THE NATURE OF THE NEWER KNOWLEDGE IN THE ORIGIN OF LIFE

DR. PRICE: I came to the platform in order that I may use the pointer to advantage. I will show you that I come to this topic with a great deal of concern and timerity, both because it is so comprehensive and because of the danger that I may be misunderstood in trying to hurry so rapidly.

I will ask you to study with me, then, the nature of the newer knowledge and I shall ask you to not expect that I will unravel for you the secrets of the origin of life as to the first life that came upon the earth but I will undertake to discuss for you the newer knowledge that relates to the life of the earth and the rebirth of life upon the earth, and in order that you may orient yourselves in the theme as we are approaching it, I will ask you to go back over the approach of the last two lectures, - the first one the need for more science in the modern christian home - and you remember the emphasis we placed was upon the fact that our Bible was written at a time when the known facts of the universe were very much less than they are today, with the result that we could not possibly expect that the people who wrote our Bible could anticipate the situation that we would be in today when we have learned that instead of their being six great channels of truth as separate divisions of knowledge,as existed at the time our Bible was written, we find ourselves now with all of those six merged into one.

In other words, we now know or have evidence that lends itself to no other interpretation than that matter such as you know it all about you - whether in living things or inanimate things and energy that comes to you as heat waves, radio waves, light waves or any other kind of radiation, are the same thing in different form and each can be measured in quantitative forms of others.

In the lecture just preceding this we undertook to correlate data that gave evidence that nature in all its various expressions is under the control of constant and uniform law and that the laws with which we are concerned are understandable by the human beings upon the earth in the light of their knowledge today.

We find ourselves changed from a viewpoint in which we are the center of the universe and the object of God's chief and principal concern to being a very infinitesimal part of God's universe, but an infinitely more important part of God's universe, for we are a product of the laws of His universe.

I will ask you, then, in approaching the study today of the forces that control the rebirth of life, to go back to the viewpoint that I left you with a week ago today, or a month ago.

We will have our first slide. I will ask you to look up to the heavens and see a part of the Milky Way which looks to you like a dash of some great paint brush, but when it is magnified, as it can be, it is found to be made up of an infinitely large number of individual stars, each one of which would be comparable to our sun and would average as large as our sun, and their distance from us is so great that even though light travels 106,000 miles per second, a distance that requires only a second to go seven times around the earth, that light that comes from the stars has been from four years to the nearest star to a million years and even millions of years to the farthest of the stars.

The first thing then is that in the great space in which they are there are a great many sources of radiant energy, for these stars are like our sun in every particular, apparently.

Passing now to the next one, we see our sun which will probably correspond to these according to the temperature of these various bodies

and their temperatures can be determined with great accuracy. These bodies will give off great flames of gas which come from dark spots which we see under certain lights and light spots under other conditions. This goes off into the distance. It may be 100,000 or 400,000 miles and when we come to our next thought, now, you will probably find a little difficulty to orient yourselves, namely, that the product that all these stars are made of can be proven to be approximately the same as the product our earth is made of, and there are only ninety-six known elements and eighty-two of these have already been proven to be in the sun. The swept off some of this gas and it congealed, cooled getting away from the hot sun,and it comes off into space and makes our sun.

If you would go out some night, as I did late last evening, and look into the sky, you will note that we have at this time three of our planets in view at the same time, and if you think again you realize that they are on the same course that the sun is taking and the moon is taking, and if you will take a piece of paper and let that represent - cutting it round - the path of all the planets going around our sun, and put our sun in the center, this earth and all of our seven planets will be so perfectly in alignment with each other and with the sun that if you reduce the size of our globe to the size of that sheet of paper, those stars would all be in that sheet. Can you imagine it as a wheel so true that each, though it is many millions of miles in diameter - really thousands of millions of miles - that it is perfectly true that the shadow of one of those will fall upon another of those what comes in the same part of the circuit?

Then we pass to the next and in order to remind ourselves again that the lines in the sun can be produced in the laboratory and can be identified and by that means every substance that is any star can be determined with accuracy, because the light that comes from any source carries the alphabet

which spells the material that that substance is made of,and having that now in line we will pass to the next and see our sun with its great sun spots and we see it in the light of one chemical. This is the light which comes from calcium which makes up five per cent of our earth. We see the sun produces different spots.

If we pass now to the next we see that the chemicals in the sun have their places. There is calcium and sodium.

In the next we have the pictures of the stars and you see these various lines coming in precisely in the same positions showing that substances are in all those sources.

The next will give us the production of light from what looks like a star. It may be a great mass like our Milky Way but so far away that it looks like a spot of light but is an infinite number of stars. When we come to this point we find ourselves ready to consider what perhaps is the greatest new truth that has been brought to science within one hundred years and it was given to us by Professor Milliken, - that the energy that is going off from these suns into space as light is not lost but in the great spaces between these great planets and suns,and in passing that you might orient yourselves to distance and the freedom of movement that these bodies have, if you think of four minotaurs occupying the Atlantic Ocean, you will find that those minataurs would have the same relative freedom that these bodies have in space. If now we come back to Milliken's important contribution, we find that he furnishes evidence that the energy that is going off from these great bodies into space is coming together again to form matter, and that that matter can be determined because of the character of the lives, the bands here in the picture, the energy that is coming to our earth from a distance.

He has built an instrument for measuring the amount of radiant energy coming from a distant star, let us say. It is an electroscope and as

energy comes from any distance of practically any kind and falls on that gold leaf or the air surrounding it, the air is changed so it becomes a conductor of electricity, letting the ions pass and that leaf collapses with the result that the electroscope is discharged and the rate of the fall of that gold leaf is a direct measure of the quantity of that energy. Now by putting something in front of that, a quantity of water, lead or iron, the amount that will be absorbed by that intermediary substance will determine the penetration of the rays which we are dealing with. He has found it will take two hundred feet of water in order to absorb all these rays. He has found it will take fifteen feet of lead to be equivalent to the water. It works out that it can be computed with very great accuracy.

The energy change that is taking place out in the interspaces between these great stars from which comes this energy that is so obscure that the Milliken rays, the dark rays that come in the night as much as in the day time - and it is found that they are produced by a change in a chemical constituency of matter.

Next slide. Here we have the spectrum of neon, helium, hydrogen, potassium, mercury. Helium is made up of four parts of hydrogen, 4 atoms of it. The atomic weight of hydrogen is 1.008. Multiply that by four and it comes out even. What becomes of the balance? That is eight-tenths of one per cent that you see there. We find that the energy that comes to the earth corresponds exactly with the loss in matter which hydrogen makes when changing to form helium or oxygen or silicon or iron - and those three substances, silicon and oxygen and iron are the three most abundant substances in the surface of our earth. Now get the significance of it. First having made their charts of the particular length of these bands of rays and establishing what their lengths were, they were then able to use the computing tables and to tell just exactly what chemical change would have to take

place whereby the experiment shows that a certain amount of hydrogen would be destroyed and produced in all this radiant energy.

That is interesting as a phenomenon, but the significant thing we are concerned to know is what makes life? What makes things grow? What is it that makes everything?

We must hurry on. This is like taking an airplane view of the mountains. If we have time we will stop on the natural properties of the various kinds of rays, but I will only discuss that chart long enough to say that all of the energy that comes from the rays can be expressed in this way. Take a long ruler on which you would
Give each one its proper place. If you would make that ruler as long as from here to the moon, the part you see as light would occupy one yard. Having that in mind, you will see that when we are dealing with radiant energy we are dealing with factors that go beyond the range of what we see as life.

Now, when radiant energy strikes into vapor or like gas or air, chemical changes take place and the vat through which these islands travel can be photographed,and in our next slide we will see the position of the newer knowledge with regard to the creation of the substances which we think of as being purely related to life.

Sugar is organic. We speak of organic substances and inorganic. Is it possible to make sugar without having a plant or animal to get it from? Yes, but only by having radiant energy and Bailey working in Liverpool devised a device called a mercury quartz bulb which gives off ultra violet rays and he puts into it a stream of carbon dioxide. The bulb is in water and has this radiant energy fall on it at the same time and then by putting certain chemicals in there, one of the most important of which is calcium, he can make sugar by the ounce - an organic substance that we thought only plants could

make. He can't do it without radiant energy, though. The sugar can be strained into starch and the starch into cellulose and it can be eaten by animals which become a source of energy and the muscles in the animals contract and they have all the first requisites for food.

The next picture will give us a plant, and in our plants we have the cell structure and these

Perhaps no one substance in all the universe is, in so far as life is concerned, so important. I say it is the most wonderful thing in the world, as all the energy man deals with, practically, is possible because of chlorophyll, the substance that receives the radiant energy and is able to act as a catalyzer. That is like some of these people who have the ability to get other people to work but can't work much themselves. And so the catalyzer is a wonderful thing because it can be present and then lets the other chemicals work, and as they do so, there is no loss of the boss of the job. That is what this chlorophyll is. It acts as a catalyzer.

If we pass to the next, we will have a plant that has been - when growing naturally grows in this form, but if exposed to radiant energy of fifty millionths of a unit in length are (a national unit is about ten millionth of an inch and that is the unit by which we measure these rays) - if we could take a fifty millionth of a unite, namely radium, and let it fall on a plant you immediately change the plant so it grows differently and all its posterity are different.

The problem then that we are to study specifically this morning is what the nature is of that energy that makes a plant different so it can change its type. That is the same thing that makes people different.

Now we have before us a little fly and you will think of that as having been exposed to x-rays or radium rays and the proper amount of ray on the embryos of that fly will make them take on changes that will be permanent

in all their posterity. And those changes which we have known to occur in plant and animals that make a different plant and different animal, makes it possible for advancement in the development of life. If now, we will think of this energy factor, we will have to think of it, in terms of catalyzers.

I think at this time I will make a demonstration for you which should be very helpful. I want you to see how catalyzers work. We will put in front of the machine a cell of water simply to control temperature. In this cell we have a test tube and in that test tube there will be the equivalent to what would be in this clock if I would take the escapement wheel off it, that clock could not run. We have to view this test tube upside down. Here is a drop of water running down the glass, because our lens reverses. That is the bottom. There is a grain of pure platinum that has been deposited electrolytically. Mr. Short will put into that some hydrogen dioxide. That gets down to the bottom when the globule of water gets down to the bottom. Now the presence of that small amount of catalyzer of pure platinum is making action like this escapement wheel. It bosses the job so the oxygen can get loose. That energy action has been released. Put in a little more of the hydrogen dioxide. He could keep putting in there all day and that platinum will always work just the same. There is no limit to the energy that platinum has in the capacity to act for escapement for the energy. It amounts to violent boiling.

That problem of a catalyzer is the secret of life, for nature by these rays that come to us is producing catalyzers and catalyzers are in very many forms. I mustn't take more time for this except to tell you that you only have a dim realization of what an infinitely large amount of energy that grain that is so minute can get. It could produce an unlimited quantity of that chemicalization.

We will apply that to life, and then we will find the processes which make up life itself.

I want to say in passing that in order to make this demonstration I am using my own lantern and not the one in the booth merely because there is better light here. There is no reflection on the lattern up there or the booth.

Now we note in passing the difference in these three chickens. The difference in this one is almost entirely due to radiant energy and the difference in these is entirely radiant energy. This one got one kind and that one got all kinds. I will discuss that in a later lecture more in detail.

Now I would have you see the process of fertilization. The sperm comes into the ovum and it carries a group of catalyzers, like that platinum, and those catalyzers have specific action. They will produce certain kinds of effects and that makes the difference in different animals and plants. And as we carry it through the different stages we would see how they are transferred to bodies known as chromosons, These chromosons distribute themselves among the protoplasm and divide up in the process of and make a network in the structure. The arrangement of that material has to do with the potential force of life and that material is associated with chromoson, a chemical we can easily see in cells.

If we take a dog, the principal cells would show that chromoton which goes to make up individual units, for every cell carries characteristics of that first cell, that chromoton would be distributed throughout the protoplasm and when the animal gets rested it comes together again in structural form.

Now as these cells divide after being fertilized, they pass into these stages when we get many millions of cells. Next is the characteristic

form. These various layers here will take on structural form and will give us the different kinds of origin, the original tissue that will determine whether it is bones, flesh, heart, kidneys, etc. These particular catalyzers that have gone into the dog's original tissues are the cause of the difference between the dog and man.

If, now, we take an ear of corn and you are familiar with the cobs of red corn a d white corn and you know that by mixing those two forces, this organic catalyzer in the grain of corn will make some of the grains white and some red according to the fertilization, precisely the same as in the animal, for in the animals a white animal and a black animal will always produce black, but in the next generation those animals will have one white and three black.

You will think of it now as catalyzers, for here we have the evidence showing this thing which we are dealing with is not related to some obscure general quality of the entire animal but related to the sex organs.

In the next now you have the thought that that factor, that energy factor is contained in those sex cells. If now we think of the tissues themselves as being influenced by this radiant energy factor and we use a source of radiant energy and tissues whether fat or muscle or membrane or rabbit's ear, they will all have different ability to absorb. They will each one take different kinds of energy from this mixed spectrum of life.

The next will give us a series of forms, for here we have our face - from fish to man, and you find that we looked like that once. Lots of people get very much disturbed and worried when they see a picture like that. You all went through it on your way here before you were born in your own embryonic life. You looked like that and then that opened on through. Perhaps here you were in the interuteral life. You looked just like a fish did, then finally a tortoise and finally more like a rabbit until ultimately like a human.

If now we take the skull development we will find this progressive changing going on. Keep the catalyzers in mind - how they are working.

We have the development of the teeth from these various forms to the time when we had three molars. If you are cultured you will only have embryonic third molars and if you are far advanced you won't have any molars at all, - wisdom teeth I am talking about. If you have three third molars, you are human animals in this stage of development. Incidentally, I haven't had any third molars.

Now, whether we take the theory that all these different forms - Caucausian, Chinese, Hottentot, Australian, Korean, and so forth - got their catalyzers from the same parent stock and branched off as shown here in separate branches or whether they came through a channel that gives greater relationship between the Orangoutang, the chimpanzee and the monkey, as believed by Gregory, is not important at all.

The next thing is to find that we in our development have been able to progress and the most important thing that we could be concerned with is the laws that make it possible for progress. What are they? That is what we want to study.

We have before us stalactites and stalagmites from a cave and in this cave were found these wonderful specimens of bison. This skull was made over 25,000 years ago by the people that lived in the caves and we think of modern civilization as something that hasn't been equalled in the past, but we would have very few better evidences of modeling. What made those people so advanced? Those ice periods made it possible for those men to go into the caves and in the caves they learned how to do things that they would not have learned without that stress, and one of the things was to keep warm and another thing was the need for clothing. We find their bones and bones of the animals they lived with. They were contemporary and they drew pictures of such animals as the woolly elephant that is long

since extinguished and we even find organisms or forms of life like the monster centaurs painted on cardboard on the walls.

I am going to call your attention to another problem.

I am pressed for lack of time. While this is very important, I am going to ask George to skip the next four, five or six slides. We will not take them but it is a tremendously important thing. It has to do with this: Why is it that a mouse can be dropped into a mine a mile deep and not be hurt at all, just jarred a little, whereas if a rat would fall in that same mine it would be killed. A man would break open, a horse would splash. The size of the body and its relation to the outer surface determines the nature of this cell activity. I will have to pass that and take you to this general problem and why it is that things do not grow larger.

These animals were long cells. They have a small mass to hold up but as the animal gets larger - the Polar Bear and the Hippopotamus are larger and stouter, we come to a limit that determines the size of practically every animal. Now that size makes it impossible for it - for example, bacterium could never grow large like a horse, for a bacterium can get all of the gas, all of the food it wants from its outer surface. The limit of life is dependent upon the strength of material for here is the law - as you increase the size ten times to each of the three dimensions of a cube, you increase the weight one thousand times, but you only increase the surface one hundred times. Why, we readily see then that the bacteria are able to get all the food they want from their external surface, but animals that are going to give that can never be larger than a certain size.

You see a bird can only take a certain size. Eagles can never be as large as man. If there were real angels, angels would have a chest

four feet deep to house the muscles necessary to lift the human body.

Now we come to a duckbill, an organism or young animal halfway between the bird and animal, which has a bill like a bird, a flat foot like a duck and lays an egg like a duck. This animal has made a wonderful step forward. It doesn't lay an egg and then stay home to keep the nest warm. It just builds a vest pocket and takes the egg along with it when it goes down stream to the card party with the toads and frogs and turtles, and it carries the egg along and it doesn't even have to take it home to feed it for the mother developed in the tissue of that pocket a little device where protein was mixed with an energy factor which was made out of energy and juice. The young animal just has to rustle the skin in the pocket and it gets a juice that is juice like the juice you and I started with, for chemically it is exactly like milk.

Now the problem then of the development of milk will bring out the problem of health, which I will take up. I want you to see now how another form of animal carries its young. This is the Rock Wallaby which has built a pouch and that vest form was put on to that little gland that excretes milk, the same kind of milk as your mother developed for you and me, a little gland in there with a tit and the little fellow it put in there. A Kangaroo's baby is not larger than a man's little finger. The mother puts it in there and it stays there and hangs on to the tit.

Where and whence came these changes in life forms? I am perfectly familiar with the nature of that theory that it is supernatural, but these things are nature. Some say that is sacred ground. No, I say then we are getting the secret.

In connection now with the pictures of the milk from the different sources. We find that chemically the same whether taken from the cow, goat, buffalo, woman, mare, ass, mule, bitch, cat, rabbit, lamb - that milk

made by all those forms of life, whether the kangaroo or duckbill, is the same thing. Why? Because radiant energy combines with proteins and carbohydrates to form a certain combination to form milk.

When now we take our radiant energy as it comes from the sun, we find in the last four years in Ohio, in Cleveland our sunshine from January to December is shown on this chart. It was high in May last year.

Here we have a chemical analysis of 141 clinical patients wherein we analyzed the level of certain chemicals in the blood. That was during the past year. Now this diffusible calcium goes up in May. You see the product of serum calcium goes up in May, down in summer, up in fall, and drops in December. We are talking about these catalyzers that are made by radiant energy for this product makes these things go up. Here is serum calcium the thing which will determine the kind of life we get every day.

Here is the sun's radiation for 1928 in Cleveland and here we have the chemical analysis and you see these notches represent sunshine and fit practically into the changes in the serum calcium of our blood. We are the product of the radiant energy. Our life is an expression of radiant energy, whether it was yesterday, or last week, or last year, that we got the sunshine. Do you get the significance of that? We begin to follow the nature of these.

I want to call your attention in passing to the next slide when we take the sickness curve in comparison with these curves of the amount of radiant energy as expressed in these food products, we find it an answer to why more funerals are in April. You get the significance of it? It is tragic that I haven't more time. Might I take one minute more?

Let me tell you that by analyzing the butter you eat, the milk you drink, it can be determined how much of these energy factors are in the milk. That energy factor which comes to you in your food goes

into your system and determines whether or not you have health or have disease,and disease is largely an expression of the absence of these factors.

With your permission then we will go on from this point at the next lecture which will be the nature of personality.