

### Coulomb and Structural Engineering

To mark the bicentenary of the birth of Charles Augustin Coulomb (1736-1806), to which reference was made in NATURE of June 13, p. 976, Mr. S. B. Hamilton read to the Newcomen Society on December 16 a paper dealing with his work as a "Pioneer in the Science of Construction". After briefly sketching Coulomb's career, Mr. Hamilton dealt first with Coulomb's paper written in 1773 entitled "Essay on the Application of the Rules of Maxima and Minima to Statical Problems Relating to Architecture". This paper, which has never been published in English, was concerned with beams, piers and arches. Mr. Hamilton then turned to the researches of Coulomb on torsion, and after reviewing the work of Galileo, Mariotte, Hooke, La Hire and many others, he said that Coulomb, in considering the strength of materials, realized that brittle materials subject to crushing failed by shear; that he recognized the truth of Hooke's law and gave it its true place in elastic theory; that his theories of bending and twisting, although incomplete, were a sound contribution to knowledge, and still provide the basis of everyday calculations; that by a stroke of genius he anticipated the modern view that elastic strains are due to distortion of the space lattice within a crystal, while plastic deformation and fracture are due to the development of slip planes; and he also derived a satisfactory *simple* method of calculating the thrust of earth against retaining walls, and made a sound contribution to the study of masonry arches.

### Air Raid Precautions

THE sixth of the handbooks issued by the Air Raid Precautions Department of the Home Office is entitled "Air Raid Precautions in Factories and Business Premises" (London: H.M. Stationery Office, 1936. 6d. net), and is intended primarily for factory occupiers, for occupiers of large commercial premises and other employers of labour, on whom would rest in time of emergency a responsibility for the protection of their employees while at work and the safeguarding of their property. The handbook explains that the air raid precautionary services which are being organized by local authorities all over the country should be supplemented by the individual efforts of householders and of employers of labour. It is suggested that in undertakings employing considerable numbers of workers, a scheme of air raid precautions embracing as many as possible of the services required should be worked out. The importance of close co-operation with the local authority of the area is stressed. Since in the event of air attack it would be impossible to improvise the necessary precautionary measures at short notice, the measures to be adopted should be surveyed at the present time and the necessary plans and preliminary arrangements made for putting them into force without delay. The handbook contains detailed guidance on means of protecting employees against gas, and blast and splinters from high-explosive bombs; the safeguarding of property and material from damage, and arrangements for emergency

repair work; first-aid facilities; the organization of adequate fire-fighting appliances, including special measures to deal with incendiary bombs; decontamination of material affected by persistent gas; provision of emergency communications and steps to ensure the effectiveness of lighting restrictions. Employers of labour are recommended to prepare schemes covering these aspects of air raid precautions and to arrange for their employees to receive training in the duties involved.

### Celtic Studies

MR. J. M. DE NAVARRO, in his John Rhys Memorial Lecture for 1936, delivered before the British Academy on December 17, surveyed the history of research in an early phase of Celtic culture, dealing with the La Tène period of the European Iron Age, in which the Celtic peoples emerged from the half light preceding the dawn of written history. He pointed out that the geographical extension of the La Tène civilization and its association with Celtic peoples was first determined by Sir Augustus Franks. Subsequent research has tended to confirm his views. No serious contribution to the study of this civilization was made before the fifties and sixties of the last century, when Thurnham, Franks and the German archæologist Lindenschmidt made research possible by assembling various La Tène types into a definite group. The problem was at first approached in the light of literary evidence. Therefore, Mr. de Navarro went on to show, special importance is attached to the typological work in 1885 of Tischler, which resulted in his division of the La Tène period into three phases, and the work five years later of Sir Arthur Evans on the Aylesford urnfield, a contribution of which the significance is felt more to-day than it was then. After reference to Reinecke, Déchelette and others, special mention was made in dealing with post-War activities in this field to the work of Jacobsthal, who like Reinecke was a trained classical archæologist. He viewed the La Tène style on its own merits, and not as a mere barbaric reflection of classical art. Finally, in discussing the locality in which the La Tène civilization originated, M. de Navarro expressed himself as in agreement with Déchelette and Dr. R. M. Wheeler in placing it in the region of the rich Early La Tène chieftains' graves of the middle Rhenish area.

### Central American Studies: The Copan Project

DR. A. V. KIDDER, reporting on the work of the Division of Historical Research of the Carnegie Institution, Washington, D.C. (Year Book, Carnegie Institution of Washington, 1935), in Central America during the year 1935, records two additions to the already wide range of subjects embraced in the Institution's scheme of correlated research in the archæology, ethnography, physical anthropology and human ecology of Yucatan and Honduras. The new activities are the Copan Project and the Maize Survey. The Copan Project is a joint undertaking with the Government of Honduras to conserve and