

I should like to see such a book that would set forth on the elementary side the best arrangement of work, the accuracy desirable and attainable in any given process, short cuts, rough approximations and rough checks and on the more advanced side, in the use of differences, interpolation, mechanical quadrature, numerical solution of equations, calculations with infinite series.

Even more advanced topics might be introduced, but that question involves another aspect of numerical calculation about which I wish to say a few words in closing. The solution of problems for mathematical physics in general, and of many problems in geophysics in particular, are often satisfactory enough from the purely analytical point of view, but rather unsatisfactory from the point of view of numerical calculation. It would be desirable if mathematicians would think more of this aspect of the question, for, after all, the final test of a theory is numerical comparison with the results of observation. The book on numerical computation of which I have spoken might contain as a second part a discussion of the numerical solution of differential equations, of integral equations, of the treatment of series that converge for the pure mathematician, but not for the practical computer, in short, a number of topics continually increasing as our mathematical theories develop. The easiest way to have such a book kept up to date would be for each mathematician who develops a theory that leans in any way towards practical application not to leave the analysis until he has considered the question of putting his formulas into numbers by the easiest and safest way.

These remarks can be summarized very briefly: Geophysics involves mathematics to a greater extent than do most physical sciences. Elementary mathematics is involved because of the extensive tabulations and numerical computations that are required. Even elementary mathematics, judiciously used, may serve to check the vagaries of an over-active imagination and to warn the inquirer off paths that lead nowhere, except perhaps to confusion. Advanced mathematics is needed, not merely because geophysics is a part of mathematical physics in general and has given rise to many interesting mathematical problems, but chiefly because geophysics is peculiarly dependent on mathematical methods.

W. D. LAMBERT

U. S. COAST AND GEODETIC SURVEY

SCIENTIFIC EVENTS

THE LONDON MUSEUM OF SCIENCE AND TECHNOLOGY

THE resolution given below in regard to the London Museum of Science and Technology has been

adopted by the Royal Society, the British Association for the Advancement of Science, the British Science Guild and about thirty other scientific societies of Great Britain, and has been submitted to the Board of Education:

We the undersigned, being deeply interested in the progress of science and in its application to industry, desire to bring to the notice of H.M. Government the inadequacy of the accommodation provided for the collections at the Science Museum, and the disadvantages resulting to science and technology therefrom. Several committees have reported on the Science Museum, notably in 1874, 1884, 1889 and 1912, and all of them have emphasized the importance of the collections and the value of the assistance which they can give to science and industry; they have also commented on the unsatisfactory character of their accommodation; to-day the Science Museum is still the only national museum housed in buildings most of which were neither designed nor constructed for museum purposes.

The collections which illustrate the development of science and of large and important branches of technology are in some respects unique. They include many selected examples of modern practice and are of the greatest value to students as well as to investigators and all who are concerned with these departments of knowledge, but they can not be fully utilized for consultation and study in the crowded and insufficiently lighted galleries where they are now displayed, while the risk from fire is very great.

The Departmental Committee which reported in 1912 considered that a total of 265,000 square feet of exhibition space was immediately necessary, which should be increased subsequently by an additional area of 287,000 square feet. They sketched out a plan for a building in three blocks, and recommended that the immediate need should be met by the erection of the Eastern and Central Blocks. We understand that the work at present authorized will bring the exhibition area up to a total of 120,000 square feet only, or less than one half of what the Committee recommended, and only about 30,000 square feet in excess of that now available.

We venture, therefore, to urge upon H.M. Government the importance of completing the whole of the Eastern Block of the new Science Museum building forthwith, thus raising the space available for exhibition to 180,000 square feet, and since this will not provide all the space which was considered immediately necessary in 1912, of preparing plans for a central block as soon as possible.

STANDARDIZATION IN GERMANY

STANDARDIZATION of industrial production has been one of the important factors in enabling Germany to maintain its industrial machine intact, in the face of the obstacles now confronting that country, according to a bulletin by Dr. P. G. Agnew, secretary of the American Engineering Standards Committee, recently issued by the American Engineering Standards Committee. Dr. Agnew recently returned from Europe,

where for two months he made a study of the standardization movement and the manner in which European developments in this direction are likely to affect American industry.

He reports that the elaborateness of the organization for the work, its activity and the scale on which it is being carried out constitute a new development in industrial organization. Practically every important manufacturing concern in Germany is officially participating in the industrial standardization program of that country. More than a thousand German companies have formal standardization organizations within their own works.

The extent to which industrial life has been coordinated is shown by the fact that more than seven hundred national standards have been adopted. This includes only those in which several different industries are concerned, and which are approved by the central national body. In addition to this work of the central body, and closely correlated with it are no less than sixty-five special industry committees actively working on the subject.

A striking example is cited of the efficiency of national standardization as it has been developed in Germany, in the case of a rush order placed with German manufacturers for 200 locomotives for delivery to Russia. "Production of different parts was allotted to seventeen different manufacturers to be produced strictly upon the plan of interchangeable parts, no one manufacturer making a complete locomotive. No serious practical difficulty was encountered in filling the order. The inspectors made a test of the feasibility and accuracy of the plan by ordering a complete locomotive to be assembled from parts chosen at random from those furnished by the seventeen manufacturers. It proved to be ready for service immediately after assembly without the necessity of any disassembling for readjustment."

Standardization engineering is now a recognized profession. An interesting development of the last few years is the appearance of consulting engineering firms specializing in this work. There are now five such firms in Germany. The work is closely connected with industrial or efficiency engineering, in which there is a great and growing interest.

BAYER 205

As has been reported in *SCIENCE*, Professor F. K. Kleine, of the Robert Koch Institute of Infectious Diseases, Berlin, who has just returned to Europe, has been investigating the therapeutic properties of a drug known as "Bayer 205" in Rhodesia and the Congo in cases of human sleeping sickness and trypanosomiasis of domestic animals. *Nature* writes as follows: "It is well known that salts of arsenic and antimony are able in many cases to control these dis-

eases, but these remedies are far from satisfactory, and the remarkable results which were reported in Germany in 1922 in the treatment of experimental trypanosomiasis in animals and in dourine of horses with the new drug 'Bayer 205,' the composition of which has not yet been made public, aroused much enthusiasm. The completely satisfactory treatment of a human case in Hamburg, after arsenic and antimony had failed at the Liverpool School of Tropical Medicine, excited considerable interest. Other patients were treated at the London School of Tropical Medicine, and it became evident that in many cases the drug had a rapid action on the trypanosomes, and, so far as can be said at present, has effected a permanent cure. The one disadvantage is a certain irritative action on the kidneys, which, however, is not of a permanent nature. Professor Kleine was granted permission by the British Government to conduct experiments in Rhodesia, and the published accounts of his work show that the hopes which were entertained were fully justified, and that cures can be effected in a large percentage of natives suffering from sleeping sickness even in its advanced stage. As regards the trypanosomiasis of domestic animals, he has noted that it is only efficacious in ridding them of trypanosomes which are most closely related to those which produce disease in man. Experiments on the prophylactic action have shown that if cattle which are to be exposed to the bites of tsetse flies are given an injection of the drug before exposure, the chances of infection are reduced, and even if infection does occur its course is considerably modified. It is understood that Professor Kleine will, in the near future, give an account in London of his experiences."

THE METRIC STANDARDS BILL

AMONG the first bills introduced in the new session of the Congress are the Metric Standards Bills, providing for gradual adoption of the metric units of weights and measures in merchandising.

The metric bill was introduced in the House of Representatives by the Honorable Fred A. Britten, of Illinois, and in the Senate by Honorable Edwin F. Ladd, of North Dakota. The legislatures of these states, in company with many others, have petitioned the Congress to enact metric standards laws. More than 100,000 petitions, directly representing several millions of voters, are pending before the Congress, urging favorable action on adoption of the world units for weighing and measuring.

The simple decimal nature of the metric system is ingeniously stressed in the numbers of the metric bills themselves, Congressman Britten's being number 10 in the House and Senator Ladd's bill number 100 in the Senate.