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718TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL, WESTMINSTER, S.W.1, ON MONDAY, FEBRUARY 4TH, 1929, AT 4.30 P.M.

ALFRED W. OKE, ESQ., LL.M., F.G.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the following Elections were announced:—As a Member: Clair Adrian Wontersz, Esq.; and as Associates: Alfred Cowper Field, Esq., George P. H. Maynard, Esq., and the Rev. Charles W. Cooper, F.G.S.

The CHAIRMAN then introduced Dr. P. J. Le Riche to read his paper on "Scientific Proofs of a Universal Deluge."

SCIENTIFIC PROOFS OF A UNIVERSAL DELUGE.

By PHILIP J. LE RICHE, ESQ., M.R.C.S., L.R.C.P.

THE object of this paper is to show that the stratified layers of the Earth's crust have been laid down comparatively suddenly.

At the present time nearly all geologists are agreed that the whole of the stratified layers have been laid down *slowly* throughout untold ages, and that each layer represents the surface or stratum on which plants grew, and marine or terrestrial animals lived.

This theory, on the other hand, attempts to show that the *whole* of the strata has been laid down comparatively suddenly, due to *re-deposition*, by means of sub-marine and sub-terranean *volcanic* explosions, and that the strata represent only "the graveyard of a past marine and terrestrial fauna and flora."

This theory, therefore, is opposed to the chronology of geologists, and is in opposition to Lyell's theory of *slow* stratification.

If we observe the sediments which go to compose the strata of the crust of the Earth, we find a peculiar sequence of events, which geologists term the " Ternary Succession of Sediments," in which a more or less distinct three-fold arrangement, or succession occurs, in which the sandy, muddy, and calcareous sediments have followed each other.

In order to explain this " Ternary Succession," geologists have to assume that the Earth has been submerged and re-elevated—first below, and then above the waters—and this condition of things must have been repeated many times.

There is, however, another method of explaining this condition, viz. : that these sediments were re-deposited in water, due to the effects of volcanic action—both sub-marine as well as sub-terrestrial—for it can be shown that the strata contain the fossil remains of fish which have been *suddenly* interred before putrefaction had acted upon their fleshy bodies, for their bodies are preserved as they were during life.

But this remarkable state of preservation of fish-life is also found in the flora ; for plants—ferns as fine as maidenhair—are found embedded in the matrix, with even their veinules intact, showing that they must have been buried very shortly after their deposition in the sediments, otherwise they would have become converted into leaf-mould and indistinguishable, whereas a botanist can place that fossil plant in its proper Order of plant-life.

Therefore, both fish- and plant-life have undergone an interment different from that which now obtains, for at the present time if a fish dies, in river, pond, or sea, its fleshy body is preyed upon by the predaceous animals, and nothing remains but, perhaps, its skeleton, otherwise its body would have become converted into adipocere.

How, then, has this state of preservation been brought about, both for fish and plants ? Something *sudden* must have taken place in order to have preserved them.

Professor J. Muirhead Macfarlane, D.Sc., LL.D., of the University of Pennsylvania, in his book, " Fishes the Source of Petroleum," gives an exhaustive description of the manner in which fish have been destroyed and *suddenly* buried before putrefaction had taken place, while their fleshy parts were

intact, and the destructive distillation of their bodies has produced *petroleum*, on which we now depend for the motive power of our internal-combustion engines.

But this Petroleum is found all over the Globe, and at different levels in the soil; therefore, the *cause* which buried them thus must have been universal.

What was that cause? What *sudden* catastrophe could have brought about the interment of fish-life, and at the same time the preservation of plant-life in the strata? Professor Hugh Miller explains the appearance of fish of the "Old Red Sandstone" by stating that they were suddenly killed by the action of a sub-marine volcano, and that explanation holds good to-day.

Sub-marine explosions, therefore, took place in the days of the deposition of the "Old Red Sandstone." In speaking of the carboniferous deposits, Professor Muirhead Macfarlane states that Professor H. M. Cadell (of the Scottish Geological Survey) *hints* what he—Professor Macfarlane—would *strongly emphasize*, viz.: that the inorganic material of the limestone, and much of the clayey material of the oil-shales, is of *volcanic sub-aerial origin*!

This is indeed an admission! for here again—higher up in the strata than the Old Red Sandstone—we find a statement coming from two eminent scientists, that *volcanoes* have played a great part in the deposition of the *inorganic* material of the carboniferous layers, in fact that volcanoes were the actual source and origin of the carboniferous layers! But volcanoes have not the habit of "spitting up" their contents *slowly*, and Lyell's "Theory of Stratification" demands that *slow* processes have taken place throughout the strata.

Lyell assumes that what is going on *now*, has ever gone on, and that the present-day processes—multiplied by millions of years—are sufficient to account for stratification, viz.: that as rain brings down sediments to lower levels; as rivers bring down the sediments from the higher ground to the lakes or sea; that, as the sea encroaches here and retires there; that, as land is slowly rising in some places, and is slowly sinking in other places; that all these phenomena are a sufficient explanation for the laying down of the strata all over the Earth.

If this is not so, what is the other explanation? Certainly *slow* deposition cannot explain the well-preserved state of thy fish, nor of the plants as stated above.

Let us suppose that at an early period of the Earth's existence, there were *no* stratified layers on the Earth's crust, except the fire-clay upon which the plant-life grew; that organic life had been *created* in a *progressive* manner; that fish had been created from their lowest form, viz.: the single-celled mass of protoplasm up to their highest form the mammal, namely, the whale, etc.; that reptilian life had also been created in the same way from the lowest to the highest form of reptilian life, and the same with other animal forms, and that they had been created so *progressively* that it was possible for them to have mixed their "kinds," and that the hybrids of those days were fertile; hybrids to-day are infertile.

If this were so, it would account for the "links" which we now find fossil, and which have been attributed to Evolution. Huxley tried to persuade Darwin to allow that evolutionary processes might have taken place *per saltum*, in order to explain the many anomalies in the theory of Evolution which Darwin had to encounter. This *progressiveness* in creation would therefore bridge over the difficulties, and account for that which is at present unaccountable.

In those early days of which we are speaking, plant-life was growing luxuriantly in the fire-clay which formed the soil in which the roots of the vegetation were embedded, and which at present is found underlying each bed of coal.

It has always been a puzzle to the geologist to account for the luxuriancy of the vegetation of the coal, so much so that at one time geologists supposed that the atmosphere of those days was composed of carbonic acid gas, until they found embedded in the resin of the trees of the carboniferous vegetation, butterflies, cockroaches, scorpions, etc., which were oxygen breathers; and therefore that theory fell to the ground.

If, however, we allow that there were no other stratified layers than the fire-clay, the solution becomes easy, for the plants would have been in much closer apposition to the internal fires of the Earth which would represent what is at present known as a "hot bed," and would account for the luxuriancy of the vegetation. Animal-life had been multiplying, and on account of the close affinity of their creations, hybrids were the result, the proofs of which we find embedded at the different vertical levels in the strata.

The difficulties which Darwin experienced in evolving his theory as to the "appearances" of animal-life in the strata,

were more than equalled in his attempting to account for their "disappearance," for he says in his *Naturalist's Voyage Round the World:* "The mind is at first irresistibly hurried into the belief of some great catastrophe; but thus to destroy animals, both large and small, in Southern Patagonia, in Brazil, on the Cordillera of Peru, in North America up to Behring's Straits, we must shake the entire framework of the globe . . . Certainly, no fact in the long history of the world is so startling as the wide and repeated extermination of its inhabitants."

But were these exterminations *repeated*? Is it possible that *once* and for all, a great catastrophe *did* shake the entire framework of the globe? And what geologists believe to have been a "Glacial Period," or periods, was but *one* phase in this great and unprecedented *bouleversement*?

Geologists assume that at one or more periods of the Earth's existence there came to pass an unusual phenomenon, the "Glacial Period," and that one hemisphere at least was affected at one time. Croll attributes its cause to astronomical conditions, but if Croll is right, we ought to have evidences of these "Glacial Periods" recurring every few hundreds of thousands of years; which, however, we do not find.

Geikie thinks that one hemisphere was "pushed up" above the snow-line, and later on the other hemisphere followed suit. Neither of these theories seems to fit in with the phenomena which are discovered in "The Book of the Earth," and neither has an explanation as to the "causes" which produced such results.

Let us see what "History" has to say about the matter, for there is a book which states that at *one* precise period—calculated in the year of a certain man's life—in a certain month, and a certain day of that month, "the fountains of the great deep were broken up."

I take it that huge rifts or fissures took place in the ocean-bed, and that the waters came into contact with the internal fires of the Earth, producing huge volumes of steam. When the pressure of that steam reached its "critical point" a submarine volcanic explosion took place, which dislocated the ocean-bed, and redeposited those sediments, according to their specific gravities, in water, either on the ocean-bed, or if land were in the vicinity, over the surface of that land.

The animal-life in the sea in that vicinity would be killed by the explosion—as well as by the mephitic gases—and their

bodies would be buried in the detritus of that explosion: this would happen quickly before decomposition had time to act upon their bodies.

The first fish which are found embedded in the strata—the Devonian or Old Red Sandstone layers—are the mud-fish, which are the slow-moving fish, and this can be explained by the slowness of their movements, and their inability to escape from the oncoming sub-marine explosion; the quicker-moving fish would escape, but only to be overtaken later on. When one sub-marine explosion had taken place, there would be a lull, during which a fresh quantity of water would rush on to the internal fires, and another sub-marine explosion would be repeated.

Therefore, these sub-marine eruptions would be "intermittent" and yet continuous, and would only cease when the fires were quenched.

Another phenomenon connected with these sub-marine eruptions, would be that a "back-wash" would take place, the same as it did at Lisbon, but of course on a gigantic scale, and it would act upon the freshly deposited sediments, producing the same effect as if "denudation" had taken place, but it would act quickly.

Geologists state that "denudation" takes a longer time to produce than the action of "deposition," but it can be seen that "denudation" took a no longer time to be produced than it would take for the "wave of translation" to act, that is, at once.

The re-deposition of the sediments, therefore, took place, not only on the land but on the bottom of the sea, and it was possibly in this manner that the "continent of Atlantis" was produced, the sediments of which were undermined by the sea later on, and subsided suddenly. In this manner those portions of the globe which are now islands may have been linked together after the Flood, by means of the deposition of these sediments, and might have allowed migration to have taken place from one island to another, and then have sunk under.

Volcanic eruptions may not have been limited to sub-marine ones, but sub-terrestrial volcanic eruptions may have also taken place: the difference being that the sub-terrestrial eruptions would throw their volcanic *débris* into the atmosphere, and enormous quantities of volcanic ashes and volcanic dust would be distributed. Sir Henry Howorth shows that mud-volcanoes of New Zealand produce the nearest approach to that peculiar

deposit known as the Loess, and it is due to these volcanic emanations that I attribute the origin of the Loess.

One of the most difficult problems which faces the upholders of a *Universal* Flood is to account for the enormous rise of the waters of that Biblical Deluge; and this has caused many to imagine that the Flood was purely local.

As Huxley stated to Gladstone, with reference to a local Flood: "The plains of Mesopotamia are open to the South, and water has a nasty habit of retaining its own level." This difficulty, however, disappears if the scientist remembers that steam occupies 1,400 times the space of the water that goes to form that steam; the consequence would be that the waters would be forced up to an enormous extent: but another most important factor would be that when the waters rose they would reach the North and South Polar Regions, where they would come into contact with enormous quantities of ice.

At the Antarctic we find Glacial Ice at the present time 5,000,000 square miles in extent, and from 4,000 to 10,000 feet thick. This Antarctic Glacial Ice together with the North Polar Region's Ice must have had a prodigious effect in raising the waters, for the displacement of that quantity of water by the Polar Ice was another most important factor in the raising of the waters of the Flood.

Ice floats with eight-ninths below and one-ninth above. Professor Sir Edgeworth David, of the University of Sydney, who accompanied Shackleton to the Antarctic, states: "That for every 35 feet thick of ice-cap melted off the Antarctica the sea-level all over the world would be raised about 1 foot; so that if the average thickness of the ice is now 1,800 feet, and if all the ice-cap were melted off, sea-level all over the world would rise about 50 feet."

If we add to the Antarctica the ice at the Arctic Regions, together with the height to which the waters would rise due to the expansion of steam, we would get a considerable elevation of the waters of the Flood. It would, therefore, be possible, after the Antarctic glaciers had floated away, that rafts of floating vegetation might become deposited on the site formerly occupied by those glaciers.

Let us see what effect this floating ice would have upon the terrestrial surfaces. If floating ice came into contact with igneous rock, it would cut, groove, striate, and polish the surfaces with which it came into contact. In fact, it would act in the same

manner that a glacier would, except that it would act quickly. It might fracture that rock, and carry the fractured pieces on its underlying ledges, and transport them to distant parts. On the rising waters of the Flood, it might fracture the rock which lay at a lower level, and transport it to a higher level on percussion. Professor G. H. Hitchcock found boulders on the summit of Mount Washington 6,000 feet above the sea, which he was able to identify as derived from the ledges of light grey Bethlehem gneiss 3,000 feet lower than Mount Washington (G. F. Wright, *Man and the Glacial Period*).

One well-known "bloc erratic" is that which forms the pedestal on which the statue of Peter the Great once stood in St. Petersburg. That "bloc" was found on the steppes of Russia, in a superficial position, and geologists from far and near gathered to view it, and it was agreed that this "bloc erratic" could not have come from any locality nearer than Norway. The explanation of its presence on the steppes of Russia, many hundreds of miles away from its original position, was given as being due to its transport by a "glacier."

In order, however, to meet the conditions of the case, the mountains of Norway would have to have been elevated to at least three times their present height, and the ice-field which fed that glacier would have to have been many hundreds of square miles in extent. A moraine would have to stretch from Norway to the steppes of Russia, and it would have to be shown that glaciers are capable of surmounting mountain heights.

Now it would have been an easy matter for a floating iceberg to have struck the Norwegian mountain, and to have fractured it: the detritus, including the huge "bloc erratic," might have fallen on to its submerged ledge, and have been transported to Russia, and when the iceberg stranded, it would have deposited its burden where, as a fact, it was found.

Another action of floating ice would be, that if it came into contact with the sea-bottom it would act as a mighty plough, and might push onwards any detritus, such as the shells which are found on Moel Tryfyn. Another action is that, if two masses of floating ice came into contact with the floating bodies of animals, they would crush and fracture their bones, as we find the bones of animals fractured, but not gnawed or rolled, in the "Pikermi Beds of Attica," and elsewhere. Another action is, that when floating, the glaciers of the Antarctic, carrying their

boulder-clay on their under-surface, would melt, and the boulder-clay would become detached and deposit itself vertically over the place at which it was floating at the time ; and this would account for the presence of boulder-clay, when no other evidence of glaciation is found.

On the abatement of the waters of the Flood, these floating icebergs would become stranded, and would again form glaciers, and act as if formed *in situ*. Still another action would be that on the abatement of the waters they would ground, and " pond back " the waters into lakes, which would remain as lakes until the ice-barrier melted and allowed the waters to disperse.

In Ohio we have evidence of this having taken place, on a large scale over thousands of square miles. The presence of floating ice on the abatement of the Flood can be seen in the " Parallel Roads of Glenroy," when an iceberg entered the Valley of Glenroy at its lower part and was unable to find an exit. As the waters fell below the level of the " Col," they rushed out of the Valley by its *embouchure*, carrying the iceberg with them, which dammed the waters back, forming a lake.

As the winter came on, the waters froze at the level of the highest " road." The sides of the Valley having been under water had absorbed water, and, as water expands at 40° C. it split the rock, which fell in pieces on to the ice. In the spring the ice dissolved, allowing the pieces to deposit themselves, forming the Upper " road." During the summer the level of the water in the lake fell to the level of the middle " road." This froze during the succeeding winter, and the same occurrences took place again, the pieces of rock falling on the surface of the ice at the level of the second " road " ; this was again repeated, and then the iceberg melted, allowing the imprisoned waters to rush out, and the Valley is as it is now.

But the highest " road " is over 1,100 feet above the level of the sea ; therefore, as water retains its own level, water must have stood at that height all over the Earth.

Again, we have accounted for the presence of floating ice in that water. These " roads " are perfectly horizontal and perfectly parallel, therefore they must have been produced by water, and the Earth has not moved out of its horizontal since those " roads " were formed.

Let us turn to the carboniferous layers, in which we find coal. In order to explain the presence of coal, geologists assume that each layer of coal represents a past vegetation which was growing

in lagoons close to the sea, and they state this because they find fish embedded in the carboniferous layers. But coal is found in the centre of vast continents hundreds of miles away from the sea. This vegetation sank under the sea for from 10,000 to 100,000 years, and then rose again to the surface. Each layer of coal has its underlying fire-clay. A fresh deposit of fire-clay is supposed to have formed upon the newly-risen surface, and also a fresh supply of seeds from which the future vegetation would derive its plants.

In England we have as many as thirty layers of coal, superposed to each other, and in America as many as eighty coal layers, and each layer has its underlying fire-clay. Whence did each layer derive its fire-clay ?

More important still, whence came the seeds for each new coal vegetation ? According to geologists, it would take, at the lowest computation, thirty times 10,000 years for the formation of coal in England, and eighty times 10,000 years for the formation of the coal-fields of America ! Are not periods of from 300,000 years to 800,000 years sufficient to provide evidence of " evolution " in the vegetation ? The vegetation, however, of the highest layer is similar to that of the lowest layer !

And we find trees embedded in the carboniferous with fruits still hanging to their topmost branches and expanded as perfectly as in a herbarium (Macfarlane). Also we find erect trees, not rotted away, covered over by *different* sediments ; geologists state that it must have taken thousands of years for these sediments to have deposited themselves. We find leaves impressed in the matrix with their veinules perfect, showing that they must have been buried at once—buried while growing.

Let us try to explain the presence of coal on the basis of our theory. When the sub-terrestrial volcanic explosions took place at the beginning of the Flood (while the sub-marine volcanic eruptions were causing the waters to rise), they broke up the terrestrial vegetation into huge rafts, which—on account of the woodiness of the trees—floated, but on account of the mosses and ferns, they absorbed water, and finally sank, carried onward by the marine currents. Each raft had its underlying fire-clay. The volcanoes supplied the carboniferous limestone which Cadell and Macfarlane attribute to a sub-aerial volcanic origin, and the fish were enmeshed in the detritus.

In this way we can explain how fish-life found its way into

the carboniferous layers, without calling in the aid of lagoons by the sea. Neither is there any need to assume that the Earth kept " bobbing down " and " bobbing up " again, so many times, to explain what we actually find. There is need for only *one* submergence to explain the facts as they are found.

Further, let us turn to the appearance of animal-life in the strata. Certain it is that we have now but an impoverished animal world—pigmies of a past fauna, compared with the fossilized monstrosities of " the World before the Deluge." " Everything that was in the dry land died." We ask, " how comes it that the animal world was buried at different levels in the strata ? " When a man drowns, he sinks, and about the ninth day his body floats, due to the gases of decomposition generating in his intestines. What makes that man sink again ? —A further process of putrefaction, in which the skin putrefies, bursts, and allows the gases to escape, and the " heavier-than-water " body sinks.

Now if these sub-marine volcanic explosions were going on, and laying down fresh sediments, the longer an animal floated, the higher up in the strata would the body of that animal be found. Consequently, the animals that had the thicker skins would be buried at higher levels in the strata than the animals that had thin skins. Therefore, the Pachydermata ought to be found highest of all in the strata. But when it comes to the horizontal distribution of animal-life in the strata, it does not follow that, because, when alive, an animal inhabited the Arctic Regions, its body should be found in those regions, for during the time the body floated, it might be carried from the Poles to the Equator, or *vice versa*. Consequently the carcases of Torrid, Temperate, or Arctic animals are found buried in a common grave, irrespective of their original habitat.

There is, however, a peculiar condition found in the strata, viz. : the legs of animals—the Mammoth—and *not* the rest of the body. We find in the Loess the limbs of the Mammoth, but the rest of the body is not there. Why is this ? I reply : The skin of the Mammoth's limbs is thinner than that of the body, and in floating the skin of its limbs putrefied first, the ligaments did the same, and the limbs of that floating Mammoth separated themselves from the rest of the body, which floated on, and was in due time, deposited in some other locality.

The same can be shown of the lower jaw of the Ungulates, for we find their lower jaws buried by themselves and not with

the rest of the body. The reason of this is, that the Ungulates have lower jaws that are loosely articulated; and these, due to early putrefaction, separated from the rest of the body and became deposited earlier than the rest.

There is, however, an animal which is found perfectly preserved, in Siberia at the mouth of the Lena—the Mammoth. Here we have an extraordinary condition of things, differing from that of other animals. The Mammoth met its death in the plenitude of its strength, suddenly, whilst browsing on the thick grasses at the mouth of the Lena, and the remains of these grasses were found still between its teeth, and its last meal was found undigested in its stomach. Its skin and hair were in a perfect condition, as when alive. How came this about? According to the Biblical account of the Deluge, it took place in the second month of the year on the seventeenth day of the month. This corresponds to November, and in November the gravels at the mouth of the Lena were frozen.

The first sub-marine explosion which took place at the mouth of the Lena threw over that Mammoth the frozen gravels, and embedded it *in* those frozen gravels; and from that day up to the time that Mammoth was freed from its icy bed, its body had not come into contact with the germs of decomposition, because the putrefying bacteria are inert at freezing-point. It might have happened that other Mammoth, close by, and also feeding, escaped being buried under those frozen gravels and were drowned; their bodies would float on, and finally become interred in the Pyrenees or even in England, wherever the floating carcase might burst its skin, through putrefaction, and finally sink.

There are other conditions in which we find fauna and flora interred, for which no explanation can be given other than that water was the agent which transported them. For example, in the Argau district of Switzerland we find the beetle-cases of insects, forming a large deposit, and in Spitzbergen only 8 degrees south of the North Pole, we find only the spores of plants forming coal, while the plants themselves are not there.

The evidences which we have brought to bear on this subject are surely testimony to the verity of the Biblical record of the Universal Flood, but what has hitherto caused doubt, both to the Biblist and the Scientist, as to the Flood having taken place at all, is Lyell's hypothesis of *slow* stratification which has been generally accepted and believed in. Dr. J. A. Fleming was

surely correct when he said: "The majority of persons take their opinions on difficult subjects ready-made from those whom they deem to be special authorities; and hence when once a certain view of a subject has been broadcast, and widely accepted as the right or fashionable one, it is very difficult to secure an unbiassed re-consideration of it."

One of the most interesting, and the most superficial of all deposits is called the "Loess." It is a yellow homogeneous clay or loam, unstratified, and when crushed in the fingers forms an impalpable dust. It is found as the topmost of all deposits, and its distribution is extensive. It covers a wide area in Central Europe, in Northern France and Belgium, up the valleys of the Rhine and its tributaries. It spreads across Silesia, over the plains of Poland and Southern Russia. It extends into Bohemia, Moravia, Galicia, Hungary, Transylvania and Roumania, sweeping far up into the Carpathians, where it reaches a height of 2,000 feet. In the United States it is widely distributed in the great basin of the Mississippi. It crosses water-sheds.

The Loess is found extensively in China. In Shansi it reaches a height of 9,000 feet. In hilly regions it fills up valleys, and traverses mountain-chains. It spreads over the ground so as completely to conceal inequalities. In the Mississippi Valley of the United States, and in Europe in the Rhine Valley, the Loess rests in places upon elevations of 800 feet above the river, but does not occur at higher levels. This would clearly indicate that it is a water deposit.

What is the origin of the Loess? Sir Henry Howorth compares the Loess to the "Moya" or volcanic mud that is thrown out in certain districts, and its calcareous ingredients seem to point to a subterranean origin; and he shows that it consists of comminuted angular particles, free from structure and from the presence of foraminifera, and is charged with carbonates. Silica we know to be a product of volcanic eruptions. The Loess is apparently a substance of volcanic origin, deposited slowly in water, and then acted upon by the wind in many places after its deposition. Its ubiquity, the lateness of its deposition, its disregard for water-sheds—for it is found on each side of a water-shed—shows that it cannot be regarded as having been produced by local floods, but, rather, it must have been deposited by a flood which reached unprecedented heights; and that it is *not* of marine origin, the microscopical

evidence clearly shows. Three crops can be raised on this Loess annually.

Those who assert that the Loess is the product of glacial action, in fact is "glacial milk," cannot maintain that glacial products are fertilizing agents, whereas it is well known that volcanic products are fertilizing agents. My belief is that the Loess is the product of subterranean volcanic eruptions, which took place at the same time as the sub-marine volcanic eruptions, and that it is volcanic *dust*. It fulfils the conditions necessary for a volcanic product, viz.: that it is extremely light in the air or in water, and it is one of the most fertile of soils, its fertility being in the Loess itself. It floats out to sea for nearly 100 miles, and it is that which we find forming the Yellow Sea. It is brought down from the heights by the Rivers Hoang-Ho and the Yang-tse-kiang.

Silica is shown to be a product of volcanic action, and this would explain its occurrence in the Loess. It is found practically all over the world, and, as already said, is the most superficial of all deposits. Professor Muirhead Macfarlane and Professor H. M. Cadell attribute the inorganic portions of the carboniferous to be of volcanic sub-aerial origin; therefore we can trace from the carboniferous right up to the most superficial of all deposits a *cause* which produced these deposits, and the Old Red Sandstone is also of sub-marine volcanic origin.

It therefore seems as if volcanic agencies, from the lowest stratum up to the highest, had been mainly instrumental in the laying down of the stratified layers of this Earth, that volcanic activities had been produced all over the surface. The distribution of the Loess in positions so far apart as China, the Danube and the Rhine, and in North America, lying everywhere in the same stratigraphical position—and the surmise that it was deposited in water—leads one to suppose that it was the very latest of all the sedimentary deposits. In America, where glaciation is found, the Loess disappears, which is accounted for by the waters of the newly deposited icebergs washing away the superficial Loess.

It is this Loess which has produced the fruitful soil of Minnesota and Manitoba, the granary of the world, for the "ponding-back" of the waters by the stranded icebergs allowed the Loess to deposit itself at the bottom of this huge lake; and when the waters drained off, after the ice-barriers had dissolved, the Loess remained *in situ*, and from the Loess the fruitfulness of that land

is found to arise. Not only on land, but in the sea we find evidences of enormous volcanic action as one of the latest of deposits.

In the *Voyage of the Challenger* Sir C. Wyville Thompson states: "Over a large part of the bed of the Atlantic Ocean, pumice occurs in quantity in different stages of decay," and that this is more especially evident in the "red clay" area; and he traces a great part of the material of the red clay to this source. Nodules containing a large proportion of manganese peroxide are usually more or less abundant in the "red clay," which are believed to be derived from the decomposition of volcanic products.

Here again we have evidence of volcanic products being found as a superficial deposit, as ocean deposits. Dr. G. Frederick Wright, in his *Man and the Glacial Period* states: "The connection of lava-flows on the Pacific Coast with the Glacial Period is unquestionably close. For some reason which we do not understand, the vast accumulation of ice in North America is correlated with enormous eruptions of lava west of the Rockies. The extent of outflow of lava west of the Rockies is almost beyond comprehension. Literally hundreds of thousands of square miles have been covered by them to a depth—in many places—of thousands of feet."

Here again we find volcanoes exerting their influence at the higher levels in the strata; but in the Rockies it is more as if the tired Earth, in its last throes, had belched forth these enormous emanations of lava, as it were, in its dying efforts. So, from the lowest to the highest layers of the Earth's crust we find that volcanoes and volcanic products have been the main causes (if not the entire cause) of stratification. The volcanic mud of the Old Red Sandstone, the Argillaceous material of the oil-shales of the carboniferous, the lavas of the Tertiary, the pumice of the Atlantic Ocean, the Loess—ubiquitous and most superficial—all these are of undoubted volcanic origin.

One of the most startling facts brought out is the very recent, almost universal, change that has taken place in the character of the fauna in Europe, in North America and in South America.* In the most recent deposits—cave earths, peat-bogs and gravels—we find the remains of a whole series of large animals which have

* Professor Alfred Wallace, "The Geographical Distribution of Animals, vol. i, pp. 149–51.

since become wholly extinct, and as Professor Alfred Wallace says, at certainly not a great while ago geologically, and it is almost certain that this great organic revolution, implying physical changes of such vast proportions that they must have been due to causes of adequate intensity and proportionate range, has taken place since man lived on the Earth. It is clear that so complete and sudden a change in the higher forms of life does not represent the normal state of things.

Species and genera have not at all times become so rapidly extinct. For instance, in Central Europe rhinoceri, the great machairodus, hippopotami and elephants, all suddenly become extinct or leave a country. In North and South America the same sequence happens, and all become extinct. Hence it is clear that we are now in an altogether exceptional period of the Earth's history. We live in a zoologically impoverished world, from which all the hugest and fiercest and strangest forms have recently disappeared; yet it is surely a marvellous fact and one that has not been sufficiently recognized—the sudden dying out of so many large mammalia, not in one place only, but over half the land surface of the globe.

We cannot but believe that there must have been some physical cause for this great change; and it must have been a cause capable of acting *almost simultaneously* over large portions of the Earth's surface, and one which, as far at least as a Tertiary Period is concerned, was of exceptional character. Such a cause exists in the great (and recent) physical change known as the "Glacial Period." If Professor Wallace's surmise, that the "Glacial Period" was but a phase in the great and universal catastrophe brought about by the "breaking up of the fountains of the great deep," then we have the solution of the difficulty of accounting for the sudden destruction and the sudden interment of the fauna from the Old Red Sandstone up to the Tertiary.

Professor Muirhead Macfarlane states that petroleum is produced by the destructive distillation of the fleshy bodies of millions of billions of fish, which had been suddenly destroyed, and equally as suddenly buried by means of volcanic disturbances, and interred by the volcanic products at different vertical positions in the strata. I can find no other solution which can account for these intermittent and yet continuous volcanic catastrophes than the one I have given.

I have attempted to show that the "variation of species" of the animal-world has been produced by their "mixing their

kind" owing to the progressiveness of their creation, but in the plant-world we have evidence of the creation of a higher plant-life in Gen. ii, 9, which was produced at the time of the creation of Adam, "And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food." This clearly is *not* the same plant-life which was created on the third day of the Genesis records. These trees would be of a more buoyant nature than those of the carboniferous period, and would therefore be found higher in the strata than that of the coal.

Addendum.

The seeming discrepancies between the Biblical versions of the Creation and the Deluge, and the scientific assumptions as to the Origin of Life and the appearance of a "Glacial Period" or periods, lie in the fact that the Geologist has accepted Lyell's Theory of *slow* stratification as the correct solution of stratification. Science—after all—is nothing more than man's attempt to probe God's mind.

Professor Adam Sedgwick once said: "When the Biblical history of the Creation is thoroughly understood, I have no doubt that it will entirely agree with Geology."

DISCUSSION.

Lieut.-Col. F. A. MOLONY said: I regret that this paper was not entitled "Scientific Evidence of a Universal Deluge"; for the arguments in it seem to me to come far short of proof. I see no reason why those who, like myself, desire to uphold the inspiration of Scripture, should feel bound to defend the theory of a universal deluge. Gen. vii, 20, has not received the attention that it deserves. It runs—"Fifteen cubits upward did the waters prevail, and the mountains were covered." Now, fifteen cubits is almost certainly less than thirty feet, a negligible dimension compared with what *we* call mountains, but a sufficient rise of water to cover all the artificial mounds and sand-dunes of the great plain of Mesopotamia, which is 340 miles long by 140 wide. Doubtless everything that Noah could see, or of which he could hear, was covered; and so he naturally thought that all the high mountains that were under the whole heaven were covered. Bearing in mind, however, the way

that words change their meanings, I do not think that we are bound to believe that Noah had Alps and Himalayas in his mind. Neither is the mention of Ararat evidence against my theory that the flood was mainly confined to the great plain of Mesopotamia, for it seems unlikely that the Ararat of Gen. viii, 4, is the mountain which we call Ararat to-day.

The very important questions, where the water all came from, and where it all finally disappeared to, are inadequately dealt with by Dr. Le Riche. I cannot understand the argument on l. 13, p. 92, about steam forcing the waters up to an enormous extent; surely the steam would immediately rise through the waters! Our author claims to prove a universal deluge, not a universal steam-bath! The only definite minimum figure which he gives for the universal rise of the water is 1,100 feet in connection with Glen Roy. But he only plausibly explains a possible rise of 100 feet by the melting of both polar ice-caps. The argument about the Loess appears to be relevant, but his other detailed arguments do not strike me as proving much more than this, that there are many things which science has not yet correctly explained.

Our lecturer recognizes that his theory of strata laid comparatively suddenly is opposed to the fact that these strata contain very different fossils, and he seeks to explain the difficulty by arguing that some fish swam away from the approaching cataclysm faster than others, and so got embedded in different strata. This may be, but many of the fossils are shells, and the explanation does not account for their varieties being so markedly sorted out into different geological beds. Again, the slow stratification theory seems to account for the carving out of our valleys, and for the weald of Sussex, better than the theories advanced in this paper.

Neither my knowledge, nor the time allowed me, will permit of my dealing with Dr. Le Riche's arguments seriatim, but I should like to refer to Glen Roy, as I have visited it, and, since reading this paper, also looked up the maps. From the up-valley ends of the famous "Parallel Roads," to the sources of the streams feeding the Roy, the distance is five miles, and the rise 1,900 feet. Hence, if an iceberg, or glacier, completely dammed up the mouth of the valley, the rain-water would slowly rise to 1,100 feet, at which level it found another outlet. Thus there is no need to postulate

a universal deluge to account for these "roads." In demanding faith in a universal deluge, our lecturer is laying on some of us a burden heavier than we can bear, until he gives a better explanation of what became of all the water.

Lieut.-Col. SKINNER said: It is not an easy matter to criticize so many details of evidence, most of which would call for very careful examination before one could assent to (or dissent from) the conclusions drawn. But in thanking the lecturer for his able and helpful paper, I will merely say that I have always felt the doctrine of "uniformity" to be inadequate to account for all the facts with which science is confronted. The two schools, uniformitarian and cataclyemic, are poles apart: each has a share of truth, but neither has a monopoly; and it seems to me that, rightly to interpret facts as they are, there must be a sensible fusion of the two ideas.

I may also add that the fact denoted by "the breaking up of the fountains of the great deep" is one that, in my humble estimation, ought to have had the serious attention of all scientists long since, and I feel personally grateful to Dr. Le Riche, alike for his interpretation—not necessarily the only one, or complete, but helpfully suggestive of seismic disturbance and a succession of tidal waves—and for his courage in bringing it forward at the present time.

While agreeing that the title might better have been "Some Evidences of a Universal Deluge," I would deprecate the condemnation with which the paper has been received in some quarters. In every honest attempt to explain phenomena, it seems to me that the truth is better served by an endeavour to extract and employ what is good than by efforts to destroy a thesis altogether by criticism that is purely hostile.

Dr. H. C. MORTON found it impossible to agree with Colonel Molony, that the deluge was merely local, and that in the Biblical narrative Noah is describing simply what passed under his own eyes. The Biblical narrative, on the other hand, very emphatically states, and repeatedly, that all those creatures that breathed the breath of life under the whole heaven, perished, except such as were taken into the Ark, and the Flood is presented to us as a new

beginning for the whole of human history, whilst St. Peter says that the world, that then was, perished. General McMunn's recent attempt to give a modern parallel to the Flood, also, for the same reason, entirely fails. The waters *prevailed* over the whole earth, and, manifestly, the record means "fifteen cubits above the tops of the mountains." Dr. Le Riche seeks to meet the difficulty thus presented, by the theory of volcanic movements altering the levels both of the earth and of the sub-marine areas.

He approached Dr. Le Riche's paper very sympathetically, though certain portions of it appeared to him not possible, yet the general conception of what happened he regarded as worthy of consideration, and he thanked Dr. Le Riche for his paper. But by laying emphasis upon sub-marine volcanic action, as an explanation of the Bible record, the case suffered, for the Bible, on the contrary, lays all its emphasis upon the dry land. Again and again it is repeated that the life of the dry land perished, whereas Dr. Le Riche makes the Flood mainly depend upon mighty volcanic movements and explosions under water, whereby, he suggested, vast quantities of fish and sea animals perished.

The speaker understood the general concept to be this, that by mighty volcanic movements beneath the sea, the sea-bed rose, the sea waters were warmed; they played upon the vast Arctic and Antarctic icefields, and thus the fountains of the great deep were "broken up." In that case, the icefields are evidently included in the fountains of the deep. One of the lecturer's arguments was based upon Professor MacFarlane's contention, that the source of petroleum was the destructive distillation of the bodies of fishes which must have been buried in vast quantities at the time of the Flood. The chemistry of paraffin is organic chemistry, and so far looks in the direction indicated, but did Dr. Le Riche think that fishes could have been destroyed and buried in sufficient quantities, and in such positions, as to account for the huge "gushers" in various parts of the world to-day?

Mr. W. E. Leslie objected that the paper was seriously at variance with facts of geology. Dr. Le Riche (he remarked) says that at the time of the Flood the Carboniferous forests flourished with *no* sedimentary rocks beneath them; but he also says the sedimentary

rocks were *re*-deposited during the Flood. Where were they before ? With some probability it is suggested that a Mammoth feeding on the gravels at the mouth of the Lena was overwhelmed by the Flood. But the author forgets that these gravels and the sedimentary rocks under them only came into existence, according to his theory, during the Flood.

That the sedimentary portion of the earth's crust was not laid down during the Flood is evidenced by the following considerations : (*a*) Their enormous thickness, measurable in miles rather than feet ; (*b*) unconformable bedding upon faults and overthrusts, shows that the lower beds had been hardened into rock before they were reburied ; (*c*) some strata show marks of wind erosion—the effect of an arid climate ; (*d*) the strata preserve, not only the bodies of animals, but their tracks, where they walked or hopped over soft ground—conclusive evidence that they are old land surfaces, not a heap of debris ; (*e*) the chalk (familiar in the South Downs) is mainly composed of the remains of minute organisms, similar to those which to-day are slowly accumulating upon the floor of still ocean depths far from land. That such deposits could, in the course of a few days, assume the proportions of the South Downs is, to my mind, utterly incredible.

Mr. WILLIAM C. EDWARDS said : I think the lecturer attempted too much in his paper ; but I thank him and refrain from criticism. Some of the suggestions of our lecturer will bear more serious consideration than they have received, *e.g.* the theory of the fish origin of mineral oils. We know that seismic disturbance and volcanic eruptions do destroy untold masses of fish which, floating upon the ocean, might be deposited under the conditions, with such results as he suggests. There are many things in the lecture which I think ought to be emphasized because they can only be explained by the deluge. Take the case of the Mammoths which have been found in Siberia with food in their mouths and undigested food in their stomachs. Consider what that means : there were these mighty beasts browsing, and a mighty wave, probably from frozen Arctic regions, in a few seconds overwhelmed them and buried them in deep, freezing mud. Nothing but the deluge can explain this and other facts brought forward by our lecturer.

I once spent some time in a St. Petersburg museum examining some of their remains, and that left upon my mind a never-to-be-forgotten impression.

Our lecturer instances the remains of trees in the Coal Measures, standing with the fruits and leaves upon them. Here the flood of mud must have risen more slowly, but steadily, burying the tree *in situ* and completely; or, again, the fact that in places coal is discovered composed alone of the seeds of plants, without the leaves or the timber. These things *are* only explicable by such a Flood as that described in Holy Scripture.

Mr. HOSTE remarked that it was hardly fair to make the lecturer's theory stand or fall on his ability to answer all the "hows" and the "whys" involved. It was well known one wise man could ask a question that the unwise could not answer, but he can always be met in the Irish way by asking him some more. He would venture to say that Dr. Le Riche's floating icebergs would seem more able to account for the general situation of rocks, and transference of boulder clay and erratic boulders, than the condition of absolute fixedness, which one would suppose must have prevailed during a period of intense cold, like the Ice Age, when everything would be fixed solid. Have great ice-caps power to move over flat surfaces? But still the icebergs must have been enormously numerous, and could only have striated rock surfaces, when the water was comparatively shallow.

As for the question, "Where did the water come from?" he believed it was a generally admitted scientific fact, that were the surface of the earth a uniform curve, there is enough water in the oceans to cover the world two miles deep. This does not include the enormous quantities of water suspended in the form of vapour above the firmament. If the Flood consisted merely of enormous waves of translation, how could the Ark survive except by a continual miracle of which there does not seem a hint in the Genesis narrative?

Mr. Hoste had not noticed any attempt on the part of the critics of the paper to answer the facts cited by the lecturer, as hostile to the Lyell theory of gradual deposit, such as to the occurrence of whole tree trunks in the Coal Measures, with fruit still *in situ*, and

delicate substances like maiden hair ferns, flies, butterflies, whole fish, being found embedded as though so suddenly engulfed that they had not had time to fade or rot. Also, what the lecturer cites about whole Mammoths being found frozen and kept "in cold storage" all these millenniums. However, is it not unthinkable that strata like the Jurassic formation, 1,300 feet in thickness, or the numerous superimposed Coal Measures, or even the Dover Cliffs, could have been deposited in the brief period of the Flood? On the one hand, there is a danger of underrating the extremely important effects of the Flood, but on the other, there is an equal danger of exaggerating those effects, and so bringing the whole theory of the Flood into ridicule.

Written Communications.

Rev. W. M. H. Milner wrote: Having been brought up from my earliest years in the study of geography, physical as well as political (gaining the R.G.S. Public School Medal in 1876), when it came to University and preparation for the ministry, I turned at once to the study of Bible geography in 1880, almost specializing on the scientific proofs of the Bible record of a universal deluge. It almost at once occurred to me that the magnetic poles indicated a second, perhaps the original, axis of the earth.

Suppose a shift of axis took place, some of the old astronomers used to vision a terrella or inner earth, comprising the heavier elements, separated by a fluid surround—perhaps mercury—from the outer shell. At first the whole, the outer shell, and the terrella rotated on one axis. And something happened suddenly to dislocate the shell, which would slide, as it were, on the intermediate fluid surrounding the terrella. I say "suppose," but the Bible language agrees with the "supposition," and goes far to establish it as a scientific fact. "All the fountains of the great deep were broken up," and, as a consequence, "the floodgates of heaven were opened," "and the rain was upon the earth." It was not the rain that caused the Flood, but the Flood the rain.

It is interesting to note that, when the commotion ceased (Gen. viii, 1–3), "the waters returned from off the earth"—*not* "*continually*" (A.V.) but "in going and returning" (Heb.).

Obviously this was the reverse process of what might have been equally well described (of what happened when the great commotion started) as "the waters advanced upon or around the earth, coming and advancing."

It was indeed as if Almighty Power had, in the poetic language of the book of Job (xxxviii, 13), "taken hold of the ends (Heb. "wings") of the earth, and shaken out the foul unnatural brood that had contaminated the human kind."

And a foul brood it *was*. Gen. vi, which leads directly up to the narrative of the Flood, explains what had happened 120 years before the great catastrophe took place (*v.* 3). Human kind including, of course, human women (*v.* 1), had, in the course of some sixteen centuries, grown into an increased population, filling the globe. The women were very fair, the "beni ha-elohim" (sons of God) in Job, who describes them as convened (with the great "Angel" Lucifer as one of them) to give account of themselves "before God in Heaven." The Bible does not use its phrases loosely or at random. "Daughters of men" were human women; "sons of God" (*i.e.* those who had no Father but their Maker), were *immaterial beings* who, on this occasion, 120 years (Gen. vi, 3) before the Flood, *materialized* in human form in wilful contradiction of the natural law of *kinds*.

Having materialized, they intermarried with the women of earth, who doubtless felt honoured by union with celestial mates. The issue of these marriages, increasing in number as the years of the closing century of the Antediluvian Era rolled on, were big, strong men—*nephilim* (literally, "the fallen ones"), naturally "giants." The whole plan of Creation—"each after its kind"—would have been wrecked if this had been allowed to go on unchecked. The *only way* to cleanse the earth of this foul intermixture, *without destroying it altogether*, was by water. And so it happened that at the appointed moment some great continental areas collapsed by one of those volcanic outbursts so well described in the lecture, sent the disturbed ocean *spirally swirling* round the land surfaces of the globe, so that not at one moment, but at successive moments "the whole earth" was overwashed, and "all life" washed out.

Greek mythology in full of the "gods" coming down from heaven

and fathering a wondrous and mighty posterity. Discoveries in the great caves of the earth show large-sized human bones cheek by jowl with those of beasts of the chase, that perpetual "sport" of hunting which would still be in full swing when the last day of that age broke, and involved them both in a sudden and complete destruction. Science and nature conspire with Holy Scripture to tell what happened.

The detailed scientific evidence of such a catastrophe as a Universal Deluge is priceless, and I thank the lecturer. I have ventured to supply, as the result of nigh on fifty years' exploration of the facts of terrestial changes and of the Bible narrative, the motive and the method of the Flood. Nor do I forget that the New Testament yields its quota of corroborative evidence. For in the First Epistle of St. Peter (iii, 19–20) we are told that our Lord exhibited the extreme limit of Redeeming Love when (doubtless during those forty days of His Resurrection Life on earth) "He went and preached to the spirits" (no mere humans) "in prison—which once were disobedient, while the long-suffering patience of Almighty Power waited (120 years) in the days of Noah."

Dr. A. T. SCHOFIELD wrote: This able and learned paper seems to call for a few important queries. "Flood" and "Deluge," apparently referring the whole of the geologic changes described to Noah's Deluge, are found in pp. 92, 93, 96, and 97. Is this view correct, and could half of the geologic changes which Dr. Le Riche describes have occurred in 150 days? Was not the object of Noah's deluge to destroy the corrupt Adamic race and not the earth? Is not the destruction of "*the world that then was*" by water (2 Pet. iii, 6) a better solution of Dr. Le Riche's problem? Is it not clear that, so far from the Adamic race being widely spread, Gen. xi, 9, treats this as subsequent to Noah? Is not the earth we know "*that which is now*," and is there not a "new heavens and earth"—three in all?

We are quite sure that the Flood of Gen. i, 2, was absolutely universal and of long duration. We know Noah's was of far too short duration for such geologic changes. Moreover, may not the expression of its universality be qualified, according to the genius of Hebrew idiom, by the actual facts? No ark could hold the fauna

of the universe, nor is the idea of water over three miles deep conceivable in the time given. I suggest that this admirable paper best refers entirely and obviously to Gen. i, 2, and 2 Pet. iii, 6, only, and not to Noah's deluge at all.

Mr. W. R. ROWLATT JONES writes: With regard to the Loess, Rev. W. B. Galloway, in his work published in 1888, *Science and Geology in Relation to the Deluge*, thinks that Lamech's remark in Gen. v, 29, "This son (Noah) shall comfort us concerning our work and the toil of our hands, because of the ground which the Lord hath cursed," refers to the continued deposit of cosmic dust, which, having been suspended round the earth like Saturn's rings, was now precipitated downwards as the moisture in the air condensed and spoilt the vegetation which in that rainless era before the Flood depended on a heavy diurnal dew to sustain it.

With regard to the universality of the Great Deluge, it is just possible that these emphatic words "so that all flesh perished that moved upon the earth" (Gen. vii, 21) are open to the same qualifying as Luke ii, 1—"that all the world should be taxed." It might be that the Great Deluge only affected the descendants of Adam and Eve; that the white race, in contradistinction to the races round about, had been hedged around to keep them pure; they had shouldered the White Man's Burden, and having failed to elevate the inferior races of mankind, having "mingled among the heathen and learned their works," their Creator swept them aside, and planted a new Noachic race as torchbearers, disseminating not only true religion but the blessing of civilization to the remotest lands (*see* both Professor Clay's *Origin of Biblical Traditions* and Professor Waddell's *Phœnician Origin of the Anglo-Saxons*—two works recently appearing independent of each other, yet confirming this world-wide influence of the favoured Noachic families). This theory, too, explains the cryptic sixth chapter of Genesis.

Mr. G. WILSON HEATH wrote: I am sorry I cannot accept the "*sudden*" theory. I believe that stratification by the so-called Lyell theory of an age-long and slow process is true, and also the "*sudden*" theory now before the meeting may be likewise true. The two views are not antagonistic, but are capable of assimila-

tion. I doubt if the Noachic Deluge had very much to do with the matter; for the definite results of action by water, we must go back into the watery wastes of the ages before Gen. i: fire, gases, vapour and other kindred elements must have run riot during countless millenniums, and volcanic irruptions would be the characteristic condition of the period.

I cannot believe that it was during the relatively short period of the Noachic Deluge that gigantic icebergs were floating around ready to crash into the nearest mountain-side, take out of it an enormous slice, and forthwith float away with its prize on a journey of many hundreds of miles in order to deposit it in southern Russia, etc. To me the Glacial theory is clear and simple: the Deluge theory is replete with difficulties. The surface of the earth to-day is subject to undulatory movements; in past ages these movements were doubtless more like the great waves of the ocean under the pressure of storm and tempest. Must we not regard this undulatory movement as responsible for much which is difficult of explanation in *irregular* stratification? It seems impossible of belief that stratified coal-seams were formed by "sudden" action! In those countries where masses of soft coal are found in the mountain-side the "sudden" theory might be considered.

The paper raises many questions and provides food for careful study, but it has not left any sense of satisfaction or finality on my mind.

Mr. F. C. Wood wrote: Noah and the Deluge are mentioned as facts associated with warnings eight times in the Bible. The number is significant. Those who referred to them were Peter, probably Paul, both filled with the Pentecostal Spirit; the Lord Jesus who spake only His Father's words, and Jehovah Himself in Isa. liv. I state it in this way, because I particularly wish to emphasize that we can trace through nearly the whole of the prophetic writings that the Prophets did not speak their own words, but that God Himself spake through them.

My object in entering this discussion is to refer to the fact that the narrative in Gen. vi–viii, gives *two* statements, that not only did the waters above the firmament pour down on the

devoted earth for forty days and forty nights, but that the fountains of the great deep were broken up. This last remarkable statement must have reference to internal convulsions, and without attempting to explain how those convulsions worked geologically, if we accept the statement as inspired—and why should we not ?—it is evident it refers to matters of serious moment in the history of the world, by which the combined waters were able in forty days to rise above the mountains.

There is another matter of vital importance to consider, which, if Christians would give God credit for meaning what He says as did the Apostles of old and the Lord Jesus, would enable us to get rid of more than half our troubles. If we read Isa. liv with a candid mind, we must see that Jehovah claims to be speaking for Himself, and that the prophet is not represented as giving forth his own imaginations. Note the passage in question. God utters a promise, joining it up with His oath. He says distinctly that He sware to Noah that the waters of Noah should no more go over the earth. That implies that at one time the waters did go over the earth, namely, in Noah's day, and it is remarkable that, seeing those waters went over mountains, we find the Lord saying that the mountains shall depart, and the hills be removed, rather than His Covenant of Peace concerning Israel should be broken.

It is interesting to notice how frequently for the Divine Being the personal pronoun is used in this chapter, and, in fact, in the whole of the Old Testament. But the critic comes in, and with the stroke of a pen tells us that was only the prophet's way of expressing himself, and thereby the divine promise, though accompanied by oath, is made of none effect.

Lecturer's Reply.

Lieut.-Col. Molony upholds the theory that the Noachian Deluge was a merely local flood, but this great Plain of Mesopotamia 340 miles long by 140 miles wide is not enclosed, and water has—as Huxley said to Gladstone—a " nasty habit " of retaining its own level, and the Plain of Mesopotamia is open to the South. Again, surely *Elohim* in Gen. vi, 13, meant what He said : " The end of *all* flesh is come before Me ; I will destroy them with the earth."

If *Elohim* only meant to bring about a local flood in the Plain of Mesopotamia, it would have been easy for Him to tell Noah to remove himself and his family *away* from the locality in which this local flood was about to take place, and so save Noah the trouble of building an Ark. *Elohim* distinctly states that He is about to "destroy the *Earth*."

Colonel Molony asks where the waters came from and where they have gone to. In Gen. i, 9, "*Elohim* said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear, and it was so." These waters which were "gathered together unto one place," together with the rain which fell for forty days and forty nights, explains where the waters came from, and it was "the breaking up of the fountains of the great deep" which allowed these waters to come into contact with the internal fires of the earth, producing steam. This steam was formed deep down under the solid floor of the ocean, and did not (as Colonel Molony believes) produce a "steam-bath." This interned water was forced upwards to 1,400 times its previous volume by the generation of steam at high pressure.

Colonel Molony again asks, "Where did this water go to?" The waters of the universal flood returned into those cavities into which they had been commanded to go on the "third day." Professor Hecker, of the Potsdam Observatory, has ascertained that the apparently solid earth is subject to daily oscillations, analogous to the tides, rising and falling twice in 24 hours, some 20 centimetres, or 8 inches, called the "earth-tides." This discovery shows us clearly that the crust of the earth is *not* a solid inflexible mass, but that it rests upon a fluid base; so, assuming these sub-terrestrial cavities being filled with water, the explanation of "where the waters went to" may be answered. "Where wast thou when I laid the foundations of the earth? Or who shut up the sea with doors, when it brake forth, as if it had issued out of the womb?" (Job xxxviii, 4, 8). I have attributed the striæ and groovings made on to rocks to the action of floating ice, and therefore the limits of the height to which the waters reached are marked by the height at which we find those markings, and are not limited by the height of the "Parallel Roads of Glenroy."

Re the carving out of the valleys. I will answer this in my reply to Mr. W. E. Leslie.

As to the " Parallel Roads of Glenroy," I fail to understand, on Colonel Molony's theory, how these " Parallel Roads " could have been formed unless you have a mass of descending waters imprisoned in the valley. Each winter a sheet of ice would form, upon which would fall the pieces of rock which constitute the sides of the valley. This on account of the expansion of water at 4° C. These " Parallel Roads " therefore took three winters only in the making. Referring to the height of the flood, we read in Gen. vi, 17, 18, 19, that the waters increased, and all the high hills were covered; and *v.* 20, " fifteen cubits upwards did the waters prevail, and the *mountains* were covered." I take it that the height of fifteen cubits must be added to the height mentioned in the previous verse.

In reply to Mr. W. E. Leslie, let me say that I do not wish to convey the idea that there were no sediments in the sea before the Deluge, but, rather, that they became re-deposited on land during the Flood; and as Macfarlane and Cadell agree, the inorganic material of the limestone, and of much of the argillaceous mass of the oil-shales, are of sub-aerial volcanic origin: thus we have an explanation of the origin of some of the sediments. In order to explain the origin of some of the sediments, geologists are obliged to assume the existence of huge rivers, by which the sediments were washed down from imaginary continents. There is no evidence of such continents, or of such enormous rivers, but that solution is accepted without demur—*faute de mieux.*

The thickness of the sediments is acknowledged; but the present geological explanation of their presence and of their origin is quite as difficult as the theory which I have brought forward, if not more so, for the volcanic forces that elevated the Rockies, the Andes, and the Himalayas, and distributed the lava and scoriæ west of the Rockies for thousands of square miles, could with equal ease have deposited the sedimentary rocks in the waters of the Flood, and that in a comparatively short space of time. I foresaw the difficulty of explaining the footprints of animals, but Mr. T. Sheppard, M.Sc., F.R.G.S., Curator of the Hull Museum, assured me that this condition is taking place to-day at the mouth of the Humber, where a tract of land is covered over twice daily by the sea, and the Humber brings down the silt over it. Men walk across that tract; birds, animals and worms make their marks upon it; and after a time a piece of that land is dug up, dried, and carefully peeled off; and

there we find the traces of footprints of men, dogs, and worm-burrows accurately reproduced, filled in by the silt of the Humber. The impressions are *not* washed away. This condition, therefore, might have been repeated in the past, when animals attempted to escape, and left their imprints on the newly deposited mud; as a rule their bodies are not found there.

The chalk (familiar in the South Downs), and mainly composed of minute organisms, was (in my opinion) *not* originally deposited in the position at which we now find it, but was *re*-deposited from the ocean where it originally was. These organisms floated, and were churned up by the volcanic eruptions, to become re-deposited (where we find them now) on the abatement of the waters. They had lived and died ages before, but being of light specific gravity re-deposited themselves together with the particles of silica with which they are found as chalk: silica being a product of volcanic activity.

I can answer Colonel Molony's statement that "the *slow* stratification theory seems to account for the carving out of our valleys, and for the weald of Sussex, better than the theories advanced in this paper." I beg to think otherwise, for I have many a time walked on the Downs north of Worthing, and noticed with what convincing clearness one can see the effects of the downward rushing waters of a flood: they are shown on each side of those Downs. One can see the "scooping out" of the loosely deposited chalk, where the waters first swirled to one side of the little vallon, and then "scooped out" the other side, exactly as one would expect waters to do, when well above the height of the Downs, and "abating" with a rush toward the sea. This "scooping out" could not have been produced by rain, but by the mass of rapidly descending waters which had carried the "brick-earth" or loess toward the sea, and had scooped out the chalk, for no river had been there to do the work. Both to the north and to the south we can see where the waters parted, doing their work of quick erosion on loosely deposited detritus. I believe that it is this downward-rushing water at the abatement of the Flood which accounts for the distribution of the "rubble drift" which Professor Prestwich attributed to a sudden "uplift" of the land, but which the downward rushing of water would equally explain, while exactly "fitting in" with the PROOF of a UNIVERSAL Deluge.

In reply to Dr. Morton, let me say that I cannot see how the Biblical record can suffer by my explanation, for the Bible does *not* account for the *total* destruction of aquatic life—nor does my theory. Rather, the Bible accounts for the total destruction of terrestrial life—" all that was in the dry land died." One animal, viz., the Polar Bear, does not come under this category, for it lives on ice, and would be in its element—floating ice—and surrounded by the dead floating fish upon which to feed. In the *Illustrated London News* of March 16th we were given a splendid illustration, on a small scale, of the destruction of fish at Walfish Bay by means of submarine volcanic explosions. These fish cover from 30 to 80 miles of ground—thickly strewn fish—and yet the submarine explosion was so insignificant as to have escaped observation. At the Flood this took place on a gigantic scale, and the volcanic dust and debris quickly covered up the fish, so as to preserve them, not as skeletons, but as perfect fish. The fact that these fish are found at different vertical depths shows that these submarine volcanic explosions took place at succeeding intervals, and that volcanic debris were being thrown down at the same time to cover them; these intervals may have been close together.