and so fundamental to it are correlation and cooperation, it does seem that among its proposals of service the National Academy of Sciences might include something looking toward the improvement of international relations.

For instance, has science nothing to contribute to the supreme international problem of the day, that of the use of the high seas? And can science suggest no way of utilizing its riches of anthropological and psychological knowledge through governmental channels to help toward a better understanding among peoples of different nations and races?

Lack of sympathetic knowledge on the part of citizens of one country about those of other countries is undoubtedly one of the fertile sources of international friction and hatred; and since a nation must have a large measure of responsibility for its nationals while sojourning in foreign lands, it seems only reasonable that it should make some effort to prevent its citizens, especially those engaged in international trade, from needlessly imperiling its good relationships with other nations.

Since such knowledge is so largely involved in ethical science which in turn is inseparable from physical and cultural anthropology and comparative psychology, it would seem eminently proper that a National Research Council created at the request of the President of the United States falls short of recognizing its full possibilities if it has nothing to propose touching these vital aspects of the national life.

WM. E. RITTER

THE SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH OF THE UNIVERSITY OF CALIFORNIA,
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QUOTATIONS

SCIENCE AND INDUSTRY

ON July 28, 1915, an Order in Council constituted two new bodies—a "Committee of the Privy Council for Scientific and Industrial Research," of which Lord Crewe (as Lord President) is chairman, and an advisory council, consisting of eight very eminent men of science under the chairmanship of Sir William McCormick. The first annual report of each of these bodies is now published, and that of the latter, signed by Sir William McCormick, is a document of considerable length and importance. He and his scientific colleagues have made a serious attempt to gauge the extent of our deficiency, both in the volume of scientific research which is being conducted in this country and in its correlation to the needs of industry. In reviewing the question they recognize that the distinction between "pure" and "applied" science is, in a sense, a false one. They point out that all the important advances which recent generations have made in industrial science, from wireless telegraphy to synthetic indigo, have been the direct outcome of discoveries made by "pure" science conducting research solely for its own sake. At the same time they have temporarily concentrated their first attention upon "research of directly industrial application," both for reasons of industrial urgency and because the universities, which are the natural homes of research in pure science, have been so depleted both of students and of teachers by the war, that "they are barely able to continue their routine work, and can command at the moment neither the leisure nor the detachment of spirit that are essential conditions of original research."

Within this narrower field their first step was to save from actual or imminent abandonment a number of researches which were being conducted or directed by professional associations in the period preceding the war. These have been kept going by a series of government grants, and in one case by getting the War Office to release the investigator from military duties. The next step was to hold conferences with the various professional societies and trade associations. These showed that in the main it is the most highly organized industries that have made most use of scientific research, and are therefore most ready for, though perhaps not most in need of, encouragement to make more. Thus "the engineering trades, with their attendant group of distinguished professional societies, have

long been alive to the need and value of scientific research; while the chemical trades for the most part are so divided and individual in outlook that the various professional societies have had neither the influence nor the means necessary to enable them to take any large share in promoting research in connection with those industries." Simultaneously the council undertook a very important project—the formation of a register of all researches actually being conducted on the outbreak of the war. They have also been busy in forming standing committees to advise them on special subjects. One on metallurgy, one on mining, and one on engineering have been set up, with sub-sections of each; and others are in contemplation. The question of aid to research in educational institutions is likewise engaging them. It will thus be seen that they have broken a good deal of ground during the year. But their main task is still ahead; and on this they make some careful observations.

There are two aspects of it—on the one hand, the sheer deficiency of scientific research and training in the country, and on the other, the failure of manufacturers to appreciate the conditions under which science can help them. The first is to some extent a quantitative matter, upon which an increase of endowments can do a great deal. The second is very intricate, since there is no problem of industrial structure—whether the relation of firms to other firms, or that of firms to their employees—which has not its bearing upon it. The council point out that a state of things, under which a number of relatively small firms in a country are more bent on cutting each other's throats than on promoting the success of the national industry against organized foreign competition, can rarely if ever be conducive to scientific advance in an industry. A certain amount of willingness to pool researches and results is almost indispensable to such an advance; and the more there is, the more advance can be hoped for. Quoting a famous American example the council distinguish three sorts of laboratories which a trade requires: (1) An ordinary works laboratory, such as a firm needs for routine tests and controls; (2) an "efficiency" laboratory, studying improvements in products and processes; (3) a laboratory devoted to more fundamental research, whose fruit is less immediate, though over long periods it will prove supremely important. Only a very large firm or else a combination of firms can be expected to undertake all three; and thus the future of industrial science is very closely linked to that of industrial combination. Another factor upon which the council lay hardly less stress is that of solidarity between firms and their employees, such as only a thoroughly generous and enlightened treatment of the employees can secure. It is not an accident that the firms which have been most conspicuous in the world for their scientific advances—such as the Carl Zeiss firm of Jena—have also been most conspicuous for enlightened and generous conditions of employment. The connection between "welfare work" and a more scientific industry is close and vital.—*The London Daily Chronicle.*

SCIENTIFIC BOOKS

The Turquoise. A Study of its History, Mineralogy, Geology, Ethnology, Archæology, Mythology, Folklore and Technology. By Joseph E. Pogue, Ph.D. Third Memoir, Vol. XII., National Academy of Sciences, Washington, D. C., 1915. Pp. 162. 22 plts. 4to.

While not ranking in intrinsic value with the precious stones *par excellence,* diamond, ruby, sapphire and emerald, no gem-material has longer enjoyed favor for personal ornament than the beautiful turquoise. Three thousand years before the beginning of our era, the Egyptians adorned their jewels with turquoise from the mines of the Sinai Peninsula, from very ancient times the famous Persian deposits at Nishapur have yielded material of the finest quality to the Orient, and in our own land, for the aborigines of the southwest and for the Aztecs of Mexico, the turquoise was at once a gem of exceptional beauty and one to which they attributed talismanic powers.

Hence it is that no more attractive subject for a monograph can well be imagined than the history and study of the turquoise, and