But on the engineers' maps, the shade on the non-illuminated down-slope of a ridge is not infrequently continued beyond the basal stream line by the shadow of the ridge on the next up-slope: hence the line of change between shade and illumination does not here always lie along the stream line of a valley bottom; indeed, a subordinate ridge on the non-illuminated slope of a higher ridge may be wholly shadowed in this way. As the contours are somewhat obscured by the dark shading here adopted, a close inspection is needed in order to determine whether the edge of the dark tint in a hilly area lies along a valley bottom or not; and to this extent the easy legibility of the maps is lessened. On the other hand, partly because of stronger shading, partly because the shadow of a lofty ridge extends out over the low land somewhat beyond the ridge base, the engineers' maps give a more immediate impression of dominant features, the recognition of which on the survey maps calls for closer attention.

As to the relative truthfulness of the two sets of maps: It is a general principle that every additional process introduced between an original manuscript map, as drawn by a skilful topographer in the field, and the final printed map, ready for distribution to the public, is likely to cause some slight loss of accuracy. Such loss is presumably minimized in photographic processes, but even there difficulties arise in connection with such matters as the variation of a sheet of paper with changes of humidity, as above alluded to. Manual processes are more difficult to control, and they here intervene in both the methods of producing shaded maps: in the hand-shading and in certain lithographic processes of the survey maps, and in the contour cutting as well as in certain later processes such as the building of the cardboard negative and the tooling of the first positive of the engineers' maps. But in both cases, errors are lessened by care; and as far as I have had opportunity of inspecting the work of making the maps, skilful care is exercised at every step of both methods.

The delicacy of the hand-shading on the survey maps is truly admirable; yet it can hardly have the authenticity of the shades as photographed from a model on the engineers' maps. Similarly, the accuracy of the jigsaw contour-cutting for the engineers' maps is remarkable; it is much increased by the use of a fine wire-like saw, with minute teeth on all sides, so that the cardboard may be fed against it in any direction; yet it would seem impossible that sharp angles such as are occasionally found in contour lines should be cut by this mechanical device. Again the tooling of the beeswax on the first cast model may fail to follow the cut contour lines here and there, especially in sharp reentrants. Yet as far as I have been able to learn, the final accuracy of the two sets of maps is closely comparable.

These new-style maps as produced by the Geological Survey have not been officially given any special designation. "Shaded maps" would seem to be a natural name for them, as they are darkened only on slopes turned away from the source of illumination. A possible confusion may be feared from the misuse of the term, shaded, for hachured maps also, but such confusion would be avoided if hachured maps were so called. The name "Shadow maps" has been proposed, but it seems unsuitable because the term, shadow, is properly used for the darkened part of a surface which is turned toward, not away from the source of illumination, but which fails to be illuminated by reason of some opaque object that stands in the way of the light. True, the engineers' maps include some shadows of precisely this kind, as has been pointed out above; but they are on the whole disadvantageous features, and as such do not serve well for a name. The engineers' maps have been officially called "Pictorial relief maps," but apart from the cumbersomeness of a trinomial term, the word "pictorial" seems unsuitable because, vivid as the maps are in the expression of relief, they are not at all pictorial in the ordinary sense of that word, which is commonly associated with perspective representation, and not with vertical projection.

The technical uses of these fine maps by the organizations which produce them are not here considered: it is their geographical value that should bring them into general notice. Fortunately, they are not secret official documents.

All the shaded maps thus far produced by the Survey and by the Engineer Corps may be purchased by the general public at ten cents each.

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SCIENTIFIC EVENTS

FIRST CONFERENCE OF SPECIAL LIBRARIES AND INFORMATION BUREAUS

THE first Conference of Special Libraries and Information Bureaus was held from September 5 to 8, at High Leigh, Hoddesdon, Herts, England. Over eighty men and women interested in various ways in the collection and dissemination of informative matter attended.

The objects of the conference were outlined at the opening session by Dr. R. S. Hutton, director of the Non-Ferrous Metals Research Association, and J. G. Pearce, director of the Cast Iron Research Association. It has long been felt that many diverse agencies concerned with the treatment of information have

problems in common, and needed an opportunity to establish mutual cooperation and assistance, and to determine their relationship to the press, and to the great municipal and national libraries and other institutions.

Subsequently, Allan Gomme, librarian to H. M. Patent Office, London, B. M. Headicar, of the London School of Economics, and Dr. S. C. Bradford, of the Science Museum, South Kensington, addressed the conference on their respective libraries.

Group meetings on the scientific, industrial and economic libraries were addressed by W. M. Corse, of the National Research Council, Miss L. Stubbs and H. G. Lyall. The session on economic and statistical libraries indicated valuable developments which are taking place with regard to forecasting of trade tendencies.

An address by Lieutenant-Colonel J. M. Mitchell, secretary to the Carnegie Trustees, outlined the policy of the trustees with regard to special libraries, and L. Stanley Jast, chief librarian in Manchester, and Lieutenant-Colonel E. L. Johnson, director of the Cleveland Technical Institution, dealt with special libraries in relation to other libraries and institutions.

Among the details of methods and equipment, Dr. J. C. Withers, of the British Cotton Industry Research Association, presented a paper on abstracting, and H. Rottenburg, of Cambridge, on a guide to scientific and technical literature. Bibliographical aids to special libraries, such as "The subject index to periodicals" and "World list of scientific periodicals" were considered.

The important function of the press in collecting and distributing information was dealt with by F. H. Masters, editor of *The Electrician,* and V. C. Faulkner, editor of *The Foundry Trades Journal,* and at the concluding session, Dr. E. A. Baker, director of the school of librarianship, University College, considered the question of training men and women for work in special libraries.

The conference, which was highly successful, provided abundant evidence of the interest in this field of work, and in order to ensure continuity of interest, without forming another association, a standing committee of the conference was appointed with power to consider matters in the interests of those engaged in directing or operating special libraries, and to convene a further conference at some future date. This committee is representative of a wide range of institutions, and has already held its first meeting.

The most striking feature of the conference was the keenness displayed by a large number of highly diversified interests, including scientific, technical, industrial, wholesale and retail commerce, railways, political, agricultural, governmental, universities, press, medical, sociological and banking. This diversity served merely to emphasize the common interest of all these agencies in receiving, treating and distributing documentary material.

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INVESTIGATION OF REINFORCEMENT IN CONCRETE ROADS BY THE NATIONAL RESEARCH COUNCIL

THE details of plan and procedure to be followed in the investigation of the economic value of reinforcement in concrete roads, being undertaken by the Highway Research Board of the National Research Council, are now completed and field examinations are about to commence. Director Chas. M. Upham reports that the various state highway commissions will actively cooperate with the board in conducting this investigation. Except in cases of actual failure, inspections will concern principally pavements having had at least five years of service, a great number of which are located in states such as New Jersey, Ohio, New York, Pennsylvania, Delaware, Wayne County, Michigan; Milwaukee County, Wisconsin; Iowa, Illinois and California.

In this intensive study an effort will be made to determine from a survey of existing roads the influence of steel reinforcement on the resistance of the slab to traffic, subgrade and climatic conditions; the conditions under which steel reinforcement is especially beneficial to concrete slabs; the effect of slab design on the efficiency of reinforcement, and, finally, the relative cost of plain and of reinforced concrete roads, considering the initial investment, and the annual maintenance and renewal charges.

The procedure will consist of a personal examination of a sufficient number of existing road surfaces to cover different slabs, traffic and climatic conditions. It is proposed to supplement the examination by photographs, sketches, soil determinations and other available data. In each case, attention will be given to a study of the subgrade to determine its general characteristics and properties as well as the existing drainage conditions. In the case of the slab, a study will be made of original data to determine the materials and proportions that entered into the concrete, the method of construction that was followed and the particular cross section used. Careful note will be made of joints, cracks, replacement areas and general surface conditions. The influencing factors of grade, alignment, location and maintenance will be noted, and the matter of age, traffic and climatic conditions will be given careful consideration. In the case of the reinforcement, a study will be made of the rela-