

latter spread fairly uniformly over the volume. The energy of agitation tends to stir the material and 'melt' the crystal, but the crystalline state is a fair approximation to the actual condition. The gaseous character of the material would be manifested chiefly in its mechanical properties of expansion and compressibility, while the crystalline structure would appear chiefly in the optical properties.

A discussion of Cepheid variables regarded as pulsating stars occupied a considerable portion of the lecture. Although the difficulties of the conception

have not been completely overcome, Prof. Eddington regards them as by no means serious. The problems set by such stars have led him to the view that the influence of temperature and density on the rate of liberation of sub-atomic energy must be an indirect one. "The energy is released from certain active substances formed inside the star; the rate of formation of these substances increases with temperature and density, but they break up and liberate the energy at a rate unaffected by temperature and density."

### Museums and Education.

SIR HENRY A. MIERS accomplished a great work for the museums of Great Britain when he wrote his report for the Carnegie Trustees, but that report was designed more particularly for museum committees and museum curators, and its appeal was for the specialist rather than the public. Now Sir Henry adds a second to his former accomplishment, for he has gone out into the wilderness to preach the gospel of museums to the people. This is as it should be, for it is to the apathy of the public and the dislike of intellectual effort, observable even where first-rate museums offer no excuse for it, that much of the inefficiency of museums can be traced.

On Jan. 23, Sir Henry Miers delivered an address on "Museums and Education" to the Royal Society of Arts, when the Right Hon. The Earl of Crawford and Balcarres, himself known for his wide interests in museums, was in the chair. Readers familiar with the strictures of the report will be prepared to learn that his address was not a gospel out and out, but underlying the very just criticisms which he made of certain types of museums, of curators, and of the public, lay a deep current of optimism in the educational possibilities of museums, and in a rejuvenated future in which they would take their due place in the development of the nation's outlook and thought. His address fell into two broad sections: in the first, he displayed the weaknesses and inefficiencies of many museums as they now exist, and showed how these had a direct and unfavourable repercussion upon the people's museum outlook. In the second, he pointed the way in which steady improvement might be made, by a reorganisation of museums towards special ends.

Sir Henry Miers' general criticisms of local museums as they are familiar to readers of NATURE. He summed them up in the course of his lecture: "There are many signs of improvement in

the general situation, but, when all is said, it must be confessed that the large majority suffer from over-exhibition, lack of policy, and the fatal habit of accepting miscellaneous gifts, so that of the service which they might render throughout the country a very small part is actually fulfilled by them."

Perhaps it is more profitable to dwell on Sir Henry's constructive suggestions. He founded his proposals on the proper assumption that museums are designed for the use of four distinct categories of visitors: the ordinary, more or less casual, visitor; the local student, whether he be of ripe years or an elementary scholar; the definite and purposeful collector and inquirer; and the scientific research worker. Not every museum can cater for each of these groups, but the principle of appeal for any group ought to be similar wherever it has a place. Thus it is most fitting that for the ordinary visitor the nature and resources of the town or district should be displayed, the labelling should be thorough yet simple in word, and easy transitions should lead from one collection to another of different kind.

For school children and older scholars, summary collections or introductory series are desirable, and Sir Henry said a true word when he stated that the writing of lucid, accurate, and short labels is a very difficult task, requiring much care and thought, and, we would add, experience. For the collector, the introductory series must be supplemented by systematic collections, and for the research worker, to these must be added great stores of classified and authenticated material.

A strong appeal was made for the strengthening of the Museums Association, as a correlating body, for the extension of interaction and inter-lending between the national and local museums, and for the creation of a type of museum new to Great Britain, the 'folk museum,' which would depict in complete units the life of English (why not British?) people through the ages.

### Culture Sequence in the Swiss Lake Dwellings.

OWING to lack of supervision and organisation in the earlier explorations of the Swiss lake dwellings, chronological data relating to the finds are scant. As, however, investigations were for the most part of a superficial character, many sites were left undisturbed except for the topmost layer. Some of these have now been explored by M. Vouga under the auspices of the Neuchâtel Committee for Archaeological Research. A summary of the results is given in *Antiquity* for December.

The civilisation of the Swiss lake dwellings up to and including the Copper Age is represented by two phases. The older appears in a single stratum, while the second consists of two or three superimposed. These are distinguished as lower, middle, and upper Neolithic and Eneolithic ages. They are separated each from each by a barren layer of a certain thickness. It is to be noted that in the deposit of the first occupation, which always rests on the lacustrine bed,

the objects found are for the most part of a much more advanced technique than those found in the upper layers. This is particularly true of the pottery, which reaches a high grade of excellence. Here, too, the flint is dark brown, semi-transparent at the edges, and not the opaque white, dusky, or black local product. The spindle-whorl seems unknown.

The middle Neolithic has been called the *bel âge de la pierre*, but that appellation must now be abandoned in view of the finds in the hitherto neglected lower Neolithic. It is, however, still the most important settlement, its deposit sometimes being a metre thick. The remains of the habitations have generally been destroyed by fire. Its flint work is richer and more varied than in the early stratum, the 'type-fossil' being the arrow-head. The pottery has degenerated, and gives the impression of an art in its infancy.

The upper Neolithic is a normal evolution of the middle, of which it represents merely an advanced