

use of the potter's wheel, and which are covered with characteristic ornaments. Further, there are some three-edged arrow-points of bronze, with a hole for poison; there are teeth pierced with a hole, mussel shells, whetstones, and bobbins for spinning. On the crown of the hill above this cave extensive patches of ground on which there had been fires have been found, and immediately under the turf, along with numberless fragments of pottery, there were dug up fragments of graphite vessels, stone tools, and, among other things, a knife 117 millimetres in length, a polished ball with a hole through it, and various bronze and iron objects. As in Austria, cave remains of this kind, with the exceptions of the Vypusthek Cave, have never been discovered, and as in all Central Europe they have but seldom been found, it is readily understood that these excavations are exciting the keenest interest among anthropologists, and it is to be hoped that the researches may be fully and thoroughly carried out, as it is to be anticipated that there are still many more objects of interest yet to be brought out of their hiding places, where they have lain for thousands of years, in order to help to clear up the mystery of man's first appearance on earth. By the result of the excavations we have above described the series of discoveries in reference to the original human inhabitants of central Europe has been considerably extended. The nearest spots in middle Europe, where discoveries have been made similar to those in Moravia, are in the south-west of Germany, thus leaving a wide interval in which nothing of the kind has up to the present time been found.

A NEW PEOPLE.

The Arctic explorer, Prof. Nordenskjöld, found a new race of people in the Arctic regions in latitude $67^{\circ} 7'$ north, longitude $137\frac{1}{2}^{\circ}$ west from Greenwich. They are known as the Tschuktshi, and are described as savages because their civilization is not very far advanced. But the Professor is enthusiastic in his testimony to their excellent qualities—social, domestic and national.

They are described as distinctly differing from the Esquimaux tribes; and though it is not yet decided to what race they belong, they are thought to be related to the Kamtchatkades and Koriaks.

Some very interesting and valuable details have been collected by Nordenskjöld and his staff as to their ethnography and history. About 250 years ago they were distinguished and gallant warriors. The discoverers have gathered a valuable assortment of the arms and armor of that period. Many of these implements are preserved among the families, whose habits are no longer aggressive. Very noticeable are their cuirasses, carefully wrought out of mammoth ivory, and fashioned with a remarkable resemblance to the old Roman panoply. Their spears and bows are made of whalebone, wood and ivory, spliced and bound with the sinews of the reindeer, and showing an advanced perception of artistic ornamentation on the part of the makers. One hundred and fifty years ago the famous Russian, Col. Paulovski, commanded an expedition sent against them from Siberian settlements. In his first engagement with them he was badly worsted. He subsequently defeated them, but with heavy loss to his own troops, and has recorded such a tribute to their valor as Pyrrhus bestowed upon the Italian legions which he overthrew. A mild form of disease is averred by the natives to have been left behind by his soldiery and to be still in existence.

Strangely enough they have no government, no laws, and almost no religion, if any. A Russian starost is their nominal ruler, but has neither authority nor influence. In fact, there seems to be no necessity for the exercise of either the one or the other, for his subjects are evidently an exceptionally excellent and well-disposed people. The foreigners were on terms of intimacy with thousands of them, and never saw or heard of a single case of quarreling among them. Perfect harmony prevailed in the villages and families. Women have great influence, and are treated by the men in all respects as their equals and with much politeness and deference. The language spoken by this tribe is peculiar, and as far as has been yet determined, shows no affinity to others.

The features are less Mongolian in type than are those of the Esquimaux or the other indigenous tribes of Siberia. The hair is generally, but not invariably, black, and the complexion is decidedly light. Young women are often very fair, handsome, and of perfect symmetry and fine proportions. The men are tall, above the medium height of man's growth, some of them attaining to very little short of the splendid stature of the best specimens of humanity in northern Europe. One woman is mentioned to me as being of gigantic size, so large, in fact, that she might well be shown for money. One of Nordenskjöld's

attaches has a note—I regret at this moment inaccessible to me—of her height and bulk, the former being over seven feet. They are omnivorous in their diet.

THE PHYSIOLOGY OF RECREATION.

So much, then, for the meaning of recreation. The next point that I shall consider is the physiology of recreation. It may have struck some readers as a curious question, why some actions or pursuits should present what I may call a recreative character, and others not. For it is evident that this character is by no means determined by the relief from labor, which these actions or pursuits secure. A week on the moors involves more genuine hard work than does a week in the mines, and a game of chess may require as much effort of thought as a problem in high mathematics. Moreover, the same action or pursuit may vary in its recreative quality with different individuals. Rowing, which is the favorite recreation of the undergraduate, is serious work to the bargeman; and we never find a gardener to resemble his master in showing a partiality to digging for digging's sake. If it is suggested that it is the need of bodily exercise which renders muscular activity beneficial to the one class and not to the other, I answer, no doubt it is so partly, but not wholly; for why is it that a man of science should find recreation in reading history, while an historian finds recreation in the pursuit of science? or why is it that a London tradesman should find a beneficial holiday in the country, while a country tradesman finds a no less beneficial holiday in London? The truth seems to me to be that the only principle which will serve to explain the recreative quality in all cases is what I may call the physiological necessity for frequent change of organic activity, and the consequent physiological value of variety in the kinds and seasons of such activity. In order to render this principle perfectly clear, it will be necessary for me very briefly to explain the physiology of nutrition.—George J. Romanes, in *Popular Science Monthly* for October.

SPECULATIONS AS TO THE LAPSE OF TIME involved in producing the enormous changes that geologists have noted have a special interest when applied to the problem of the antiquity of the human race. In this particular case, also, the probabilities of a serious error are incomparably smaller than in most speculations of a similar character, from the fact that the time that has elapsed since man made his appearance is, comparatively speaking, so trifling, that the evidence of his advent and existence are in many localities well preserved, and the sequence of natural changes not obliterated. Prof. Mudge has presented some interesting evidence relating to the antiquity of man, in the *Kansas City Review of Science*. He starts by assuming the correctness of the generally-accepted opinion among geologists, that man was on the earth at the close of the Glacial epoch, and presents evidence to prove that the antiquity of the race cannot be taken at less than 200,000 years. After the Glacial epoch, geologists have recognized, by their effects, three others, namely, the Champlain, the Terrace, and the Delta, all supposed to be of nearly equal length.

His argument for estimating the duration of these epochs is about as follows: He takes the case of the Delta of the Mississippi, and notes the fact that, for a distance of about 200 miles of this deposit, there are to be observed buried forests of large trees, one over the other, with interspaces of sand. Ten distinct forests growths of this nature have been observed, which must have succeeded one another. "These trees are the bald cypress of the Southern States. Some have been observed over 25 feet in diameter, and one contained 5700 annual rings. In some instances, these huge trees have grown over the stumps of others equally large, and such instances occur in all, or nearly all the ten forest beds." From these facts it is not assuming too much to estimate the antiquity of each of these forest growths at 10,000 years, or 100,000 years for the ten forests. This estimate would not take into account the interval of time—which doubtless was very considerable—that elapsing between the ending of one forest and the beginning of another. "Such evidence," concludes Prof. Mudge, "would be received in any court of law as sound and satisfactory. We do not see how such proof is to be discarded when applied to the antiquity of our race. There is satisfactory evidence that man lived in the Champlain epoch. But the Terrace epoch, or the greater part of it, intervenes between the Champlain and Delta epochs, thus adding to my 100,000 years. If only as much time is given to both these epochs as to the Delta epoch, 200,000 years is the total result."