

THE "ELEMENTS OF THE UNIVERSE" IN BIBLICAL AND SCIENTIFIC PERSPECTIVE

by *Walter Wink*

There is precious little science in the Bible, and such as there is has been borrowed largely from more scientifically advanced neighbors, such as the Babylonians and Greeks. Despite this lack, the attitude of biblical writers can be instructive for us in forging a new rapprochement between science and religion. Let me take as a single instance the use of the concept of "elements" in the New Testament. First, however, I must warn the reader that we cannot take an unmediated leap into the first century. Many hedges of thick brambles stand between now and then, not the least of which are those thrown up by contemporary scholars. Only as we have cut our way through can we begin, in the second part of this paper, to measure the value of the result for the contemporary dialogue between science and religion.

The "elements of the universe" (*stoicheia tou kosmou*) have been regarded increasingly of late as demonic spirits and have been relegated consequently to that same scrap heap of arcane superstition already peopled with angels, Beelzebul, and the devil. I too began this study by assuming that the "elements" were demonic powers. Then as I proceeded I found my views being sharply altered. Before attempting a solution to the problem, however, let me briefly review its history.

HISTORY OF AN IDEA

The early Christian theologians tended to regard the *stoicheia* in physical terms, either as the familiar four elements—earth, air, fire, and water—or as the heavenly bodies.¹ A few identified the *stoicheia* as those Greek philosophies (such as Epicureanism) which falsely reverence the physical elements.² Others believed they meant knowledge of the law or worldly learning or religious ritual and customs.³ It was recognized generally that pagans and heretics might worship these

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“elements” as gods, but apparently no early Christian theologian regarded the *stoicheia* as demons, fallen angels, or personal beings.⁴

Prior to the rise of modern scholarship, Martin Luther and John Calvin believed the *stoicheia* were the precepts of the Law, whereas Hugo Grotius (d. 1645) developed the remarkably sensible idea that the *stoicheia* are the elements of piety held in common by Jews and pagans: temples, altars, libations, new moon, calendars, festivals, etc.⁵ As far as religion itself is concerned, he scarcely could have been more right, yet few followed his lead.

Nineteenth-century scholars largely followed Luther and Calvin in identifying the *stoicheia* with the Law or religious practices.⁶ Following the majority of early Christian theologians, a few perpetuated the idea that the term referred to the constituent elements of physical reality.⁷ But the tide had begun to turn. Scientific scholarship now permitted conclusions even where they were antithetical to the modern world view and repugnant to the liberal theology of the researchers themselves. It was well known that the ancient sky was full of demons; that the stars were gods who governed one’s fate, down to the smallest business appointment; that the giants of Genesis, spawned of disobedient angels and women, had become disembodied spirits roaming the world. It was clear that Jesus encountered people possessed by them. And since Paul was upset because his addressees were worshipping the *stoicheia* as gods, could it be that they were “superhuman, world-ruling heavenly powers,” “living heavenly beings” (A. Hilgenfeld), astral spirits, fallen angels, gods and demons (A. Klöpffer), or the angels who delivered the law at Sinai (Albrecht Ritschl)? The suggestion appeared cogent, and scholarly opinion swung almost wholly to this view, despite the utter lack of a single scrap of evidence that anyone prior to the third century C.E. had regarded the *stoicheia* as personal beings, fallen angels, or demons in any form.⁸

Savor the irony: The “elements of the universe” came to be regarded by the antimythological consciousness of modern scholarship as mythological in the extreme when in fact they had never been mythologically conceived by the mythological consciousness of the first-century world in the first place! Any attempt at demythologization therefore must begin with this anomalous fact: The *stoicheia* are not mythological in their original mythological setting. They are mythological only in the modern, antimythic world. The task then is not to demythologize the term in the Bible but to demythologize it in the minds of modern scholars.

So deeply is this mythological mind-set fixed in the gray matter of scholarly brains that despite excellent studies by A. W. Cramer, Andrew John Bandstra, and Gerhard Dellling new translations of scrip-

ture continue to roll off the presses with renderings and “explanatory notes” which prejudice the reader entirely toward the groundless notion that these poor, bereft *stoicheia* are personal, malefic beings perched somewhere aloft waiting to seize us in their demonic grip.⁹

Without drawing out the discussion further, I would like to hazard a solution to this baffling problem. One will be disgusted with its simplicity. Imagine a television guessing game, with a row of mystery guests seated behind a dais. Each of them wears a sign. One reads “the Jewish Law,” another “elements common to Jewish and pagan religion alike.” Here is a sign saying “earth, air, fire, and water,” there one reading “the alphabet.” A tweedy, professorial type bears a sign, “Greek philosophy and worldly learning,” while beside him is a woman with the legend “stars, planets, sun, and moon.” Now what if after all this guessing game of two thousand years in which one contestant had picked now one, and another another, the master of ceremonies were to turn to the panel and to a flourish of drums say, “Will the real *stoicheia* please stand up”—and all of them rose to their feet? That would represent our solution. “All of the above.” Not included among our guests, one may have noticed, are demons, spirits, and personal beings. They do not belong. All of the rest do, however.

As Aristotle himself already had made clear, the idea common and basic to all meanings of *stoicheia* is that which is the primary component immanent in a thing which is indivisible into kinds different from itself.¹⁰ It is the most basic constituent of any substance or entity. The letters of the alphabet are the *stoicheia* or irreducible constituents of words, as are phonemes for syllables, numbers for arithmetic, theorems for geometry, notes for the musical scale, or the basic physical elements for matter. All these long had been dubbed *stoicheia* before the first century lumbered onto the scene, and apparently everybody knew it.¹¹ Scarcely a single writer who uses the term feels any urge to define it or even to indicate the particular nuance with which he is applying it. It is, as Bandstra rightly concludes, a generic term or a “formal word,” which of itself has no specific content. It denotes merely an irreducible component; what it is an irreducible component of must be supplied by the context in which it is used.¹²

That really should occasion no excess of surprise were it not for our thralldom to the contemporary mythological interpretation of the term, for we use the English word “element” in precisely the same way. We speak of physical elements, the elements of the Lord’s Supper, the elements of a problem, the raging elements of a storm, in each case understanding immediately from the context whether the table of chemical elements is meant, or bread and wine, or the fundamental issues of a given problem, or the whistling wind and driving

rain. So also the context makes clear what we mean when we speak of an elementary school or the elementary particles of physics.

The solution is very simple. Nevertheless, I think it wise to leave the panel standing on its feet for the rest of this paper since the problem has avoided solution so long. Perhaps if we can see the panelists shifting from one foot to the other and casting a rather baleful eye upon us, we will not so soon again inconvenience or ignore them.

This solution makes it possible to abandon the myriad attempts at a single, specific definition of *stoicheia* and to treat each occurrence of the term as context determined.¹³ Thus the *stoicheia* in Hebrews 5:12 are the “elementary” or “first principles” of God’s word. Since *stoicheia* often refer to the alphabet, J. B. Phillips and the New English Bible render a nice pun when they translate them as “the ABCs” (as if to say, you need someone to teach you the ABCs of God’s oracles all over again—proof that you are still children, needing milk, not solid food).¹⁴ What did the modern mythologizers of the term do with this passage? Quite obviously the ABCs were not demons, not even to schoolchildren. So they simply bracketed Hebrews and went on to Paul.

But we cannot go so quickly to Paul, for there is still 2 Peter 3:10 and 12. Now almost no one among us wants to say much for 2 Peter, that slippery old ecclesiastic. However, when he says that “the day of the Lord will come like a thief, and then the heavens will pass away with a loud noise, and the elements will be dissolved with fire, and the earth and the works that are upon them will be burned up” he clearly does not mean angels or heavenly spirits, who have very little substance to ignite or melt, but simply the constituent elements of the physical universe—a theme well rehearsed in Stoicism as well.¹⁵

When we do turn to Paul the solution is not so easily applied, but then that is because Paul is not so easily understood. Three passages are clear enough. The first is Colossians 2:8 (“See to it that no one makes a prey of you by philosophy and empty deceit, according to human tradition, according to the *stoicheia tou kosmou*, and not according to Christ”). The pairing of “philosophy” with “empty deceit” suggests a kind of thinking which has confused that which is most fundamental in the world with what is divine. Linked with philosophy in the context is “human tradition”; that it is used in apposition with “elements of the world” is clear evidence that Paul is dropping the contextual clue to the interpretation of *stoicheia*. It apparently is equivalent to the basic presuppositions and guiding premises of a mind-set inimical to God. Phillips’s paraphrase is apt: “Be careful that nobody spoils your faith through intellectualism or high-sounding nonsense. Such stuff is at best founded on *men’s [sic] ideas of the nature*

of the world [his rendering of *stoicheia tou kosmou*] and disregards Christ!" (my italics). This negative attitude toward philosophy derives not from a know-nothing prejudice against reason itself but from the way philosophy has been subverted by "the world" and has rendered divine adoration to things which are not in fact ultimate.

Clement of Alexandria at least understood it that way:

Let us now, if you like, run through the opinions which the philosophers, on their part, assert confidently about the gods. Perchance we may find philosophy herself, through vanity, forming her conceptions of the godhead out of matter; or else we may be able to show in passing that when deifying certain divine powers, she sees the truth in a dream. Some philosophers, then, left us the elements (*stoicheia*) as first principles of all things. Water was selected for praise by Thales of Miletus; air by Anaximenes of the same city, who was followed afterwards by Diogenes of Apollonia. Fire and earth were introduced as gods by Parmenides of Elea; but only one of this pair, namely fire, is god according to the supposition of both Hippasus of Metapontum and Heraclitus of Ephesus. As to Empedocles of Acragas, he chooses plurality, and reckons "love" and "strife" in his list of gods, in addition to these four elements (*stoicheia*).

These men also were really atheists, since with a foolish show of wisdom they worshipped matter. They did not, it is true, honour stocks or stones, but they made a god out of earth, which is the mother of these. They do not fashion a Poseidon, but they adore water itself. For what in the world is Poseidon, except a kind of liquid substance named from *posis*, drink? . . . Let the philosophers therefore confess that Persians, Sauromatians, and Magi are their teachers, from whom they have learnt the atheistic doctrine of their venerated "first principles." The great original, the maker of all things, and creator of the "first principles" themselves, God without beginning, they know not, but offer adoration to these "weak and beggarly elements," as the apostle calls them, made for the service of men.¹⁶

Just what philosophy Paul was attacking is unclear—possibly Epicurean or Stoic thought, more probably that kind of speculative mentality which would burst full-blown on the second century as gnosticism.¹⁷

Colossians 2:20 follows shortly after 2:8, but so much has been said in between. Consequently the context has shifted. Paul has just mentioned kosher food regulations and calendrical concerns characteristic of Judaism ("questions of food and drink or with regard to a festival or a new moon or a sabbath" [2:16]); he has alluded opaquely to people who are worshipping angels and requiring ascetic practices and self-abasement (2:18). He follows with warnings against regulations ("Do not handle, do not taste, do not touch") and cautions against human precepts and doctrines which bind people to the Law and to self-abnegation. Few would disagree that the problem here is Judaizing: Someone is trying to persuade those Colossians that they

must take on the whole practice of Jewish law and custom in order to be Christians.¹⁸ But Paul is not speaking to converts who first had been Jews. They had been Gentiles. Therefore when he says to them, "If with Christ you died to the elements of the universe, why do you live as if you still belonged to the world?" (2:20), *stoicheia* cannot mean the Jewish Law.¹⁹ It must mean similar rites which they had practiced previously as pagans, for pagans also celebrated festivals and seasons, kept sacred calendars, offered sacrifice, had temples, cherished doctrines, abstained from certain foods, and so on, as Eusebius and Grotius so thanklessly had observed long ago. So Paul must be referring to religious practices common to pagan and Jew. These were not evil as such—no religion can exist without ritual, beliefs, celebrations, rules, and traditions, and the early church was no exception. Such practices were evil only insofar as they had become an end in themselves, empty of choice, conviction, and meaning. Institutional religious practices are always but a "shadow" (2:17), slipping all too quickly into attempts to lay a claim on God by sacrificial acts and self-mortification. Paul therefore wants the Colossians to "stay dead" to such religious strivings and not shed the chains of paganism only to sell themselves into slavery to the precepts of the Jewish Law. *Stoicheia* in Colossians 2:20 then are given fairly precise definition by their context. They are the whole bundle of practices and beliefs which make up *homo religiosus*, whatever the brand. They are those rudimentary notions and ritualized acts which comprise institutional religion. That at least is the specific content given to this formal term here.

What then of Galatians? Galatians 4:3 can be dealt with quickly; the context makes clear that the issue is the Jewish Law—so much so that *The Living Bible* can paraphrase *stoicheia tou kosmou* correctly as "Jewish laws and rituals." Paul has just been speaking about the Law as our custodian or guardian until Christ came (comparable to its being a "shadow" of what is to come in full reality in Christ [Col. 2:17]). Then comes 4:3 ("So with us; when we were children, we were slaves to the *stoicheia tou kosmou*"). He then continues with a statement about Christ's being "born under the law, to redeem those who were under law, so that we might receive adoption as sons" (4:4–5). No appeal to angelic mediators of the law (3:19) helps us comprehend the passage, despite the urgent insistence of certain exegetes. The sense is abundantly clear in the context. The *stoicheia tou kosmou* are here those elementary rules and rituals which characterize Judaism. Paul, himself their beneficiary and heir, regards them as enslaving precisely because, as he is at pains to explain throughout this epistle and even more so in Romans, the very attempt to keep the Law put him "on his

own." He did not need God's grace; the effort was all his. The harder he tried to become observant, the farther he found himself from grace. The more he relied on his own fidelity, the less he depended on God till at last he had gone to wreck on the cross, seeing in one who had died cursed by the Law, outside the Law, the means by which the real objective of the Law at last could be reached—a life fully lived out in relatedness to and filial dependency on God.

Galatians 4:9 is the only remaining reference to *stoicheia* and the most difficult for commentators. Is Paul still speaking of the Law to Jews? How then can he say to them, "Formerly, when you did not know God, you were in bondage to beings that by nature are no gods" (4:8)? Surely here he speaks to pagans. When he then chastises them for turning "back again to the weak and beggarly elements whose slaves you want to be once more,"²⁰ he must mean those religious practices common to pagan and Jewish observance alike: "You observe days, and months, and seasons, and years!"²¹ So *stoicheia* in Galatians 4:9 apparently means the same as in Colossians 2:20 but only because in the context it refers to the same things.

Why does Paul then speak of these pagan religious and cultic practices as "gods"? Surely here the Revised Standard Version's "elemental spirits" makes more sense! Not at all. As early as the fifth century B.C.E. Empedocles had argued that those elements which are original and constitutive of reality deserve the appellation "gods" since everything is made from them. The fire he called Zeus, air was Hera, etc. That this "divinization" was merely the personification of physical properties and implies no personal qualities is shown in that there was no unanimity on which god represented which element. Thus not only Zeus but also Hestia and Hephaestus represented fire, and in Homer Zeus is the ether! The divinization of the elements quickly caught popular fancy; from then on right through the fourth century C.E. the description of the *stoicheia* as gods was familiar to the educated and semieducated alike.²²

Regarding this tendency to divinize the *stoicheia*, Franz Cumont's remark is pertinent: "Theology became more and more a process of deification of the principles or agents discovered by science and a worship of time regarded as the first cause, the stars whose course determined the events of this world, the four elements whose innumerable combinations produced the natural phenomena, and especially the sun which preserved heat, fertility and life. In all forms of pantheism the knowledge of nature appears to be inseparable from God."²³ This divinization of the *stoicheia* as the fundamental constituents and irreducible principles from which the whole universe

has been constructed, however, does not then imply that they were considered animate, or personal, or beings. Many of the objects of Greco-Roman worship were inanimate.

It is not at all surprising then that the ancients called "gods" those things which seemed worthy of worship because of their fundamental qualities. What is shocking is Paul's lumping of the Jewish Law and religion in the same category as the pagan cultus, with the attendant warning that taking on Jewish practices would be for these Gentile Christians a reversion to nothing less than the very same idolatry they once knew as pagans!

Now, having surveyed the New Testament passages and seeing how *stoicheia* as a formal category for whatever is constitutive of a thing can be taken best to mean now one thing, now another, in a specific context, I must confess to a growing suspicion that the early Christian theologians must have known this as well. Reviews of their positions in previous studies have represented them as in conflict over the term's meaning. But in fact the issue does not seem for them to have been much of a matter of debate. What modern scholars have done is to assume that what the early theologians said in one context about the *stoicheia* is what they would have said in them all. Tertullian, for example, is reported by exegetes to have regarded the *stoicheia* as the Jewish Law. As far as Galatians is concerned, this is largely true, though he specifically limits his comments to Jewish ceremonial and cultic regulations. But he also notes that "the Romans" speak of the *elementa* as "rudiments of learning" and, in passing, comments that the reference in Galatians 4:8 to "beings which by nature are no gods" might refer to "the error of that physical or natural superstition which holds the elements to be god," that is, the four physical elements. But he prefers instead to take Galatians 4:10 as the clue and defines *elementa* as "the rudiments of the law."²⁴

In another context, when Tertullian examines Colossians 2:8 he understands by these "elements of the world" neither the Jewish Law nor "the mundane fabric of sky and earth," though in the passage above he also acknowledges the latter as a possible meaning. The context shows that the *stoicheia* here are "traditions of men," secular literature's worldly learning: "In this sentence . . . all heresies are condemned on the ground of their consisting of the resources of subtle speech and the rules of philosophy," especially Epicureanism and Stoicism. Yet in the same paragraph he can speak of the kosher laws and cultic practices of Colossians 2:16-23 as references to the Jewish Law, leaving us to infer with fair warrant that he would interpret *stoicheia* in 2:20 as Jewish cultic regulations.²⁵ Such a subtle

weighing of the term proves that Tertullian regarded it as a formal category and was searching for the best meaning in the context.

If only we had more extensive sources for the rest of the early theologians, we probably would discover that they too were treating it as a generic category and, rather than being at odds with one another, were relatively in agreement and, by my lights, were largely correct.²⁶ One thinks of the parable of the blindfolded men and the elephant but with this caveat: It is not they who were blindfolded but we with our limited sources and lack of a proper definition.²⁷

MODERN EQUIVALENTS

So much for the New Testament passages. I hope this analysis is satisfying so that our panel of mystery guests can take their seats at last. Now we become the panel, and they are going to sit back and enjoy watching us identify our own *stoicheia* for them. Now they will play the game with us. After all it is not they but we who have mythologized the term. If we were pressed, how would we “demythologize” our modern *stoicheia*?

We already have seen that the *stoicheia*, depending on the context, can mean in the New Testament such diverse things as the alphabet, the physical elements of the universe, vacuous philosophizing, pagan religious practices, and the Jewish Law. They also might refer to the heavenly bodies, though this is by no means as clear. We have seen that the formal similarity among these diverse meanings consists in their pointing to the primary component immanent in a thing which is indivisible into kinds different from itself (Aristotle). What would be the modern equivalents of these biblical *stoicheia*?

When the question is put thus, answers flow quite easily. Our “atomic chart” may have grown from four elements to over 104, but we still regard them as the fundamental units from which all higher aggregates of matter are formed. But, like Democritus, we have pressed beyond these elements to atoms and now to the infinitesimal nodes of moving energy within the atom: neutrons, electrons, quarks. Such *stoicheia* are not evil; they simply are. What can become evil is our attitude toward them. Ancient and modern materialism alike deified matter by seeing it not as animate but as ultimate: “You are made up of atoms and molecules. When you die, you will cease to exist, but your atoms will not. Hence atoms and molecules are more ultimate, more real, than you are.” Thus caricatured, nineteenth and early-twentieth-century materialism recreated reality after a mechanistic model and reduced us to things. In such a view no place is left for inwardness, for love, for the soul. Such ideas are the “weak and beg-

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garly elements” by which whole generations of modern people have been enslaved, including scarred and twisted hunks of ourselves.

Every field of knowledge has its *stoicheia*. Take mathematics. Euclid wrote a book entitled *The Stoicheia of Mathematics*, by which he meant the basic theorems of geometry. Today there is a multitude of mathematical systems, each of them possessing its own *stoicheia* or basic axioms. In biology the *stoicheia* would be random mutation and adaptive selection, which seem to be the “ultimate principles” by which life evolves. In physical chemistry the *stoicheia* are in the two laws of thermodynamics, which articulate the process by which energy is expended. And in astrophysics the *stoicheion* is the velocity of light as a fixed universal constant of nature having the same value for all observers regardless of their state of motion with respect to the source of light.

Yet each of these *stoicheia*, none of them intrinsically evil, has been turned into a god in our time. Mathematics, by which we could have “thought God’s thoughts after him” as the astronomer Thomas Kepler was fond of saying, has become for many a rage for statistical quantification, a mania to reduce all things human to numbers coded and filed in computerized memory banks.²⁸ As for random mutation and natural selection, they were quickly conscripted by the needs of industrial capitalism as an ideological justification for the crushing of the weak by the strong. The laws of thermodynamics probably no longer cause many of us to lose sleep, but their application by Henry Adams to the winding down of the universe left many around the turn of the century with a world view of unrelieved gloom and purposelessness.²⁹ And Albert Einstein’s theory of relativity, which found its Archimedean point in the absolute speed of light, was twisted by the popular imagination into a so-called scientific world view in which everything is relative and nothing absolute—especially ethical judgments.

No *stoicheion* is thus safe from perversion. Yet not one of them is evil in itself. We are responsible for their perversion, as we become overawed, or fascinated, or blinkered in our appreciation of their transcendent powers and project onto them an ultimacy which they themselves do not possess.

Moving up the pyramid of life, we discover new *stoicheia* at each successive level. There are the axioms of logic, the rules of chance, the laws of society, the rituals and regulations and doctrines of religion. Each of these too can enslave us. Logical positivism is a particularly pernicious example of logic run amok. But I am reifying: Logic did not run amok; logicians did with their demand that every meaningful statement be empirically verifiable. It was the attempt to reduce all

human communication to science. Such "vain and delusive philosophy" (Col. 2:8) produced not thinkers but pedants.

Chance is an especially interesting *stoicheion*, for it was worshipped as a god by the Romans and now has found a modern devotee in Jacques Monod, the Nobel laureate in physiology and medicine. When he writes in his best-selling *Chance and Necessity* that "chance alone is at the source of every innovation, of every creation in the realm of life . . . at the very root of the towering edifice of evolution," his tone of mixed rapture and dogmatism is virtually indistinguishable from that of Roman hymns to Fortuna.³⁰ But the undeniable fact that chance is the *stoicheion* operative in random events need not force us to regard it as ultimate or to take such an overarchingly religious attitude toward it.

And as for the laws and practices of society and religion, our time has seen far too much of the idolization of the nation-state and the capacity of religion to shrivel the human spirit for us to need to list examples.

The characteristic all these *stoicheia* have in common is their being the irreducible and basic principles or entities at their own discrete level of operation. But they also have this in common: They are powerful, irresistible, ubiquitous. Like gravity, itself the *stoicheion* governing the inertia of matter, they are laws which cannot be "broken" with impunity. They are, on the contrary, the very conditions of existence. We cooperate with them or are "judged" by them.³¹ But they can be transcended by *stoicheia* operative at a higher level, as gravity can be overcome (without being cancelled) by the laws of aerodynamics in aviation.

This hierarchical principle of transcendence must be kept in mind lest we succumb to the allure of reductionism, that crowning and most devastating of modern idolatries, with its penchant for explaining phenomena at higher levels as if they were "nothing more" than the sum of their most fundamental parts. Once we erred by ascribing to animals faculties found only in humans; today behaviorism denies to humans faculties not found in animals. In Arthur Koestler's sardonic phrase, we have substituted for the anthropomorphic view of the rat a ratomorphic view of humans.³² Reality is hierarchical, however, and each level of complexity operates with its own set of laws, gathering up the laws of a lower level into a higher level of complexity, the new level being more than the sum of its parts. The principles of physics and chemistry are employed at the higher level of mechanics, for example, and are operative in the atoms and molecules of a machine, but they cannot explain why the machine runs. For that we require the principles of engineering. Psychological principles (*stoicheia*) are

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operative in the love between two people; but love cannot be “reduced” to oedipal longings, the search for a parent, or vestigial dependency—even where these are operative.

This is clear even at the lower levels. No one could have predicted, from the laws of physics, that the combination of two atoms of hydrogen and one atom of oxygen would have produced water. That is a possibility inherent not in hydrogen or oxygen as such but only in their relation to the total system of reality. That is why worship of the lower elements—which is what reductionism essentially is—fails even as an explanation of phenomena. Not that which is lowest in the chain of being but that which is the source of all possible transformations and brings them about alone deserves the name “ultimate.”³³

Nor is it the case that the *stoicheia* are simply human projections of order and regularity onto the universe. Take that most subjective of spheres, aesthetics. For the Greeks the *stoicheion* of art was the “golden mean,” a rectangle now measured to the ratio of 0.618034 to 1. Thousands of objects even today randomly approximate it: index cards, playing cards, stationery, boxes. Apparently people sense, without knowing why, that rectangles of roughly the proportion of 3 x 5 or 5 x 8 are pleasing to the eye. They are also, it seems, pleasing to nature, for the proportion 0.618034 to 1 is the mathematical basis for the shape of sunflowers and snail shells, the curl of surf and the chambered nautilus, spiral galaxies and pineapple scales, elephant tusks and lion claws. The human organism is itself shaped by, and acts as a receptor for, sense data of this proportion. For example, the musical chord that seems to give the ear its greatest satisfaction is the major sixth. The note E vibrates at a ratio of 0.62500 to the note C. A mere 0.006966 from the exact golden mean, the proportions of the major sixth set off good vibrations in the cochlea of the inner ear—an organ that just happens to be shaped in a logarithmic spiral of the proportion 0.618034 to 1.³⁴

The *stoicheia* are not then merely constructs of human thought. They are given within nature, patterned into the organism, and objectified in science, symbols, images, art, rules, and religions. These function in nature and society the way electrostatic bonds function in molecules: They operate to hold the shape or maintain the stability of physical, biological, and cultural systems.³⁵ Precisely this use of *stoicheia* is reflected in Cicero (1 B.C.E), who praises the Greek mystery religions, “by which we [Romans] have been educated out of a boorish and savage life into humanity and have been made civilized. From them we have learned the rudiments [*initia* = Greek *stoicheia*] as they are called, which are in fact the fundamental principles [*principia*

= Greek *arche*] of living, and thereby have received a rule not only of happy living but of dying with a better hope" (*De Legibus* 2. 14. 36).

A NEW TRANSLATION

If we are to complete our demythologization of the modern scholarly mind-set, we need a new translation of *stoicheia*. The best I have found is "invariances." Invariances are those unchanging conditions and laws according to which we find the more changing phenomena of nature and society to be operating. Ralph Wendell Burhoe specifically applies the notion of invariances to the rise of belief in the divine: "In the history of human thought, among the earliest and most comprehensive systems of abstractions of invariance were those of primitive myths and theologies, which *gave the name of gods to the sources of the invariant and powerful forces or laws which man had to obey* if he was successfully to adapt to life."³⁶ It is the physicists, Burhoe argues elsewhere, who today have

become the best revealers of the elusive but sovereign entities and forces, not immediately apparent to common sense, that do in fact far transcend human powers, that did create life and human life and do ordain human destiny. I suggest that it is to such real, superhuman, and ultimately insuperable powers and conditions of the cosmos—however primitively envisaged—to which the gods or supernatural powers of prior cultures referred rather than to nonexistent beings. "Supernatural" refers not to their unreality but rather to both the hiddenness of their reality from our commonsense view and also to their prior reality as a more ultimate source and ground of the more apparent or "natural" phenomena.³⁷

It now becomes possible to see more sympathetically why so many modern scholars were led astray into thinking of the *stoicheia* as "spirits." They are not beings; yet they exist. Insofar as they are fundamental principles or cultural symbols or derived axioms or psychological archetypes or social or religious laws and beliefs, they are invisible. They may not be embodied, but they are real. For all that they are not simply human inventions. Numbering is possible for us only because the universe is numberable. Social laws and religious taboos may vary from place to place in content, but they are ubiquitous. Societies cannot survive without them, and none exists without them. These *stoicheia* then are the very building blocks of physical, social, and spiritual reality. They antedate us, they transcend us, they outlast us. To a degree far beyond awareness they determine and shape us. We are compassed by superhuman powers, and we come into a world already organized for their idolization.

ZYGON

We have only an inkling of the magnitude of the dominance of these "elements" over our lives. Light, for example, is now known to enter the brains of mammals directly and not only through the visual system, with consequences for bodily adaptations to changes of seasons, sexual activity, menstruation cycles, etc.³⁸ The air itself affects us not simply by being "there" to be breathed or polluted but by the degree of negative or positive ions which it contains at any given place and time. (Atmospheric ions are tiny electric charges in air molecules.) The famous "ill winds" that blow seasonally in certain places—the Khamsin, the Mistral, the Santa Ana, the Foehn—do bring with them higher incidence of crimes of violence, admissions to mental hospitals, and certain illnesses, though once we regarded such claims as superstition. Now these winds are known to contain unusually high concentrations of positive ions. Smog also evidences high levels of positive ions, and laboratory studies have shown that positive ions can reduce resistance to infectious diseases and even retard the growth of certain plants. Negative ions, on the other hand, speed up tissue growth, remove the "stuffy" feeling in rooms, and aid in healing, especially in recovery from burns. While research on these matters is still in its infancy, enough is known to explain why adepts of the contemplative life have gravitated toward waterfalls, mountain tops, deserts, and shores, for these are places where negative ions tend to abound.³⁹

The frequency of sunspots also affects human life in ways only now beginning to be perceived. Their incidence correlates with temperature averages, glacial activity, the winter-severity index, and carbon-14 abundance in tree rings. All of these phenomena seem to result from fluctuations in the rotation of the sun. The consequences for human life are subtle but far ranging. During one period of prolonged sunspot inactivity, for example, the ice pack off the coast of southwestern Greenland failed to thaw year after year. Because their boats could not be freed, the Norse colony there could not secure food, and all perished.⁴⁰ Were they not victims of the "elements of the universe"?

Since we are surrounded by so great a cloud of determinants, it is easy to see how certain people would worship them as ultimate, or devise systems of magic to manipulate or divert them, or concoct speculative systems of thought to comprehend them. In the ancient world the system which caught the fancy of most people, spreading from Babylon into Greco-Roman hellenism the way a new disease falls upon some remote island people (in Gilbert Murray's phrase), was astrology. The fascination of astrology lay in its appearing so scientific; indeed it was built upon the invariant movement of the stars and

upon what appeared to be their empirical effects on people. (The tug of the moon on tides and menstrual cycles were already recognized by the second century B.C.E.). Astrology attempted to substitute in place of the old methods of divination a scientific method, founded on an experience of almost infinite duration, by which to decipher the destiny of individuals with the same precision as the date of an eclipse.⁴¹ It sought a complete reconciliation of science, religion, and politics and remained open to the perpetual adjustments required by the new knowledge ceaselessly being discovered. Christianity, like Judaism before it, had no science, and either scorned it or borrowed it as it found it from others. It attempted no great synthesis of knowledge. Compared to astrology, Christianity must have appeared to be one of the "weak and beggarly elements of the world"! But astrology also served as a *praeparatio evangelii*: It filled the gap left by the collapse of the parochial city-state religions, bringing a wholly nonphilosophically oriented public for the first time in touch with universals (our "invariants") operating harmoniously and dependably in a united cosmic order.⁴²

Two attitudes toward astrology prevailed in the early church, attitudes which take on a special relevance for us today who are witnessing a recrudescence of astrological interest. Such thinkers as Tatian and Tertullian rejected astrology outright as hopelessly fatalistic, deterministic, and pagan.⁴³ Nor could they tolerate the way it was being used ideologically as a rationale and a symbolism for the ruler cult.⁴⁴ Others regarded it as redeemable so long as it was restricted to prognosis and not predestination. Theodotus is representative of the latter: "The stars, spiritual bodies, that have communications with the angels set over them, are not the cause of the production of things, but are signs of what is taking place, and will take place, and have taken place in the case of atmospheric changes, of fruitfulness and barrenness, of pestilence and fevers, and in the case of human beings. The stars do not in the least degree exert influences, but indicate what is, and will be, and has been."⁴⁵ The Gospel of Matthew reflects this same benign attitude (chap. 2). The "Magi" (astrologers) are treated as legitimate scientists of the heavens, whose wisdom successfully guides them to the Christ child. No polemic enters the narrative; if they go back "another way," we are not to read that as indicating they had been cured of astrology!

In our time no one has done more to recover a chastened use of astrology than Carl G. Jung, who spoke of the task of living as "mastering our horoscopes" rather than submitting to them—a task depicted in mythology by the story of the twelve labors of Heracles. In

this view astrology helps identify the “givens” which a person must surmount in order to become a fully mature self. To fail to shoulder this task is to succumb to fate.

But this is a far cry from popular astrology, with its heavy pall of determinism. Possibly the stars do affect us in ways beyond our measuring. But the real life issue is not “am I being influenced by *stoicheia* greater than me?”—obviously I am—but “where do I find the whole meaning of life coalescing into a vital center capable of empowering me to overcome my givens?” The Book of Revelation is unequivocal: in Christ, who holds in his right hand the seven stars (1:16).⁴⁶ Even the wisdom of the heavens must be kept subordinate to the principle of systemization itself, to Christ, in whom and through whom and for whom all things exist, even the solar systems (Col. 1:15–20).

The popular mentality, so long starved of the supernatural by the materialistic world view, has rebounded in other ways as well. People today not only sit long hours under dowel-poled pyramids but also place their razor blades under them too, convinced that they stay sharp longer.⁴⁷ And I recall one fascinating evening as a guest at a Broadway cast party, talking to the actress Jane Russell about her newest religious solace, which was at all essential points identical with ancient numerology.⁴⁸

Superstition today is in flood tide. But lest intellectuals wag their heads in condescending horror, it is not the masses who are alone culpable. The intellectuals themselves helped bring it on. They may not have worshipped the cruder *stoicheia* of the *National Enquirer* and the pulp press, but they fashioned and propagated a world view from which the divine was excluded, leaving a world bereft of meaning or transcendent value, reducing every higher significance to its rudimentary components, and destroying the whole in the analysis of the parts. No age has ever been more in the thrall of the *stoicheia*; no age has been less aware of its bondage.

Nothing is less satisfying of course than a diatribe on idolatry. Let me close then by offering a more positive way of relating to these *stoicheia*. We must abandon altogether the notion that reality is more real the lower we descend on the chain of being. On the contrary, reality is hierarchical. The laws of each level are taken up into the next level above them but do not explain the next level above them. Therefore no *stoicheion* is ultimate except at its own level in the hierarchy. Insofar as it is the primary component immanent in a thing and indivisible from itself, however, it then becomes possible to speak of such *stoicheia* at their own levels as manifestations of God.⁴⁹

Thus, in the light of the vision of all things cohering or systemically

(*sunhisteken*) being interrelated in Christ (Col. 1:17), we can say that God is manifest at the level of atomic physics in the bond within atoms. This short-range bond between neutrons and protons is millions of times stronger than any other bond in nature.⁵⁰ Such energy is not God, not if we intend a metaphor capable of extension to the reality of God at all levels. Energy itself is not even “God” at the physical level, for energy is only a moment in the transformations of which matter is its pair. God might be said to be related to energy/matter somewhat as “I” am to my body. Yet wherever energy is manifest, God is being manifested in one aspect and at one level.

Moving up the hierarchy to living systems, George A. Riggan sees a miraculous theophany in the stability of DNA. This alphabetical *stoicheion* makes up the genetic code which guides our creation, keeps our body receiving nutrition, and preserves its unique shape and qualities. DNA causes us to be, systemically. As such it declares the glory of God. Put more deeply, DNA *is* God—at the level of genetics.

Burhoe, formerly the executive secretary of the American Academy of Arts and Sciences and a campaigner for dialogue between science and religion, wishes to reinterpret “God” as meaning natural selection. Like the biblical God, natural selection judges from the future those experiments in nature and human society which promote the highest value: survival of the species and its further mutation toward its highest potentialities.⁵¹ To a degree Burhoe is right: At the level of biology God *is* manifest as natural selection. And insofar as civilizations are “selected out” by their response to the challenges before them, his metaphor may apply in a limited way at other levels as well. Biology does give us, in Riggan’s phrase, a preliminary vision of God, just as do the heavens (Ps. 19; Rom. 1:18–32). But God is not reducible to natural selection, and at the level of human society or spirituality the notion of natural selection, or the valuation of survival as ultimate, may become absolutely demonic, as in social Darwinism or Nazism. What Burhoe calls “God” the New Testament knows as a *stoicheion*: the basic principle operative in biology. In that sense natural selection *is* God—at the biological level.

Every search for a single ultimate principle within nature—or even a congregation of them—comes to wreck on the hierarchical complexity of nature itself and the irreducibility of the principles of one level to those of another.⁵² The Hebrews insisted that God is not simply one aspect of nature, such as energy, process, selection, matter, or order. God is not even to be conceived of as the capstone of the pyramid of being, the “highest” power among the powers of the natural order. God is rather that power that penetrates all being at every

level and is revealed at every level, providing the systemic interrelations bonding the whole and the parts; but God's reality is never exhausted in what is made manifest at any given level.

Nor can God be reduced to the *stoicheia* taken in their totality (henotheism), for change and disorder are as integral to a universe involved in repeated transformations as are order and invariance. As Riggan points out, "Systemicity confronts us not only in invariant universals, but in the transient particulars as well."⁵³ God denotes rather the immutably systemic interrelatedness of order and disorder in the universe, or what Alfred North Whitehead called the principle of concrescence. And since we cannot possibly obey all the principles of the universe at the same time, the only way to fend off their rival claims is to see them as theophanies systemically integrated within a whole greater than they. The presupposition of an integral life, says Riggan, is obedience to the integrity of that greater whole and faith that one can mirror it even if brokenly. Stated symbolically as Israel did through its Temple, the holy of holies is dark and it is empty; God negates our attachment to any particular theophany.⁵⁴

Time does not permit a complete itinerary up the chain of being. But perhaps we simply can note a few other *stoicheia* on our way. The biblical writers identified the law as one *stoicheion*, and Paul is clear that, whatever its failings regarding salvation, law manifests something of the very nature of God insofar as law represents the constraint placed upon life by the very limitations and proclivities of the human organism. It is God's will that humans live lawfully. Hence Israel rightly regarded the Law as a manifestation of the divine (Rom. 7:12).

Law orders life. Next up this chain are the principalities and powers, which organize life. The principalities and powers are those social institutions and human systems organized to serve the needs of collective human life. They are the social bonding, enabling changing subsystems to grow together in their transformations. Human gregariousness is thus a manifestation of deity. And this is true despite the evil of these powers: They do good as well as evil. Even a street gang, to take an extreme example, insofar as it coheres together and protects its members, is a theophany. Yet it is perverted insofar as it works against the total system

Or again the First Epistle of John says that God is love (4:8). With Riggan we now can reverse that, against the whole history of theology, and assert: Love is God—but only at the level of human interaction. Whenever outgoing care happens between humans there is a sense of something transcendent. This does not mean that love exhausts what can be said of God's self-manifestation at other levels. Some of the

time we are so anthropocentric that we act as if there's no universe, and only our salvation matters. But if we have not perceived the divine in our outgoing concern for others—or, in the First Epistle's words, if we have not loved our brothers and sisters whom we have seen—we cannot love God whom we have not seen (4:20), for we have not yet evolved in our own beings to the higher levels to which we aspire.

Understood thus, the otherwise arrogant assertions which the Fourth Evangelist puts into the mouth of Jesus take on a new meaningfulness: "I am in the Father and the Father in me"; "I and the Father are one"; the person "who has seen me has seen the Father" (John 14:10; 10:30; 14:9). Heard as the claim that Jesus alone manifests the truth about God, these statements are obscene. But heard as the acknowledgment that the very essence of the divine as it pertains to humans ("Father") is revealed in the humanness of Jesus, the statements are ones to which even many non-Christians can subscribe. It is clear that God's self-revelation is not exhausted in Jesus: "For the Father is greater than I" (14:28).

Finally we are systemically related to the ecology. Call her Mother Nature if you will, for she produced us. The earth's ecology is the most inclusive theophany to which we relate directly. If we live on all the levels (the physical and biological and personal and social and spiritual), responsive to what is going on in the total system in all its interchanges and transformations, we will survive. But if we go against the grain of the whole of which we humans are a part, we will become extinct. Yet, even if we behave in such a way as to bring on ourselves the judgment of the ecology, that too will be a manifestation of God. Divine judgment, says Riggan, is always operative in the irony of the behavior of the subsystems. When a single *stoicheion* is elevated above the whole of which it is a part, it invites the rebound of the whole against the part in ironic ways. One thinks of Richard Nixon's inability to trust his own closest aides, and so he installed a taping system which itself ironically became the source of his own downfall. Whether it be from arrogance, from greed, or from ignorance, idolatry destroys the harmonious interaction of the subsystems within the whole and ultimately jeopardizes the survival of the part, as in cancer.

Yet such idolatry is understandable, for these "invariances" are God's agents and revealers—numinous, powerful, eternal, primary, unchanging. As such, they participate in the divine and are to be revered and honored—but not themselves worshipped. "Idolatry," as Paul Tillich wrote, "is the perversion of a genuine revelation; it is the elevation of the medium of revelation to the dignity of the revelation

itself.”⁵⁵ Idolatry is understandable enough; even the redoubtable Seer of the Apocalypse was overwhelmed by it momentarily: “I fell down to worship at the feet of the angel who showed [the visions] to me; but he said to me, ‘You must not do that.’ I am your fellow servant with you and your brethren the prophets, and with those who keep the words of this book. Worship God” (Rev. 22:8–9).

NOTES

1. Hilary of Poitiers, Marius Victorinus (in part), Clement of Alexandria (in part); before them Flavius Josephus, Wisd. of Sol. 7:17, 13:1, 19:18, 4 Macc. 12:13, and Plato regarded them in physical terms. Aristotle considered earth, air, fire, and water to be derivative of four more fundamental elements—heat, cold, dryness, and moisture. (Citations for these and other ancient sources are given in full by A. W. Cramer, *Stoicheia tou kosmou: Interpretatie van een nieuwtestamentische term* [Nieuwkoop, Netherlands: De Graaf, 1961]; Andrew John Bandstra, *The Law and the Elements of the World* [Kampen, Netherlands: J. H. Kok, 1964]; and Gerhard Delling, “Stoicheion,” in *Theological Dictionary of the New Testament*, ed. Gerhard Kittel and Gerhard Friedrich, 10 vols. [Grand Rapids, Mich.: William B. Eerdmans Publishing Co., 1971], 7:666–87.) Justin (*Dialogues* 23:3), John Chrysostom, Theodoret, Eusebius of Caesarea, Jerome, Victorinus (in part), Theodore of Mopsuestia, Epiphanius, and Augustine identified the *stoicheia* as heavenly bodies. No pre-Christian evidence exists, however, for this identification; indeed the earliest references are all from the end of the second century c.e. (including *Diogenes Laërtius* 6:102).

2. Clement of Alexandria in part (in *Patrologia Cursus Completus*, series Graeca, ed. J. P. Migne, 161 vols. [Paris, 1857–], 9:284) and also apparently Origen (see Bandstra, pp. 5–6).

3. Tertullian, Jerome, Theophylact of Bulgaria, and Gennadius believed them to be worldly learning. Eusebius believed them to be religious ritual and customs; this position now is represented ably by W. Kern (“Die Antizipierte Entideologisierung oder die ‘Weltelemente’ des Galater—und Kolosserbriefes Heute,” *Zeitschrift für Katholische Theologie* 96 [1974]: 185–216), who regards the *stoicheia* in modern terms as the ideological use of sports, tourism, fashions, mass media, political theory, astrology, witchcraft, the *Playboy* philosophy, etc., as pseudoreligious rites and beliefs.

4. The one exception may be Augustine, but see the discussion in Bandstra, pp. 10–12. *Testament of Solomon* (8:1–4 and 18:1) alone of all ancient sources associates the elements with stars conceived as demons or gods; its date (3 c.e. or later) and mentality are far removed from New Testament times.

5. Hugo Grotius, *Annotationes in Novum Testamentum*, 8 vols., 2d ed. (Gröningen, Netherlands: W. Zuidema, 1828), 6:576–78; 7:124, 131. So also E. De Witt Burton in this century.

6. W. M. L. DeWette, C. J. Ellicott, B. Weiss, H. A. W. Meyer, and J. B. Lightfoot. They were followed in the twentieth century in various ways by P. Ewald, H. L. Strack, P. Billerbeck, W. Barclay, A. Cole, M. J. Lagrange, S. Greijdanus, H. Ridderbos, T. F. Torrance, R. Schippers, R. M. Grant, A. L. Williams, O. Langercrantz, and Wilfred Lawrence Knox (in part).

7. A. Neander, followed by A. H. Blom, T. Zahn, and J. C. K. Hofmann and in the twentieth century by J. Kögel, G. Kurze, and N. W. De Witt. J. Van Wageningen and F. H. Colson referred to the *stoicheia* as heavenly bodies.

8. F. Spitta, H. Diels, O. Everling, E. Y. Hincks, and A. Dieterich; in the twentieth century B. Reiche, G. A. Deissmann, M. Dibelius, Rudolf Bultmann, Dietrich Bonhoeffer, F. Pfister, T. K. Abbott, W. H. P. Hatch, L. B. Radford, W. Bauer, R. T. Stamm, A. M. Hunter, G. H. C. Macgregor, E. Langston, H. Lietzmann, H. Schlier, S. G. F. Brandon, E. Lohmeyer, G. S. Duncan, R. Leivestad, F. F. Bruce, A. Lumpe, G. B. Caird, J. H. Thayer, M. Jones, W. Bousset, and J. Knabenbauer. Most citations for these and other

modern writers listed previously can be found in the excellent bibliographies of Bandstra, Delling, and Cramer.

9. The Revised Standard Version, otherwise our best guide to a literal rendering of the Greek, is on this point the worst of the versions. In Gal. 4:3, 9 and Col. 2:8, 20 it consistently translates *stoicheia* as "elemental spirits," even though only the word "elements" stands in the Greek. Yet when it comes to Heb. 5:12 or 2 Pet. 3:10, 12 the rendering is "first principles" and the physical "elements." Ironically the worst paraphrase of Scripture, *The Living Bible*, is consistently the best in its versatile treatment of *stoicheia* as context dependent for its meaning, thanks to the fact that the author, not knowing Greek, had to take all of his clues from the context and therefore stumbled on the right solution! The Jerusalem Bible and J. B. Phillips are also excellent. The New English Bible follows the RSV's "elemental spirits" but acknowledges in footnotes that other translations are possible such as "the elements of the natural world" or "elementary ideas belonging to this world."

10. See Bandstra, p. 32. Delling (p. 673) cites Plato's view ("an original constituent" which is not perceptible) and Hesychius' (5 c.E.), still reflecting the doctrines of Empedocles—"all that which is indivisible and without parts."

11. Thus Isocrates spoke about the "elements of a good commonwealth" (*Ad Nicodem* 55), Plutarch of the "prime elements of virtue" (*De Liberis Educandis*, sec. 16). Galen wrote a medical book "concerning the Hippocratic principles"; Euclid did the same on the elements (theorems) of geometry.

12. For reasons quite puzzling to me Bandstra (n. 1 above) abandons this fundamental insight as his book proceeds and ends by virtually equating the *stoicheia* with the Law. Note the title of his book and his first proposition: "The phrase 'elements of the world' . . . in Gal. 4:3 (9), and Col. 2:8, 20, refers specifically to the law and the flesh as the two interactive, fundamental forces operative in human existence before and outside Christ" (p. i).

13. This includes rejecting all those tortured attempts to reduce the *stoicheia* to a common denominator, from Theodoret to Wilfred Lawrence Knox (*St. Paul and the Church of the Gentiles* [Cambridge: Cambridge University Press, 1939], pp. 108, 165, 168-69) and T. F. Torrance ("The Atonement," *Scottish Journal of Theology* 7 [1954]: 263-64).

14. John Pairman Brown has directed my attention to the hellenistic practice of inventing *hypogrammoi*, or verses composed of the twenty-four letters of the alphabet, each used only once, as writing examples for children in school (cf. 1 Pet. 2:21). Clement of Alexandria has preserved three such verses in *Stromata* 5. 48-49, which he ingeniously interprets as lists of the four elements: "The way in which the *stoicheia* [of the alphabet] are taught to children contains as its interpretation the four *stoicheia* [of the universe]" (5. 46. 3).

15. This use of elements as the physical stuff of the universe was already routine in the Septuagint (Wisd. of Sol. 7:11, 19:18; 4 Macc. 12:13).

16. Clement of Alexandria, *The Exhortation to the Greeks*, trans. G. W. Butterworth, Loeb Classical Library, no. 92 (Cambridge, Mass.: Harvard University Press, 1960), chap. 5.

17. Edward Schweizer has attempted to specify the philosophical milieu of Colossians even more precisely as a kind of neo-Pythagoreanism in which the physical elements were revered and accorded a certain transcendent power ("Die 'Elemente der Welt' Gal. 4, 3,9; Kol. 2, 8,20," in *Verborum Veritas: Festschrift für Gustav Stählin zum 70. Geburtstag*, ed. Otto Böcher and Klaus Haacher (Wuppertal, West Germany: Theologischer Verlag Rolf Brockhaus, 1970), pp. 245-59).

18. See the essays in *Conflict at Colossae*, ed. F. O. Francis and Wayne A. Meeks (Missoula, Mont.: Scholars Press, 1975).

19. The RSV's "elementary spirits of the universe" again derails comprehension. *Living Bible's* translation ("the world's ideas of how to be saved") fits perfectly with the meaning as I understand it.

20. In RSV's "elemental spirits" the word "spirits" of course does not appear in the Greek. *Living Bible* is graphic if awkward: "How can it be that you want to go back again

and become slaves once more to another poor, weak, useless religion of trying to get to heaven by obeying God's laws?"

21. "Zeus," says Cicero, "attributed a divine power (*vis divina*) to the stars, but also to the years, the months, and the seasons." "General opinion," says Proclus, "makes the Hours goddesses and the Month a god, and their worship has been handed on to us: we say also that the Day and the Night are deities, and the gods themselves have taught us how to call upon them. Does it not follow that Time also should be a god, seeing that it includes at once months and hours, days and nights?" (as quoted by Franz Cumont, *Astrology and Religion among the Greeks and Romans* [New York: G. P. Putnam's Sons, 1912], p. 109).

22. M. Brändle, cited by Delling (n. 1 above), p. 672. The Gospel of Mani (4 C.E.) went so far as to regard the *stoicheia* as part of the divine quaternity: "Praise and glory be to the Father and to the Son and to the elect Breath, the Holy Spirit, and to the creative (or: holy) Elements!" (*New Testament Apocrypha*, ed. Wilhelm Schneemelcher, 2 vols. [Philadelphia: Westminster Press, 1965], 1:359).

23. Franz Cumont. *The Oriental Religions in Roman Paganism* (Chicago: Open Court Publishing Co., 1911), p. 33.

24. Tertullian *Against Marcion* 5. 4 (in *The Ante-Nicene Fathers*, ed. Alexander Roberts and James Donaldson, 8 vols. [Grand Rapids, Mich.: William B. Eerdmans Publishing Co., 1951], 3:435-37).

25. Tertullian *Against Marcion* 5. 19.

26. Enough can be known to make this more than just a good guess. Thus those who identified the *stoicheia* as earth, air, fire, and water (Clement [in part], Victorinus [in part], and Hilary) were correct regarding 2 Pet. 3:10, 12, though the context of 2 Pet. justifies as a variant translation "the heavenly bodies will disappear in fire" (*Living Bible*) since not only the earth but the entire solar system would be dissolved (Chrysostom, Theodoret, Victorinus [in part], Theodore of Mopsuestia, and Augustine). However, this astral interpretation probably was late, prompted by the tremendous rise of astrological fatalism. Col. 2:8 does refer to philosophy as Clement and Origen saw it, just as Gal. 2:20 refers to religious practices (Eusebius). Gal. 4:3 clearly points to the Jewish Law (Jerome), and 4:9 implies worship of *stoicheia* as gods (Theodore of Mopsuestia).

27. Even if further sources which identified the *stoicheia* with stars or angels or demons or personal beings should be discovered—an identification for which we have as yet no evidence prior to the close of the second century C.E.—there would be no problem to this solution. *Stoicheia* still would be a formal term used in specific reference to these entities. The stars functioned as *stoicheia* in Greek thought, even if they may not have been thus named, as did the angels in Jewish apocalyptic. The prologue of 2 En. (2-7 C.E.) in speaking of the orders of angelic powers in heaven includes "the ineffable ministrations of the multitude of the elements." The text is in Slavonic, but *stoicheia* no doubt lies behind it. One could connect this back easily with the angels set over the physical elements described in 1 En. 82:10-14, Jub. 2:2, Asc. Is. 4:18, 4 Ezra 8:20-22, Rev. 9:15, 16:5. However, the early Christian theologians continued to speak, as did Jewish apocalyptic, of angelic powers in charge of the elements (Athenagoras, Hilary) and not of the elements themselves as angelic.

28. A nineteenth-century physicist, Lord Kelvin, typified this stance: "When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind" (as quoted by Marshall McLuhan and Barrington Nevitt, *Take Today: The Executive as Dropout* [New York: Harcourt Brace Jovanovich, 1972], p. 108). It is easier for us today to see that such a pitiable generalization has only limited validity even in the realm of physics, but such an attitude still straitjackets many people.

29. Henry Adams, *The Education of Henry Adams* (Boston: Houghton Mifflin Co., 1918).

30. Jacques Monod, *Chance and Necessity*, trans. Austryn Wainhouse (New York: Vintage Books, 1972); John A. Miles, Jr., "Jacques Monod and the Cure of Souls," *Zygon* 9 (1974): 33-34.

31. Sirach 16:27–28: “He [God] arranged his works in an eternal order,/ and their dominion for all generations;/ they neither hunger nor grow weary,/ and they do not cease from their labors./ They do not crowd one another aside,/ and they will never disobey his word.” The powers of creation are declared thus to antedate life and to operate invariably (“they will never disobey his word”) and harmoniously (“they do not crowd one another aside”) in their ceaseless maintenance of the universe. The angels having oversight over invariant phenomena, unlike other angels, cannot observe the Sabbath therefore (Bk. Jub. 2).

32. Arthur Koestler, *The Ghost in the Machine* (New York: Macmillan Co., 1968), p. 17.

33. On the issue of reductionism see Arthur Koestler and J. R. Smythies, *Beyond Reductionism: New Perspectives in the Life Sciences* (New York: Macmillan Co., 1969), esp. the chaps. by Ludwig von Bertalanffy and Viktor Frankl; Ludwig von Bertalanffy, *General System Theory* (New York: George Braziller, Inc., 1968); David Bakan, *On Method: Toward a Reconstruction of Psychological Investigation* (San Francisco: Jossey-Bass, Inc., 1967).

34. William Hoffer, “A Magic Ratio Recurs throughout Art and Nature,” *Smithsonian* 6 (December 1975): 110–12. Wolf Strache’s *Forms and Patterns in Nature* (New York: Pantheon Books, 1973) uses the photographic essay to document the way the same designs and patterns are repeated in nature. Marie-Louise von Franz adduces other examples and postulates that the natural integers are the archetypal patterns that regulate the unitary realm of psyche and matter (*Number and Time*, trans. Andrea Dykes [Evanston, Ill.: Northwestern University Press, 1974]). For further examples see Tobias Dantzig, *Number: The Language of Science*, 4th ed. (London: G. Allen & Unwin, 1962).

35. I have adapted this image from Ralph Wendell Burhoe’s “Introduction to the Symposium on Science and Human Values,” *Zygon* 6 (1971): 98, n. 30.

36. Ralph Wendell Burhoe, “Natural Selection and God,” *Zygon* 7 (1972): 60; italics mine.

37. Ralph Wendell Burhoe, “The Phenomenon of Religion Seen Scientifically,” in *Changing Perspectives in the Scientific Study of Religion*, ed. Allan W. Eister (New York: John Wiley & Sons, 1974), p. 32.

38. See Robert E. Ornstein, *The Psychology of Consciousness* (New York: Viking Press, 1972), p. 212.

39. Ornstein, pp. 213–16; A. P. Krueger, “Preliminary Consideration of the Biological Significance of Air Ions,” in *The Nature of Human Consciousness*, ed. Robert E. Ornstein (San Francisco: W. H. Freeman & Co., 1973). Gravity also is suspected of having an effect on psychological states through physiological structure (David Sobel, “Gravity and Structural Integration,” in *ibid.*, pp. 397–407).

40. John A. Eddy, “The Case of the Missing Sunspots,” *Scientific American* 236 (May 1977): 80–92.

41. Cumont (n. 21 above), p. 137. Cf. n. 23 above.

42. Clinton V. Morrison, *The Powers That Be* (London: S.C.M. Press, 1960), pp. 77–80.

43. Tatian *Oratio ad Graecos* 9–10; Tertullian *De Idolatria* 8–11.

44. To which John Fairman Brown adds in a personal communication that “the astrologers Thrasyllus and Balbillus were Sun Myung Moon to all the Julio-Claudian emperors.”

45. *Excerpts of Theodotus* 55 (in *Ante-Nicene Fathers* [n. 24 above] 8:49). The pseudo-Clementine *Recognitions*, in a section of the *Kerygmata Petrou* (1:32), describes Abraham as an “astrologer” who was able to recognize the Creator in the order of the stars. In 9:12–32 and 10:7–12, on the other hand, the later editors attack the entire astrological system. Jews also were split on the issue. Philo rejected worship of the stars and the dependence of human fate on the stars (*De Migratione Abrahami* 69, 181–87) yet believed that the seven planets produce growth and ripening on earth (*De Opificiis Mundi* 113) and that Pleiades influences seasonal events (115). Rabbis debated the influence of the stars on Israel, but all apparently agreed that they held sway over Gentiles (see Jacob Neusner, *History of the Jews in Babylonia* [Leiden: E. J. Brill, 1965–70],

1:139, 171–72). The magnificent zodiacs on the synagogue floors in Beth Alpha and Sardis are the weightiest evidence of the popular acceptance of astrology among Jews, however.

46. No book of the New Testament evidences so much contact with astrology as the Book of Revelation. For a rather judicious treatment see Philip Carrington, "Astral Mythology in the Revelation," *Anglican Theological Review* 13 (1931): 289–305.

47. Advertisement in the *New York Post* (May 18, 1977), p. 69.

48. The Metaphysical Intelligence Services have offered to read your numerological chart if you wish.

49. The fundamental statement in this thesis is George A. Riggan's "Epilogue to the Symposium on Science and Human Purpose," *Zygon* 8 (1973): 476. The subtlety of Riggan's notion of levels resolves the ancient theological position of the validity of reversing predicative statements about God. Most of what I have learned from Riggan emerged orally in a series of team-taught courses at the Hartford Seminary Foundation's church-and-ministry program, 1975–77.

50. Thus Kirtley Mather can be moved to suggest that such forces "come as near to being ultimate causes as the mind can grasp. They cannot be directly experienced by sense perception, but their reality is now beyond challenge" (as quoted by John Ruskin Clark, "The Great Living System: The World as the Body of God," *Zygon* 9 [1974]: 66). But why should the lowest level of God's systemic self-manifestation be regarded as explanatory for the whole?

51. Burhoe, "Natural Selection and God" (n. 36 above). Burhoe believes that nature and natural selection reveal a God who can be the center of the rebirth of a universal religion for a scientific and technological world. In science, nature itself finally becomes the creator, guide, judge, and sustainer of life and reveals the nature of God: ". . . it is this doctrine of elements [sic!] intrinsic to nature as the source, creator, and judge of man which has been growing in the scientific and public mind in the century since Darwin" (p. 35). Well-meaning as this program is, it threatens to fall back into a worship of the *stoicheia*. Elsewhere Burhoe is more cautious (see his "The Human Prospect and the Lord of History," *Zygon* 10 [1975]: 365).

52. I am using "hierarchy" not in the sense of ranked importance, superiority, or preference but in the more neutral sense of relationships of ascending complexity, without judgment as to relative importance. Perhaps an organismic image would be better, such as Paul's in 1 Cor. 12:14–31. Clearly we are speaking not of a straight stairstepping but of a clustering of subhierarchies, without reference to their relative values.

53. George A. Riggan, "Christ and the Cosmos" (manuscript).

54. "Call it the evolving cosmos, call it *mansoul*, or call it *god*, the superposition of states of the cosmos, in its logically primordial aspect, transcends any possible stage of its actual evolution while containing all qualities possible of manifestation—commensurable and incommensurable alike. Yet the cosmic system exists nowhere else than in the transient components of its evolving stages. Viewed transcendentally, the cosmic superposition is immutable, omnipotent, omniscient; viewed immanently, it participates in the hopes, joys, sufferings, and failures alike of mankind and of all creation. In the polarity of transcendence and immanence it remains forever a self-surpassing system, surpassed by none of its self-transcending subsystemic components" (Riggan, "Epilogue," p. 480).

55. Paul Tillich, *Systematic Theology*, 3 vols. (Chicago: University of Chicago Press, 1951–63), 1:133. Philo sensed the appropriateness of revering the elements without worshipping them. They are, he says, matter without soul, subject to God. Yet the altar of incense is appointed for thanksgiving for the four elements, and the four elements of which the universe is created are used as a sanctuary for the father and governor of the universe! (cited by Dellinger [n. 1 above], p. 676).