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See Announcement page XII.

10 827



**PROFESSOR ELIE METCHNIKOFF**

The distinguished Russian scientist, who, as a member of the Pasteur Institute in Paris, has attracted world-wide attention to his theories as to the causes of death and the prolongation of human life. Professor Metchnikoff's latest paper on these subjects appears in this number.

10.824

# THE STING OF DEATH

THE SLOW GROWTH AND PREMATURE DECAY OF MAN—THE BLUNDERS OF NATURE AND THE RELICS OF APEHOOD—SHALL WE CONQUER THE PAINS OF DEATH?

BY ELIE METCHNIKOFF



*We are enabled to place before our readers these striking extracts from a new study of the causes of death and the prolongation of life by the kindness of Professor Metchnikoff, who writes: C'est avec le plus grand plaisir que je vous autorise de publier ma conférence de Stuttgart dans votre journal, THE WORLD'S WORK [EDITOR]*

**J**EAN JACQUES ROUSSEAU started his "Emile" with the following words: "All that emanates from the hands of the Creator is good, but everything in the hands of man degenerates." To-day we can assert exactly the reverse and say: "Man is by nature badly designed for life, and culture alone permits him to become better." To prove this statement it is necessary, first of all, to consider the origin of human nature.

At the present time we must regard it as an established fact that man is of animal origin, and that he has sprung from some kind of ape. This conclusion laid down fifty years ago has made gradual progress, despite the strongest reluctance on the part of the people to share this theory. The Darwin Centenary celebrations lately held at Cambridge are a pertinent comment in this connection.

When Darwin made public his doctrine of the origin of species, which showed that man is an offspring of an animal form or species, many voices were loudly raised against him. The University of Cambridge, where Darwin spent some time as a student of theology, and where the theological Faculty occupied a most prominent position, declined to recognise Darwin's theory. For many years this negative attitude was maintained, and only during recent years has the matter assumed a different aspect.

Several months ago the University of Cambridge invited scientists from all over the world for the purpose of celebrating the hundredth anniversary of Darwin's birthday, and the fiftieth anniversary of the day of publication of his capital work. This jubilee was a remarkable success.

The recognised representatives of science and of all noble human endeavour in every leading country, who met last June at Cambridge, proclaimed Darwin's theory of the origin of organisms, among them that of man, a well-established fact.

The attitude of the Cambridge University in this respect may be regarded as a weighty argument. But more important than this are the acquisitions collected in the course of the past fifty years, constituting new proofs concerning the animal origin of man. During Darwin's lifetime and during that of his nearest followers almost nothing was known about the history of the development of the manlike apes.

Since then numerous valuable contributions have been made, proving that the embryo of anthropoid apes, especially of the gorilla and gibbon, bear the closest resemblance to the human embryo. The investigations of the finest qualities of the blood undertaken by medical scientists recently have established the fact that the blood of human beings bears in every respect the greatest resemblance to the blood of manlike apes.

Medical science has also furnished from a different point of view new and very important proofs to substantiate the animal origin of the human species. In the quest of means to combat diseases it has been established that certain diseases which seemed to be peculiar to human beings only were also peculiar to manlike apes. This is true, for instance, of spotted fever, that dreadful pestilence which in years gone by claimed many victims even in Germany, and which is to this day still widespread in Russia. A French bacteriologist in Tunis, Charles

Nicolle, has recently transferred spotted fever to a chimpanzee, although the lower species of apes proved particularly capable of resisting this disease.

The same result was recently secured in the case of one of the most widespread infectious diseases—cholera among infants. Ordinary apes, even the young ones, are not at all susceptible to this epidemic, whereas young chimpanzees contract this disease very easily. These facts show very clearly that there exists a true blood relation between man and the man-shaped ape. Nevertheless there are certain scientists who would not be convinced by such arguments as these.

They demand direct evidence, and they ask about the forms of transition of man and the anthropoids. But such links are not so easily found, for their bones are buried deep in the ground, and many of them most likely in remote places, where people have hardly begun to search for the remains of long-dead creatures. In this respect we may emphasise the generally known discovery of Dr. Dubois, who found in Java several skeletons linking the human with the anthropoid forms.

While a collection of facts has been discovered to substantiate the theory of man's origin from the ape, nothing has been discovered during the long period of half a century to upset this theory. Man must therefore be regarded as a perfected ape, with a much more strongly developed skull and with a less developed face.

#### Man's Slow Growth

The new-born guinea-pig finds itself in a more developed condition than the new-born human being. The latter comes into the world unhappy, crying and helpless; the guinea-pig, on the contrary, starts to run at once and in every way gives the impression of the joy of living. The new-born guinea-pig is also in a condition almost to subsist independently and to nourish itself with vegetables. Under such circumstances it is really very hard to regard human nature as perfect.

After the human being has come into the world the long and disagreeable period of development sets in. New-

born animals differ from the grown animals much less than the new-born child differs from the grown human being. This difference exists in the physical development of the body as well as in the mental faculties. When very young animals imitate instinctively the conduct of their parents, they acquire thereby some useful qualities within a short time. A young dog, for instance, learns quickly how to hunt game.

It is entirely different with the human being, particularly with the civilised human being. The contrast between a boy and his father is by far greater than among animals. Instinctive imitation, which is such an excellent method for development among animals, very often leads the child to evil results. Picture to yourself a young boy who wants to imitate his father while hunting with firearms! How much trouble children give their mothers who try to keep them away from the use of dangerous tools, knives, scissors, and so forth.

#### His Premature Decay

After a much too slow period of development in the life of a man, a much too early state of old age sets in. A man at the age of fifty will find a position in a new trade only in exceptional cases. In certain places an official must give up his office at the age of sixty. In Denmark every sixty-five-year-old man, without means, is entitled to a pension from the Government. In Australia he is entitled to a pension at the age of sixty. In France a hospital physician or a university professor at the age of sixty-five is regarded as incapable of continuing his work, unless he is a member of the Academy of Medicine or the Academy of Science. Generals in the French Army must retire from service at the age of sixty or sixty-five.

Notwithstanding his premature old age the man who thus becomes useless still feels the greatest need of continuing to live, and an invincible fear of death comes over him. This fear of death is one of the main characteristics that differentiate the human being from the animal, even from the best developed animal. All animals shun death instinctively, but they are not conscious

of it. . . . There are scientists who are striving to prove that death as a perfectly natural phenomenon is not at all terrible in itself. Recently Professor Bloch, a Danish surgeon, developed these views on death in a two-volume work on the subject. He produced a great deal of evidence in his effort to prove that many people met death without fear.

#### His Fear of Death

But there is far more evidence to prove that man dreads death. This feeling is something quite instinctive in human nature and has ever caused the greatest worry to man. Thus it has also become the main problem of philosophy to solve the death problem. It remains remarkable that man, a being of animal origin, who has brought into the world many most evil qualities, should have acquired as a new quality, through his mental development, the consciousness of death.

Under such circumstances it is not surprising that many thinkers have declared that certain animals are more fortunate than man, and that it is therefore impossible to regard happiness as the aim of human activities. This opinion, expressed by very many philosophers of all times, was but recently repeated by the famous French mathematician Poincare.

Man has acquired from his animal ancestors a heritage of a number of qualities that are injurious to him. As there are many upon which we cannot vouch, we will throw our critical gaze upon the digestive organs of man. Although my views on the subject are possibly known to many of my readers the importance of the subject demands that they should not be passed over. The intestinal canal of the human being is exactly like that of the anthropoid ape. While the ape takes his nourishment in raw condition, the human being, much higher in his mental development, prepares his food with the aid of the more or less perfected art of cookery. He also uses artificially cultivated and raised plants and animals instead of the wild plants and animals used by the apes. Cultivated fruits and vegetables, just as the meat of domestic animals, are more easily digestible than the raw wild food.

It thus becomes clear that man could, in a certain respect, do without some of the highly developed digestive organs of the ape. It is well known among surgeons that a big piece of the entirely too long small intestine can be removed without the slightest detriment to the human body. While a portion of our small intestine is superfluous, the entire large intestine is not only a useless but even an injurious organ in the human body. This was inherited from our former ancestors, the mammals, to whom it was useful for the digestion of plant nourishment, and so to speak a depot for remains of nutritive matter which was inutilisable. But it has become superfluous in the human organism, in which digestion is confined exclusively to the small intestine. Thus the large intestine has become a useless ballast to the human being, a source of much misery.

These views, which I have expressed before, have called forth some sharp criticism in certain quarters; nevertheless I am more than ever convinced of the correctness of my position. . . . People who suffer from the results of the enlarged intestine are frequently treated by physicians for nervous ailments, but unfortunately without any favourable consequences.

#### Dr. Lane's Operations

Dr. Lane, a remarkably skilful and daring English surgeon, has decided in such cases to resort to the knife, instead of the slow and useless internal treatment. He removes either a part of the large intestine or the entire large intestine. Dr. Lane, who has already performed more than fifty operations of this nature, reported in the beginning of last year his experiences with thirty-nine of these cases. He lost nine of his patients, or 23 per cent., which is too high a death rate. But, therefore, the other thirty patients upon whom Dr. Lane operated have gained great advantages through the operation. I saw three of the persons upon whom Dr. Lane operated a few years ago, and have convinced myself that the condition of the health of two of them is perfect in every way. Sick people, who had been for many years in a condition of

unendurable suffering, have felt after the operation as though risen from the dead, and have become once more able to work.

Dr. Lane's work has naturally called forth vehement opponents, who point to the very high death-rate in order to condemn the entire method. Meanwhile, we must bear in mind that the technique of operations can be improved so that the death-rate will be reduced.

The facts gathered by Dr. Lane and other surgeons substantiate thoroughly the opinion that man can do without his large intestine, consequently that this organ is really superfluous. Apart from the fact that the contents of the large intestine clog it up for a long time (which sometimes leads to trouble, even to dreadful intestinal cancer) the large intestine must also be regarded as dangerous because of the great multitude of bacteria that collect in it.

Notwithstanding certain opposition, I regard this assertion as perfectly justifiable. We nourish in our digestive organs, namely, in our large intestines, an extraordinarily rich flora of microscopical organisms which constitute a constant danger to us. It is known to everybody that the body begins to decay after death; this decay commences from the intestines and spreads gradually over the whole body. This is executed by the bacteria which exist normally in the human intestine. But in the living human being they are unable to engender decay, for they are hindered in their activity by certain influences. But it is sufficient for the slightest cause of disease to bring out this threatening activity.

Professor Ribbert, the well-known pathologist of Bonn, recently attacked my theory concerning old age in a vehement manner. He finds fault with my supposition that the poisonous substances of the intestinal bacteria play an important part in senility.

The opinion expressed by Ribbert to the effect that the human organism is perfectly suited to the conditions of existence must be rejected. We have seen already that man is suffering from numerous shortcomings from the very moment of his birth. The fact that the

development of the human being requires a very long period of time, whereas his days are few as a result of chronic poisonings, forms the main cause of human misery. The animal qualities in man, that is, his organs, which are suited for animals, constitute a continual opposition to his purely human qualities, that is, to his highly spiritual development and its requirements. The heritage he has received from the animals hinders the human being from attaining the aim of his life. . . .

#### The Problem of Death

The main point is that our life is too short and therefore our existence cannot achieve its purpose. The chief problem of religions and of philosophical doctrines is the problem of death. The former declares that our earthly life will be continued after death, that consequently man should steadily prepare himself for his future life. The philosophers who would not recognise immortality assert that man is a fragment of a metaphysical whole, and that therefore his aim consists in working for the welfare of this whole. This view, which has been expressed long ago, was recently developed by Paul Mobius, a distinguished physician and thinker, who unfortunately died too soon.

Although Mobius recognises that "the main aim of man is his existence," he does not believe that we are in this world for our pleasure. "For what other purpose, then?" he asked himself, and he came to the conclusion that "certain aims are pursued through our life" and that "our life can serve as a means for higher purposes." Mobius thought that there is consolation in our being able to say to ourselves, "We serve some great purpose, even if we do not know how and what purpose." Thus he leads us into metaphysics with which science can have nothing in common. . . .

Our feelings develop slowly. Our æsthetic taste is formed comparatively late in life. Children experience no pleasure at the sight of beautiful landscapes. Here is a characteristic instance. One of my friends was born in a very distant city, where he also spent his years of childhood. When he grew up to be a man he visited the place of his birth.



He recalled the exact location of the sweet-shops and of other shops where he used to buy other savoury things. But he had not the slightest idea about the beauty of the country in which he had passed his childhood. As the feeling of life is composed of a number of other sensations, among them also the æsthetic feeling, it is easy to understand that it requires a rather long period of time for its development.

An old lady, who had been seriously ill for a long time, expressed her desire to live a little longer in the following words: "Ah, if I could live another spring, so that I could see the blossoming of the trees. You cannot imagine the joy I experience when I see the sunrise."

### The Aim of Life

Among the feelings which change strikingly with age the sense of time may be mentioned. Everybody knows how differently the lapse of time is measured by people in childhood and in later years. While a year seems a long period to the child or the youngster, old people consider the same period as very brief. Under such circumstances we can understand that the sense of life and together with it the fear of death develop but very slowly and it is to be noticed much more strongly in older people.

The result of the development of this sense of life is that the older man worries less about the aim of life, for he is conscious that life itself forms a great portion of this aim. But as the desire for life is not extinguished even in later years, man acquires a feeling of discontent, especially when the prospect of approaching death looms up before him terribly.

From time immemorial mankind has striven to find an answer to this question. The majority of the people believed, and many people believe even now, that death is not the actual termination of life, and that there is another, eternal life beyond this life. The belief in the immortality of the soul or in the immortality of man has become very deeply rooted in man. It is often declared that this belief is qualified for the purpose of

defeating the fear of death, and thus solving the problem in the best manner. But this may be true in a narrow sense only. Highly educated people, notwithstanding the profound faith of which they may be capable, develop a very strong fear of death. It is not surprising that it should be so, for the belief in eternal life is acquired by certain people through education, whereas the fear of death is something purely instinctive.

For this reason it is easy to see that the philosophical systems, with their theory of a metaphysical whole, to which human life must subject itself and sacrifice itself, will not meet with great success. There is nothing left but to turn to science with this question and see whether science is in a position to solve the great problem of human life. To be sure, science cannot solve this problem definitely, but it is very possible that it can point the way in which a satisfactory solution may be found.

In order to attain the aim of life completely the present life of man is too brief, just because his psychic development requires such a long time. But the brevity of life is the result of man's animal origin. Organs and arrangements which were essential to animals have become entirely superfluous to the far more perfected human being. Therefore science must remove this evil, which may be accomplished through a systematic adherence to hygienic rules. Thus the period of life could be prolonged to such an extent that man would live until the instant of real, natural death. In this respect it would be particularly useful to remove the bacteria poisons from the intestine, which poison our organism chronically and thereby shorten our life.

It is very probable that natural death is also a form of poisoning which is caused not by the foreign bacteria in our organism, but by various natural elements in our own bodies.

We are justified in believing that natural death is accompanied by extraordinarily sweet sensations. It is probable that the poisons in the body that participate in this process arouse these pleasant sensations.

