

ETHNOLOGY.

The Races of Egypt.

IN the spring of 1888, Professor R. Virchow visited Egypt in order to inquire into the physical character of the Egyptians, his special object being to study the influence of the climatic and other conditions of the country upon man, and the other question, to compare the type represented on ancient monuments with that of the present inhabitants. Far-reaching conclusions have been made from studies of ancient paintings and carvings, but so far no sufficient anthropological basis existed for these studies. From this point of view, Virchow's work is of special interest to the ethnologist. The "Proceedings of the Royal Geographical Society" contain a full report of Professor Virchow's observations, from which we glean the following notes. The author says, that, although a final and satisfactory solution of the question is not yet to be expected, the solution of it in the case of Egypt is of great importance, because in that country the oldest historical data have made us familiar with men of the most highly developed civilization, who, through the position of their habitation,—an island in the sea of desert,—appear, in the most remote times, to have been shielded from foreign influences. At the time of the most ancient historical king of upper Egypt, King Menes, who reigned about the year 6000, we find a people with all the arts of civilization, an elaborate state system, a complete hierarchy, famous monuments of architecture and sculpture, and the rudiments of painting. But what was the state of things before the time of Menes? Here the threads of history break off short: the prehistoric period is filled up by later Egyptian and Grecian writers by means of a promiscuous collection of legends and myths, of which the student can take no account; although Professor Lant of Munich has endeavored, and not without success, to extract a reliable historical kernel out of the myths. Since 1869, positive data have been continually collected, and the result is to show that there has been an Egyptian stone age. But between the latter and the age of Menes, which presents the arts of civilization in complete form, there exists a yawning gap; and we seek in vain for a connecting link between any one of the oldest temples near the Sphinx, which itself presents no inscriptions and decorations of the later age, and the period of the stone age. As to the conventionalism of Egyptian works of art, we know now some details.

The supposition which was long held, that the ancient Egyptians at the time of Menes correspond with the type of man to-day existing there has been shown to be erroneous. Since the mummies of the old Egyptian kings, such as Sesostri, Settri, Rameses, and others, were discovered in 1870, and the crania of these conquerors have furnished us with measurable data, it can be asserted with safety that the existing images and statues of these rulers are not portraits, but that the latter were fashioned according to a certain conventional design. We are not, however, in the same position with regard to the sculptures of the older dynasties. Of these we only find scanty remains. Some crania, authenticated, but partially covered by inscriptions, are the only relics which we possess of that earlier time; viz., from the fifth dynasty backwards. With these, however, the statues agree. They are the skulls of short heads, while the fellaheen of to-day have long heads. This, then, at least, may be taken as settled,—that a change of type in the case of the dynasties has taken place. The case is otherwise with regard to the ethnological figures on the Egyptian works of art which are represented beside the king. These show that in the oldest historical times the different types of people, which we find up to this day in Egypt and the neighboring countries, were just as sharply distinguished from each other as they are now. The question in this case, however, is not about portraits, but about types, in which the essentials (such as the kind of hair, form of head, etc.) remain the same, while the externals (the armor, clothing, etc.) change according to the periods. The oldest representation of a negro is found in the tomb of Una, one of the kings of the sixth dynasty. In the opinion of many, especially of Lepsius, the territory situated between the first and second cataracts, between Assuan and Wadi Halfa, which is the true Nubia or Ethiopia, is the district where the change of the Central Africans into the Egyptians took place. It is the same region which for four

thousand years, down to the present time, has been the object of strife between the northern and southern races. In the oldest times the country which lies immediately south of Assuan was called Kash (the biblical Kush). Lepsius tried to prove, from considerations of language, that the inhabitants of Kash were negroes. The investigations of Professor Virchow on the spot, however, have resulted in establishing the contrary. The Nubians have, in skin, hair, or shape of head, no racial connection with the Nigritians, who are pure negroes. The Nubians, or, as they call themselves, the Barâbra (Berbers) have to look for their kinsmen in the north, and not in the south. The Bedouins of the eastern deserts, the Bisharin and the Ababde, resemble them very much. As regards constancy of types, it is sufficient that no noteworthy changes have taken place within historical times. One of the most important anthropological characteristics is the color of the skin. In the case of the Nigritians, this is practically independent of all external circumstances; air and light have no effect upon it; the negro remains black. Among the northern inhabitants there is an important variability of coloring. Light and air exert a considerable influence upon the color of the skin of the Egyptian and Bedouin. The people of southern Europe also become dark in Nubia, but grow pale again when they return to the north. This fact furnishes the explanation of the diversity of coloring found in the old Egyptian pictures, which were painted according to certain rules, and in which the men appear always dark red, and the women light yellow. The prime color of the one is vermilion, and of the other orange. The former characterizes the man working out in the open air; and the latter, the woman working in the house, and thus preserving her light skin color. Greeks of the third generation living in Nubia have to-day a completely Kushitic appearance. This changeability of the color of the skin characterizes all the peoples as far as Dongola, where the Nigritians first begin, and forms the principal basis for the theory that the north and south of Egypt never belonged to each other ethnologically, and that the northern races of Egypt did not spring from negroes. The direct anatomical proof for this assertion cannot, it is true, be adduced, inasmuch as prehistoric skulls have not been found. Craniological studies point to the near relation of the Egyptians of to-day to the Berbers of Morocco and the Guanches of the Canary Islands.

DICULAFOY'S EXCAVATIONS AT SUSA.—One of the most important archæological expeditions undertaken in western Asia is that of M. and Mme. Dicufof, who were sent by the French Department of Public Instruction and of Public Works to Media and Persia to explore the remains of the ancient cities of these regions. Their first expedition was undertaken in 1881 and 1882, and their work was completed in the years 1884, 1885, 1886. The excavations, which were carried out with great difficulty, on account of the fanaticism of the inhabitants, have yielded valuable results from an archæological as well as from an historical standpoint. The palaces of Artaxerxes and of Darius have been excavated, and it is now possible to reconstruct the plans of these magnificent buildings. The objects collected during these excavations have been transported to Paris, and form one of the most interesting departments of the new galleries of the Louvre. The collections contain polychromic bas-reliefs from the royal palace, representing lion and warriors, and potteries of the first or second century of our era. Besides architectural remains, numerous inscribed cylinders, ivory, bronze, and clay objects have been found. The palace, a model of which is being made, was a magnificent building rising on a platform sixty feet in height, protected by walls, and accessible only on the south side by a large staircase.

ETHNOLOGICAL COMPARISONS.—There are two methods of studying ethnology,—one by studying the growth of a single culture, the other by comparing isolated phenomena among a great number of tribes. While the former yields results of historical interest, the second is of prime importance to the student of psychology, who investigates the laws of the growth of human thought. R. Andree, who has for a long time continued the latter course of studies, has collected a series of essays on "ethnological parallels," most of which have previously been published in various journals. One of the most important results of such comparisons is the conclusive evi-

dence that many similar customs must have originated independently in regions far apart. Among many other phenomena, the author traces the occurrence of masks among various peoples, and shows that they occur all over the world, in America as well as in Australia and all parts of the Old World. It seems that the games in which our children delight are well-nigh universal. The children of the ancient Egyptians played tag; they had balls and dolls. Bodies of dolls were made of wood, and might be mistaken for modern fabrics. Undoubtedly they were dressed by the Egyptian girls, as our girls nowadays enjoy dressing their dolls. There were even movable ones, the hands and feet of which could be moved by means of strings. Others, made of painted wood, were very imperfect in form, and had strings of beads instead of hair. In the museum of Leyden there is an ancient toy that looks as though it had been bought at a Christmas fair. There were figures of animals with movable mouths, and balls of leather. Among Greek and Roman antiquities, dolls made of wood or clay, and others of wax and ivory, are found. Dolls' houses with lead furniture; the saving-box with a slit on top; toy cows, horses, and hogs, — were known to the children of ancient Rome, as they are to our own. From this evidence it might be supposed that our dolls are "descendants" of the ancient dolls; but it must be remembered that there is hardly any people that does not have them. Their use is so general, and so natural to the child, that even the laws of Mohammedanism are disregarded by the childish desire. The Koran forbids representations of human beings, and still the Mohammedan child plays with its doll. The women of Bagdad believe that a doll may eventually come to life, and harm their children, and therefore prevent their use. The girls, however, play with cushions and pieces of wood instead, which they nurse and dress. In Siberia and arctic America ivory dolls, clothed in furs, of beautiful workmanship, are found; in Peruvian graves, dressed dolls of clay are found; and in Africa the girls play with wooden or clay figures. In this way Andree traces numerous ethnological phenomena in their distribution among various peoples, and shows that the human mind everywhere develops on the same lines, and that a migration of inventions must be supposed only in such cases where its existence can be proved by historical facts.

ELECTRICAL NEWS.

Ether, Electricity, and Ponderable Matter.

SIR WILLIAM THOMSON'S presidential address before the English Institute of Electrical Engineers was looked forward to with some eagerness by electricians. The title given above is fascinating, and promises solutions of questions which have been asked for so many years, and whose answer had seemed so hopeless. We think that the address is disappointing. It tells us little that we did not know, and, although suggestive, it hardly points out how to follow the suggestions.

After a few introductory remarks, Sir William dwelt briefly on the necessity of an electrician being also an engineer. He would give a youth desiring to take up the study of electrical engineering a good deal of chemistry, of mathematics, and of dynamics. "I am perfectly sure, that, if the youth is qualified in other departments, the mere addition of electricity to the education of a competent engineer will not take such a long time as might be imagined, and that the merely educational part of the work will not be protracted unduly by adding electricity to the branches learnt in general engineering."

Passing to the main subject of his address, Sir William spoke of the demand that was every year growing in intensity, for something like a mechanical explanation of electrical phenomena: "to know something of the internal relations connected with the wonderful manifestations of force and energy which are put before us in the action of the magnet, in the working even of a common electrical machine, and in electro-magnetic phenomena." The question of the transmission of messages through cables was then taken up at some length, and the history of the theory on which the first Atlantic cable was constructed was given. Sir William then spoke of the two effects which must be considered when an electrical wave is transmitted, — that due to static induction, and that due to magnetic induction. In the first solution of the problem, only the

statical effects were considered, since the propagation was so slow that they were large compared with the magnetic effects; but Mr. Heaviside has lately shown that the magnetic induction is really an advantage in signalling or in transmitting speech by telephones, since it makes the dying-out effects much more uniform. If only static induction were considered, the waves of short period would die out more quickly than those of greater length. The magnetic induction helps to make this difference less, and is therefore beneficial.

Taking up the subject of alternating electric currents in wires, the speaker gave some figures on the increase in the resistance of a wire carrying alternating currents as compared with the resistance of the same wire for continuous currents. It has become well known in the last few years that the distribution of a varying current in a wire is not uniform, but the density is greatest near the outside. This has the effect of increasing the resistance: for instance, taking a period of 80 reversals per second, the increase in resistance of a wire 1 centimetre in diameter is not so much as .01 per cent; for a diameter of 1.5 centimetres the increase is 2.5 per cent; for 2 centimetres it is 8 per cent; for 4 centimetres, 68 per cent. For periods of twice the frequency we must multiply by $\sqrt{2}$. The inward penetration of the current into the wire may be compared to the motion of water in a long tube, when the tube is moved backward and forward in the direction of the axis. To represent the case of alternating currents in parallel wires, Sir William would replace the wires by densities of fluid in direct proportion to the electric conductivities, the space around being a fluid without mass, the cylinders of dense matter rotating periodically in opposite directions. To represent the electro-static effect in such a case, "imagine an interface between the two fluids, and give it such stiffness against change of shape as is required to cause it to fulfil the conditions which electro-static knowledge, and our knowledge of the laws of electric and electro-magnetic influence, dictate to us."

Sir William then went on to say that he believed that an electric current actually caused a rotation of the ether, and considered the case of a copper core surrounded by a helix. Induced currents were set up in the copper, and the only action conceivable in the space between the coil and the core was a rotation. This might be either a continuous rotation, or a rotation through an angle proportional to the strength of the current. In iron, however, something quite different must take place. If the fluid whose rotation caused the observed effects moved around continuously, there would be no shearing. If, on the other hand, there were only a drag upon the ether through a certain angle, then there must be a force resisting steady rotation; that is to say, there would have to be an arrangement of such character that a constant torque would produce a constant instead of an accelerated rotation. It would appear that such an effect could only be produced by an inherent rotation of the molecules. To represent a medium of this kind, Sir William imagines a space divided up into a number of small squares, with their sides fixed together by rubber bands. In each a gyrostat in the form of a rotating molecule is placed. Such a medium, without the gyrostats, would represent a perfect fluid; but, with the gyrostats in place, turning could only take place by stretching the elastic bands, which would require a constant force. On this hypothesis, we must suppose that the ether is less rigid in iron than in other metals, and has the same rigidity for all non-magnetic substances. But no model that can be imagined can represent the electro-static as well as the magnetic effects. In concluding, Sir William pointed out that even the very imperfect attempts at a mechanical explanation of electrical phenomena which he had indicated would only apply to a very small part of the subject; and the tremendous difficulties in the way of a complete mechanical explanation prevented him from hoping to see the question solved in his own lifetime, though he felt confident that a solution would be found, and that what appeared so insuperable a mystery to us would be no mystery at all to future generations.

AN ELECTRIC DATE STAMP. — According to *Engineering*, the Electric Date and Time Stamp Company are introducing a new stamp, which at one operation marks on any document the minute, hour, day, month, and year, as well as the usual address and business of the proprietor. Unlike many automatic appliances which are dubbed electrical merely for the purpose of imposing on un-