ISSUED BY DEFENSE COUNSEL, STATE OF TENN. vs. JOHN T. SCOPES.

This document is for release when it has become completely a part of the court record. It is accepted by newspapers and correspondents with the condition and explicit understanding that it is not to be published or any of its contents referred to in any way until it is definitely released. It may be amended or changed before such release.

----------o----------

STATEMENT BY Kirtley F. Mather.
(Chairman of the Department of Geology of Harvard University)

(Biography. ---- Kirtley F. Mather graduated in 1909 from Denison University, a Baptist college at Granville, Ohio, in which evolution has for years been taught by every science teacher. In 1915 he received the degree of Ph. D. from the University of Chicago. He taught geology at the University of Arkansas for three years, at Queens University, a Presbyterian institution at Kingston, Ontario, for three years, and from 1918 to 1924 he was head of the Department of Geology at Denison University. In 1923 he was appointed professor of geology at Harvard and has recently been made Chairman of the Department of Geology at Harvard. He has been a geologist of the United States Geological Survey for many years, and has made geological examinations for various oil companies in Bolivia, Peru, Mexico, Canada, etc. He was for several years a trustee of the Baptist Church at Granville, Ohio, and Chairman of the Baptist Laymen's Council of Southwestern Ohio. He is a member of the Baptist Church at Newton Centre, Massachusetts, and teacher of the "Mather Class" in Bible School of that church. He is a fellow or member of such scientific organizations as the Geological Society of America, the American Academy of Arts and Sciences, and the American Institute of Mining and Metallurgical Engineers. In 1923-24 he was president of the Ohio Academy of Science. He is the author of numerous scientific publications and bulletins of the United States Geological Survey dealing with petroleum resources of Kentucky, Oklahoma, Alaska, and Colorado; technical papers on geology, paleontology and evolution in scientific journals; Christian Fundamentals in the Light of Modern Science, etc. In 1919 he prepared a bulletin of the Tennessee Geological Survey dealing with the geology and oil resources of Summer County, Tenn.)

----------o----------

The facts of life development are so numerously displayed and so evident in the rocks of the earth's crust that every geologist with whom I am acquainted has accepted the evolutionary principle as demonstrated. Much of the exposed part of the earth's crust is composed of rocks deposited in layers as sand, mud, gravel or limestone in the seas, lakes, or ponds of past time, or upon the surface of the dry land. These are in many places broken

through by masses of rock which was formed by solidification of molten lava. The successive ages of the various kinds and formations of rock are determined by their physical relations. Where not greatly disturbed by crumpling or upheavol of the earth's crust, the rocks formed in layers are obviously still in their original order, the oldest underneath and the younger layers in order one upon the other, just as they may now be observed in the hills overlooking Dayton, Tennessee. Where cut through by rocks which were once in a fluid state, it is apparent that each body of rock is younger than the ~~eldes~~ youngest rock through which it broke and older than the oldest rocks deposited upon its surface after it was solid. Thus the succession of physical events in the history of the earth may be determined by patient and careful scrutiny of the earth's surface as it now is visible, either in natural or artificial exposures such as canyon walls, valley slopes, mines and wells.

In many of these rocks there are found entombed the fossil remains of the animals and plants which were alive at the time the rocks were formed. Some of these are the shells or bones of animals that lived in the seas or lakes, some are the harder parts of animals that lived on the land and were buried beneath the mud of river flats or the ashes blown out of voncanic vents. Discovering these fossil remains and knowing by their physical relations the successive ages of the rocks in which they are found, the geologist is able to sketch the history of animal and plant life upon the earth.

In the very oldest rocks which have yet been discovered, which are at least one hundred million years old there are absolutely no traces whatsoever of any animal or plant life. In somewhat younger rocks, but rocks, also referred to the oldest era

of geologic history, the Archeozoic Era, there are remains of one-celled plants of the type known as algae. The next era of earth history has been named the Proterozoic. In rocks formed during it, there are a very few fossils of lowly types of shell-bearing animals and some rather obscure markings which are probably in part due to the presence of worms and in part represent the remains of sea-weeds. The rocks of these two oldest eras are nearly everywhere very much distorted and broken by volcanic activity and crustal upheavals.

Upon these ancient formations there rest in orderly succession the layers deposited during the several periods of time which geologists group into what is called the Paleozoic Era, which began at least fifty million years ago. Most of the rocks of Tennessee were laid down during that long space of time. In this state as elsewhere, these strata are known at many places to contain a great abundance of fossils. In the oldest rocks of that era, the fossils are of many and various intertebrate animals, many of which are of kinds not now known to exist anywhere on the face of the earth to-day. There are no fossils of animals which had a back-bone of any sort in any of these rocks. In somewhat younger beds, referred to the second period of the Paleozoic Era, there are however very scanty and fragmentary remains of primitive fishes, the first known animals which possessed a back-bone. The oldest known forest, composed of trees of fern-like rather than of seed-bearing types, was found a few years ago in New York in rocks formed about at the middle of this Paleozoic Era. That was the time when fishes ruled the waters, for remains of sharks and lung-fishes are present in great numbers in the rocks formed in the seas, but in the rocks laid down on the land or in swamps there is not a trace of animals with a back-bone, although insects and land

snails have left their fossil remains in them. Toward the end of the Paleozoic Era, however, the rocks formed of desert sands and swamp much contain the footprints and petrified bones of amphibians and reptiles, the first animals with a back-bone which could breath air by means of lungs. This part of the Paleozoic System of rocks includes the coal seams of the Eastern States, and associated with the coal are many beautiful specimens of ferns and primitive evergreen trees, but none of the modern types of flowering plants. About at the close of the Paleozoic Era the Appalachian Mountains were formed by the crumpling of the earth's crust in this region.

That episode of crustal crumpling is taken as the milestone to mark the end of the Paleozoic and the beginning of the Mesozoic Era, which began at least twenty five million years ago. Since that time, Tennessee and neighboring states have with minor exceptions remained continually above sea level, so that we have to transfer our search to other localities to find the continuation of the fossil record. The Mesozoic Era, the fourth great era of earth history, is frequently referred to as the Age of Reptiles. In practically all the stratified rocks of this era there are petrified bones and foot-prints which tell that cold blooded, scaley animals with back-bones and four limbs lived in great numbers on land, in the sea, and in the air. The largest and most ferocious animals that ever inhabited the lands left their bones among the fossils of that era. Animals with enough feathers to enable them to fly, yet with claws on their fore-limbs and teeth in their jaws, lived then and indicate the transition forms between reptiles and birds. In the same rocks with these reptiles, most of which have long since vanished from the face of the earth, a very few fragments of quite primitive mammals have been found.

These were small and insignificant creatures, most of whom laid eggs as do a couple species of small mammals today, but who suckled their young, were warm-blooded and presumably had no scales as surface covering. For the most part the reptiles were small-brained and large-bodied; they placed their trust in strength of talon and claw, rather than in mentality and agility. Observing the earth at that time, one could not help but feel that no good could possibly come from that welter of blood-thirstiness and cruelty. Yet the small minority of puny mammals, present then, was so endowed with instinct, such as parental love for offspring, that at the end of Mesozoic time it became the dominant form of life on land, while the few reptiles which did not become extinct were for the most part banished to the swamps and deserts or other out-of-the-way places. The close of Mesozoic time, the Age of Reptiles, was marked by the upheaval of the Rocky Mountains. In a small fraction of the time that has elapsed since then, the entire Grand Canyon of the Colorado River has been carved by the ceaseless wear of running water. For this, and many other reasons, geologists believe that each of these eras of time should be measured in terms of tens of millions of years.

The Cenozoic Era which began five or ten million years ago, began as the Rock Mountains were formed. Most of the rocks of that era are still unconsolidated layers of silt or sand or volcanic ash, although some are firmly cemented into sandstone, limestone, etc. In the earliest beds deposited around the flanks of the new-born mountains of the Western States, the bones of a great variety of mammals have been found. They are evidently the improved offspring of the puny mammals which had lived in constant fear of the ponderous reptiles during the preceding era. Not until about this time had there been any large quantity of the kinds

of vegetation upon which modern mammals feed, and this presumably explains in part the slowness of the mammalian minority in throwing off the yoke of the reptilian majority during the Age of Reptiles. The first flowering plants had left their leaves and seed pods in the rocks formed during the middle of the Mesozoic Era, but grasses and herbs, fruit-and-nut-bearing trees were not numerous until the beginning of the Cenozoic Era.

With an abundance of the right kind of plant food and freed from reptile dominion, the mammals increased rapidly in numbers, and their bones in great variety may today be seen in the rocks of the Rocky Mountain and other regions. Among those of the earliest Cenozoic strata, may be mentioned the five-toed and four-toed ancestral horses, the trunkless and small-tusked ancestral elephant, the cat-like forerunner of the modern seal. At that time, too, we find the first record of a primate, that order of mammals to which the zoologists refer man. This was evidently a small quadruped with toes terminated neither in hoofs nor claws, but with rather horny nails, and with teeth adapted neither for grinding grain like those of a horse nor for tearing flesh like those of a tiger nor for for gnawing nuts like those of a squirrel, but like those of a man for eating herbs, fruits and eggs. But in general appearance this creature resembled a rat much more closely than a monkey, ape or man. Bones of that lowly type of primate have been found in North America, Asia and North Africa.

Somewhat higher in the series of Cenozoic strata of India, there were recently found a fragment of jaw which had teeth totally different from those of any non-primate, somewhat different from those of a money, and closely resembling those of the great apes and of man. That animal lived somewhere between two million and ten million years ago. He is believed to have been ancestral

to the apes, chimpanzees, gorillas, and mankind, all of which had by that time become completely differentiated from the monkey strain. If that be true, man has become distinct from the other anthropoids since that creature left his bones on the banks of an Indian stream. Narrowing our attention now to the strain that leads to man, the next fossil of significant interest is that known as the ape-man of Java. Some thirty years or so ago, there was found on the island of Java a partially cemented layer of gravel and sand containing fossil bones and fossil plant remains. The plants were of the same sort as found elsewhere in rocks known to have been formed rather late in the Cenozoic Era just before the first glaciers of the Great Ice Age were accumulating, therefore, it must be that the associated animal bones are also of that age. The skull of this animal had brain capacity somewhat greater than that of the most brainy apes now living and somewhat less than that of the smallest-brained human tribe. He had a receding forehead and a heavy ridge of bone above his eyes like an adult chimpanzee; yet his leg-bones show unmistakably that he stood and walked erect upon his hind limbs. The name ape-man describes him exactly; he was truly intermediate in body structure between the apes and man. He lived one or two million years ago. In rocks of just about that same age in England there have been found crudely fashioned flint implements, unmistakably shaped by some intelligent creature with hands so developed as to be capable of holding a stone and striking it with another stone. Modern apes have been observed to hold clubs in their clumsy hands, but none of them can at will touch his thumb against the tip of each finger of the same hand. Presumbly the creature who chipped the flints found in those rocks near Foxhall, England, could do so.

Then came the first of the great glacial advances of the Ice Age about one million years ago. Five times the northern lands were buried beneath a mantle of moving ice. Five times the ice melted until the glaciers were at least as small as those now remaining on Greenland and in the valleys of Alaska. In the gravels deposited in Germany by the rivers flowing from the melting ice of either the first or the second of these inter-glacial intervals, there has been found the jaw of the so-called Heidelberg man. The jaw resembles that of a modern man; its sides are nearly parallel, the canine teeth are only a little higher than the incisors and molars. But it has no chin at all, and the portion of the jaw-bone which articulates with the skull just in fromt of the ears looks considerably like the equivalent portion of an ape's jaw. Scientists classify that creature as a member of the same genus to which modern man belongs, but as a different species.

Gravels of later interglacial stages have revealed the bones of still another extinct species even closer to modern man. More than a score of practically complete skeletons and hundreds of fragmentary bones of this the Neandertal man, have been found in France, Spain and Germany. It is chiefly in the characters of the skull rather than in the other bones of the skeleton that he differs from modern man. His forehead was very receding, his brain capacity was just a little less than that of the most primitive of existing savage tribes, his brow ridges were more prominent than those of the negro, his chin was approximately half way between the chinless profile of the Heidelberg man and the clearly defined chin of the white race of today. With his petrified bones there are frequently found the stone spear-heads and bone knives which he fashioned. To this array of facts concerning him, I

want to add just one inference. Many skulls of Neandertal type were broken when found, as though struck with a hammer on top of the head either at the moment of death or very shortly thereafter. Several tribes of aborigines in recent years break the skulls of their dead in order, as they say, to permit the spirit to start on its journey to the happy hunting ground. The inference is that the Neandertal men, a couple of hundred thousand years ago, had the same thought that man was immortal.

During the last of the glacial stages, about the same time that the ice pushed southward across Ohio and Indiana to the Ohio River, forty or fifty thousand years ago, there lived in Southern Europe a race of men known as the Cro-Magnons. They were stalwart highbrows with prominent chins and large brain capacity, and eyebrow ridges no more protruding than those of the existing white race, but with massive cheek-bones like the North American Indian. Clearly, they belonged to the same species as that which today includes the white, yellow, brown and red races, but they cannot be included in any of these races. Their implements were much better manufactured than those of their predecessors, the Neandertals, and they had a remarkable artistic ability as shown by the pictures they engraved or painted on the walls of caves in southern France. For thousands of years they maintained their life in Europe, but about ten thousand years ago they were displaced by the first members of the races of mankind which are today in existence.

During all this time no known record of the presence of man or man-like creatures was left in either North or South America. Not until the ice sheets of the latest glacial episode had dwindled nearly to disappearance was any clear indication of man's presence left in the New World. The oldest human inhabitants of

North America were members of the existing races of mankind. They reached this continent not more than ten or twelve thousand years ago.

The facts stated in the foregoing paragraphs have been discovered by many different individuals. Probably no one man could be found who could testify to all of them as having been personally observed by himself. Knowledge of them is the common property of countless scientists. I can, however, affirm the truth of many of these facts from personal observation; the others I believe to be true because of my confidence in the technical ability and integrity of those who have seen the actual evidence. I have also studied many of the specimens collected by these follow-workers and now on exhibition in various museums. In 1916 and 1917 I examined the oldest known rocks of the Archeozoic Era in eastern Ontario and was unable to discover any fossil remains in them. The presence of these rocks had already been made known by a Canadiam Geologic Survey party. I was accompanied by four or five my my studemts. In this bleak and windswept waste of rounded rock hills and impassable swamps, these ancient rocks are cleanly displayed. Om the same trips I saw in slightly younger rocks of the same era in that locality the evidence of the presence of primitive organisms, but no record of any of the higher forms of life. In 1906, I collected fossil shells of lowly invertebrates from the early Paleozoic rocks of Wisconsin. During the spring of 1916 I found the remains of somewhat higher types of invertebrates in slightly younger rocks of the same era in eastern Ontario and later described these fossils in publications of the Ontario Bureau of Mines and in the Ottawa Naturalist. Other invertebrate fossils of about the same age and about the same kinds were observed when I was in Bolivia in 1919 and 1920. Accom-

panied by half breed guides and camp hands I together with

K. C. Heald, formerly chief of the Oil and Gas Section of the U.S. Geological Survey, pushed far beyond the outposts of civilization into the rocky fastnesses of the Eastern Andies and there we found these fossil remains.

I have seen the fossil remains of primitive fishes of middle Paleozoic age on a number of occasions near Columbus, Ohio; in 1917, in Allen County, Kentucky, and in 1919, in Sumner County, Tennessee. I observed the footprints of large reptiles in rocks formed shortly after the upheaval of the Appalachian Mountains at several places in the Connecticut Valley during 1921. While exploring in Alaska during the summer of 1923, I searched for fossils in rocks of middle Mesozoic age, but found in them only the remains of shell-fish and corals. There was a party of six dispatched by the U.S. Geological Survey to search for mineral resources in a previously unknown and altogether uninhabited portion of the Alaska peninsula not far from the famed valley of Ten Thousand Smokes, so named because of the countless vents from which steam roared Heavenward. We had to cut steps with our geologic hammers across glaciers and snow fields in traversing the almost inaccessible mountains of that bleak barren and rugged land. In Colorado, during the summer of 1924, I had occasion to study the petrified bones of mammals embedded in flat-lying rocks of Cenozoic age directly overlying tilted strata of late Mesozoic age, in which were the fossil bones of reptiles. The tilting of those beds was a part of the crustal movement which formed the Rocky Mountains; the flat layers on top of them were deposited while those mountains were being eroded.

To this summary of known facts concerning the life of the past, there might be added a multitude of other facts concerning the body structures of the various animals, the life history of the

individual animal from its start as a single fergilized cell until its attainment of adult stature, etc. I have, however, personal knowledge of only a few of the facts in those fields in which I am not a specialist. While exploring the headwaters of the Amazon in Bolivia and Pera in 1919 and 1920, I lived for some time among quite uncivilized peoples, many of whom had never before seen a white man. At the same time I watched the habits and examined the bodies of several different kinds of South American monkeys. I have studied with care the skeletons of many of the Asiatic apes and Old World monkeys, as they were available in various university laboratories and museums. From these studies and from the studies of others, I can affirm the following generalized statements: - Comparing the body structure of monkeys, apes and man, it is apparent that they are all constructed upon the same plan; with only trivial exceptions every bone in the body of one has its counterpart in the body of the others. Only in details of shape, in relative size, and in method and angle of articulation with their neighbors do these bones differe in the different creatures just mentioned. Monkeys have long tails; some apes have long and some have short tails; man has a vestigial tail composed generally of about four vertebrae so small and so short as to be entirely concealed in the flesh and muscles at the base of the spine. In relation to the total dimensions of the body, the brain of monkeys is quite small, that of the apes is much larger, while that of man is largest of all. This determines in large degree the contour of the head; thus the face of the monkey occupies more space than the top and back of its head, that of the apes is comparatively smaller, while the face of man is smallest of all in relation to the total area of head surface. No one would be surprised or shocked to learn that apes and monkeys had a common ancestor, nor would he regard it as a startling scientific theory, yet in general

there are more differences between the modern monkeys and the modern apes, such as the chimpanzee, the gorilla, the gibbon and the orang-utan, than there are between the apes and man. Yet in general there are more differences between the apes and man than there are between the existing races of men. The gaps between these various groups are, however, largely filled by the fossils, some of which I have already described. There are in truth no missing links in the record which connects man with the other members of the order of primates.

Such facts as I have stated above can be explained only by the conclusion that man has been formed through long processes of progressive development, which when traced backward through successively ~~progressive development~~ simpler types of life, each living in more remote antiquity, lead unerringly to a single primordial cell. The facts ascertained by natural science are obviously incomplete; the record of the rocks by no means tells the whole story. Man not only has an efficient and readily adaptable body, he also possesses a knowledge of moral law, a sense of rightness, a confidence that his reasoning mind finds response in a rational universe, and a hope that his spiritual aspirations will find increasing answer in a spiritual universe. Such things as these cannot be preserved in the fossil record, yet their presence must be accounted for. Nor have we a direct record of whence came the first living cell. The inference is unmistakable that the material substances from which living cells were first constructed were previously present among the rocks and minerals of the earth. All the necessary ingredients were certainly present in the outer shell of the youthful earth of even pre-Archeozoic time. But life is something more than matter. Living creatures are characterized by vital energy, something about which we really know

very little, but something which is absolutely indispensable to every living creature. T. C. Chamberlin, the Dean of American Geologists, closes his volume on the origin of the earth with the following sentence: "It is our personal view that what we conveniently regard as merely material is at the same time spiritual, that what we try to reduce to the mechanistic is at the same time volitional, but whether this be so or not, the emergence of what we call the living from the inorganic, and the emergence of what we call the psychic from the physiologic, were at once the transcendant and the transcendental features of the earth's evolution". With this conclusion I am in hearty accord. I believe that life as we know it is but one manifestation of the mysterious spiritual powers which permeate the universe. The geologic factors assembled in the primitive earth provided an invironment within which the spiritual could manifest itself in the material. The form which it should assume may have been largely determined by that environment; the primitive cell was the result. Thus, in truth, was man made from the dust of the ground.

Again, the record of the rocks tells nothing except by inference of the previous state of the mineral matter of which the earth is made. Several theories, varying from one another in greater or less detail, are now under consideration by geologists and astronomers in their attempt to understand the actual beginnings and the antecedents of the earth and its follow planets in the solar system. So far as we now know all the planets, suns and stars within range of our telescopes are composed of the same sort of matter, reducible upon analysis to about eighty different elements, nearly all of which are present in the earth. In other words, it is a fair sample of the material substances of the entire universe. Science has not even a guess as to the original source

or sources of matter. It deals with immediate causes and effects, not at all with ultimate causes and effects. For science there is no beginning and no ending; All acceptable theories of earth origin are theories of rejuvenation rather than of creation-from nothing. Indeed, there is some evidence for the prevalent view that our sun had had at least one earlier generation of planets in its train before the disturbing effect of the close approach of another star caused the re-organization of part of its matter into our present solar system. Conversely, it is probable that at some remotely distant date in the future this group of planets, on one of which we live, will be similarly destroyed by another rejuvenating disturbance and still another cycle of planetary organization may take place.

But none of these facts is really in any way disturbing to the adherent to Christianity. Not one contradicts any teaching of Jesus Christ known to me. None of them could; for his teachings deal with moral law and spiritual realities. Natural science deals with physical laws and material realities. When men are offered their choice between science, with its confident and unanimous acceptance of the evolutionary principle, on the one hand, and religion, with its necessary appeal to things unseen and unprovable, on the other, they are much more likely to abandon religion than to abandon science. If such a choice is forced upon us, the churches will lose many of their best educated young people, the very ones upon whom they must depend for leadership in coming years. Fortunately, such a choice is absolutely unnecessary. To say that one must choose between evolution and Christianity is exactly like telling the child as he starts for school that he must choose between spelling and arithmetic. Thorough knowledge of each is essential to success - both individual and racial - in life.

Although it is possible to construct a mechanistic evolutionary hypothesis which rules God out of the world, the theories of theistic evolution held by millions of scientifcally trained Christian men and women lead inevitably to a better knowledge of God and a firmer faith in his effective presence in the world. For religion is founded on facts, even as is the evolutionary principle. A true religion faces the facts fearlessly, regardless of where or how the facts may be found. The theories of evolution commonly accepted in the scientific world do not deny any reasonable interpretation of the stories of divine creation as recorded in the Bible, rather they affirm that story and give it larger and more profound meaning. This, of course, depends upon what the Bible is and what the meaning and interpretation of the stories are to each individual. I have been a Bible student all of my life and ever since my college days I have been intensely concerned with the relations between Science and the Bible. I have made many addresses and have written several articles upon this subject. I have many times lectured to Bibical students, such as those in the Boston University School of Religious Education.

It is ovvious to any careful and intelligent reader of the book of Genesis that some interpretation of its account must be made by each individual. Very evidently, it is not intended to be a scientific statement of the order and method of creation. In the first chapter of Genesis, we are told that man was made after the plants and the other animals had been formed, and that man and woman were both created on the same day; in the second chapter of Genesis, we read that man was formed from the dust of the ground before plants and other animals were made, that trees grew until fruit was upon them, that all the animals passed in review before man to be named, and then after these events woman was made. There

is obvious lack of harmony between those two Bibical accounts of creation so far as details of process and order of events are concerned; they are, however, in perfect accord in presenting the spiritual truth that God is the author and the administrator of the universe. And that is the sort of truth which we find in the Bible. It is a text-book of religion, not a text-book of biology or astronomy or geology. Moreover, it is just exactly the Bibical spiritual truth concerning God which rings clearly and unmistakably through every theory of theistic evolution. With it, modern science is in perfect accord.

There are a number of reasons why sincere and honest Christians have recently come to distrust evolution. These reasons must be understood and discussed frankly, before the world will believe that science and religion are not in conflict. Some of the opposition to evolutionary science results from failure to read the Bible. Too many people who loudly proclaim their allegiance to the Book, know very little about what it really contains. The Bible does n t state that the world was made about six thousand years ago The date 4004 B. C., set opposite Genesis 1:1 in many verious of the Bible, was placed there by Archbishop Ussher, only a few centuries ago. It is a man's interpretation of the Bible; it is in the foot-notes added recently: It is not a part of the book itself. Concerning the length of earth history and of human history, the Bible is absolutely silent. Science may conclude that the earth is a hundred million, or a hundred billion, years old; the conclusion does not affect the Bible in the slightest degree. Or if one is worried over the progressive appearahce of land, plants, animals, and man on the successive six days of a "creation week", there is well-known Bibical support for the scientists' contention that eons rather than hours elapsed while these things

things were taking place. "A day in the sight of the Lord is as a thousand years, and a thousand years as a day". Taking the Bible itself as an authority dissipates many of the difficulties which threatem to make a gulf between religion and science. The fact that the seventh day was stated to ve a day of rest has no bearing upon the length of the other days. I have no doubt that the man who made that chapter of Genesis had in his mind days of twentyOfour hours each, but I reserve for myself the right to make my own interpretation of the meaning of words, as does every Chrstian, be he liberalist, trivialist or modernist.

Another of the reasons for eh-n the modern distrust of science in the religious workd is the idea that evolution displaces God. Many seem to think that when the scientist enthrones evolution as the guiding principle in nature he detrones God, that the two words are somehow synominous, that there is not room for both and one must go. But the facts are as follows: Evolution is not a power, nor a force; it is a process, a method. God is a power, a force; he necessarily uses processes and methods in displaying his power and exerting force. Many of us believe that science is truly discovering in evolution the processes and the methods which God, the spiritual power and eternal force, has used and is using now to effect his will in nature. We believe we have a more accurate and a more deeply significant knowledge of our Maker to-day, than had the Hebrew patriarchs who thought a man could hide from God in a garden, or who believed that God could tell man an untruth. (Genesis 2:17 states that God told man he would surely die if he ate the fruit of the tree of knowledge; man ate, he did not die, God knew he would not die therefore)."

Again there is the widespread misconception that if one accepts the evolutionary process as the method which God used, he

will find himself in a moral dilemma. Regardless of sect or creed, all followers of Christ must accept his teaching that the law of life is love, that service to others is the true guiding principle, that self-sacrifice even to death is the best trait a man can display. To many, evolution means the survival of the fittest in the struggle for existence; and that is taken to imply that the selfish triumph, the most cruel and bloodthirsty are exalted, those who disregard others win. Obviously this is the very anthitiesis of Christianity; both principles cannot be true; one must be false. The Christian needs not to be told which of the two it is. Here is a real reason for opposition to evolution; men are not driven from it by the fear of discovering that their bodies are structurally like those of apes and monkeys; it doesn't bother us to discover that we are mammals, even <u>odorous</u> mammals - "by the sweat of your brow must man earn food" states the Bible. It <u>does</u> bother us to find the implication that the law of progress has thus apparently been opposed to the love of Christ. But here are the facts. It has been my privilege as a geologist to read the record in the rocks; knowing the ages of the rocks has led to better knowledge of the Rock of Ages; I have watched the procession of life on the long road from the one-celled bit of primitive protoplasm to the present assemblage of varied creatures including man. At times of crisis in the past it was rarely selfishness or cruelty or strength of talon and of claw that determined success or failure. Survival values at different times have been measured in different terms. Ability to breath air by means of lungs rather than to purify the blood by means of gills meant success in escaping from the water to the land. Love of offspring and tender care for the young gave the weak and puny mammals of long ago the ability to triumph over much stronger and more powerful reptiles like

the dinosaur. Especially in the strain that leads to man can we note the increasing spread of habits of cooperation. of unselfishness, of love. The survival of the "fit" does not necessarily mean either the survival of the "fittest" of of the "fightingest". It has meant in the past, and I believe it means today and tomorrow the survival of those who serve others most unselfishly. Even in evolution is it true that he who would save his life must lost it. Here, if nowhere else, do the facts of evolution lead the man of science to stand shoulder to shoulder with the man of religion.

Another difficulty arises from our present limitations of knowledge. If man has evolved from other forms of animal life by the continuous process of evolution it is asked how can there be any difference between him and them, how can we believe that he has an immortal soul. Again, the appeal to facts makes it clear that somehow out of the continuity of process real differences have emerged. When the cow pauses on the hillside to admire the view, when the dog ceases to bay at the moon in order to construct a system of astronomy, then and not till then will we believe that there are no differences between man and other animals. Even though we may not understand how these differences arose, the facts are there; knowledge and mystery exist side by side; mystery does not invalidate the fact. Menof science are working on those very problems. They have not learned - and may never learn how God breathed a living soul into man's body. If they should discover that process, and the method used, God will still be just as great a power. In the image of God cannot refer to hands or feet, heart, stomach, lungs. That may have been the conception of Moses, it certainly was not the conception of Christ who said that God is spirit, and proclaimed that man must worship Him in truth. It is man's soul,his spirit, which is patterned after God the Spirit.

It is the business of the theologian not the scientist to state just when and how man gained a soul. The man of science is keenly interested in the matter, but he should not be blamed if he cannot answer questions here. The theologian must tell when the individual gets his soul, whether at the moment of conception, or when the unborn babe first stirs within the womb, or at the moment of birth, or at the first gleam of intelligent appraisal of his environment and how he knows this.

Men of science have as their aim the discovery of facts. They seek with open eyes, willing to recognize it, as Huxley said, even if "it sears the eye-balls". After they have discovered truth, and not till then, do they consider what its moral implications may be. Thus far, and presumably always, truth when found is also found to be right, in the moral sense of the word. Men of religion seek righteousness; finding it they also find truth. The farther along the two avenues of investigation the scientist and the theologian go, the closer together they discover themselves to be. Already many of them are marching shoulder to shoulder in their endeavor to combine a trained and reasoning mind with a faithful and loving heart in every human individual and thus to develop more perfectly in mankind the image of God. Neither the right kind of mind nor the right mind of heart will suffice without the other. Both are needed, if civilization is to be saved.

As Henry Ward Beecher said, forty years ago, "If to reject God's revelation of the Book is infidelity, what is it to reject God's revelation of himself in the structure of the whole globe?" With that learned preacher, men of science agree when he stated that "the theory of evolution is the working theory of every department of physical science all over the world. Withdraw this

theory, and every department of physical research would fall back into heaps of hopelessly dislocated facts, with no more order or reason or philosophical coherence than exists in a basket of marbles, or in the juxtaposition of the multitudinous sands of the seashore. We should go back into chaos if we took out of the laboratories, out of the dissecting-rooms, out of the field of investigation, this great doctrine of evolution." Chaos would inevitably destroy the whole moral fabric of society as well as impede the physical progress of humankind.

# # # # # # # # # #