ous irrigation systems, and many customs closely resembling those of the ancient Egyptians because their culture was really an offshoot of the Egyptian culture, how can it be explained that in all pre-Columbian America there was no such thing as a wheeled vehicle? Chariots of various sorts were much used in ancient Egypt, as well as in the intervening areas, yet there is not a shred of evidence to prove that the Indians of America ever knew anything even remotely resembling them. Had the founders of American culture come from an area where wheeled vehicles were known, is it not inevitable that they would have made use of such vehicles during their long journey? Does it not seem that wheeled vehicles would be more useful to them than pyramids, and that therefore they would have been remembered first on the arrival of the wanderers in their new land? It is difficult to believe that the American aborigines were the cultural descendants of a wheel-using people, for wheels, being essentially useful, would inevitably have persisted as a feature of their material culture, had that been the case.

2. In a like manner, one is puzzled by a lack of any ships or vessels of advanced type among the American Indians. Even in Mexico, Yucatan and Peru, where civilization was, in other respects, of a well-advanced type, there were no really complicated vessels before the coming of the Spaniards. On the coast of Ecuador there was found the most elaborate type of boat known to the Indian race. It consisted of a raft of light wood with a flimsy platform on which stood a rude shelter. A simple sail, sometimes even two, was used. Large canoes with sails were also used in Yucatan. Not one of these, however, is worthy to be compared with even the earliest and simplest ships used in Egypt.[1] It is known, of course, that boat-building reached very early a high development in Babylonia, India and China, through all of which the "cultural wave" is said to have passed.

3. Finally, the date B.C. 900 is altogether too late for the beginning of the alleged migration of cultures. If this migration took place at all, it must have left Egypt much earlier than this, for we have the Tuxtla statuette (dated about B.C. 100) to prove that even before the commencement of our era the Maya calendar had already gone through its long preliminary stages and was already in existence in practically its final form. No doubt every one will admit that the period B.C. 900–100 is entirely too short for a "great cultural wave" to roll from Egypt to America in. The year B.C. 1500 is much more likely to be the date needed.

In conclusion, the present writer admits that, despite the three objections here noted (and several others), there is a large amount of seemingly corroborative evidence that tends to support the views of Mr. Elliot Smith. It will, however, be a long time before American anthropologists will be forced to accept these views as final, and many tests, based on physical anthropology, history, archeology, etc., will have to be successfully applied before the Egyptian source of American civilization is finally proved.

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[1] *Cf.* Joyce, *S. Am. Arch.*, 1912, pp. 60, 125, and Plate XIII.; Joyce, "Mex. Arch.," 1914, pp. 203 and 300; Beuchat, 1912, p. 651; Pinkerton's "Voyages," 1808–14, Vol. XIV., pp. 407–409; Torr, "Ancient Ships," 1895, pp. 2, 4, 9, etc., and Plate I.; Mookerji, "Indian Shipping," 1912.

RESEARCH FUNDS FOR PHARMACY

To the Editor of Science: On page 230 of Science the appropriation of $5,000 made by the regents for specific research in engineering is mentioned as the only research appropriation at Wisconsin outside of the agricultural grants. For the sake of completeness you may care to know that several years ago the state legislature made an appropriation of $2,500 for a pharmaceutical experiment station, the first one, and, thus far, the only one of its kind in this country. This entire sum, though small as compared with the agricultural grants, is devoted to research. The department of pharmacy also enjoys the income of the Hollister Fellowship Fund of $5,000

for research work. This amounts annually to between $250 and $300. In addition to this the State Historical Society has a fund of $12,000 from Mr. and Mrs. Hollister for a pharmaceutical library. The income of this fund is not being used for the purchase of books, but for historical research in pharmacy and publication of the results. Temporary grants, such as the sum of $500 for a research fellowship by the Association of Flavoring Mfg. of the United States, I suppose fall outside the field covered by the report of the committee.

EDWARD KREMERS

QUOTATIONS

SCIENCE AND INDUSTRY

THE privy council report on scientific and industrial research, of which we publish a summary this morning, is a very able document. It reveals a firm and comprehensive grasp of the subject. To begin with, it gives an account of the existing institution for promoting industry by science. In the National Physical Laboratory, the Engineering Standards Committee, the Imperial Institute, the Imperial College of Science and Technology, the engineering schools of Cambridge and Oxford, the technological departments of the other universities and the larger technical colleges, we possessed before the war an apparatus which would excite the enthusiastic admiration of native critics if they came across it in some other country where the arts of advertisement are better understood and more efficiently practised. It is true that the apparatus was comparatively young, and the use made of it miserably inadequate to its potentialities and to the need; but that was due to a general failure to appreciate either. It is a mistake to infer that we possessed no means for developing industrial science because a poor use was made of them through conservatism, lack of insight, and the obsession of cheap imports deceptively labelled "free trade." The war has changed all that. It has made manifest the need of applying far more energetically the means we have and of supplementing them, as the present report points out. The outbreak of war found us unable to produce at home many essential materials and articles for carrying it on; and since then it has become clear that the future maintenance of our industries in peace demands a new attitude and new efforts in this field on the part of all concerned. This is the sufficient reason for undertaking the reorganization and development of industrial science now, while we are still at war.

The two main things required are financial support and the cooperation of manufacturers. Of the two the latter is, in our opinion, both the more important and the more difficult to secure. If it is effectively secured, the rest will follow; if it is not, nothing else will be of much use. Our manufacturers have not been wholly indifferent to science. The steel industry of Sheffield leads the world in the application of scientific metallurgy to commercial production. Nowhere do the laboratory and the workshop cooperate more closely or with better results. And in recent years other branches of industry have been making a gradual advance in the same direction. But the great bulk of our manufacturing interests have stood aloof and clung to the old. So have the labor interests, which are still more obstructive to change. The British workman's dislike of novelty and his power of resistance are an insufficiently recognized element in the British manufacturer's conservatism. It is obviously useless to spend money on discoveries and new processes if the attempt to apply them leads to strife. This prospect is enough to deter men who might otherwise be inclined to take up research and experiment in their works, and it must be taken into account. But it is not the chief cause of manufacturing inertia. Nor is the small size of many business concerns, to which the report refers. Small concerns can not undertake large, far-reaching researches of a fundamental order; but that is no reason for general indifference or hostility to research. They can carry on scientific work of a different kind with a direct practical bearing on their own business. Some do, but they are few. In Germany they are many. The notion that works there which