

Corporation of the place, is to be held as corporate property, and will be sustained mainly out of the corporate funds. With a total cost of 70,000*l.* (or, taking into account the value of the land, 100,000*l.*) the only endowments at present are the 10,000*l.* presented by an anonymous donor, and 300*l.* from Lady Ossington (for a scholarship). It is expected that the trustees of the late Mr. F. C. Cooper will, in accordance with his will, apply some part of his estate towards the endowment of classes in the College, but it is not at present known how much. Thus the expense of maintenance will, at least in the outset, mainly fall on the town itself. The experiment will doubtless be watched with interest.

The general internal arrangement of the new building may be here briefly noticed. The library-rooms are in the eastern wing, to the left of the principal front, and the natural history museum is housed in the other wing. The former include two reading-rooms on the ground and first floors. Behind the principal entrance are placed the three theatres for chemical, physical, and general lectures, the two former having laboratories, work-rooms, and professors' rooms attached. The largest theatre accommodates 600 persons, the chemical 220, and the physical 100. These rooms are well provided with modern appliances. In addition may be noted a balance-room, and an optical gallery 125 feet long for experiments in light.

It is stated in the report of the Organisation Committee that all persons will be admitted students who give evidence of their desire to improve their education and make advances in the acquisition of knowledge. More particularly the object of the founders of the institution seems to have been of a threefold character. First of all the College will absorb, as already indicated, the University Extension Lectures and Classes and the Government Science Classes, developing and systematising the courses of instruction in which these have been engaged. Next a technological school will be provided, and classes formed for teaching, in a more direct manner, the theoretical parts of certain trades. Once more, the preparation of students for residence at the older universities seems to have been contemplated; but this feature will probably, at least for some time, have little prominence.

For the purpose of systematic education the course of instruction has been arranged under four heads: (1) ancient and modern languages, literature, history, political philosophy and economy, logic, and philosophy; (2) mathematics, theoretical and applied mechanics, and physics; (3) inorganic and organic chemistry, pure and applied; (4) biological science, botany, zoology, and physiology; also geology and allied subjects. In the Government Science Classes (distinct from the College curriculum) instruction will be given in several of the subjects in which aid is given by the department at South Kensington. The Technological School will deal with the following among other subjects:—Cloth, cotton, silk, lace, and hosiery manufactures, weaving, metallurgy, gas manufacture, telegraphy, pottery and porcelain, bleaching, dyeing, and printing, tanning, mechanical engineering, oils, colours, and varnishes. It is to be distinctly understood, however, "that these classes are not so much for teaching trades as for teaching those subjects which underlie work and bear upon trade, and help to develop the intellect of the workmen."

The scheme of education provided will thus be seen to be of a comprehensive nature. All who are solicitous that England should take a good place among the nations in industrial competition will be glad to see a new technical school added to the few we already possess. The number of these schools will have to be greatly multiplied before we have anything like the advantages of Germany in this respect. In this connection we may direct attention to an interesting little volume recently written by Mr. Felkin (a native of Nottingham, by the way) who has

carried on the manufacture of hosiery in Chemnitz, Saxony, since 1861, and describes what is being there done in the way of technical instruction, and its results. (Mr. Samuelson criticises the system in the *Fortnightly* this month.) The aspects of such technical education are various, and not the least in importance is that the workman, who is thereby enabled to feel an intelligent interest in his work, to comprehend the scientific principles on which it is based and the conditions of excelling in it, and to seek to do it as well as he possibly can, becomes conscious of mental growth and expansion. He even thus acquires new vistas (to use Prince Leopold's expression), and finds the drudgery of routine materially lightened. For those again who seek culture in different directions (scientific or literary) from that bearing on their daily work, a wide range of subjects is presented for choice. The cultivators of science for its own sake will doubtless not be wanting, and some excellent solid work, we trust, will be done. The youth seeking to be trained for a scientific career, and the working lad ardently pursuing some favourite study in his scanty hours of leisure, may alike resort to the College for stimulus and direction.

In the strong reaction which has become evident in recent years from that neglect of science which was so long prevalent among us, it has appeared to some that there is now an objectionable tendency to oneness in education. However this may be, the founders of the new College have determined, and we think wisely, that it should be more than merely a college of science and technical institute, and the purely literary elements of culture are included.

The requirements of the industrial population will be respected by the holding of classes in the evening, and the adoption of lighter fees than those for the day-students. The teaching will be conducted by resident professors, non-resident lecturers, and local teachers; and the student, after passing through the regular course of instruction and training, will, on passing an examination, receive a certificate.

The four professors required for the curriculum have been appointed as follows:—Professor of Language and Literature, Rev. J. E. Symes, M.A.; Professor of Mathematics and Mechanics, Dr. J. A. Fleming, B.A.; Professor of Chemistry, Dr. F. Clowes, F.C.S.; Professor of the Biological Sciences, Rev. J. F. Blake, M.A. One of the professors will act as Principal or Dean, with some extra emolument.

The University College of Nottingham, in fine, begins its career with good promise of usefulness, and it is to be hoped that wealthy and liberal friends of education will respond in a practical way to the appeal of the College Committee, who "desire it to be known that they are prepared to receive endowments in aid of the funds of the College." We hope soon to hear that the burden of maintenance for the townspeople has been thus happily diminished.

ANTHROPOLOGY¹

TO those readers whose knowledge of ethnology or anthropology has been derived from a perusal of Prichard's "Natural History of Man," or the compilations of Wood, Brown, Peschel, or Brace, the present work will present a surprising amount of freshness and originality. They will in fact find themselves introduced to a new and very captivating science. Instead of the disconnected, and often confusing accounts of the numerous races, families, and tribes into which mankind have been divided, with separate details of the appearance, manners, customs, houses, implements, weapons, and ornaments of each, the reader of the present work will be shown how

¹ "Anthropology: an Introduction to the Study of Man and Civilisation, by Edward B. Tylor, D.C.L., F.R.S. With Illustrations. (London: Macmillan and Co., 1881.)"

mankind may be studied in a logical, connected, and far more interesting manner, by the method of comparison, and by tracing the growth or development of those faculties which more especially distinguish him from the lower animals. Everywhere he will find proofs of the essential unity of man; whether in the close similarity of the forms of the stone implements and weapons found in the most remote parts of the earth, and among the most varied races; in the identity of signs and gestures, and the striking resemblances even among the most diverse languages; or in the wonderful similarity and often identity, of habits, customs, ideas, beliefs, and religions among all savages, and the curious way in which traces of these can often be found in the very midst of modern civilised society.

It is very difficult to give any adequate idea of a work of this kind, which, in a moderate compass, contains the essence and outcome of all modern research on the various branches of the study of man and civilisation; but we shall perhaps best exhibit its wide scope and systematic treatment by an enumeration of the subjects discussed in the several chapters, adding a few remarks or criticisms where called for.

The first chapter contains a brief sketch of what we learn from history, archaeology, and geology, as to man's antiquity and early condition; and in the next we are shown man's relation to the lower animals both in bodily structure and mental characteristics. These two chapters might, with advantage, have been considerably enlarged, as they constitute the foundation, and, to many persons, the most interesting portions of the modern study of man. The results hitherto arrived at by these branches of study, are, besides, both suggestive and important, and might, we think, have been more expressly referred to. The numerous remains now discovered of prehistoric man, and of his works, dating back to an undoubtedly vast antiquity, show us in no case any important deviation from the existing human type, nor any indication that his mental status was lower than (if so low as) that of many living races. At the same time the increasing rudeness of his implements as we go back, undoubtedly indicates that we have made some approach towards the period when he first emerged from the purely brute state and became "a tool-using animal." We find him in the remote past surrounded by a number of huge mammalia, including many carnivora of greater size and destructive power than any that now exist, and we know that at a still earlier period these animals were even more abundant and more destructive; yet man must have held his own against them during the time when he had not yet begun to make tools or use fire. How did he do this without the possession of some additional natural weapons or faculties, of which nevertheless we find no trace in the earliest remains yet discovered? Again, the whole bearing of the evidence as to the development of man, indicates that the point of union or of common origin of man and the anthropoid apes, is enormously remote. Each of the existing types of these great apes possesses some specially human characteristic wanting in the others (for an enumeration of which see Mivart's "Man and Apes"), and this indicates that the common origin of these apes is of less remoteness than the common origin of them all and of man. How immensely remote, then, must be this point of common origin, and what a long and complex series of diverging forms must have existed, always in sufficient numbers to hold their own against their numerous competitors and enemies! The evolutionist *must* postulate the existence of this long series of divergent forms, yet notwithstanding the richness of the Tertiary deposits in many parts of the world no trace whatever of their actual existence has yet been discovered. The extreme remoteness of the origin of man is also shown by the facts, that neither the size nor the form of the cranium of the prehistoric races shows any inferiority to those of existing

savages, while the approximate equality of their mental powers is shown by the ingenious construction of weapons and implements, and the artistic talent which we find developed at a period when the reindeer and the mammoth inhabited the south of France. It has been argued that the inferiority of the early implements shows mental inferiority, but this is palpably illogical. Did Stephenson's first rude locomotive—the *Rocket*—show less mind in its constructor than the highly-finished products of our modern workshops? Or were the Greeks mentally inferior to us because they had rude cars instead of locomotives, and had no clocks, water-mills, steam-engines, or spinning-jennies? It is forgotten that arts are a growth, and have little relation to the mental status of the artificer. A number of European infants brought up among savages would not, probably, in many generations, invent even the commonest implements and utensils of their ancestral homes; and it is difficult to say how slow may have been the development of the arts in their earliest and by far most difficult stages. It is therefore by no means impossible that the makers even of the palæolithic implements may have been fully equal, mentally, to existing savages of by no means the lowest type.

In the next chapter we have an excellent sketch of the chief races of man copiously illustrated by portraits, mostly from photographs and very characteristic. Among the best are those of the Andaman Islanders and the Dyaks, which we here reproduce. The Malays are less characteristic, this race being in fact better represented by the cut of the two Cochin Chinese at p. 98.

The four chapters on Language, whether manifested by gestures and signs, by articulate speech, by pictures, or by written characters, are exceedingly interesting and instructive, especially the account of the gesture language and the illustrations of how connected stories may be told to the deaf-and-dumb quite independently of any knowledge of alphabetical or even verbal signs. Picture-writing, as exhibited in the works of savages, in Egyptian hieroglyphics and in the modern Chinese characters, is also well explained, and is so interesting that one wishes the subject were more fully gone into. In treating of the origin of language Mr. Tylor doubts the sufficiency of the theory that emotional, imitative, and suggestive sounds were the basis on which all languages were founded, though he gives tolerably full illustrations of how roots thus obtained became modified in an infinite variety of ways to serve the growing needs of mankind in expressing their wants or their feelings. He impresses on his readers the important fact that language is always growing and that new words are continually made "by choosing fit and proper sounds." He shows how words once imitative or emotional have been often so changed and modified as to have their original character totally concealed; yet he concludes, that—"it would be unscientific to accept all this as a complete explanation of the origin of language"—because "other causes may have helped." It seems, however, to the present writer, that the imitative and emotional origin of language is demonstrated by a body of facts almost as extensive and complete as that which demonstrates the origin of species by natural selection; and that the "other causes" are in both cases exceptional and subordinate. As the examples of imitative words given by Mr. Tylor are comparatively trivial and altogether inadequate, it may be well to call attention to the wide and far-reaching character of such words, and to show how much of the force, expressiveness, and beauty of our language (as of most others) depends upon them.

Putting aside all mere representations of animal sounds—as the *whinny* of the colt, the *mew* of the cat, or the *bleat* of the sheep—let us consider what an immense number of natural sounds are named by words which we at once see to be appropriate representations or imitations of them. Such are—*crash*, *whizz*, *fizz*, *hiss*, *creak*, *whistle*, *rattle*, *bang*, *clang*, *flop*, *thud*, *clap*, *roar*, *snore*,

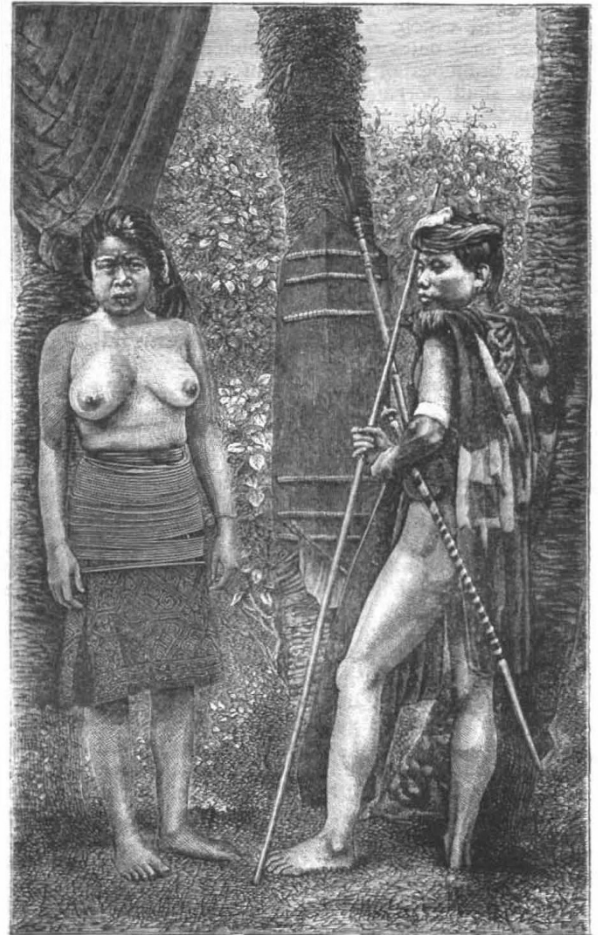
groan, moan, wail, thunder. In other cases sights, sounds, or feelings, are represented by their accompanying or appropriate sounds. We see a *splash*, or a *slop*; we feel a thing to be *smooth* or *rough*, or to *vibrate*; and we *shiver* with cold or *terror*. Again, how many actions and qualities are represented by words expressing the sounds which sometimes accompany them—as *knock, shock, crack, snap, ring, whisper, hush, sigh, sob, wash, squash, crush, crunch, rip, rend, grind, scratch, split, spit, cough, sneeze, wheeze*. How characteristic are such words as *sticky, flicker, flutter, hurry, flurry, stumble, hobble, wobble*. Here we have not only sound, but motion and quality, represented by the arrangement of letters and syllables. How clearly do such words as *slide, glide, and wave* imply slow and continuous motion, the movement of the lips while pronouncing the latter word being a perfect double undulation. How curiously do the tongue and palate seem to be pulled apart from each other while pronouncing the words *glue* or *sticky*. How marked is the contrast between the harsh consonants used to express *rough, rugged, and gritty*, as compared with the soft flow of sounds in *smooth, oily, even, polished*. Look again at



Andaman Islanders.

the sense of effort and feeling of grandeur in pronouncing the words *strong, strength, power, might*, as compared with the opposites, *weak, faint*; or the open-mouthed sounds of *grand, huge, monstrous, vast, immense, giant, gigantic*, as contrasted with the almost closed lips with which we say *small, little, tiny, minute, pigmy, midget*. So *crawl* and *drag* are pronounced slowly as compared with *run, fly, or swim*; while *difficult* and *easy* express their own meaning while we pronounce them. Many objects and substances have names curiously corresponding with their qualities. We have already noticed *glue* as indicating stickiness, but no less clearly is *oil* smooth; while *brass* and *glass* indicate resonance; *tin* a tinkling sound; *lead* and *wood* a dull sound or *thud*; in *bell* we imitate its sound, while the word *jelly* indicates the shaking of the substance. In *ice* we hear the interjectional *sh* of shivering with cold; in *fire* the flicker of the ascending flame. In other cases the motion of the breath gives an indication of meaning; *in* and *out, up* and *down, elevate* and *depress*, are pronounced with an inspiration and expiration respectively, the former being necessarily accompanied with a raising, the latter with a depression,

of the head. When we name the *mouth* or *lips* we use labials; for *tooth* and *tongue*, dentals; for the *nose* and things relating to it, nasal sounds; and this peculiarity is remarkably constant in most languages, civilised and savage. Among the Malay races, for instance, we find such words as *mulut, bawu, mohon, and moda* for mouth; *gigit, nisinin, nigni, and niki* for teeth; and *idong, ugerun* and *usnul*, for nose. So in words for *large* we find a prevalence of broad sounds involving a wide opening of the mouth, as *busar, bākè, bāgut, lāmu, elāmo, ilāhé, erāāmei, aiyuk, māina*—and for *small*, words that are pronounced quickly and with slight opening of the lips, as *kichil, chili, kidi, kōi, roit, kemi, anan, kiiti, fek, didiki*, all taken from languages of the Malay Archipelago.



Dyaks.

These few examples, which might be greatly increased, indicate the variety of ways in which, even now, after all the modifications and development which language has undergone, sound still corresponds to sense; and if the reader will turn to Dr. Farrar's suggestive little work on the "Origin of Language," he will find how wonderfully, by the help of analogy and metaphor, the uses and meanings of simple words and sounds have been indefinitely increased, so as to subserve the growing need of mankind to express more and more complex ideas. Mr. Tylor is rather unfortunate in his illustration of words for the form of which no cause can be assigned, when he says: "There is no apparent reason why the word *go* should not have signified the idea of coming, and the word *come* the idea of going." But, in accordance with the examples already

given, there *is* a very good and sufficient reason. We pronounce *come* with a closure and contraction of the lips and usually during inspiration, *go* with open and protruding lips and usually during expiration. Now many savages point with the lips as we do with the finger, signifying *there*, by protruding the lips in the direction to be indicated; and any one who has seen this curious gesture must be struck with its close similarity to the protrusion of the lips in pronouncing the word *go*. The same difference of the nearly closed or open lips characterises the words for these two ideas in many other languages. In French we have *viens* and *va*, in German *komm* and *geh*, in Italian *vieni* and *vai*, showing that words in distinct languages differing greatly in spelling and pronunciation may yet have a common character in the mode of speaking which indicates their common meaning.

The five following chapters treat of the Arts of Life, a subject which Mr. Tylor has to a great extent made his own, and which he discusses in a very interesting manner. The doctrine of development in the arts is however somewhat strained when it is implied that the modern gun is an outgrowth of the South American or Indian blow-tube; while the origin of bank notes, and the account of the rise and progress of mathematics are hardly anthropology.

The next two chapters discuss the ideas of savage man as to the spirit-world, and the origin and development of myths; while the final chapter gives an admirable sketch of man as a social being, and of the development of that complex organism, Society. This thoughtful chapter cannot be epitomised, but the reader will find in it much curious information as to the sources of many of the customs, laws, and observances of civilised life, which are shown to be often traceable among the lowest savages. The following passage will serve to illustrate the author's style and treatment of his subject:—

"Much of the wrong-doing of the world comes from want of imagination. If the drunkard could see before him the misery of next year with something of the vividness of the present craving, it would overbalance it. Oftentimes in the hottest fury of anger, the sword has been sheathed by him across whose mind has flashed the prophetic picture of the women weeping round the blood-stained corpse. The lower races of men are so wanting in foresight to resist passion and temptation, that the moral balance of a tribe easily goes wrong, while they are rough and wantonly cruel, much as children are cruel to animals through not being able to imagine what the creatures feel. What we now know of savage life will prevent our falling into the fancies of the philosophers of the last century, who set up the 'noble savage' as an actual model of virtue to be imitated by civilised nations. But the reality is quite as instructive, that the laws of virtue and happiness may be found at work in simple forms among tribes who make hatchets of sharpened stones and rub sticks together to kindle fire. Their life, seen at its best, shows with unusual clearness the great principle of moral science, that morality and happiness belong together—in fact that morality is the method of happiness."

The reader who wishes to know what is the outcome of modern research into the nature, characteristics, and early history of man; and into his progress in the arts of life, in morality, and in social economy, will find a store of valuable information and much suggestive remark in this carefully-written but unpretending volume.

ALFRED R. WALLACE

NOTES

WITH regard to the forthcoming session of the American Association in Cincinnati, to begin August 17, we have to add to information already given (p. 146) that all the meetings, general and sectional, will be held under one roof, that of the

Music Hall and Exposition Buildings. On the evening of the first day of meeting there will be a citizens' reception. An afternoon is to be devoted to visiting the Zoological Gardens. An exhibition of scientific apparatus, appliances and collections will be held during the Association meeting. The objects displayed will be kept over for the ninth Cincinnati Industrial Exposition in September. After the adjournment of the Association excursions will be organised on the Cincinnati Southern Railroad, and also, it is hoped, to the Mammoth Cave.

THE Prince of Wales is expected to lay the foundation-stone of the Central Institution of the City and Guilds of London Institute, on Monday next, at 3.30 p.m. His Royal Highness and the Princess of Wales were present at the Lord President's reception on Wednesday night at the South Kensington Museum. Prior to the reception the Prime Minister and several members of the Cabinet visited the Science Schools.

WE regret to announce the deaths of Dr. E. Zaddach, director of the Zoological Museum at Königsberg, who died on June 5 last; of Dr. Wilhelm Gottlob Rosenhauer, Professor of Philosophy at Erlangen University, who died on June 13, aged sixty-eight (on the same day on which Medical Science lost Josef Skoda at Vienna); of Dr. Matthias Jakob Schleiden, the well-known botanist, and author of many works on natural history (amongst which we may point out as standard works "Die Pflanze" and "Das Meer"), who died at Frankfurt on June 23, aged seventy-seven; of Dr. Theodor Benfey, Professor of Philosophy at Göttingen University, a celebrated orientalist and linguist, whose death occurred on June 26 at the age of seventy-two; and of Dr. Rudolf Hermann Lotze, Professor of Philosophy at Berlin University, author of the "Mikrokosmos," who died on July 1, aged sixty-four years.

MESSRS. SIEMENS have received advice of the completion of the new Atlantic cable recently constructed by them. The reports of insulation and working speed are highly satisfactory. The cable connects Sennen Cove, Land's End, with Dover Bay, Nova Scotia, direct, a length of 2500 nautical miles.

M. PASTEUR has received the Grand Cross of the Legion of Honour.

M. WURTZ, the present president of the Academy of Science, has been appointed Life Senator by a very large majority. This highly-approved appointment raises to three the number of members of the Academy of Sciences who now belong to the Upper House of the French Republic; the two others are M. Robin and M. Dupuy de Lome. M. Berthelot, another member of the section of chemistry, has been proposed for a seat which is at present vacant, and his election is considered quite certain. A large number of the French senators belong to the other section of the Institute, which is now taking such a prominent part in French politics. This influence of the Institute was contemplated by M. Thiers, and his views are advocated principally by Mr. Barthélemy St. Hilaire, the Minister for Foreign Affairs and Member of the Academy.

SIXTY French members of the Congress of Electricians have been appointed by M. Cochéry, the Minister of Telegraphs, who has been made President. M. Ferry, Minister of Public Instruction, has been appointed Vice-President, and four other members of the Cabinet will be chosen by the Congress. The Academy of Sciences and other public scientific institutions will appoint their own representatives, as well as foreign nations.

WE have received the sixth report of Mr. Crookes and Professors Odling and Tidy, to the President of the Local Government Board, on the London Water Supply. It relates to the quality of water supplied from May 20 to June 30, and is highly favourable. "The results of our six months' work" (say the authors),