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Uniformitarian Principle

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marily be said of revelation as a unity, inclusive of both supernatural pre-redemptive and natural revelation. The revelation of God in nature as it now is, is still clearly manifestory of God." It is in this context that Van Til comments: "We may, therefore, with Kuyper, speak of twofold science and yet also speak of the unity of science." (p. 13) and: "Why should the Christian then not gratefully employ, for purposes of advancing knowledge, the funded results of the investigation of scientists, whether they be Christians or not? He may do so, only if he does not, while doing it, thereby concede the

independence or the juxtaposition of the natural principle as over against the special principle." (p. 14)

5. Carl F. H. Henry, ed., Revelation and the Bible. Grand Rapids: Baker Bookhouse, 1958, pp. 18, 19, 23.

6. The result of such an attitude to life, and especially of neo-Pentecostalism, is the establishment of all sorts of Bible Schools. One might as well put padlocks, then, on all institutions of (advanced) scholarship and on all other centers of training for various tasks in our culture and world.

THE UNIFORMITARIAN PRINCIPLE

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The Uniformitarian Principle Defined

The Uniformitarian Principle, which has been a basic assumption of historical geology since it was first proposed by James Hutton of Edinburgh, Scotland, in 1785, has been frequently questioned by Bible-believing Christians. Over the past two centuries many extreme statements have been made on both sides of this subject, so that it would be well to try

to set the record straight.¹

The Uniformitarian Principle holds that "...rocks formed long ago at the earth's surface may be understood and explained in accordance with physical processes now operating" (Gilluly, Waters, and Woodford, Principles of Geology, 3rd ed., 1968, p. 18). There are two reasons why this definition is far better than the brief dictum "The present is the key to the past," which is commonly

quoted. First, the principle is not blind extrapolation on the basis of the present conditions apart from supporting observational evidence—an impression its opponents have often sought to convey. Second, our knowledge of "physical processes now operating" is not perfect, but is subject to improvement as a result of current and future research. Thus, The Uniformitarian Principle is not as dogmatic as some have taken it to be.

As Christians we should recognize that our knowledge of the physical processes going on in the created universe is limited. The so-called "Laws of Nature" are merely the generalizations drawn by man from somewhat limited data, based on observations and experiments conducted on and near the planet Earth.² Only the Sovereign God knows fully and completely the laws and principles by which His creation is governed. In the Bible

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we learn that God rules by laws, yet personally over His creation (cf. Psalms 78, 104, 107, etc.). He is a faithful Guardian of His creatures.

On whatever subject the Bible speaks (including science) it speaks with the full authority of God. It is not merely the word of Moses or Paul or Peter. Thus Scripture teaches that God made man by a special act of creation uniquely in His own image; Darwinism and Neo-Darwinism are clearly contrary to Scripture. (Likewise, some theories of modern cosmology cannot be squared with the Scriptures either). The Bible, however, does not tell us about all the fundamental constants and scientific principles displayed in the creation. It says nothing about the principles of electricity and magnetism, nor about the relationship of chemical elements and the periodic table. It tells us nothing about the design or repair of modern farm machinery. These must be discovered from the study of the creation, not the Bible.

It would appear that in respect to the physical creation God has been pleased to

exercise His rule in a fairly consistent and uniform manner. There are certain fundamental constants and physical principles observed by scientists which have been found to be consistently the same throughout the observable universe. For example, Kepler's laws of planetary motion also apply to binary star systems. Another example is gravitation. Fortunately for us, it is not a part-time phenomenon. Rather a universal constant of gravitation has been determined which applies not only to the Earth and Solar System, but to the stars and galaxies as well. The length of the year (the period of the Earth's revolution around the Sun) can be very precisely determined, and does not vary. The velocity of light in space (most recently determined to be 299,792,456.2 + 1.1 meters/second) is apparently the same everywhere and throughout time. Light has the same velocity today as that

measured in 1675 by Olaus Romer when he first noted that light has a finite velocity in connection with observations of the eclipses of Jupiter's satellites.

That there should be such fundamental physical constants and principles seems to be indicated as a creation ordinance in Genesis 1:14: "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days and years:" This orderliness of God's creation was reaffirmed in His promise after the Flood: "While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease" (Genesis 8:22). God promises regularity of times and seasons to us, not chaos and disjunction.

The fundamental constants and principles mentioned above are but a few of those utilized by scientists in various fields. There are many others in physics, chemistry, and astronomy, which might be cited.

There are some events recorded in the

Scripture which constitute exceptions to these fundamental physical principles. Christ changed water into wine at Cana (John 2:1ff). He walked on water (Mark 6:45ff, Matthew 14:22ff, John 6:16ff). He calmed the storm (Luke 8:2ff). He ascended bodily into heaven (Acts 1:9-11). Clearly, the laws of chemistry and of gravitation presently known to man cannot confine our God. Such unusual cases, however, were designed to manifest the glory of the Triune God and to promote the welfare of His people. Most were manifested at critical times in the history of God's people. They impress us as remarkable because they stand out from the orderly manner that the Lord employs in upholding and sustaining His creation—an operation we tend to take for granted.

God is not presented in Scripture as a magician who delights in tricks and deceptions, who engages in capricious activities.

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He is a God of order, not of chaos.

Application of observationally and experimentally well-attested fundamental constants and principles in science should not therefore be cause for objection. They seem to be implied in God's Word (cf. Genesis 1:14, 8:22 *supra*), and they are the very backbone of the scientific enterprise. In the field of planetology (which includes geology), this application involves the use of the Uniformitarian Principle. In interpreting the rock strata of the Earth's crust, therefore, the geologist assumes that the same physical laws were operative when the rock strata were deposited as the operative today.

The Uniformitarian Principle in Action

What physical laws are assumed to have existed in the past on the basis of the Uniformitarian Principle? Many critics of the

principle do not go into this, preferring to talk in general terms about the terrible dangers of extrapolation. Let us, however consider some of the "reckless" assumptions which are made under the banner of the Uniformitarian Principle.

First it is assumed that water has always run down hill by reason of gravitation, which is a fundamental constant. This may sound trivial, but water in the form of rains, rivers, oceans, and glaciers is very important in the geological processes of weathering of rocks and erosion. Sedimentation usually also involves water.

Under the Uniformitarian Principle it is assumed that rivers have always eroded the outside curve of their banks, developing more and more pronounced meanders until these loops intersect and cut-offs occur. This is in accordance with Newton's First Law of Motion, which involves inertia. Two other ba-

sic assumptions according to the Uniformitarian Principle are commonly made: (1) in a lake or along a coast, sediment tends to settle in nearly horizontal strata at a given time, and (2) in undisturbed formations, the oldest strata are to be found under the younger strata. In similar manner there are distinct characteristics of erosion by glaciers and by wind.

The consistent working of these physical processes is seen throughout the world today, and has been seen throughout recorded history. In the light of God's orderly maintenance of His creation is it dangerous and farfetched to assume these processes were operative in prehistoric times?

Many of the buildings in Glasgow, Scotland, for example, are constructed of sandstone quarried nearby. The structure of the sand particles in these stones is well-rounded grains that have been evenly and cleanly

sorted in a manner typical of windblown desert sand, and clearly not characteristic of beach sand. This is strong evidence that at one time the Glasgow area was a dry desert, quite different from the well-watered region we know today. We find similar sand conditions today in the Mohave Desert in California, and also in central Australia.

The case of the Glasgow sandstone indicates that the climate of a given region of the Earth may change drastically over long periods of time in accordance with the Uniformitarian Principle—in this case the physics of weathering and erosion. Climates change, mountain ranges rise and erode, coastal seas intrude and recede from continental interiors. The rock records of the world, enough to make a composite geological column 155 km high, tell many strange wonders when interpreted in the light of observed physical processes.

"The case of the Glasgow sandstone indicates that the climate of a given region of the Earth may change drastically over long periods of time in accordance with the Uniformitarian Principle—in this case the physics of weathering and erosion."

Another example of radically different climatic conditions is that involving lower Michigan, eastern Ohio, northwestern Pennsylvania, and the Finger Lake region of New York during the upper (late) portion of the Silurian period known as the Cayuga series. In the upper portion of the Salina shale of this series we find an enormous amount of salt. South of Ithaca, New York, at a depth of 0.6 to 1.0 km underground there are seven beds of salt with a combined thickness of 80 meters. In the central portion of lower Michigan the thickness of the salt beds is immense. Deep wells reveal a thickness of 0.5 km of rock salt, and the formation underlies most of the lower peninsula!

How could such vast salt deposits have formed? Recently discovered Silurian rock beds in the Notre Dame Mountains south of the Gulf of the St. Lawrence indicate that there was probably a narrow arm of the Atlan-

tic intruding into the mid-continental region bringing salt water into an area of very little precipitation and high evaporation. In other words, the region was a desert containing a very dead sea. (A similar situation existed much later in the Permian basins in west Texas, where other enormous salt deposits exist).

A Change of Atmosphere

Just as we cannot extrapolate past climates for given regions from present conditions in those regions, neither can we assume that the composition of the Earth's atmosphere is the same throughout its history. Over 90% of the atmospheres of Venus and Mars (the major planets whose orbits are nearest our own) consists of carbon dioxide, while that gas constitutes less than 1% of the Earth's atmosphere. Many scientists now think that the limited

amount of carbon dioxide in the Earth's atmosphere is not the original condition, but is due to the unique presence of life—particularly plant life—which has transformed much of the carbon dioxide into free oxygen, and allowed much of the carbon to be absorbed into the Earth's crust.

Geology supplies strong evidence for such a change in the constitution of the Earth's atmosphere. In some of the very oldest rocks there are unusual banded iron formations. Specifically, these include the Animikie rock series and older series around Lake Superior, which belong to the earlier portion of the Cryptozoic Eon and are dated by geologists at 1.6 billion years of age or more. These vast deposits, formed by the deposition of iron and silica, could not have been laid down at a time when the Earth had an oxidizing atmosphere as it now does. These deposits, from which we get most of our iron ore in North

America, must have been formed before there was a significant amount of free oxygen in the atmosphere. Consistent with this, one does not find banded iron formations in any of the later rock formations of the world.

In this case, on the basis of the principles of chemistry, physics, and what we know of the biological requirements and effects of life, we perceive a radical change in the Earth's atmosphere. Here again the application of the Uniformitarian Principle does not mean that the present simply dictates the past.

The Bible and the Uniformitarian Principle

I strongly believe there is nothing unbiblical in the Uniformitarian Principle if it is rightly applied and interpreted. It does not (as I hope I have shown above) lay a base for inordinate extrapolation. It is not to be used in vacuo, that is apart from the data presented in the rock record.

Since many modern geologists are Darwinian or Neo-Darwinian evolutionists, there have been misapplications and misinterpretations in many of the textbooks. This situation exists in part because so few Christians with a Reformed, Kingdom perspective have entered the field, not because the rock record really supports the evolutionary theory.³

Some readers may be inclined to reject the Uniformitarian Principle because of the large number of skeptics, agnostics, and atheists who are its proponents. Unbelievers, however, embrace many other fundamental constants and principles as well, such as the laws of Kepler and Newton. Do we reject these also because of the supporters they may attract? Is it the course of wisdom to oppose something simply because many heretics and infidels happen to believe it? Is it not true that we continue to confess in the Nicene Creed our belief "...one holy catholic and apostolic Church..." in spite of the many heretics and unbelievers who may have enrolled in denominations utilizing the names "Catholic" and "Apostolic"? Mention of the Uniformitarian Principle should not provoke an extreme reaction. Properly defined and understood, it is valid.

Some Christians have opposed the Unifor-

mitarian Principle because it was supposedly condemned by the Apostle Peter in 2 Peter 3:4, where Peter condemns those who deny the Second Coming of Christ because they allege "...all things continue as they were from the beginning of the creation." As we have seen, however, the Uniformitarian Principle does not preclude radical changes and disastrous events from happening in the course of the Earth's history. In the case of Jesus Christ's Second Coming in glory, we have an exceptional situation in which the wisdom of God surpasses the generalizations of men based on a study of the created universe.

In this connection it is well to remember that some misapplications of Scripture have been made in relation to science in the past. Somewhat over 400 years ago the ancient theory of Aristarchus that the Earth was a planet revolving around the Sun, was revived by Copernicus. At that time some Christians (including Tycho Brahe) argued that this was impossible on the basis of Psalm 93:1c and 96:10b, which both say, "The world also is established, that it cannot be moved."⁴ Now that we have the laws of Kepler and Newton, and have determined the Earth's motion precisely in space, and even journeyed to the Moon, no one gets excited any more. (The passages are really speaking of the firm rule of God over the world of men. But that was not understood four centuries ago).

Another case, this one involving geology and the providence of God, emerged three centuries ago when it was realized that the magnificent Giant Elk (or Irish Elk) of Europe, whose antlers measured as much as 14 feet from tip to tip, was extinct. Many people were sure that this could not be the case—it would be an imperfection in the providential care of God if He allowed any whole species to perish. It was a pious and heated argument for some time, now largely forgotten. Some Christians were sure that the Lord was protecting a small herd of elk somewhere in a hidden valley. Such views rested on religious sentiment, but not upon any explicit promise of the Scriptures.

The Lord is King

One other important question concerning

the Uniformitarian Principle remains to be discussed. Does it bind the history of Earth to the canons of some man-made or man-discovered physical laws, leaving no room for the divine creation of our planet, and of the universe? Does it rule out God's subsequent rule over and intervention in His creation? Doubtless, some atheists would like to construe it that way, but I do not think that we should let them get away with it, any more than we should allow a good word like "catholic" to become the exclusive property of the Papists. Too long the atheistic evolutionists have regarded geology and the Uniformitarian Principle as their private domain.

The Uniformitarian Principle does not limit the activity of the Sovereign God. It is an expression of the way in which He has been pleased to conduct geological processes through the course of Earth's history, at least so far as His general operations are concerned. As has already been pointed out the Bible records some unique events manifesting the power of God transcending ordinary expectations. Among these events certainly must be placed His works of creation ex nihilo, and His many unique acts recorded in Biblical history. God is not limited, yet He does not have to act chaotically to prove His freedom. He does not have to prove anything. He is not on trial.

Some scientists have tried to use the Uniformitarian Principle in connection with a naturalistic world and life view to explain away God's works of creation and to deny His present rule over the created universe. Their effort is an evidence of the sinful rebellion of mankind against its Creator. In the face of these distortions, the Christian is called to set the record straight, and to emphasize the claim and the rule of Jesus Christ over all of His creation.

1. Consider some of the dogmatic scientism of Andrew D. White's History of the Warfare of Science with Theology in Christendom (2 vols., 1896). The first president of Cornell University, White went out of his way to attack Biblical Christianity, and went far beyond the warrant of scientific data. On the

other side, for example, Seventh Day Adventist Harold W. Clark of Pacific Union College maintains that the disappearance of the dinosaurs is due to their being drowned in the Noachic flood (Fossils, Flood and Fire (1968) pp. 11, 35, 130). If that were the case, it would appear that Noah failed to obey God's command to take at least two of every kind of animal into the ark (Gen. 7:2). This argument concerning dinosaurs is part of Clark's attack on the Uniformitarian Principle.

2. In this article, Earth, Moon, and Sun are capitalized in accordance with astronomical convention. I adopt this practice to emphasize that the Earth and the created universe are emphatically not co-terminous. It is important that the reader sense that we are living, working, and thinking on a tiny space platform called Earth, if he would see with true perspective. One must try to correct some of the incredible geocentricity of man to make way for a true theocentricity. Perhaps capitalizing the name of our spaceship may serve to remind us how frail and limited we are.

3. If the reader wants a recent account of the extreme improbability of evolutionism, he should read Frank W. Cousins' The Solar System (1972), chapter 15, on the possibilities for life's starting accidentally in the universe. This very learned, well-documented examination is written by a secular scientist who has no reason to support the Christian doctrine of creation. He is honest with his data, as a true scientist must be, and punctures the balloon of Darwinism with devastating effect. It is the best I have read on the subject. Cousins finds the chance for accidental origins of life anywhere in the universe to be one in 10.⁴⁸⁵

4. This was part, but not all of Tycho Brahe's reason for rejecting the view of Aristarchus and Copernicus. Another weighty factor was the absence of observable stellar parallaxes which would indicate the Earth's motion around the Sun. Because even the nearest stars are so far away (4.25 light years), stellar parallaxes remained unobserved until the development of moderate-sized telescopes.