus affording a comprehensive basis for bibliographic work. The scheme visualises a public utility association for the United States of America which could afterwards be developed on international lines. Despite the inherent difficulties in the project, and the fact that the international aspects are among the most important and difficult in the problem of dealing efficiently with scientific literature, it should not be lightly dismissed. Bold treatment on such novel lines may possibly lead to a rational solution of a problem which has so often been attacked half-heartedly.

Bureau of American Ethnology, 1931

IN the forty-eighth annual report of the Bureau of American Ethnology for the year ending June 30, 1931, Mr. M. W. Stirling, chief of the Bureau, in making his usual report on the activities of his staff in the period under review, directs attention to archaeological investigations carried out by him in Florida. Among the sites examined on the west coast was a large sand burial mound on Blue Hill Island, south of Key Marco, which was found to be of early post-Columbian Calusa origin. A number of structural features unusual in Floridan sand mounds was disclosed. Among them was a clay floor, six feet above the bottom of the mound, which gave evidence of having been the base of a temple structure. It was surrounded by post holes, in some of which the decayed remains of the wooden uprights were still in place. The "accompanying paper" of the report, which as usual takes up the greater part of the volume, does not on this occasion deal with researches in American ethnology carried out by members of the staff, but is a useful general index of the contents of the annual reports of the Bureau from their inception to date. It has been compiled by Dr. Biren Bonnerjea. Originally intended by Dr. Bonnerjea for his own use, the index has been adopted officially and published by the Bureau. As the early volumes cover the period in the 'eighties of the final resistance of the Indians to white control in the south-western States, they record much valuable material relating to the final stage of independent culture which the index will assist in preserving from oblivion.

Modern Street Lighting

THE characteristic and peculiar colours of the discharge lamps used for street lighting have attracted much interest to this important public service. With the development and research departments of great companies behind it, this branch of lighting has made rapid progress. In a paper read to the Royal Society of Arts by J. M. Waldram on January 17, it was pointed out that the use of these lamps has led to material improvements in our knowledge, leading to a new technique. One of the immediate problems of street lighting is connected with the question of who is to pay for it. It is an anomaly that a national trunk road should be built, drained and maintained at the national expense, and the lighting left to local authorities, each lighting its section according to its own ideas and naturally being sometimes very limited as to the cost. The requirements of the motorist are the most difficult to satisfy. He has when moving at high speed to see every obstruction in the road many feet in advance, whatever the condition of the road surface. Claims have been made that certain lights have more fog-penetrating power than others, but recent experiments throw doubt on this. Experience shows that from the safety point of view, when driving, the spectral colour of the light matters little. In general, recent progress has been made mainly in the direction of lowering the cost of production of the light and thus making more light available, and in distributing it over the road in such a way that it is more helpful to both pedestrians and motorists.

Short-Circuit Testing Station

WHEN an electric generator is accidentally short-circuited, huge currents are developed and unless the 'circuit-breakers' act promptly, serious damage may be done to the generator and there is a risk of fire. Until a few years ago, practical experience was the only guide to the rating of these circuit-breakers. The enormous currents required for testing purposes, in most cases, made the testing costs prohibitive. Proposals were made for a co-operative or national testing plant, but nothing materialised. In 1929 a private company, Messrs. A. Reyrolle and Co., Ltd., of Hebburn-on-Tyne, laid down their own testing station, which has proved capable of testing the largest circuit-breakers used in Great Britain. They have erected a miniature power station which has a capacity of 1.5 million kilovolt-amperes. Any short-circuit conditions which might possibly occur in practice can be produced in their testing room. The generators are driven by 5,500 volt motors connected with the public supply mains. Very large transformers are used to produce the heavy currents required. The observation gallery is built of reinforced concrete and has slits in the wall fronting the test bay, through which the behaviour of the apparatus under test can be safely observed. A system of traffic signal lights and alarm bells is installed outside the test bay to give warning when a test is about to be made and when all is clear. Short-circuit phenomena can be observed in time intervals

as short as two millionths of a second. Messrs. Reyrolle's plant is one of the largest and best equipped short-circuit testing stations in the world. A scheme has now been initiated whereby full facilities are provided for utilising this testing plant for the benefit of the electrical industry. A company has been formed which will operate independently and will be in a position to issue national test certificates.

A Piano with no Wires

ACCORDING to a recent report by Science Service, pianos are now being constructed in Kalamazoo, Michigan, U.S.A., with no strings or wires. To produce the tones, strips of steel not more than a few inches long are made to vibrate electrically. The new instrument, called a *clavier*, uses a piano keyboard to operate the strips producing the notes, which are practically pure tones. These tones, which are almost inaudible, are picked up by magnetic induction and passed through an audio-frequency amplifier. The capacity of the amplifier is about ten times that of the average radio amplifier having a capacity of 30 watts. The player therefore has at his command a tone ranging from a mere whisper to one that would balance an orchestra. The impact noise sometimes audible in a piano is filtered out, and thus the pure tone is produced. The piano was invented by Prof. Lloyd Loar after experiments extending over several years. Through the use of ear-phones, the piano student can practise his lessons without disturbing anyone, the sound being heard only by himself. The tone volume can be varied over a wide range simply by turning a dial. The operating devices occupy very little space, the *clavier* consisting of little more than keyboards.

Ipswich Museum

AN appeal on behalf of the Ipswich Museum has been issued by Mr. J. Reid Moir, its president. The Museum is not well provided with exhibits illustrating the culture of the bronze age; but it now has the opportunity of acquiring an exceptional collection of bronze implements, many of which were found in Suffolk, at a cost of £100. The collection is at present on view in the Museum. Mr. Reid Moir, in issuing his appeal, does not confine himself to this immediate object; he takes a long view of the situation. Availing himself of the occasion, he suggests the institution of a body of "Friends of the Museum" who might collaborate in its work in various ways, and might, by subscription, provide a fund for use in emergencies which the provision from municipal funds could not meet for various reasons. The case for the local museum as a centre of regional scientific and historical studies is ably stated in the appeal and needs no further elaboration here. On the question of general principle, however, it may be pointed out that any proposal such as that made by Mr. Reid Moir, which helps to broaden interest among the local public in the function of its museum, deserves every encouragement. Without desiring to relieve the municipality, as the local

education authority, from any responsibility that may be imposed upon it for the maintenance of the general intellectual level of its area, it must be admitted that occasions frequently arise in connexion with the work of a museum in which voluntary effort, financial or other, is salutary and expedient, or even necessary, to supplement the official obligation of the municipality.

Grassland and Grazing Research

Two new bulletins in the Herbage Publication Series have been issued by the Imperial Bureau of Plant Genetics at Aberystwyth. The first, entitled "Grazing" (Bull. No. 10. 1s. 6d.), consists of a collection of papers read at the British Association meeting at Leicester in 1933, each of which approaches the subject from a different aspect. The grazier's problems are put forward from a practical man's point of view, while the effect of the stock on the sward is considered in the light of experimental evidence. The Bureau has for some months been collecting information regarding the technique employed in pasture and grassland research in Great Britain and certain dominions, and the other bulletin ("Technique employed in Grassland Research in New Zealand", Bull. No. 11. 3s.) is the first publication on the subject. Questions of strain testing and building in grasses, clovers or lucerne, the breeding methods employed and the necessary corollary—the certification of herbage seeds—form the subject of several of the papers. The measurement of pasture production is considered in detail. A modification of the technique formerly described as 'alternate mowing and grazing' is put forward, while the layout of the experiments, the stage at which cuttings should be made, and the technique of stock grazing trials are among other major points dealt with. Reference is also made to two laboratory tests which have proved useful in conjunction with field work. In the first place the prussic acid content has proved valuable as a means of distinguishing between different types of wild white clover, while screened ultra-violet light has been successfully employed in rye grass type determination.

Russian Studies of Crop Plants

THE material collected by Dr. Klinkowski on the ecological distribution of lucerne types has been translated and published in an abridged form as Bulletin No. 12 in the Herbage Publication Series of the Imperial Bureau of Plant Genetics ("Lucerne: Its Ecological Position and Distribution in the World". Aberystwyth: I.B.P.G., Agricultural Buildings. 3s. 6d.). Lucerne is the oldest forage plant known and originated from a number of regions of a 'steppe' character. The routes along which the plant migrated are traced, and the history of its development and the importance of the crop at the present time described for 45 different countries. The geographical distribution of the types of cultivated lucerne in Europe, Asia and North Africa is also dealt with. A further publication, "Plant Breeding in the Soviet Union", has been