gas blowpipe with a little oxygen added. If the process is properly carried out, the fused metal becomes embedded in a solid glass globe hanging by a narrow neck to the end of the glass tube. On breaking the

FIG. 1.—Diagram showing the hardness of copper-tin alloy in terms of the volume-percentage of tin. The ordinates give the hardness of the alloy in tons per square inch; the abscissæ are the percentages of tin by volume.

globe when cold, the alloy is found as a bright and nearly spherical bead.

The glass remains clear and uncoloured, and it may be assumed, therefore, that there has been no loss by oxidation.

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Egyptology in Victorian Dress.

As the reviewer of "Descriptive Sociology" (NATURE, April 24, p. 578) accuses me of misrepresenting the divergent views of chronology, while making an *ex parte* statement himself of the 'demolition' of a view which he dislikes, I trust I may be permitted to outline the facts.

All scholars agreed in accepting what the Egyptians recorded as to the beginning of the history by the first dynasty about 5500 B.C., until Bunsen in 1845 started a truncation of this to 3600 B.C., rejecting the records because of our ignorance of the monuments. Yet the Egyptian view was maintained in Germany until 1884 or later. Since then, most important discoveries of monumental material have led Berlin scholars to go back to 4186 B.C., which is still the date accepted by officials of the Berlin Museum. Further, museum authorities in England, France and Belgium consider that some centuries earlier is a more likely date, but I did not quote them, as they vary. Behind all this shortening there is still the Egyptian statement of 5500 B.C. There is no general acceptance of any one view, much to the confounding of European pre-history which hangs on the debate. To attempt to give here the reasons for any of these views would be far too extensive a matter; but impartiality requires that all of them should be stated, as I have done without expressing a preference.

However repugnant the compulsory livery of Herbert Spencer may be, to myself or others, I hope readers of NATURE will find in the "Descriptive Sociology" a fuller statement of Egyptian science than has yet been issued, beside the linking of the prehistoric ages with the later conditions which has not been written before.

FLINDERS PETRIE.

By "the Egyptian statement of 5500 B.C." Sir Flinders Petrie means the *modern* calculations based on the fragments preserved by ecclesiastical copyists of the Egyptian priest Manetho's "History of Egypt," written under one of the Ptolemies. His book contained a general review of the Pharaohs "with the lengths of their reigns, and the total duration of each dynasty" (H. Brugsch, "A History of Egypt under the Pharaohs" (trans.), London, 1879, I. 13). In the first place, a chronological series of such a purely relative nature obviously cannot contain an objective date such as 5500 B.C. for the first dynasty; nor, on the other hand, can a modern calculation—even if it only amounts to the sum of the lengths of the dynasties added to a given date B.C.—be legitimately considered an "Egyptian statement." In the second place, the evidence from the monuments has shown the "absolute necessity of supposing in the list of Manetho contemporary and collateral dynasties, and thus of diminishing considerably the total duration of the thirty dynasties" (*op. cit.* 32). Precisely the same thing happened in Babylonia, where the scribes made lists of the lengths of the dynasties and of their sums, and even of the sums of the total lengths of contemporary dynasties in different cities. Moreover, the necessity of making allowance on this account in dealing with Manetho's records was already appreciated by Brugsch in 1877, as is shown by the quotation above from the English translation of his "Geschichte Ägyptens unter den Pharaonen."

In 1917, Dr. Ludwig Borchardt published a reconstruction of the Palermo Stone and its then newly discovered fragment in the Cairo Museum (which he—unlike Gauthier, Gardiner and Petrie himself—considers to be part of a separate, though similar tablet), and by calculations based on this reconstruction convinced himself that the first dynasty must have begun at about 4186 B.C. This was accepted by certain German scholars at the time, *e.g.* Schaefer, the Director of the Berlin Museum; but not by Eduard Meyer, who was not impressed, and maintained his own chronology, published some years earlier, and from that time until this generally adopted (with slight differences) in Great Britain, in America, and on the Continent. One of the most important of these "slight differences" is Hall's addition of 200 years to the Second Intermediate Period, which brings the date for Menes back to 3500 B.C., instead of 3300 B.C. It is to this modification, proposed not only by a museum curator but an historian as well, that Sir Flinders refers when he says, "museum authorities in England, France and Belgium [not historians] consider that some centuries earlier is a more likely date." As the last date mentioned by him has been "4186 B.C.," the reader naturally assumes that he means "some centuries earlier" than that, instead of Meyer's 3300 which he really has in mind.

Borchardt's 4186 B.C. was "demolished" by Peet in the *Journal of Egyptian Archaeology* for 1920, pp. 149 ff. Recently the process has been repeated by Eduard Meyer in his "Die ältere Chronologie des Ägyptens und Babylonien." The reader has only to pick up half-a-dozen books written in the last three years in Germany to see how unanimously the 'shorter' dating has been accepted.

THE REVIEWER.