

Marx Hardy Machiavelli Joyce Austen  
Defoe Abbot Melville Montaigne Cooper Emerson Hugo  
Stoker Wilde Christie Maupassant Haggard Chesterton Molière Eliot Grimm  
Garnett Engels Byron Schiller  
Goethe Hawthorne Smith Kafka  
Cotton Dostoyevsky Hall  
Baum Henry Kipling Doyle Willis  
Leslie Dumas Flaubert Nietzsche Turgenev Balzac  
Stockton Vatsyayana Crane  
Burroughs Verne  
Curtis Tocqueville Gogol Busch  
Homer Tolstoy Whitman  
Darwin Thoreau Twain  
Potter Zola Lawrence Dickens Plato Scott  
Kant Freud Jowett Stevenson Andersen Burton Harte  
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# **Man And His Ancestor A Study In Evolution**

Charles Morris

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# MAN AND HIS ANCESTOR

*A STUDY IN EVOLUTION*

BY

CHARLES MORRIS

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OF ITS ELEMENTS," "THE ARYAN RACE," ETC.

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## PREFACE

It would be difficult to find any intelligent person in this age of the world who has not some theory or opinion in regard to the origin of man, and perhaps almost as difficult to find any such person who can give a good and sufficient reason for the faith that is in him. This is especially the case with those who look upon man as a product of evolution, a natural outgrowth from the world of lower life, since here simple faith or ancient authority is not sufficient, as in the creation hypothesis, but scientific evidence and logical argument are necessary. It is to enable this class of readers to test the quality and sufficiency of their belief that this book has been prepared.

The question of the evolutionary origin of man has been by no means neglected by recent authors, yet it has been dealt with chiefly as a side issue in works of a more extended purpose, and largely in technical language, simple to the scientist, but difficult to the general reader. The only work that makes this subject its leading theme, Darwin's "Descent of Man," adds to it a still longer treatise on "Sexual [vi] Selection," so that the subject of man's evolutionary origin cannot be said to have been yet dealt with for itself alone. Darwin's work, moreover, is now nearly thirty years old, and to this extent antiquated, while at best it cannot be considered as well suited for general reading.

These considerations have given rise to the present work, in which an effort has been made to present the subject of man's origin in a popular manner, to dwell on the various significant facts that have been discovered since Darwin's time, and to offer certain lines of evidence never before presented in this connection, and which seem to add much strength to the general argument.

The subject is one of such widespread interest as to make it probable that a plain and brief presentation of it will be acceptable, both to enable those who are evolutionists in principle to learn on what grounds their acceptance of this phase of evolution stands, and to aid those who are at sea on the whole subject of man's origin to reach some fixed conclusion. For these purposes this little book has been set afloat, with the hope that it may carry some doubters to

solid land and teach some believers the fundamental elements of their faith.

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# MAN AND HIS ANCESTOR

## I

### EVOLUTION VERSUS CREATION

In any consideration of the origin of man we are necessarily restricted to two views: one, that he is the outcome of a development from the lower animals; the other, that he came into existence through direct creation. No third mode of origin can be conceived, and we may safely confine ourselves to a review of these two claims. They are the opposites of each other in every particular. The creation doctrine is as old almost as thinking man; the evolutionary doctrine belongs in effect to our own generation. The former is not open to evidence; the latter depends solely upon evidence. The former is based on authority; the latter on investigation. The doctrine of direct creation can merely be asserted, it cannot be argued; the statement once made, there is nothing more to be said; it is an *ipse dixit* pure and simple. The doctrine of evolution, on the contrary, founded as it must be on ascertained facts, is fully open to argument, and depends for its [2] acceptance on the strength and validity of the evidence in its favor.

If the doctrine of the direct creation of man had been originally presented in our own day, proof of the assertion would have been at once demanded, and the only evidence admissible would have been that of witnesses of the act of creation. There could, of course, have been no human witnesses, as there would have been no preceding human beings, and witnesses not human have, in the present day, no standing in our courts. As the case stands, however, the doctrine arose in an age when man did not trouble himself about evidence, but was content to accept his opinions on authority; and this, strangely enough, is held by many to be a strong point in its favor, it gaining, in their minds, authenticity from antiquity. It is claimed, indeed, to be sustained by divine authority, but this is a claim that has no warrant in the words of the statement itself, and one to which no form of words could give warrant. To establish it, direct and incontestable evidence from the creative power itself

would be necessary, and it need scarcely be said that no such evidence exists. It is not easy, indeed, to conceive what form such evidence could take. It would certainly need to be something far more convincing than a statement in a book.

It might have been better for civilized mankind if the opening pages of Genesis had never been written, since they have played a potent part in [3] checking the development of thought. As the case now stands, the cosmological doctrines they contain can no longer claim even a shadow of divine authority, since they have been distinctly traced back to a human origin. It has been recently discovered that they are simply a restatement of the Babylonian cosmology, as given in a literary production ages older than the Bible, an epic poem of very remote date. They are, doubtless, an outgrowth of the cosmological ideas of early man, and those who accept them must do so on the basis of belief in their probability; it is no longer permissible to claim for them the warrant of divine origin.

Modern science stringently demands facts in support of any assertion, the word "faith" having no place in its lexicon. Facts are absolutely and necessarily wanting in support of the creation doctrine, and the only argument its advocates can advance is one that deals in negatives, and demands its acceptance on the ground that the opposite doctrine has not been proved. Such an argument is valueless. Disproof of one statement is never proof of another. Its effect is simply to leave both unproved, and neither, therefore, in condition for acceptance. In the present case the weight of disproof is small. The facts in support of the evolution hypothesis are multitudinous, and many of them of great cogency; the facts against it are few, and none of them absolute. It is simply [4] argued that some questions remain unsolved, and that there are facts which seem inconsistent with the Darwinian theory of development, and which no supplementary hypotheses have explained. But no advocates of evolution hold that the Darwinian theory is final. Evolution is a growing doctrine. It has been expanding ever since it was first promulgated. Various seeming difficulties have been explained away, and it is quite possible that all may disappear as investigation widens. No such arguments add any weight to the opposite view, which has not and never could have any standing in science, since it is impossible to adduce any facts to sustain it. We shall therefore

dismiss it from further consideration, and proceed to state certain general facts in favor of the evolutionary hypothesis of the origin of man.

[5]



## II

### VESTIGES OF MAN'S ANCESTRY

When, some centuries ago, men began to find fossil remains of animals in the rocks, a severe shock was given to the prevailing doctrine of the recent creation of the earth. The adherents of the old theology made strenuous efforts to explain away this unwelcome circumstance. The shells found had been dropped by pilgrims on their way to Jerusalem; they were mineral simulations of shells; they had been created by the Deity and placed where found; they were anything but what they appeared to be, the existing evidences of a long ancient period of animal life reaching back very far beyond the assumed date of creation.

It need scarcely be said that these explanations, especially the one that God had created fossil forms to deceive man, for some incomprehensible purpose, could not long be maintained. Some of them were inconsistent with the facts, others with common sense, and in due time it was everywhere admitted that the earth is of remote duration and has been inhabited by animals and plants for untold ages. Its structure revealed its history; its annals were found to be written in the rocks; its anatomy was full of the evidences of its origin.

[6] When, not many years ago, men began to find the fossil remains of ancient structures in the body of man himself, theology was brought face to face with a problem as difficult to explain, from its special point of view, as that of the fossils in the rocks. As the latter had threatened and finally disproved the doctrine of the special creation of the earth, so the former assailed the doctrine of the special creation of man, and annihilated it in the minds of many eminent scientists. It formed a prominent argument in favor of the theory of organic evolution, and as such calls for consideration here, as a suitable groundwork for our special theme.

The structures referred to may justly be called fossil, since they present strong evidence of being the useless remains of structures which played an active part in the bodies of some former animals. A significant example of this exists in the vermiform appendix, a nar-

row, blind tube descending from the cæcum of man, and detrimental instead of useful, since it is the seat of the frequently fatal disease known as appendicitis. This tube, usually from three to six inches long and of the thickness of a goose quill, is occasionally absent in man, occasionally of considerable size. It is quite large, as compared with the other intestines, in the human embryo, but ceases to grow after a certain stage of development. The cæcum is extremely long in some of the lower vegetable-eating animals, and the vermiform appendix seems to be a rudiment of the [7] formerly extended portion of this organ. It is large in the anthropoid apes, especially in the orang, in which it is very long and spirally convoluted. Its survival in man as a useless and dangerous aborted organ is a powerful argument in favor of his descent from the lower animals.

In the brain of man and many of the lower vertebrates, hanging by two peduncles, or strands of nerve fibre, from the thalami, or beds of the optic nerve, is a small rounded or heart-shaped body of about the size of a pea, known as the pineal gland. It is so destitute of any evident function that Descartes, in lack of any more probable explanation of its presence, ascribed to it the noble duty of serving as the seat of the soul. Late research has been more successful in tracking this organ to its lair. It is larger in the embryo than in the adult man, still larger in some lower vertebrates, and in certain lizards has been found to exist as an eye, its parts plainly distinguishable under the microscope. It is placed in the middle of the forehead, between the other eyes, and was no doubt an active organ of vision in some ancient batrachians.

The pineal eye, as it is now named, once useful, long useless, has persisted as a fossil structure through a far extended line of development. No more convincing evidence that man gained his body through descent from the lower animals could be asked for than the survival in the human [8] brain of this wonderfully significant remnant of a formerly useful organ. Like various other vestiges of ancient organs, it is not only useless but detrimental. It occasionally enlarges and becomes the seat of large and complicated tumors, which may cause death by their compression of the brain.

Two other structures common to most of the vertebrate animals exist in man, though they render him little or no service. These are the thymus and thyroid glands, apparently vestigial structures. The thymus gland attains a considerable development in the embryo and shrinks away to the merest vestige in the adult. It begins to form early in the embryo life as an epithelial ingrowth from the throat, and extends from the neck into the chest. It continues to grow after birth, but later begins to shrink and nearly disappears in the adult.

The thyroid gland has a somewhat similar origin, it beginning as an ingrowth from the lower section of the pharynx and extending down to the lower part of the neck. It subsequently loses its connection with the pharynx, and in adult life is a bilobed structure on either side of the windpipe. Like the thymus it is a ductless gland, abundantly supplied with blood-vessels, and possesses a vast number of small cavities, lined with cells and containing an insoluble jelly. So far as appears, both these glands are useless, or nearly so, to man; or if the thyroid performs any useful service it is a [9] minor and obscure one. Such functions as it may have could probably be performed by some of the other organs, while it is positively detrimental as the seat of goitre. This unsightly disease is due to its enlargement, either by a great increase of its blood-vessels or a development of the capsules and increase of their contained jelly. Dr. S. V. Clevenger considers these organs to have had a branchial or respiratory origin, saying that there are many reasons for believing them to be rudimentary gills. Owen says that the thymus appears in vertebrates with the establishment of the lung as the main or exclusive respiratory organ. It is wanting in all fishes, also in the gill-bearing batrachians, siren and proteus. The thyroid appears in fishes, and Gegenbaur believes that it may have been a useful organ to the Tunicata in their former state of existence.

Dr. Clevenger, in the *American Naturalist* for January, 1884, points out another curious structure in man, whose significance does not seem to have been previously observed. This is a strange and striking fact relating to the formation of the veins. It is well known that these organs possess valves, which permit the free upward flow of the blood toward the heart, but resist its descent through the action of gravity, in this way aiding its return from the extremities. The

rule holds good throughout the quadrupeds that the vertical veins possess valves, while they are absent from the horizontal [10] veins, in which they would be of no utility. But the singular fact exists that in the human trunk the valves occur in the horizontal and are absent from the vertical veins. In other words, they exist where they are useless for their apparent purpose and are absent where they would be useful.

The only conclusion that can reasonably be drawn from this strange fact is that we are here dealing with a fossilized structure, a functionless survival. It leads irresistibly to the inference that man has descended from a quadruped ancestor, and that when his body took the upright position the structure of the veins, not being seriously detrimental, remained unchanged. Those which had been vertical became horizontal, and retained their now useless valves; those which had been horizontal became vertical, and remained destitute of valves. The veins of the arms and legs, vertical in both forms, retained their valves.

Dr. Cleverger points out that the intercostal veins, which carry blood almost horizontally backward to the azygos veins and which would run vertically upward in quadrupeds, possess valves. These are not only useless to man, but when he lies upon his back they are an actual hindrance to the free flow of the blood. In like manner, the inferior thyroid veins, whose blood flows into the innominate, are obstructed by valves at the point of junction.

[11] We quote from him as follows: "There are two pairs of valves in the external jugular and one pair in the internal jugular, but in recognition of their uselessness they do not prevent regurgitation of blood nor liquids from passing upward. An apparent anomaly exists in the absence of valves from parts where they are most needed, as in the *venæ cavæ*, spinal, iliac, hæmorrhoidal, and portal. The azygos veins have imperfect valves. Place men upon 'all fours' and the law governing the presence and absence of valves is at once apparent, applicable, so far as I have been able to ascertain, to all quadrupedal and quadrumanous animals: *Dorsal veins are valved; cephalad, ventrad, and caudad veins have no valves.*"

Of the few exceptions to this rule, he considers the valves of the jugular veins as in process of becoming obsolete, and the rudimen-

tary azygos valves as a recent development. Valves in the hæmorrhoidal veins would be out of place in quadrupeds, but their absence in man is a serious defect in his organization, since the resulting engorgement of blood gives rise to the distressing disease known as piles. The presence of valves would obviate this.

No one can argue that this useless and, to some extent, injurious condition is a designed result of creation. There could not, indeed, be stronger evidence that man has descended from a quadruped ancestor. Dr. Clevenger points out other serious [12] results of the upright position of the body, from which quadrupeds are free. One of these is the liability to inguinal hernia, or rupture, which leads to much suffering and frequent death in man. Prolapsis uteri is another, and a third to which he particularly alludes is difficulty in parturition.

It has been suggested above that the thyroid gland may possibly be of some minor functional importance, and that the thymus is developed in the embryo sufficiently to be functional. As regards the latter, no one is likely to maintain that an act of direct creation would include the production of an organ of some slight and obscure utility to the embryo and useless in later life. The strong probability is that this gland belongs in the same category with other embryonic survivals yet to be pointed out. As regards the seeming function of the thyroid, it may be said that the surviving relic of an ancient functional organ is quite capable of varying in structure and taking upon itself a new function, of minor value, which in its absence would be left undone or be performed by some of the other organs.

A highly interesting example of this exists in the swim-bladder of the fish, which there is good reason to believe is a survival of an ancient structure used for quite a different purpose. It was originally developed, in the opinion of the writer, [1] [13] as an air-breathing organ, in a very ancient semi-amphibious class of fishes, from which the existing bony fishes have descended. When the latter resumed the gill-breathing habit, this organ lost its original function, and its subsequent history is a curious and significant one. In some modern fishes it has quite disappeared. In others it exists as a minute and useless remnant, no larger than a pea. In many it has

been converted into the swim-bladder, and in this form serves a useful purpose, but varies very greatly in shape and size. Finally, in a few instances, it retains some measure of its probably original function of air-breathing. It is a fact of much significance, that those fishes without a swim-bladder do not seem to be at any disadvantage from its absence, but are able to make their way vertically through the water quite as well as those which possess this organ. The presumption, therefore, is that it is of little utility to the fish, and that its employment for this purpose is a mere resultant of its survival and character. Such an organ could never have been evolved as an aid in swimming, since its shrinkage to a useless rudiment in some cases and its complete extinction in others show that this function is in no sense a necessary one. It is there and has lost its old use, and is, in some cases, adapted to another purpose; that is all that can be said.

Man is the one hairless mammal, — or hairless [14] except on a few parts of his body. Yet the whole body is covered with a thin growth of hair, useless for any purpose of protection, and only explainable as a survival from the mammalian covering. The occasional considerable development of the hair is an indication pointing to such an origin. This applies not only to individuals, but to tribes or races, as in the instances of the Ainos of Japan and some of the Pygmies of Africa. The disappearance of the hair in man has been traced to no well established cause. Darwin's view that it may have been a result of sexual selection seems the most probable explanation. Certainly this is the case with the beard, whose absence in women shows it to be of no utility, and whose presence in man is in accord with the many structures in male animals apparently due to this form of selection.

Darwin has pointed out and explained a very curious peculiarity of the hair in man, which is absolutely inexplicable except on the theory of descent. This is the fact that the hairs on man's arms are directed toward the elbow from above and below, thus growing in opposite directions on the upper and lower arms. The same peculiarity exists in the larger anthropoid apes and in some of the gibbons, but is not found in the lower mammals. In the apes it is believed to be due to the habit of protecting the head from rain by covering it with the hands, the hairs turning so that the rain can run

downward freely in both directions toward [15] the bent elbow. This is so useless in man that it can be explained only as a survival.

There are some other survivals in man of ancient structures to which a passing allusion must suffice. In man's eye is a minute membrane, the semilunar fold, which is absolutely useless in his economy. There is every reason to believe that this is the rudiment of a membrane which is fully developed in many animals, and is especially useful to birds, the nictitating membrane, or third eyelid. Again, the muscles which move the skin in many animals, especially in horses, have left inactive remnants in many parts of the human body. These are normally active only in the forehead, where they serve to lift the eyebrows, but they occasionally become active elsewhere. Thus there are some persons who can move the skin of the scalp. Darwin cites some who could throw heavy books from the head in this manner. The same may be said of the rudimentary muscles of the ear. There are persons who can move their ears in the same way as is done by the lower animals. Again, the whole external ear may be looked upon as a rudimentary structure, since it does not appear to aid the hearing in man. As regards the pointed ear of man's probable ancestor, Darwin calls attention to what seems a trace in man of the lost tip.

Carrying this consideration farther, it may be asked, Of what use are the five toes to man? Would not a solid foot have answered the purpose [16] of walking quite as well? But as survivals their presence is fully accounted for, since they are indispensable to many of the lower animals. Question may also be made of the utility of the large number of bones in the wrist and heel of man. Equal flexibility of the joint could certainly have been obtained with a smaller number of bones. It is only when these are traced back to their probable origin in the walking organs of the fish ancestor of the batrachians that their presence becomes explainable. They are apparently survivals of a very ancient structure, originated for swimming, and adapted to walking.

As regards the wrist of man, a curious prediction that a certain bone found in some of the lower animals, the *os centrale*, would be found in man has been made and verified, it being discovered as a very small rudiment in the human embryo. The tail, so common a

feature in the lower animals, but absent from the higher apes and from man, has not vanished without leaving its traces. In the human embryo it is plainly indicated; and while it vanishes in man beyond the embryo stage, it is simply hidden beneath the skin, where its vertebrae are still apparent, usually three, sometimes four or five, in number. In addition to this, the muscles which move the tail have left traces of their presence, which not infrequently develop into true muscles.

In the human embryo, indeed, we find ourselves [17] in the midst of highly significant indications of man's origin. The body of man passes in its early development through a series of stages, in each of which it resembles the mature or the embryo state of certain animals lower in the stage of existence. It begins its existence as a simple cell, analogous in form to the amoeba, one of the lowest living creatures, and later assumes the gastrula form supposed to have been that of the earliest many-celled animals. From this state it progresses by successive stages, each of which has some relation in form to a lower class.

The most significant of these is that in which the embryo is closely assimilated to the fish, by the possession of gill slits. There are four of these openings in the neck of the human foetus, and they are at times so persistent that children have been born with them still open, so that fluids taken in at the mouth could trickle out at the neck, the opening being sufficient to admit a thin probe. [2] These slits are utilized in the developing embryo, one of them being devoted to an important duty, that of conversion into the external and middle ear. Thus the opening for hearing is an adaptation of what was once an opening for breathing. Occasionally an ear-like outgrowth appears on the neck, indicative of the attempt of a second slit to develop into an ear. The purpose of the gill slits is made more apparent by the [18] presence in the embryo of gill arches of the blood-vessels, like those normal to the fish. These disappear in common with the slits.

The temporary appearance of these gill slits is the strongest evidence that could well be demanded that the human embryo passes through the various stages which the adult has assumed in its long development in past time, and that one of these stages was the fish.