

of the *Philips Technical Review* to the material glass (22, Nos. 9 and 10, 281; 1960-61). There is a most interesting introductory paper on the history of glass, which is beautifully illustrated with colour reproductions of ancient pictures showing the use of glass and monochrome illustrations of ancient pieces of glass, including one of a Roman cage cup which consists of a series of circles of glass joined together but which has been carved out of the solid. Of particular note are two carefully written articles, one describing the development of automatic bulb-blowing machinery and the other dealing with the automatic control of modern glass-melting tank furnaces. There is a brief reference to the Glass Development Centre opened at Eindhoven in 1957; this is a well-designed laboratory which has its own pilot plant capable of taking to the manufacturing stage any new glasses and articles made therefrom. The more fundamental investigations of glass which are carried out in the central research laboratories are represented by a characteristic article on the structure of glass from J. M. Stevels.

Ferro-Alloy Industry in India

SINCE the turn of the last century, technological developments in the production of ferro-alloys have been remarkable both in range and quality. The National Metallurgical Laboratory, Council of Scientific and Industrial Research, India, has embarked on some major research and development projects to investigate the suitability of Indian raw materials for production of a range of ferro-alloys to exacting specifications and to study the economical application of the latest metallurgical techniques.

A symposium on the ferro-alloy industry in India will be held at the National Metallurgical Laboratory, Jamshedpur, during February 1962. The symposium will cover the following: (1) survey of raw materials in regard to quality and quantity for production of different types and grades of ferro-alloys in India, including auxiliary requirements such as fluxes, fuels, electric power, transport, etc.; (2) beneficiation of raw materials for indigenous ferro-alloy industry based on physical, chemical and thermal beneficiation techniques and ore-dressing cycles, formulation of optimum flow-sheets and assessment of recovery yields and economics; (3) evaluation of electro-thermal, pyrometallurgical techniques and other specific processes and developments in the production of different types and grades of ferro-alloys in relation to possibilities for application in India in the context of indigenous resources; (4) study of the basic physico-chemical and thermodynamic principles involved in the production of ferro-alloys, including theoretical investigations on slag and metal equilibria and related fundamental hypotheses; (5) latest advances in technology of production of ferro-alloys considered in relation to the laboratory-scale, pilot-plant and industrial prototype production trials; (6) utilization of by-products obtained in ferro-alloy industries and overall economics of integrated production cycles; (7) standard specifications for different grades of indigenous ferro-alloys based on corresponding specification of the raw materials needed; (8) present status of ferro-alloy industry in India and future expansion plans to be projected during India's successive Five Year Plans in the general background of trends in world production. Invitations are being extended to technologists, metallurgists and research scientists in India and abroad to attend the symposium and contribute technical papers for discussion.

The symposium will provide an international forum for establishing personal contacts and facilitating exchange of ideas on the development of ferro-alloy industry in general and that of India in particular.

Sub-bituminous Coals as Oil-well Drilling Mud-thinners

MODERN procedure in drilling oil-wells, especially the rotary system, is to employ a heavy 'mud' fluid, for example, bentonite, to counteract hole-pressure, act as drilling-bit lubricant, assist in removal of rock-cuttings, and to seal borehole walls. It is customary to introduce additives or thinners to control the rheological properties of drilling mud, which normally tends to a progressive contamination, hence thickening, by rock-powder derived from cuttings. Such additives may be of chemical origin, but also natural humic acid types are employed (in the United States under the common but perhaps somewhat misleading name of 'lignite'). The active components of this type occur in naturally weathered or artificially oxidized coals, from which they can be extracted with aqueous solution. Several Alberta coals are rich in humic acids, and in a recent publication of the Research Council of Alberta, *Alberta Subbituminous Coals as Drilling Fluid Thinners*, by E. J. Jensen (Information Series No. 33. Pp. 25. Edmonton: Research Council of Alberta, 1961), it is concluded that deposits of suitable coals requiring no treatment but pulverization occur abundantly in this Province; that they possess good thinning qualities and are characterized by high cation-exchange capacity and fixed carbon : volatile matter ratio of less than unity. The amount of coal required for maximum thinning is 2-4 per cent by weight of the drilling mud. Further investigation by the Research Council into this interesting development is foreshadowed in this publication, which also includes relevant analytical and experimental data on these Alberta coals as potential sources of drilling mud thinners.

The Le Play Society

SIR JOHN RUSSELL's presidential address to the concluding conference of the Le Play Society at Wadham College, Oxford (April 9-13), has now been published by the trustees of the Frederick Soddy Trust (Pp. 22. Hove, Sussex: The Frederick Soddy Trust, 9 The Drive, 1961). After reviewing briefly P. G. F. Le Play's methods of studying a country and its people and the developments due to Patrick Geddes, Sir John describes the characteristic activities of the Society, including its summer journeys abroad, its classes on the technique of surveying and field surveys by groups of students and the annual conferences. The changed conditions after 1945 limited considerably the character of its post-war visits, quite apart from the great increase in costs, and Sir John also discusses in some detail the drastic changes in environment that modern technology has made possible, for example, in the Zuider Zee and elsewhere in Holland, and in Jutland and the Channel Isles. While the Society can look back with satisfaction on the part it has played in fostering and stimulating interest in survey work, especially the interactions of place, work, and folk, the work has grown beyond its powers, although both name and work will live through the Frederick Soddy Trust. Sir John concludes with a warm tribute to the work of Miss Margaret and Miss Alice Tatton.