

live both as parasites and saprophytes; and being capable of multiplying wherever the proper pabulum exists, the possibility of rapid diffusion, and hence of great epidemics, is readily conceivable. It is believed by some that for most of such germs a sojourn in the soil is a necessary preparation for the parasitic stage. Pettenkofer regards cholera and typhoid not contagious, but insists that the germs must first undergo some unknown changes in the soil before they again become capable of inducing disease. Hence the spread of epidemics depends as much upon certain external conditions as upon the presence of the agents themselves. This is controverted ground, however, and most authorities to-day are inclined to consider the air, the soil, and water as simple vehicles for the spread of disease.

There still remain many obscure problems concerning the movement of epidemics, but their solution does not seem so far away, as a very firm foundation has been laid for future observations. This has been constructed from the life-history of micro-organisms. The application of the principles and fundamental facts of biology to the elucidation of the causes of disease and its prevention is once more brilliantly vindicated. Disease is no longer the mysterious, personified entity of the past. It has been brought within the domain of laws which govern all life upon the earth.

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## ON SOME POPULAR ERRORS IN REGARD TO THE ESKIMOS.

BY JOHN MURDOCH.

ONE is often surprised, on taking up a popular treatise on anthropology, to find the number of erroneous beliefs concerning a race of people about whom so much has been written as about the Eskimos, which have been quoted by author after author without question, until they have come to be accepted by the world of readers as matters of established fact. Most of these errors are due to the fact that many of the earlier authors, even when themselves explorers who correctly recorded the facts they observed, hastily accepted the conclusion that isolated peculiarities were characteristic of the race as a whole, as if, for



instance, the race of Englishmen should be described from the study of the inhabitants of a single county. Then the compilers, who had no means of ascertaining the correctness of the statements they had to work with, have perpetuated the beliefs. Even so acute an observer as Sir John Richardson has fallen into the error, in his "Polar Regions," of supposing that the peculiarities of manners and customs, correctly observed by him in certain limited areas, were universally practised throughout the whole extent of country inhabited by the Eskimos.

Certain authors of the present day, however, are not less to be blamed for this habit of hasty generalization.

In a manual of anthropology of the most recent date,<sup>1</sup> which might be supposed to contain the latest results of anthropological research, since one of the authors is a professor and the other an assistant professor in the "École d'Anthropologie" at Paris, in the midst of a concise characterization of the Eskimo race, remarkably correct, on the whole, for a compilation, is the statement, "polyandry is practised,"—"on pratique la polyandrie" (p. 537). The natural inference from this is that such a practice is general, or, at least, not uncommon, among the Eskimos.

Now, if one takes the pains to search through the original sources of information in regard to the Eskimos, as the writer has of late had the opportunity of doing to a great extent, it will be found that while sexual morality is everywhere, as a rule, at a low ebb among them, and polygamy is frequently mentioned, cases of polyandry, where a woman has two or more regular husbands, are very rarely referred to. In fact, the statement above quoted is probably based on the cases mentioned by Bancroft in his "Native Races of the Pacific States."

Bancroft states that in former times in the island of Kadiak, two husbands, a principal and a secondary one, or sort of *cicisbeo*, were allowed to one woman, but quotes no authority for this statement (vol. i. p. 82). Again, he refers to Seemann ("Voyage of the 'Herald,' vol. ii. p. 66), who says, speaking of the western Eskimos, "Two men sometimes marry the same woman." Seemann's acquaintance with the Eskimos, however, was only such as could be obtained in visits to Kotzebue Sound, in three successive summers, when the natives came on board the ship

<sup>1</sup> Précis d'Anthropologie, par Abel Hovelacque et Georges Hervé. Paris, 1887.



as she lay at anchor, and the people from the vessel occasionally visited the shore. I know from experience the difficulty of obtaining accurate information under such circumstances.

The statement, therefore, is not free from suspicion, especially as Seemann follows it up with another at variance with the experience of later explorers in the same region, and, indeed, of those who have been brought in contact with the Eskimos in most other places,—namely, that “after the marriage ceremony has been performed infidelity is very rare” (*ibid.*).

These instances stand almost alone. The only other case where anything of the kind is to be found is in Graah’s “Narrative of an Expedition to the East Coast of Greenland,” where he says, “report [among the West Greenlanders] said that the inhabitants of the East Coast were accustomed, when visited by scarcity, to destroy their women, so that the sex was usually at a premium among them, every woman having two or three husbands” (p. 78). He, however, makes no mention of finding any such cases among the East Greenlanders when he visited them, but, on the contrary, speaks of one man with two and another with three wives, which indicates anything but a scarcity of women.

On the same page of Hovelacque and Hervé’s book it is stated, “Les Eskimaux habitent, selon la saison, des tentes de peaux ou des trous creusés en terre.” “Holes dug in the earth” seems, to say the least, an exaggeration to one who has ever entered one of the comfortable and neatly-built wooden houses of the northwestern Eskimos, though these are covered by a mound of turf, or one of the extensive structures described by Captain Graah, who gives the most detailed description of the Greenlander’s house (“Narrative,” etc., pp. 45 and 46), sometimes sixty feet long, accommodating seven or eight families, with “regular walls, from six to eight feet high, built of earth and stones,” roofed with beams covered with sticks and turf.

In fact, as far as I can discover from consulting a very large number of original authorities, the Eskimo winter-house is never more than partially underground, and in some cases even somewhat elevated above the surface of the earth, while throughout the great middle region, from Hudson’s Bay northward among the archipelagos, the winter-house is generally of snow, built up, on the frozen ground. It is indeed surprising that anything so



well known as these snow-houses should be passed by unmentioned by the authors of the "Précis d'Anthropologie."

In spite of all authorities, however, the belief appears to be very wide-spread that the Eskimo passes the long cold winter night—the darkness of which, by the way, is very much exaggerated in regard to most of the region inhabited by the Eskimos, considering that the extreme northern point of the American continent extends but little beyond latitude  $71^{\circ}$ —in a sort of hibernation in underground dens, living in enforced idleness and supporting life by stores of meat laid up in less inclement seasons.

As Bancroft puts it, "About the middle of October commences the long night of winter . . . and humanity huddles in subterranean dens; . . . in March the dozing Eskimo rubs his eyes and crawls forth" ("Native Races," i. pp. 43, 44); and again, "In midwinter, while the land is enveloped in darkness, the Eskimo dozes torpidly in his den" (p. 55).

But in reality the experience of all explorers shows that the Eskimo does nothing of the kind. If he did, he would soon perish from starvation, for improvidence is one of his greatest characteristics, and very little is done in the way of storing up supplies for the winter. To be sure, they do not live the same out-door life as in the continuous daylight of summer, but their winter-life is as far removed as possible from idleness or hibernation.

A sketch of the winter avocations of the Eskimos of Point Barrow, who came under my personal observation for two winters, will serve to illustrate the truth of this statement. Point Barrow lies in latitude  $71^{\circ} 16'$  north, and consequently there are seventy-two days—from the middle of November to the latter part of January—when the sun does not appear above the horizon, though there is sufficient twilight from ten o'clock in the morning to three in the afternoon to enable one to work out-doors.

The sea is frozen over and the land covered with snow, but the seals have made their breathing-holes in the new ice, and are to be caught with the spear, while nets may be set surrounding cracks where they resort for air. Every fine day, and even some stormy ones, large numbers of men are scouring the ice in search of seals and bears, while others are busy at home with carpenter-work, often carried on in the open air, in spite of the cold.



The village by no means presents an appearance of torpidity. The children are playing out-doors, or going out with the dog-sleds along the beach for a load of fire-wood; parties are traveling back and forth between the adjacent villages, and even the old men who can no longer lounge round the assembly-house, because it is not heated, except on great occasions, are out in groups gossiping on the knolls, wrapped in their cloaks. At this season, too, visitors come from distant villages, and the great dances and semi-dramatic festivals are held.

With the "dark of the moon," late in December, comes the season for catching seals in the nets set along the rifts in the ice-field. Now the men stay out all night, night after night, in the coldest weather, and reap the great seal harvest of the year, a single man sometimes capturing as many as thirty in one night.

After the great seal-netting is over seals are still to be netted in small numbers, and hardly a day passes that the men who have stayed in the village are not out in greater or less numbers tending their nets, while all the women and children are busy catching little fish through holes in the ice. Meanwhile, the richer or more energetic families have started off with the first gleam of the returning sun for the hunting-grounds, three or four days inland, where they remain camped in snow-huts, hunting reindeer and catching white-fish through the ice of the rivers, till the approach of spring warns them to return for the whale-fishing. Thus the winter, in spite of the extreme inclemency of the climate, is passed in one continued round of activity.

Hovelacque and Hervé, however, are much more correct in regard to a point concerning which popular belief is most persistently at fault. If there is one article of popular faith regarding the Eskimos that passes unquestioned, it is that they are very small, if not actually dwarfish in stature. Our authors state that the pure-blooded Eskimos are of medium or small stature, according to the classification of Topinard, medium stature being 1.65 m. (about 5 feet 4 inches), and small stature, 1.60 m. (about 5 feet 1½ inches) and less. They believe that 1.62 m. (about 5 feet 3 inches) is the average for male Eskimos unmixed with Danish or Indian blood. (It is probable, however, that there exist few, if any, Eskimos whose blood is mixed with that of the Indians, since, till within a few years, Indians and Eskimos, where they came in contact, have been on terms of the deadliest hatred.)



Let us compare with this statement the measurements given by those who have actually observed the Eskimos.

All who have written about the western Eskimos agree that they are, if anything, above the middle height (see the authorities quoted by Bancroft). And this has been insisted upon as a point of difference between them and those of the east. This difference, however, does not hold good. Oldmixon's figures ("Report U. S. International Polar Expedition to Point Barrow," p. 50) show that the average height of males at Point Barrow (5 feet 3 inches) falls a little short of Topinard's "taille moyenne," while Parry gives 5 feet 5½ inches for the average of males at Igloolik ("Second Voyage," p. 492), and Schwatka states that the Eskimos of King William's Land are above the Caucasian race in stature, speaking of individuals 6 feet, or even 6 feet 6 inches, in height (*Science*, iv. p. 543). Parry, again, speaks of the men of Baffin Land, whom he met on his first voyage, as from 5 feet 4½ inches to 5 feet 6 inches in height; and another early explorer, Lieutenant Chappell, speaking of the natives of the north shore of Hudson's Strait, says, "The males are, generally speaking, between five feet five inches and five feet eight inches high" ("Voyage to Hudson's Bay, 1817," p. 59). According to Petitot ("Monographie des Esquimaux Tchigtit," p. xii.), "Les grands Esquimaux des bouches du Mackenzie et de l'Anderson sont d'une taille plutôt au-dessus qu'au-dessous de la moyenne. Il est parmi eux des hommes fort grands."

I can find but one series of measurements that at all corroborate the popular opinion of the small size of the Eskimos, and these are those taken by Dr. Sutherland at Cumberland Gulf. Here the average height of twenty-three adult males was found to be 5 feet 2.4 inches ("Journal Ethnological Society," iv. p. 213). Even this is above Topinard's standard of "petite taille."

Hovelacque and Hervé believe that the greater heights reported are due to admixtures of foreign blood, but it is worthy of notice that Schwatka's "giants" were found among a people who are far distant from any Indians, and have had little or no intercourse with the whites, and that most of the taller men at Point Barrow are of an age that precludes the possibility of their being the descendants of white men. Petitot expressly states (in the work referred to above), "On ne trouve chez eux [the Mackenzie Eskimos] de métis." On the other hand, the



small race measured by Sutherland come from a region where they have been long in contact with the whites.

The evidence, therefore, seems strongly to contradict the popular belief. It is not unlikely that the popular idea arose from the fact that the earlier explorers compared the Eskimos with some of the tallest of the European race.

I am strongly inclined to believe that the very name by which we know these people owes its origin to a similar case of hasty generalization. "Eskimo," according to the best authorities, means "eater of raw flesh," and most people believe that all Eskimos habitually eat their food raw, devouring enormous quantities of reeking flesh and blubber.

Undoubtedly flesh is sometimes eaten raw, especially in a frozen state, and in certain limited regions where fuel is very scarce, raw-flesh eating appears from necessity to have become a habit, as, for instance, at Cumberland Gulf (*teste* Kumlien, "Bulletin U. S. National Museum," No. 15, p. 20).

Nevertheless, most observations indicate that this habit is exceptional, and the writings of all the original observers, from the time of Egede and Crantz, are full of accounts of the cooking of food, even when the oil-lamps furnished the only fire for this purpose.

Captain Parry explicitly states that the people of Igloolik preferred to boil their food when they could obtain fuel ("Second Voyage," p. 505), and we, also, found that food was habitually cooked at Point Barrow, though certain articles, like the "black skin" of the whale, were usually eaten raw.

The enormous consumption of fat, supposed to be a physiological necessity to enable them to withstand the excessive cold, is probably the exception rather than the rule, to judge from the accounts of actual observers. It seems quite probable that the amount consumed in most cases is little, if any, greater than that eaten by civilized nations, when we consider that the people who eat the fat of the seal with the flesh and use oil for a sauce to their dried salmon, have no butter, cream, fat bacon, olive oil, or lard.

We found, indeed, at Point Barrow, that comparatively little actual blubber either of the seal or whale was eaten, though the fat of birds and the reindeer was freely partaken of. Seal or whale blubber was too valuable,—for burning in the lamps, oiling leather, and many other purposes, especially for trade.



Neither does the general belief that they drink train-oil appear to be supported by reliable evidence, and some authors in various localities especially deny it.

I trust that I have presented sufficient evidence to show that the popular picture of the dwarfish Eskimo, dozing in an underground den, keeping up his internal heat by enormous meals of raw blubber washed down with draughts of lamp-oil, is based on exaggeration, to say the least, rather than on actual facts.

## THE SIGNIFICANCE OF SEX.

BY JULIUS NELSON.

### EXPLANATION OF PLATES I—IV.

The figures have been selected to show as great a variety as possible, that the unity which can be discovered may be a generalization of value. For the sake of clearness they have been drawn with as little elaborateness as possible, and to that extent are diagrammatic.

The following abbreviations have been used:

Z. w. Z.—Zeitschrift für wissenschaftliche Zoologie.

M. J.—Morphologisches Jahrbuch.

Carnoy.—La Biologie Cellulaire, 1884.

Bütschli.—“Protozoa,” in Bronn’s Classen und Ordnungen des Thierreichs.

A. B.—Archives de Biologie—Beneden and Bambeke.

A. m. A.—Archiv für mikroskopische Anatomie.

A. Z. E. G.—Archives de Zoologie expérimentale et générale.

Kent.—Manual of Infusoria, 1881.

M. z. S. N.—Mittheilung aus der zoologischen Station zu Neapel.

A. A. P.—Archiv für Anatomie und Physiologie.

Flemming.—Zellsubstanz, Kern, und Zelltheilung, 1882.

Q. J. M. S.—Quarterly Journal of Microscopical Science.

A. z. z. I. W.—Arbeiten aus der zoologisch-zootomisch Institut zu Würzburg.

A. z. I. U. W.—Arbeiten aus zoologischen Institut, Universität, Wien.

Haeckel.—“Radiolarien,” 1862.

Hertwig.—“Organismus der Radiolarien,” 1879.

Claparede and Lachmann.—Études des Infusoires, 1861.

Stein.—Organismus der Infusionsthierchen, 1867, 1882.

### PLATE I.

FIG. 1. *Actinosphærium eichornii*—Gruber,<sup>2</sup> Z. w. Z., xxxviii.—The protoplasm is in the form of a net-work with enlarged nodes, many of which bear nuclei in various stages of karyokinesis.

FIG. 2. *Calcarina spengleri*—Bütschli, M. J., xi.—A nucleus surrounded by reticulated protoplasm is shown. It contains one large and several small nucleoli, all

<sup>2</sup> The name following the species refers to the author of the paper from which the figure was copied, and does not necessarily refer to the discoverer of the species.