

EXCAVATIONS AT NAGA-ED-DER, WHERE PREHISTORIC MAN FIRST SETTLED IN EGYPT.

BY ENOS BROWN.

The University of California has received the final report of Dr. J. C. Reisner, who has been employed for six years in prosecuting a series of excavations under its auspices, and gathering together a collection of antiquities for a museum it proposes to establish at no distant day. Dr. Reisner excavated at several different sites, and the fruits of his labors are now being received. Hundreds of cases are being unpacked and their contents catalogued. They embrace an enormous number of objects, demonstrating the gradual progress of the arts from the earliest or Paleolithic age, the age of flint, through the period of its highest development in the Cheops dynasty, up to the time when Egypt sank to the position of a Roman dependency. The rise of civilization, from a period antedating the Christian era by 7,000 years, can be unerringly traced in the flints, pottery, carvings, statues, and inscriptions, found in ancient cemeteries or sites of cities, ransacked to enrich the museum of an American university and to benefit the scholars of the new world.

Of all the discoveries of the explorer, none surpasses in scientific interest or importance those from the prehistoric cemeteries of Naga-ed-Der, where it is believed the first settlement of man in Egypt occurred. This site, never before explored, is located about 300 miles southeast of Cairo, on the edge of the eastern desert, and, at the time of its first settlement, the country round about was not the barren waste it now is, but was fertile, with an abundant rainfall, and capable of supporting a numerous population. Ninety centuries ago Egypt was not dependent upon the Nile for moisture. In this interval deposits of the river have amounted to 25 or 30 feet and, allowing four inches deposit for each century, the time for beginning, as well as the period when the climate of the country began to change, is calculated. Naga-ed-Der was a settlement long before its site was transformed into a desert.

It is generally admitted that Egypt was settled first by people of Asiatic origin, and confirmation of this theory has been discovered in the graves of Naga-ed-Der, in which many skeletons of the earliest period were found. These were fortunately in perfect condition, and afford splendid anatomical material for determining the racial character of the prehistoric people, which, ethnologists conclude, was Asiatic and not Nubian. Even the contents of the intestines were so well preserved that it was possible to determine, not only the food, but even the medicines which were contained in them. The disease from which the person died could be easily diagnosed. Many were resurrected who died of some kidney complaint, others of gall stones, and others of diseased bones.

The remarkable fact that the people now living over the site of the prehistoric cemeteries are racially identical with those who inhabited the country 9,000 years ago was established beyond a doubt. In every physical peculiarity there had been no change during this long interval. The graves also afforded much information as to the customs, habits, and progress of this primitive race, with types of burials, graves, food-stuffs, hair dressing, and pottery. The development of an instinct for art was indicated by rude figures, with which they adorned the pottery fashioned. Their weapons were carved of flint, sometimes in the shape of snakes' heads and animals. No objects of metal were found, and the conclusion is they knew nothing of metallic substances. Copper, the first metal known in Egypt, was introduced probably about a thousand years later by the race which conquered the country and is supposed to have come from the north of Africa. The burial customs at Naga-ed-Der indicated a regard for the preservation of the body, which Egyptians in later periods carried to remarkable lengths. The prehistoric mummies were preserved in salt, and in the grave were carefully incased in matting made from halfa grass, formed of reeds woven together with the fiber of the same plant. Votive offerings consisting of

flints or pottery or both were always interred with bodies. The tenacity with which ancient customs survive is shown by the use of halfa grass, of which the prehistoric people wove mats, made in the most primitive manner, and every other generation since, to the present day, has imitated. The graves were excavated in either elliptical or rectangular shape, a layer of one or more mats being placed upon the bottom on which the body reposed.

All the bodies found were in the same position, the knees supporting the chin and resting upon the side. Over the body was laid another layer of mats when the grave was filled. Some were found in which a sort of coffin of wood was around the body, large enough to contain the funerary offerings and pottery which seem to have been a necessary accompaniment of every burial. Beads, combs, and armlets of primi-

mified their dead, and most valuable results followed the unwrapping of many of them, as persons were interred in great state, with all their choicest possessions and most elaborate decorations. Beautiful jewelry, embroideries in rosettes, flowers, geometrical designs, cupids, men and women, and executed with skill, rewarded the explorers, and opened a field of investigation rich beyond anticipation.

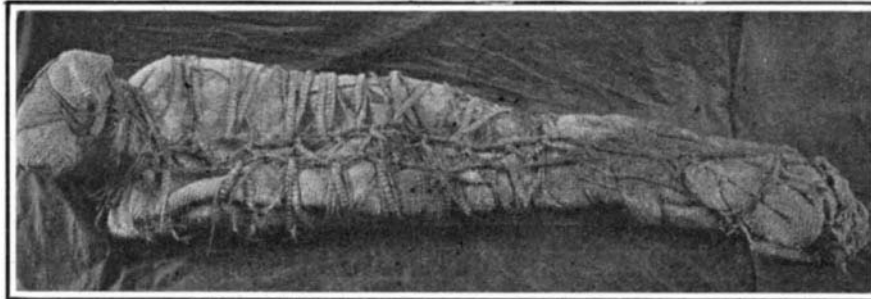
The Story of Malaria.

BY L. H. YATES.

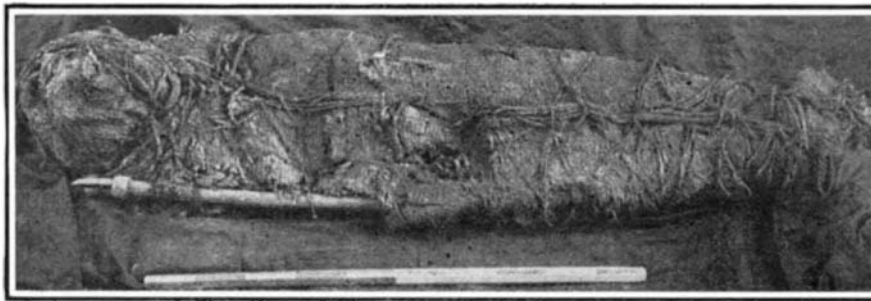
The Story of Malaria, as told by Major Ronald Ross, F.R.S., first to an audience of the Royal Colonial Institute of Great Britain, and later in the pages of the National Review, is full of most interesting facts that are apt to pass the memory, unless recalled from time to time. Our present knowledge, as he reminds us, is the result of more than two thousand years of patient study, and it forms what might be called a gigantic epic of science. It tells of a long and hard-fought battle between man and nature, and it is only to-day that we even begin to see the promise of victory.

If we go back to the writings of Hippocrates and his successors, some 400 years B. C., we learn that the Greeks and Romans were then studying the character of malaria, and had distinguished its class by two important points; the first was that malarial fevers are not continuous in type, but occur in periodical attacks, and these attacks they classified as quotidian, tertian, and quartan; that is, occurring every day, every alternate day, and every third day. Although we now understand that attacks may, by overlapping, present the appearance of a continuous fever, this does not contradict the ancient classification. The second point found out by them, and attested by succeeding experience, is that there is direct connection between marshes and swampy pools or soil and the prevalence of this kind of disease. They even went so far as to point to a probability of the disease being disseminated by a species of germ or microbe to living man, thus approaching remarkably near to our nineteenth century "discoveries"! Indeed, we seem not to have disproved any of the theories of the ancients, but rather to have enlarged upon them, added to their number, and established their certainty. After the ancients—a very long time afterward—the next step forward was taken in South America. To a villager of Malacotos, in Ecuador, we owe the discovery of the efficiency of Peruvian bark as a cure for malarial fever—or as we should more correctly term it, an antidote. This became known in Europe about 1640, and acquired fame after it had been used to alleviate the agues of Louis XIV. In 1820 two French chemists separated from Peruvian bark its essential alkaloid, quinine. Still, after the lapse of two and a half centuries, the bark or its alkaloid are the accepted specifics against malarial fevers. By experimenting with the use of these drugs, it was found possible to separate with greater precision the different types of fever and determine the periods of attack.

To the story of malaria another chapter was soon after this contributed by British military and naval surgeons, at a time when British ships were exploiting all waters. These found malarial fever to be common in all tropical and sub-tropical countries—that it was an enemy likely to be encountered almost anywhere. They added their affirmation to the theory that soil as well as water held the fever poison. About the middle of last century, however, when biology became a favorite study and the microscope a more perfected instrument, the granules of what is now called *malarial pigment* were found in the blood, and these pigment granules were found to be the refuse matter of innumerable little parasites, which, living within the blood, caused disease. Almost at the same time that this discovery was made, Pasteur, Koch, Lister, and others were discovering that bacteria were the cause of anthrax, tuberculosis, cholera, typhoid, and leprosy. The two great discoveries mark together an epoch in history. The essential difference between them, briefly stated, is that malarial germs are protozoa, or the lowest form



THE FIRST STAGE.



THE SECOND STAGE.



THE THIRD STAGE.

The Three Stages of Unwrapping a Coptic Mummy.



Group of Workmen of the Rifai Sect with Their Religious Sheikh (Sheikh Hasan).
EXCAVATIONS AT NAGA-ED-DER, WHERE PREHISTORIC MAN FIRST SETTLED IN EGYPT.

workmanship were found in the graves of women. The site of Naga-ed-Der seems to have been consecrated to burials, for the dead of every period are to be found there. The Copts have had their own cemeteries here ever since the Christian religion was introduced into the country, and use them for interment at the present day. These old Coptic graves afforded valuable results to the explorers, and much light upon the customs, habits, and manners of this interesting people was secured. Coins, minted in the time of Justinian, were found with vast quantities of beads, necklaces, bracelets, earrings, and finger rings, crowns, pendants with crosses and other emblems of the Christian religion made of bronze, sometimes gilded. Amulets of old Egyptian manufacture upon which the cross had been engraved were numerous. The Copts mum-

of animal life, while the bacteria represent the lowest form of vegetable life. By close study of the processes followed by the parasites of malaria, it was found that their capacity to reproduce themselves was almost unending, but that it kept to the order of successive generations; and just as all the stalks of corn in a field which was sown at one time reach maturity together, so do the members of the same generation of malaria parasites. The shell of the blood corpuscle which has held the growing parasite bursts when it reaches maturity, and allows its spores to fall into the fluid of the blood, and these again fasten themselves on other corpuscles and begin to germinate in their turn. Millions of parasites will liberate their spores at the same time, and it will be precisely at this time that the patient will be attacked with the ague fit, followed by fever. As some of the spores take 72 hours to reach full development, the next attack of fever will not take place until the third day; as another type develops within 48 hours, the attacks occur every other day; and those which sporulate every 24 hours produce the quotidian fever. It is possible, though perhaps not usual, for one patient to harbor all three varieties at one and the same time.

At the time that the malarial parasites scatter their spores in the blood, the patient is seized with chill, nausea, shivering, and fever; very soon, however, the wonderful anti-toxic mechanism of the body begins to act itself, the poison is acted upon, neutralized, and in a large measure eliminated by the sweating which ensues, and the patient is relieved. But another generation is developing meanwhile, and when it reaches maturity another attack is caused, and not until their power of reproduction is weakened, and finally overcome, will recovery be permanent. Even then, undue fatigue, chill, or great heat may cause a relapse by favoring the parasites and their development. The battle must be incessantly waged between the conflicting parties, poison on the one hand, anti-toxin on the other. A startling discovery, made in quite recent times, is that native children in tropical countries, although apparently healthy, often carry these parasites almost constantly in their blood. As the children reach maturity, if they have not succumbed to the poison before then, this early inoculation seems to procure them immunity as adults, for very few adult natives are subject to malarial fevers in the way that Europeans are. While they are young, however, the disease decimates them in large numbers.

The next chapter in the story of malaria had to reveal where these protozoan parasites live in external nature, and how and by what agency they effect their entrance into the human body. The older theories assumed that stagnant water made a home for them, and that they were inhaled in the mists and vapors which rose from the marsh, and possibly by the drinking of foul water. But experiments made in trying to develop the parasites from stagnant water failed to give the supposed results. Then the mosquito theory, existent and in vogue for some centuries, was revived, and trials which were made, independently of each other, added strength to the belief that infection came from the bites of the insect. In 1894 Major Ross was told by Dr. Manson (now Sir Pat-

rick Manson) of his own theory concerning the ability of parasites to transfer themselves from one species of animal to another, and he commenced to make critical examination for himself. When, after two and a half years of experimenting, he was on the point of giving up in despair, he was startled on examining a new species of mosquito to discover in its tissues the very bodies he was in search of. Before he could obtain formal proof his researches were interfered with by his being ordered to a place where there was little or no malaria. The following year the government of India placed him on special duty for the continuance of his study, and then in a few months he was able

to the conjectures and theories of the ancients. For example, the mosquitoes which carry human malaria belong to a species called the Anophelines, which breed mostly in terrestrial waters, that is, in marshes, which explains the connection between marshes and malarial fever. But it is not the parasite causing the fever which lives and breeds in the marsh, but the gnat or mosquito which is the carrier of the parasitic poison. Where appropriate marshes exist, these insects abound and infect everyone within their reach by inoculating them with the poison they carry from one to the other. It is argued that mosquitoes also exist and abound where there is no malaria, and this is true, the difference being that they are not Anopheline mosquitoes. Happily for us, the Anopheline is a comparatively rare kind.

The remedy which Major Ross advocates most strongly is the tracking and drainage of waters and swamps which favor the breeding of the malaria type; to carry out sanitation in this way is not merely to get rid of the mosquito itself, but of pests of flies and other insects.

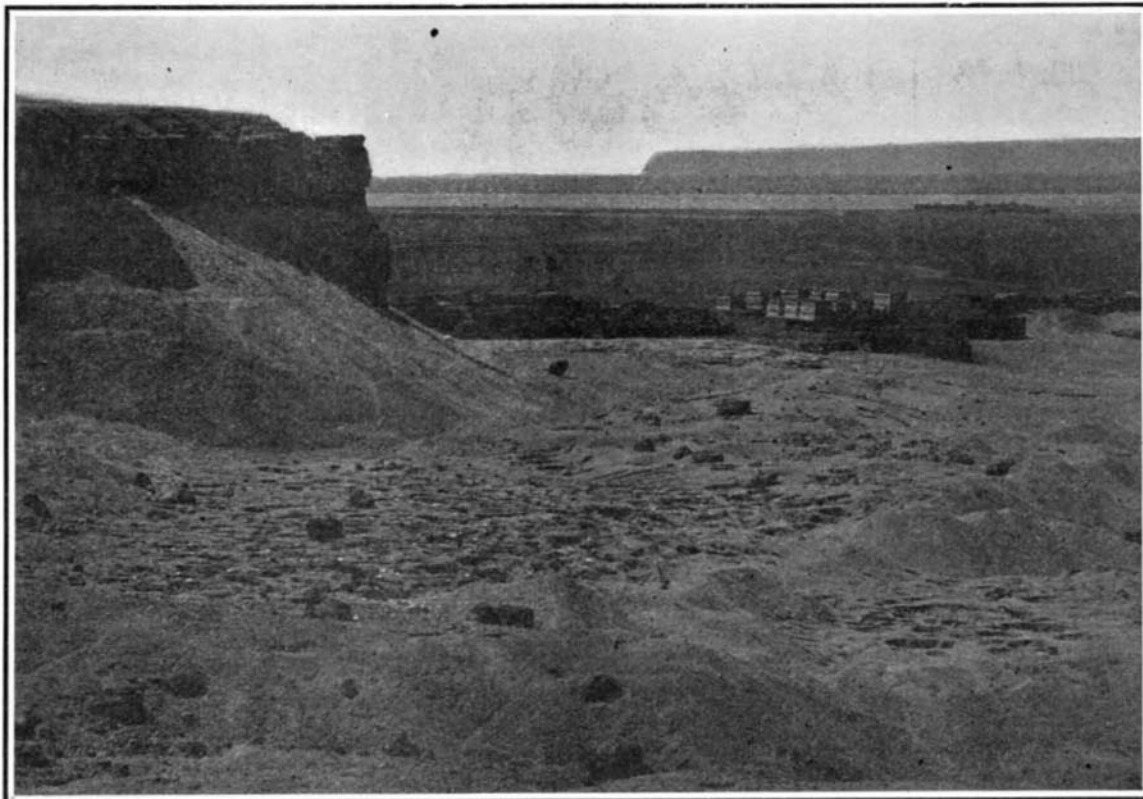
His plans are now being included in all the schemes of tropical sanitation, and with the improvement in land, air, and water, cleanliness and better housing come as a natural result, so that the local authority follows hard upon the heels of the imperial officer, and the efforts of both are fast making habitable for man the long untenanted regions of the globe, giving him, in fine, through the

destruction of unwholesome conditions, the gift of a new world.

Havana Cigars.

During last year there were exported from Cuba the enormous number of 256,738,029 "Havana" cigars. Contrary to the general idea, however, that America gets the bulk of this trade, only about 30 per cent came here, the total purchases amounting to 79,483,125 cigars, while England took 92,459,687. Germany buys from twenty-five to thirty million, and France ten to twelve million. One reason for the larger sales to England than to the United States is the fact that America buys a large amount of leaf tobacco, which is worked up here; last year twenty-five million pounds were imported, while England took only twenty-five thousand pounds. But few Cuban cigarettes come to this country, most of the manufacture going to South America. Although two hundred and fifty million cigars—the number we received from Cuba—would appear to be a considerable stock, cigar dealers' cases would soon be empty if that were the only source of supply, as America smokes some 8,000,000-000 cigars annually.

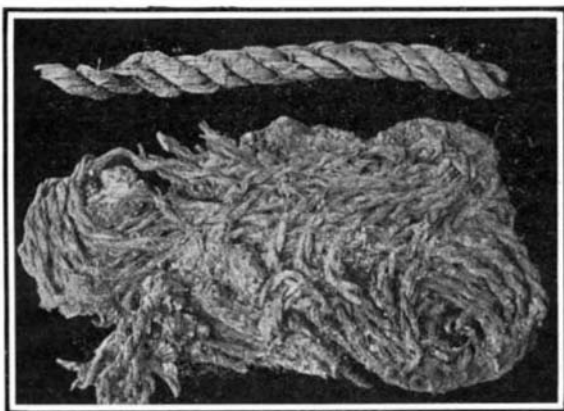
Storing coal in pits capable of being flooded has been adopted at the new plant of an American electric power company at Hawthorne, Ill. A plot about 320 feet by 75 feet has been excavated to a depth of about 12 feet, and lined and sub-divided by concrete walls into twelve 80 feet by 25 feet pits. Their bottom is the clay sub-soil, and the walls are carried about 4 feet above ground. The pits can be flooded by means of a 12-inch water main. The longitudinal division walls are wide enough to carry the tracks on which the coal is delivered.



Prehistoric Necropolis.

to establish his conclusions, which were to the effect that when mosquitoes of a particular species suck the blood of infected men, animals, or birds, they draw in with it the parasites of malaria, and these, living and growing in them, produce spores which find their way down the proboscis into the blood of their next victim, infecting him. Thus the mosquito takes the parasite from one infected person, and after a week or more conveys it into the blood of another, probably quite healthy, individual.

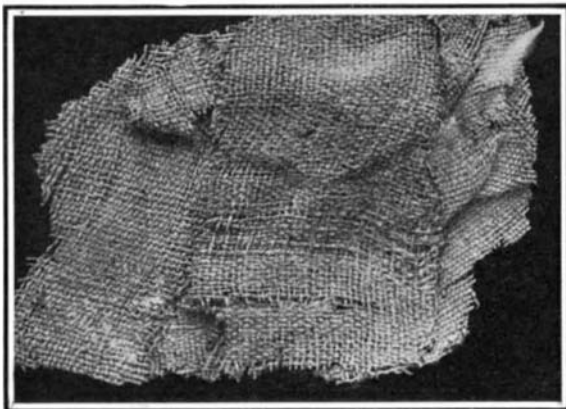
After this discovery had been made public, schools of tropical medicine and societies took it up, books and pamphlets innumerable were written upon the subject, and healthy persons volunteered themselves to be acted upon by the experimentalists, so the new study was prosecuted with all vigor. One of the things it is most curious to note is that the results of all this combined working merely developed and added



Prehistoric Cord from Clothing.



Prehistoric Ornamental Tassel.



Prehistoric Cloth (Coarse).



Prehistoric Cloth (Fine).

EXCAVATIONS AT NAGA-ED-DER, WHERE PREHISTORIC MAN FIRST SETTLED IN EGYPT.