

ucts for the production of dyes—hitherto a great German monopoly—has met with very gratifying success. Quite apart from what has been done by the powerful interests represented by British Dyes (Limited) and its allies, specimens are shown by the Chemical Research Laboratory of the University of St. Andrews of twenty-five fine chemicals previously obtained from enemy sources, most of which are now prepared on the manufacturing scale by processes developed in the laboratory during the past three years and a half.

TEXTILES AND GLASS

Mention must also be made of the extraordinary development of the textile industries. As the exhibits sent by the Bradford Technical College and the Nottingham Chamber of Commerce demonstrate, a considerable advance has been made in the production of worsted goods and of cotton embroideries which were previously almost exclusively imported from Germany. It is recognized that the production of knitting needles is one of the key industries necessary to make Great Britain self-supporting, and a great effort has been made to increase the British output of latch needles, in which before the war Germany held 90 per cent. of the world's trade. Nor is it inappropriate, in view of the use of King's College for the exhibition, to refer to the work which has been done by Sir Herbert Jackson, the professor of chemistry in the college, to provide the chemical and optical glass urgently needed when supplies from Germany and Austria were cut off. The pure potash required for certain glasses is now obtained by a new electrolytic process, and the net result of this and much other work has been the reawakening of the glass industry and the attainment of a position which it is believed is strong enough to enable our manufacturers to meet all assaults upon them.

DOCTOR ALEŠ HRDLÍČKA AND THE VERO MAN

IN Bulletin No. 66 of the Bureau of American Ethnology there has recently appeared Dr. Aleš Hrdlička's long-awaited report on the

human remains found at Vero, Florida. The delay in printing this document has resulted in giving to it some of the flavor of ancient history. In compensation, however, there are introduced certain original ideas in dynamic geology, some of which will be considered below. Unfortunately there is no adequate treatment of that 160-foot geological section which, we were assured,¹ afforded a view at once comprehensive and enlightening.

The writer does not intend to debate the question whether the geologists and the paleontologists ought to have anything to say in such an important matter as that presented at Vero. It is preferred to introduce two expressions of opinion that ought to have a degree of weight. It happens that both of these were called forth by discoveries made some years ago at Trenton, N. J. Professor W. H. Holmes² wrote:

Little by little the advocates of a paleolithic culture in America have been forced to give up the idea that there is any other reliable test of the age of a culture than that furnished by geology.

Dr. Aleš Hrdlička³ was engaged in studying a fragment of a human femur and a piece of parietal. Not having gained any results from the comparison with corresponding bones from Florida and Mexico, having regard especially to their chalkiness and their tints of yellow, he delivered the following opinion:

The determination of the age of the two bones, however, must be based principally on their location with regard to geological formation.

It is evident that Dr. Hrdlička has changed his opinion since that sentence was penned. Perhaps the geological test has not always resulted to his liking, and he has resolved to base his judgments hereafter on the state of development of the skeleton, as determined by European standards. Now he tells us⁴ that the age of the strata and the determination and age of the animal remains in them are matters quite irrelevant to the discussion of

¹ "Symposium," p. 43.

² SCIENCE, Vol. XX., 1892, p. 297.

³ "Papers Peabody Mus.," Vol. V., p. 247.

⁴ Bull. 66, p. 60.

the human bones. Anthropology then, so far as it is represented by Dr. Hrdlička, has issued its declaration of independence. We are now informed that the presence of human bones in a deposit can, without the aid of the geologist and paleontologist, be readily explained so long as the deposits could have been penetrated a few hundred years ago by a man who wanted to bury his dead. Any disturbance of the earth would subsequently soon be obliterated by "adventitious stratification" (p. 49, pl. vii). Had our physical anthropologist reached this belated result while he was studying the Trenton bones he need not have so strongly committed himself to the potency of geology.

The case needs further consideration. Mr. Volk⁵ had found the above-mentioned fragment of femur at a depth of 7 feet 6 inches. At the surface were 7 inches of black soil, followed below by 16 to 20 inches of yellowish sand, this by 44 inches of coarse gravel and cobble stones, below which were 21 inches of greenish sand. In the latter lay the bone in question. Some obsessed persons have believed that this discovery proved the presence of man in that region during the Wisconsin glacial stage. How much more reasonable it would be to suppose that a modern Indian, with an antler and his endowment of patience (66, p. 43), dug down through those gravels and sands and buried a corpse there? Naturally by the time the black soil, and the yellow and greenish sands, and the gravel and stones had been returned to the grave they would have been pretty thoroughly mixed together; but anybody by examining Volk's figure can see how nicely the materials had rearranged themselves. Had the bone not been discovered, nobody would ever have suspected that a grave had been dug there. The fact that only a piece of bone was found need not cause any surprise or skepticism; for doubtless "dissociation and fragmentation occurred later owing to movements, stresses, root action, and other agencies operating on or within the deposits enclosing the body" (66, p. 48). Apparently the fragment of parietal was caught

in its migrations 20 feet away. Perhaps we get a clue here to the reason why civilized peoples nail up their dead in good strong boxes.

That there may occur movements in rocks and soils is well known. There is recognized even a creep of the continents towards the sea. Science has, however, concerned itself too little with the local movements that, according to our author, may go on in a deposit which is not absolutely solid. Some idea of the extent and complexity of these movements may be secured by studying Dr. Sellard's figure⁶ which shows the positions of some of the bones of the scattered skeleton found at Vero. Joining by straight lines the parts of a bone or two bones which normally were in contact with each other, one may see the directions along which the forces may, in their simplest expression, have acted and the results thereof. These lines sometimes make nearly right angles with each other. If the suggested movements really occurred in the sand and muck they were probably still more complex. There must have been something like peristaltic action going on there. One can only wonder that the bones subjected to such translations are now found with the edges of fractures unworn and the surfaces unabraded.

One of the surprising results reached by Dr. Hrdlička is that derived from the study of the skull. He now expresses a good deal of doubt about the kind of Indian that owned the skull, if Indian it was at all. We are told, (66, p. 55), that it might be that of an Algonquian, or a Sioux, or even a cross between an Indian and a white man. On the page cited this last impression had been "definitely removed"; but subsequently (p. 59) we are informed that "there remains some persistent doubt" whether the skull was not that of a white-Indian individual. As the case stands now, we may be permitted to believe that the individual was none of these three varieties, but a plain Pleistocene Indian. Perhaps a renewed and intensive study of the pottery and the flint and bone articles might yield a similar result.

⁶ *Jour. Geol.*, Vol. XXV., p. 12, fig. 4.

⁵ "Papers Peabody Mus.," Vol. V., pp. 113-117, pls. 103-107, text fig. 23.

The distinguished author whose work is being reviewed has great difficulty (66, pp. 42, 43) in understanding how a human skeleton might have become covered up in a deposit being laid down slowly in water; and he concludes thereupon that the body must have been intentionally buried. In the sand deposit no. 2, Dr. Sellards⁷ found a nearly complete skeleton of a large alligator. If now, in Hrdlička's remarks "alligator" be substituted for "human body" and "corpse" we shall be compelled to conclude that the alligator too was a subject of intentional burial.

Various other difficulties are encountered by our author regarding the degrees of aggregation and dispersal of the human bones and their physical and chemical states; but after all has been said, the fact remains that they are in practically the same condition as those of the deer and the great armadillo and the alligator, about which nobody raises any questions.

On his page 37 Dr. Hrdlička undertakes a consideration of the "broader aspects of the case" and he asks whether it was possible for man to be in Florida in Pleistocene times. He himself replies that the presence of man there at that time, or even on the American continent, can not be admitted by anthropology. In doing so, he simply assumes that what is supposed to be known about man in Europe furnishes a standard by which all matters anthropological the world over must be settled. He says that no pottery is known to have existed in the world before the Neolithic age. On the contrary, it has been shown⁸ that pottery has been found in this country in the early Pleistocene at Charleston, Vero and Nampa. Did an Indian go out furtively into that swamp at Charleston, dig down 3 feet in the muck, and hide away from his fellows, alongside of the mastodon tusk and horse teeth, that potsherd?

On his page 38 Dr. Hrdlička tells us that if man had reached Florida in the early Pleistocene he must have been represented on our continent by large numbers and that these

⁷ Eighth Ann. Rep. Fla. Geol. Surv., p. 145.

⁸ Hay, *Amer. Anthropol.*, Vol. XX., pp. 15, 16, 25.

would have left some traces of their presence, of which he insists there are none. On the contrary, the present writer, as cited above, has shown that there are numerous evidences of man's early presence in America. What Dr. Hrdlička seems really to believe is that men at that time were extremely scarce, so few in number that they could not have reached America. At any rate (66, pp. 36, 49, 50) he thinks that the discovery of a single human skeleton at any place would be a marvel; while the chance of finding another near by and in a different geological formation would be infinitely small. This conception is worthy of application to other cases. Some years ago Mr. J. W. Gidley discovered in a crevice in western Maryland, a jaw of an eland hardly distinguishable from the eland of South Africa. How, now, did that eland jaw get into that fissure, "in a little wild spot of the far-away wide inhospitable" mountains of western Maryland? A great part of the Pleistocene must have been required by the ancestors of this antelope for their "physical differentiation, multiplication in numbers, acclimatization to new environments and spread over the numerous territories of the old world, the warmer parts of which were their cradle" (p. 37). And then they had to occupy the new world as far east and south as Maryland! To do this they must have existed in great numbers; and so they might be expected to have left abundant traces of themselves. No such traces have, however, ever been reported from any other locality. The animals must, therefore, have been scarce indeed. What a marvel it is then that remains of one skeleton should have been met with, especially of a species which probably was not addicted to hiding in crevices; but the miraculous thing is that Gidley found in that same formation, in that same fissure, remains of two individuals! This is more astonishing than would be the finding of a second skeleton near by in an overlying formation; for as the years by thousands passed by the chances would increase that parts of another skeleton would be buried not far away. Our credulity is overpowered. Out with geology and paleontology! How

much easier, how much more reasonable, it is to suppose that a pair of African elands escaped from some passing show, perhaps from one of P. T. Barnum's incomparable aggregations, and fleeing to that mountain side, perished in that fissure! However, the cold fact is that neither our talented physical anthropologist nor any other man knows any more about the number of men in any country during the Pleistocene than he does about the number of Pleistocene elands in North America or the number of chimpanzees that were lived in Europe with the Piltdown man.

The writer wishes to correct two misstatements. In *SCIENCE* of April 12, 1918, on page 371 the statement is made that certain fossils had been found at Wilmington, N. C. Brunswick, Ga., was meant. In the paper in the *American Anthropologist*, Vol. XX., p. 20, it was stated that Dr. Samuel Aughey furnished no details regarding the finding of an arrowhead near Sioux City, Iowa. Details were furnished and the arrowhead was figured.

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WASHINGTON, D. C.,
October 11, 1918

SCIENTIFIC EVENTS

RECENT ACQUISITIONS FOR THE LIBRARY AND MAP COLLECTION OF THE ROYAL GEOGRAPHIC SOCIETY

THE *Geographical Journal* reports that the liberality of Mr. Yates Thompson has once more brought some interesting additions to the society's collections. One is an illuminated chart, on parchment, of the coasts of the Mediterranean and western Europe, by a member of the well-known family of Oliva (originally Olives), who migrated from Majorca to Italy and worked as chart-makers during the greater part of the sixteen and seventeenth centuries. Their charts were the lineal successors of the old Portolan charts which so long served the practical needs of seamen, and which continued to be made, long after printed maps and charts had come into general use, as an ornate furniture for the libraries of the wealthy. The present specimen is in excellent condition, and bears the inscription

"Placitus Caloirus et Oliva fecit in nobili urbe Messane, año 1617." It is remarkable for the *duplication*, with but slight variation, of the portion concerned with the Mediterranean coasts, while the Atlantic coasts are shown independently, though with no dividing line, at the left-hand side of the chart. Another interesting gift from the same donor is that of copies, dated 1556 and 1558, of the map of the British Isles, engraved in Italy after the original by George Lily, whose monogram appears on the earliest known specimen, of 1546, preserved in the British Museum. This map was the first printed map of the islands to give a fairly correct representation of the outline of Scotland, though the means by which such an approximation was attained is unknown. It was revised at various dates, and included in Lafreri's famous Atlas. The two versions now presented are almost exactly alike in substance, but the later of the two was entirely re-engraved on a somewhat larger scale, with slightly more ornamentation, and intended to be read with the west, not the north, at the top. In view of the question sometimes raised whether the name "Britain" includes Ireland, it may be noted that in these maps it is distinctly reserved for the larger island only. Other acquisitions have been made at book sales, of which several during the summer were specially important from the point of view of geography. The seventh portion of the great Huth Library was disposed of early in July, and various early works of travel and geography fetched unusually high prices, justified, no doubt, by the exceptional condition of the copies offered. The society secured through Mr. H. N. Stevens, a copy of the rare small quarto Atlas of America by the French cartographer Nicholas Sanson. It is one of four similar volumes devoted to the four larger continents, of which the library already possessed those on Europe and Africa. These volumes consisted of both maps and descriptive text, and were among the earlier productions of their author, anticipating by some years the larger general atlases by which he is best known. Each ran