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A QUARTERLY REVIEW OF

DISEASES OF THE NERVOUS SYSTEM, MEDICAL
JURISPRUDENCE AND ANTHROPOLOGY.

EDITED BY

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tleman sent me by Dr. Bradley, of this city. I applied galvanism to the muscles of the tongue and throat for three or four weeks, and it certainly did effect something. The man got so that he could swallow quite well, but the improvement was only temporary, and soon the current ceased to elicit any response. In a few other cases the dysphagia has been mitigated for a time by like means. I am treating Mr. S. here with the galvanic current passed through the brain, and the medulla oblongata, and the Faradaic current to the muscles of the face. He is also taking phosphorus and strychnia. These are the only means that promise to be of any service, and, if a patient insists upon being treated, you may employ them to give him a transient respite or to alleviate his distress.

CONTEMPORARY LITERATURE.

THE writings of Mr. Darwin,¹ though by no means voluminous, have excited a wider interest, and provoked more discussion, than those of any other scientific author of the day. They have also rendered Mr. Darwin's name as widely known as that of science itself, and have gained him many friends and disciples, and not a few zealous opponents. The startling opinions and suggestions put forth in his "Origin of Species," in 1859, took a deep root in the public interest, and brought forth much fruit. It is remarkable, too, that many who at first read only to ridicule, at last became converts to the theories of Mr. Darwin, and warm advocates of the strange doctrines he taught. But even those who totally rejected his doctrines, could not fail to appreciate his wonderful industry, his sincerity, and his constant loyalty to science and truth. His theories were the result of conscientious and laborious investigations, and were never placed in offensive antagonism with the views of his opponents. And now, after more than ten years of study and preparation, he gives to the world his matured thoughts on the intricate problem of the origin of man. For many years the author has been collecting the material we here find so skilfully brought together. "The sole object of the work," we are told in the preface, "is to consider, firstly, whether man, like every other species, is de-

¹ The Descent of Man, and Selection in relation to Sex. By Charles Darwin, M. A., F. R. S., etc. With Illustrations. In two volumes. New York: D. Appleton & Co., 1871.

scended from some preëxisting form; secondly, the manner of his development; and, thirdly, the value of the differences between the so-called races of men." Originality is not claimed for many of the facts stated regarding man, but the author is original in his mode of dealing with them in their relation to other facts regarding the lower animals.

"The Descent of Man" consists of two parts. The first part is entitled the "Descent or Origin of Man," and constitutes about one-fourth of the entire work. The remaining three-fourths, constituting the second part, are devoted to the subject of Sexual Selection, which is treated of in the most elaborate detail.

The argument in regard to the descent of man opens by a comparison of the bodily structure of man with that of the animals below him, showing that man is constructed on the same general plan as other animals, and betrays in many particulars his descent from and close relationship to lower forms. The close similarity of tissue is shown by the liability of man to receive various diseases from the lower animals, and communicate the same to them. Monkeys are said to be subject to many of the diseases common to man, and to be affected in the same manner by medicines. Some tribes of monkeys have a decided appetite for stimulants and narcotics, and readily drink spirituous liquors. They have also been seen to smoke tobacco with evident gratification. These facts prove a similarity in the nervous organization. The similar mode of reproduction, common to all mammals, is also urged as an important feature in the general correspondence. The singular likeness of the human embryo in its successive stages to that of lower animals in more advanced stages is certainly a strong point in favor of Mr. Darwin's views. The existence of useless rudimentary organs is another point. Of this the author says: "Not one of the higher animals can be named which does not bear some part in a rudimentary condition, and man forms no exception to the rule." This interesting subject is more fully discussed by Mr. Darwin in his work on the "Variation of Animals and Plants under Domestication." The rudiment of the pointed ears of man's progenitors is found in "a little blunt point, projecting from the inwardly folded margin or helix." This is not uncommon in the human ear. The author thinks that the wisdom teeth in the more civilized races of men are undergoing a change and tending to become rudimentary. They appear late in life, and at irregular periods; they are much more liable to decay. In the Melanian races the wisdom teeth have three fangs, and seldom decay. The vermiform appendage of the cæcum is the only known rudiment in the alimentary canal. The hook-like process of bone generally

ound near the lower end of the humerus in man is regarded as the homologue and rudiment of the supra-condyloid foramen found in the carnivora. Judging from ancient skeletons this foramen was much more distinctly marked in man in times past than it is at present. The os coccyx is deemed the rudiment of the true tail in lower animals. All these rudiments were possessed, it is supposed, in a perfect state by our progenitors, and either through disuse or natural selection became gradually reduced. These facts, together with the phenomena of development, point to a community of descent, and make that theory so clear to the author, that he says of it: "It is only our natural prejudice and that arrogance which made our forefathers declare that they were descended from demi-gods, which lead us to demur to this conclusion."

In his comparison of the mental powers of man with those of the lower animals, the author admits the difference to be enormous, even between the lowest savage and the most highly-organized ape; yet he feels convinced that the difference is in degree and not in kind. Man possesses the same senses with the lower animals; he has some instincts in common with them, and they are excited by the same emotions as man. Many of the qualities we admire in man are found in others of the higher animals, as courage, good temper, fidelity, maternal affection, kindness. Some kinds of monkeys die of grief on the loss of their young, and in the care of their infants they manifest great tenderness, washing their faces, and driving off the flies that torment them. Even the more intellectual emotions are shared by the animals, as wonder, curiosity, imitation, attention, and memory. The fact that many animals have vivid dreams is considered a proof that they possess some power of imagination. Reason is commonly spoken of as the prerogative of man alone, but Mr. Darwin gives some interesting anecdotes of animals, showing beyond doubt the possession of a certain degree of reason. Therefore he differs from those authors who insist upon separating man, through his mental faculties, by an impassable barrier from all lower animals. The argument that man alone is progressive does not appear to be sustained by facts; it is shown how great has been the improvement in our domestic animals by culture, and among the wild animals the older ones have superior mental faculties to the young; they learn by experience. Articulate language is peculiar to man, but many animals are able to express their feelings and thoughts by a species of language; this has been greatly modified by domestication. The dog, for instance, has learned to bark in five or six distinct tones, each having its own signification. But man, in common with the lower

animals, uses inarticulate cries and gestures to express his meaning. "I cannot doubt," says the author, "that language owes its origin to the imitation and modification, aided by signs and gestures, of various natural sounds, the voices of other animals, and man's own instinctive cries." In this connection the strong tendency of monkeys, idiots, and the barbarous races, to imitation, is thought worthy of notice. It is considered probable that some rather early progenitor of man used his voice largely, as do some of the apes now, in producing musical sounds. As the voice was used more and more, the vocal organs would become strengthened and improved, until they were fitted for speech; and the various emotions would thus come to be expressed by a rude sort of language. Therefore it is argued that the faculty of articulate speech does not offer any insuperable objection to the theory of the development of man from a lower being.

The discussion of self-consciousness, individuality, abstraction, and general ideas, is necessarily brief, owing to the vague definitions attached by different writers to these terms. The author says: "Such faculties could not have been fully developed in man until the mental powers had advanced to a high standard, and this implies the use of a perfect language. No one supposes that one of the lower animals reflects whence he comes or whither he goes—what is death or what is life, and so forth. But can we feel sure that an old dog with an excellent memory, and some power of imagination, as shown by his dreams, never reflects on his past pleasures in the chase? And this would be a form of self-consciousness. On the other hand, as Büchner has remarked, how little can the hard-worked wife of a degraded Australian savage, who uses hardly any abstract words, and cannot count above four, exert her self-consciousness, or reflect on the nature of her own existence?" That animals retain their mental individuality is unquestionable, for their memories survive many complete changes in the atoms of the brain.

The sense of beauty is stated by some writers to be peculiar to man, but Dr. Darwin brings abundant proof that birds and other animals have a high sense of the beautiful in color, and that it has much to do with the courtship and love of many kinds of birds. The most curious instance given is that of the bower-birds of Australia, who build bowers, and decorate them with much taste, solely for the purpose of pleasing their female partners during courtship. There is, also, good reason to believe that birds are gratified by the sweet strains of song poured forth during the same season. "Obviously no animal would be capable of admiring such scenes as the heavens at night, a

beautiful landscape, or refined music; but such high tastes, depending as they do on culture and complex associations, are not enjoyed by barbarians or by uneducated persons."

In regard to the belief in the existence of an Omnipotent God, the author finds no evidence that it was an aboriginal endowment of man. On the contrary, there is ample evidence that many races have existed, and still exist, without any idea of a God or gods. Some sort of religion seems almost universal, but that is often merely a belief in unknown or spiritual agencies, good or evil. Such ideas are the natural offspring of curiosity, wonder, and a partial reasoning power. This belief would easily pass into a belief in one or more gods, as the intellectual and moral faculties advanced. The feeling of religious devotion is a very complex one, depending on both intellectual and moral faculties; yet something approaching this feeling is seen in the strong affection of a dog for his master; and some writers have maintained that the dog looks upon man as a god. It is admitted, however, that, of all the differences between man and the lower animals, the moral sense is by far the most important, and constitutes the noblest attribute of man. This the author considers the legitimate result of the social instincts, leading at first to a sort of selfish morality, which became gradually refined. Abundant proofs are given of the existence of true social instincts among animals, and these social feelings were probably first developed in order that those animals which would profit by living in society, should be induced to live together. "In many cases it is impossible to decide whether certain social instincts have been acquired through natural selection, or are the indirect results of other instincts and faculties." The remarkable instinct which leads some animals to place sentinels around the community has probably been directly acquired. The instincts or impulses that conduced most to the welfare of a class of animals would tend to increase through the influence of natural selection. In connection with the instincts of animals, attention is directed to the conflict between opposing instincts, in which the stronger one prevails, as for instance where a naturally timid bird faces great danger in order to gratify the stronger maternal instinct of protecting her young; and again, when the migratory instinct overpowers the maternal, and induces swallows to desert their young, and leave them to perish in their nests. Here the impulse most beneficial to a species would be rendered the more potent by natural selection, and those which had it most strongly developed would survive in larger numbers. The gradual development in man of the moral feelings is attributed to the activity of the mental facul-

ties, which led him to reflect on past actions and their consequences. "A moral being is one who is capable of comparing his past and future actions or motives, and of approving or disapproving of them. We have no reason to suppose that any of the lower animals have this capacity." The lower impulses are the stronger at the moment when excited, but the higher feelings are more persistent, so that when man has yielded to the former simply to gratify himself at the expense of others, he will afterward feel dissatisfied with himself and resolve to act differently in the future. This is conscience, which looks backward and judges past actions. Man thus acquires self-command, and subordinates his passions and impulses to his social sympathies; and at last perceives that it is best for him to obey his more persistent instincts. "The imperious word *ought* seems merely to imply the consciousness of the existence of a persistent instinct, either innate or partly acquired; serving him as a guide, though liable to be dislodged." The strictly social virtues are supposed to be the result of experience. Tribes and communities could not have held together if there had been no honesty among themselves, or if they had murdered each other with impunity. But these virtues were only relative, and limited to the tribes who practised them. It was wrong to steal from one's own tribe, but to rob or kill an enemy might be deemed a virtue. Virtues which do not obviously affect the welfare of a tribe, as temperance or decency, have never been highly esteemed by savages. According to the author's definition, then, the moral sense is "fundamentally identical with the social instincts." In concluding this subject the author declares positively that the difference in mind between man and the animals, great as it is, is certainly one of degree and not of kind; that all the faculties and emotions of man may be found, though often in an incipient condition, in the animals; that they are capable of a certain development thus gained, and that the improvement may be transmitted to their offspring.

In the chapter on the manner of development of man from a lower form it is shown that man is subject to great variations, both bodily and mental, no two individuals of the same race being quite alike. The diversities in size, in features, in the courses of the arteries, and in the muscles and viscera, are dwelt upon at length, and eminent authorities are quoted to give weight to the author's assertions. The same condition of variability prevails among the lower animals, and especially among those which have been domesticated. The supposed causes of this variability are also considered, a very powerful one being the use or disuse of certain parts, and peculiarities thus induced are transmitted

and become more marked in each succeeding generation. The same rule is well known to apply to mental qualities and aptitudes. The arrest of development seen in the brains of idiots is referred to, and the monkey-like behavior of microcephalous idiots is considered a reversion to the habits of a remote ancestry. So also certain structures peculiar to the lower animals occasionally reappear in man. It is not very unusual to find the uterus partially divided into two organs, as in some of the lower mammals. The malar bone, which in some of the quadrumana consists of two portions, is sometimes found in that condition in adult man. The canine teeth, as far as their proper function is concerned—that of tearing enemies or prey—are considered rudimentary, yet they are implanted by deeper and stronger fangs than the incisors. These teeth are occasionally developed to a great length in man, and it is remarkable that they project largely in the few ancient skulls that have been examined. Mr. Darwin says: “He who rejects with scorn the belief that the shape of his own canines, and their occasional great development in other men, are due to our early progenitors having been provided with these formidable weapons, will probably reveal, by sneering, the line of his descent. For, though he no longer intends, nor has the power, to use these teeth as weapons, he will unconsciously retract his ‘snarling muscles’ (thus named by Sir C. Bell), so as to expose them ready for action, like a dog prepared to fight.” Speaking of variations in the muscular structures, he says: “It is quite incredible that a man should through mere accident abnormally resemble, in no less than seven of his muscles, certain apes, if there had been no genetic connection between them. On the other hand, if man is descended from some ape-like creature, no valid reason can be assigned why certain muscles should not suddenly reappear after an interval of many thousand generations, in the same manner as, with horses, asses, and mules, dark-colored stripes suddenly reappear on the legs and shoulders, after an interval of hundreds, or more probably thousands, of generations.” It is maintained that these reversionary, as well as the strictly rudimentary structures, “reveal the descent of man from some lower form in an unmistakable manner.” The process of conversion from quadruped to biped is rendered clear by reference to the various kinds of monkeys, among whom there exist at present the several gradations between a form of progression strictly like that of a quadruped and that peculiar to a biped. As the progenitors of man became more and more erect, the author argues that the hands and arms became modified for prehensile purposes, and the feet and legs for support and progression. This, again, led to other

modifications, partly from inherited effects, and partly through natural selection, which caused the survival of the best individuals. At the same time the brain must have become largely developed, thus influencing the form of the skull and the supporting spinal column. The absence of tail is not distinctive of man, for those apes which come nearest to man are destitute of this organ; and among those which possess it there is a great diversity in its size and length, though it is not very clear how it has become modified or lost. Mr. Darwin admits that in the earlier editions of his "Origin of Species" he probably exaggerated the power of natural selection in regard to changes of structure. Modifications which are of no service to the race could hardly have been acquired through this means. Touching the objections urged by the Duke of Argyll and others, that man would have diverged from the brute in the direction of greater physical weakness and helplessness, the author believes that such disadvantages would have been more than counterbalanced by the development of the intellectual powers; and even supposing the early progenitors of man more helpless than any existing race of savages, if they had inhabited some warm continent or large island, they would not have been exposed to any special danger. "The competition between tribe and tribe would have been sufficient, under favorable circumstances, to have raised man, through the survival of the fittest, combined with the inherited effects of habit, to his present high position in the organic scale." The intellectual power of man enables him to adapt himself to the most unfavorable circumstances, and to anticipate future events, without the necessity, as in the case of the lower animals, of any marked changes of bodily structure. If, therefore, the intellectual faculties were of so great importance to primeval man and his ape-like progenitors, those faculties would have been advanced through natural selection. The tribes containing the greatest number of intellectual individuals would thus supplant or absorb inferior tribes. The development of the social qualities, leading to unselfishness and a desire for the general good, was also of great advantage to the dominant tribes, and morality has always been an important element of success. Why all races or tribes have not progressed alike in some degree is a question that the author discusses at some length, but it seems difficult to explain very satisfactorily, except by the general admission that progress is not the normal rule in human society. In this regard Mr. Darwin has been commonly misunderstood, for there is nothing in the theories he advances to militate against the possible retrogression of a race placed under unfavorable influences. Indeed, as nations become more and

more civilized, various circumstances incident to civilization tend to counterbalance the advantages due to intellect, such as the protection given to the weak and inferior members of society, and the consequent multiplication of worthless or non-productive individuals. "The reckless, degraded, and often vicious members of society, tend to increase at a quicker rate than the provident and generally virtuous members." Mr. Greg is quoted as saying, in illustration of this point: "The careless, squalid, unambitious Irishman multiplies like rabbits; the frugal, foreseeing, self-respecting, ambitious Scot, stern in his morality, spiritual in his faith, sagacious and disciplined in his intelligence, passes his best years in struggle and celibacy, marries late, and leaves few behind him." On the other hand, there are shown to be counter-checks to this downward tendency, such as the increased mortality among the poor and squalid. It does not appear that corporeal structure, except so far as it leads to vigor of mind, has much to do with success in the struggle of races for supremacy. Natural selection is only one element of success, and instances are not wanting in which individuals and races, having acquired great and indisputable advantages through selection, have perished for lack of other essential qualities which they had not acquired. The remarkable progress of the people of the United States is regarded as the probable result of natural selection, the more energetic, courageous, or restless men from all parts of Europe having emigrated to that country for many generations. Mr. Darwin believes, however, that progress is much more general among all races than retrogression, and that man has risen by slow and interrupted steps from a lowly position to the highest in the scale of created beings. He does *not* believe that man was aboriginally civilized, and then suffered utter degradation, as is maintained by the Duke of Argyll and other opponents of the theories advanced in the "Origin of Species," and elaborated in the volumes before us.

The author then briefly recapitulates his arguments in favor of the origin of man by development from the higher animals, but he does not attempt to describe precisely when or where man first appeared. He thinks it probable that the stock whence man arose inhabited the Old World, and more probably the African Continent; and as to the time when man first became worthy of the name, he thinks it may have been as remote as the Eocene period. The wide gap that exists between man and his nearest allies seems no objection to the belief that man is descended from a lower form, for breaks incessantly occur in all parts of the series, as between the orang and his nearest allies. The gap between man and the ape is growing wider every century, as

savage races die out or are exterminated. The closest link at present is that between the Negro or Australian and the gorilla. At some not very remote period in the future it may be as wide as that between the Caucasian and some ape as low as the baboon. The absence of fossil remains is not deemed of much weight in the argument, for those regions most likely to afford remains connecting man with the apes have not yet been geologically explored. The author hopes, and thinks it probable, that we shall some day be able partially to restore the missing structure of our early "ape-like progenitors," by the aid of rudiments which man retains by reversion, and by the assistance of embryology and morphology. The following is the author's sketch of our ancestors: "The early progenitors of man were no doubt once covered with hair, both sexes having beards; their ears were pointed and capable of movement; and their bodies were provided with a tail, having the proper muscles. Their limbs and bodies were also acted on by many muscles, which now only occasionally reappear, but are normally present in the quadruped. The great artery and nerve of the humerus ran through a supra-condyloid foramen. At this or some earlier period, the intestines gave forth a much larger diverticulum or cæcum than that now existing. The foot, judging from the condition of the great-toe in the fœtus, was then prehensile; and our progenitors, no doubt, were arboreal in their habits, frequenting some warm, forest-clad land. The males were provided with great canine teeth, which served them as formidable weapons." The physical characteristics of man's progenitors at a much earlier period are ingeniously conjectured, and it is made to appear probable that they were aquatic in their habits, the lungs being regarded as a modified swim-bladder. Man is thus traced back to the amphibians, and there is evidently no limit among living beings that may not be reached by the same process of reasoning. Here the author rests to take a brief survey of his work. "Thus," he says, "we have given to man a pedigree of prodigious length, but not, it may be said, of noble quality. The world, it has often been remarked, appears as if it had long been preparing for the advent of man; and this, in one sense, is strictly true, for he owes his birth to a long line of progenitors. If any single link in this chain had never existed, man would not have been exactly what he now is. Unless we wilfully close our eyes, we may, with our present knowledge, approximately recognize our parentage; nor need we feel ashamed of it. The most humble organism is something much higher than the inorganic dust under our feet; and no one with an unbiassed mind can study any living creature, however humble, without being struck with enthusiasm at its marvellous structure and properties."

In a chapter on the origin of the various races of man, the different opinions on that question are separately discussed, the author deeming it probable that all races are descended from a single primitive stock, and that the existing variety has been acquired, since there are in all races many evidences of a common origin; and many habits and traits of character are common to widely-separated portions of mankind. But natural selection is not deemed alone sufficient to account for the very material differences that exist. There remains, however, one important agency to consider, that of sexual selection, to which the latter and larger part of the author's work is devoted. It is not assumed that even this agency will account for all the differences between the races. "An unexplained residuum is left, about which we can in our ignorance only say that, as individuals are continually born with, for instance, heads a little rounder or narrower, and with noses a little longer or shorter, such slight differences might become fixed and uniform, if the unknown agencies which produced them were to act in a more constant manner, aided by long-continued intercrossing."

The principles of sexual selection are simple in themselves, though sufficiently complicated in the details of their operation. As the phrase "survival of the fittest" expresses briefly the law of natural selection, the phrase "propagation of the fittest" would nearly express the law of sexual selection. Superior males predominate over inferior ones in the struggles for the females, and the superior qualities of the successful male are thus transmitted to the progeny. As a general rule, there is a struggle among the males for the females, or else the female exercises some choice of her partner, being influenced by superiority in size, strength, or beauty. In either case the result is a more numerous and powerful offspring from the fortunate male than from his less-favored rival, and the augmentation in successive generations of the peculiarities of the male. Hence arose, according to Mr. Darwin, various weapons of offence or defence, which, in their earliest rudiments, gave the male some advantage over other males destitute of such organs. "In the same manner as man can improve the breed of his game-cocks by the selection of those birds which are victorious in the cockpit, so it appears that the strongest and most vigorous males, or those provided with the best weapons, have prevailed under nature, and have led to the improvement of the natural breed or species." It is pointed out that the slightest variation, if in any degree advantageous, would suffice for the work of natural selection. So also any variation in color or other quality of the male, which led to a preference by the female, would be continually increased. This supposes a certain faculty of dis-

crimination on the part of the female, and this is proved to exist among very many animals. In many cases the males are superior in numbers to the females, but this is not necessary to the success of the principle of natural selection. Much pains is taken to demonstrate the fact that courtship among certain animals, especially birds, is by no means a short or simple affair; and even when a certain male has vanquished his rival he may still be rejected by the female on account of some quality distasteful to her. The singular fact appears in the course of these investigations, that many animals which are strictly monogamous in their wild state, as the duck, become polygamists under domestication. But, whatever the habits of animals in this respect, the less vigorous males often fail to obtain partners, or else obtain less vigorous females and leave no offspring. The laws of inheritance in their bearings on sexual selection receive a lengthy consideration, in which many points favorable to the author's theories are set forth. The number of cases quoted, and of observations digested and utilized in the course of their arguments, furnish abundant proof of the immense labor that has been expended in this direction by Mr. Darwin. Several chapters are devoted to insects alone, showing the process of development of the various forms and colors under the influence of sexual selection. The vertebrates come next in order, and furnish many arguments to the ingenious author, whose points are admirably illustrated by the aid of drawings. Nearly two hundred pages are devoted to the consideration of birds and their peculiarities, in which it is shown that these bipeds are highly pugnacious during the breeding-season, and often possess formidable weapons for fighting. But, in addition to these, the males are furnished with special means for pleasing the females, sometimes by vocal sounds, as songs, calls, and cries; and sometimes with elegant decorations, including the most gorgeous ornamentation to be found in nature. These ornaments must be of vast importance, as they are often gained at the expense of the power of fighting, and even of convenient progression. The decorations are also more brilliant and attractive during the season of breeding, and are sedulously displayed before the females. To suppose all this display lost upon the female appears to the author incredible, and he demonstrates very satisfactorily that birds have often very fine taste and a high appreciation of colors and sounds. If this is admitted, the author sees no difficulty in perceiving how the points of attraction may be modified through sexual selection. It appears to us, however, that the marvellously regular beauties of some of the feathered tribes cannot be clearly accounted for by the operation, through any conceivable length of time, of a pro-

ness so nearly akin to what we call accident. It is not difficult to imagine the development of weapons and other organs of use in this manner, but the production of an artistic beauty that challenges the admiration of cultivated man can hardly be fairly attributed to the capricious tastes of a multitude of birds, which, though it might result in beauty, would be very likely to produce almost as many varieties of the beautiful as of individual tastes. The author, however, comes to the conclusion that "weapons for battle, organs for producing sound, ornaments of various kinds, bright and conspicuous colors, have generally been acquired by the males through variation and sexual selection, and have been transmitted in various ways according to the several laws of inheritance—the females and the young being left comparatively but little modified."

Proceeding to the discussion of sexual selection in mammals, it is shown that the male succeeds more through the law of battle than by the display of personal charms. Even animals naturally timid become courageous, and engage in desperate conflicts during the breeding-season, often severely injuring and sometimes killing each other. The males of wild animals very commonly show scars and other evidences of injuries thus received. In this connection a detailed account is given of the various weapons of offence and defence possessed by the larger mammals, with theories regarding their origin and mode of development, and their employment in warfare. It is maintained, however, that the preference of the female has also much influence in the pairing of mammals, and some curious and convincing instances of female choice among wild animals are given. The taste and antipathies shown by dogs and other domesticated animals are well known, though we are ignorant of the particular qualities that are most alluring to the females. The males of most animals are furnished with larger and stronger vocal organs than the females, and the voice is used very commonly in courtship. It is probable also that the glands of certain animals which emit a powerful odor are of service in attracting the females, besides being of use as a means of protection or offence. The development of these glands or sacs is checked by castration, and the secretion is often changed in character during the breeding-season. The growth and peculiarities of the hair are regarded in many cases as ornamental, conducing to the attraction of the sexes. As to the taste which would be attracted by the grotesque varieties of coloring in some of the animals, particularly the monkeys, the author thinks it merely necessary to allude to the absurd deformities which are admired by savages, and the gaudy patches of paint that are regarded by them

as eminently attractive and beautiful. In many cases, however, the color of the hair of animals is evidently due to natural selection, and serves purposes of protection from other animals, as do the green colors of certain birds and insects that assimilate them to the foliage in which they conceal themselves. The very strange colors of the hair on the face and head of some varieties of the monkey, Mr. Darwin believes to have been acquired through sexual selection. The rule appears to hold good among animals generally, that the darker and stronger colors, and more marked contrasts, belong to the male sex, and are most pronounced at and during the period of masculine vigor.

Coming at last to man, as the highest in the scale of created beings, the author gives a brief sketch of the differences between the sexes, physically and mentally, showing that they differ more than most species of the quadrumana. The points of difference are essentially the same in man and other of the higher animals. The male is larger, stronger, bolder, more energetic, and the brain is absolutely larger. Whether the brain in man is relatively larger has not been definitely ascertained. The same laws of battle, applied to man in times past, apply to-day to savages, as have been seen to exist among the animals, women being the constant cause of war. "There can be no doubt that the greater size and strength of man, in comparison with woman, together with his broader shoulders, more developed muscles, rugged outline of body, his greater courage and pugnacity, are all due in chief part to inheritance from some early male progenitor, who, like the existing anthropoid apes, was thus characterized." The strongest and boldest succeeded best in obtaining wives, and left the largest number of offspring. With regard to the mental differences between the sexes, woman differs markedly in tenderness and unselfishness. Having displayed these qualities toward her infants, she has strengthened them, and naturally extends them to her other fellow-creatures. The rapid perception and powers of intuition peculiar to woman are faculties characteristic of the lower races and of a lower stage of civilization. "The chief distinction in the intellectual powers of the two sexes is shown by man attaining to a higher eminence, in whatever he takes up, than woman can attain—whether requiring deep thought, reason, or imagination, or merely the use of the senses and hands. If two lists were made of the most eminent men and women, in poetry, painting, sculpture, music—comprising composition and performance, history, science, and philosophy, with half a dozen names under each subject, the two lists would not bear comparison." It is therefore assumed that the average standard of mental power in man is greater than that

of woman. This superiority is attributed to the transmission chiefly to the male offspring of the qualities that have been developed, through long generations, in the sex that had to bear the greater part of the struggle for existence. But the law of equal transmission to both sexes having commonly prevailed among mammals, the difference between man and woman is comparatively small. Had the law been otherwise, "it is probable that man would have become as superior in mental endowment to woman, as the peacock is in ornamental plumage to the peahen." A comparison is drawn between the vocal organs of man and woman. The sweetness of woman's voice may perhaps point to its early acquirement by woman as an attraction to the other sex. Indeed, according to the author's views, it seems probable that the vocal organs in both sexes were primarily used and perfected with direct relation to the propagation of the species. Insects, fishes, birds, and nearly all animals, produce some sound, and it is generally used during the season of courtship. Many animals show a decided fondness for musical sounds, and all savages indulge in a species of rude music.

The chapter on the influence of beauty in determining the marriages of mankind is especially interesting, as showing the vast differences in taste that characterize different races of man. The love of beauty, or what is so considered, appears to be universal. All races practise some arts of personal adornment supposed to add to their beauty; and by some savages great pains are taken to conform to the popular standard. Some shave the hair off, and others allow it to grow to a great length. The natives of the Upper Nile knock out the four front teeth, that they may not look like dogs. The face and other parts of the body are sometimes frightfully mutilated in the name of beauty. The curious sameness in many of the rude habits that prevail in remote and distinct nations indicates, the author thinks, a close similarity in the mind of man, and not the origin of all races from a common source. It is shown that each race takes a delight in the exaggeration of the qualities with which it is endowed by Nature. Beardless races pluck out every hair, while races having long beards carefully cultivate them. There appears to be no absolute standard of beauty, but each race prefers the form it is most accustomed to behold. There is reason to believe that types of superior beauty have arisen from the intermarriage of different races. The principal causes that would interfere with sexual selection are briefly enumerated, among them communism, or promiscuous intercourse; but, so long as choice is exerted before the parents unite, it is made clear that, as far as sexual selection is concerned, it matters not whether the union is temporary

or permanent. The habit of marriage is admittedly obscure in its origin, but the author is very loath to believe that promiscuous intercourse has prevailed at any period when man deserved his name. "Man," says Mr. Darwin, "as I have attempted to show, is certainly descended from some ape-like creature." Now, it is shown that many species of monkeys are strictly monogamous, while others live in separate families; and still others in bands, having each one male as their chief. The latter is looked upon as the probable condition of the earliest men and women. Among savages to-day some of the lowest tribes are monogamous, but polygamy is the rule. An intelligent Kandyan chief "was perfectly scandalized at the utter barbarism of living with only one wife," which he said was "just like the Wanderoo monkeys." Among the most curious of savage tastes regarding beauty is the fancy of Hottentot men for women in whom "the posterior part of the body projects in a wonderful manner." These extraordinary men are said to choose their wives by seating the women in a row and selecting the one who projects farthest *a tergo*. The blackness of the skin of the negro the author believes may reasonably be attributed to sexual selection, since the negroes admire their own color, and as the males of all mammals, where there is any difference in color, are darker than the females.

It is frankly admitted by Mr. Darwin that the views he advances regarding the part which sexual selection has played in the history of man lack scientific precision; but he believes that further investigation will confirm them in the main, and that "of all the causes that have led to the differences in external appearance between the races of man and to a certain extent between man and the lower animals, sexual selection has been by far the most efficient."

The grand object of the author throughout the two volumes before us is to demonstrate the fact that man is descended from a less highly-organized form of being. To this end all his facts and arguments are steadily directed, and, though he admits that many of his views are "highly speculative," it cannot be denied that the weight of evidence and probability favors the theory of development. The strongest arguments of Mr. Darwin are based on the well-known and remarkable similarity between man and the lower animals in embryonic development, upon similarity in structure and constitution, and upon the rudiments which man retains of extinct organs found in perfection lower in the scale. These are striking facts that cannot be ignored. But it is not so easy to believe with Mr. Darwin that all the vast difference, intellectually and morally, between man and his brute brethren can be

accounted for by development alone. That there are many difficulties and mysteries connected with the origin of man, even in the light of Mr. Darwin's theories, is candidly admitted by Mr. Darwin himself, who fully expects that some of his speculations will be found erroneous; but he has given the evidence, as he says, to the best of his ability, and without any desire to draw unwarrantable conclusions. Anticipating the repugnance that some persons must feel toward a system that endeavors to demonstrate the kinship of man and brute, the author declares that he would as soon be descended from a brave and affectionate monkey as from a cruel and blood-thirsty savage. The religious bearings of Mr. Darwin's views are foreign to the argument, but they need not alarm the enlightened Christian, albeit they demand some sacrifice of the pride man feels in finding himself at the summit of the scale of created beings. The fact of his having risen to that position, says Mr. Darwin in his concluding chapter, instead of having been aboriginally placed there, "may give him hopes for a still higher destiny in the future."

This pamphlet¹ is one of the first-fruits of the change made in the by-laws of our State Medical Society, at its last meeting, by which members are permitted to publish papers, read by them before the Society, in advance of their publication in the Transactions. There may be sufficient reason for the long delay in publishing these Transactions, but the change in the by-laws was imperatively called for. Medical writings do not, like wines, gain in value by keeping, and no writer can afford to wait from one to two years for the appearance of his paper. The volume of Transactions for 1870 is now more than a year overdue. When that for the current year may be expected, it would, of course, be quite useless to conjecture.

It is a little curious that, at the time when the tendency to divide medicine into specialties had become most marked, the first important efforts were made to bring a specialty which had long stood apart into closer relations with medical study and practice. The leaders of this movement found the general practitioner almost entirely unacquainted with mental disorders, and his knowledge of cases often limited to the formalities necessary for a commitment to an asylum. As it is well understood that, whatever can be done for insane patients by medicines,

¹ The Dependence of Insanity on Physical Disease. By John P. Gray, M. D., Superintendent of the New York State Lunatic Asylum. Read before the Medical Society of the State of New York, at its annual meeting, February, 1871. Utica, 1871.