SEQUENCE STRATIGRAPHY: VALUE AND CONTROVERSY—FOR WHOM?

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Abstract

The secular questioning of the quietism of Lyell, Darwin, and modern geology in general is responsible for the revolution in stratigraphy and sedimentology begun in 1977. This revolution is known as sequence stratigraphy.

Sequence stratigraphy (the classical Exxon approach) is compatible with creationist Flood geology. Sequence stratigraphy is a non-time-dominant method of doing geology. Strict uniformitarians (non-catastrophists) hate sequence stratigraphy. Sequence stratigraphy is a threat to traditional uniformitarian ***formation-scale*** *or the grain-by-grain building-up and tearing-down of the land. Beyond classification of sequence stratigraphic units within a new language for geology, this less contrived philosophy of sedimentary analysis potentially offers the dynamic of short-term sea-level changes superimposed upon a single broad long-term sea-level curve (Wilgus, Hastings, Posamentier, Van Wagoner, Ross, and Kendall, 1988). By extension, the Vail curve of sea-level change (cycles within cycles) represents an exponentially based event (non-biased)* ***devoid*** *of cumbersome, intellectually restricting appeals to uniformitarianism—either uniformity of rate or material conditions (earthly agents alone)* ***or*** *mad assertions about space and time, invariance of natural laws (the exclusion of providence).*

The failure of orthodox uniformitarianism is permitting, in the secular scientific literature, a return to the philosophy of ***katastrophe*** *(Gk.: to overturn), this time expressed in terms of "extraterrestrial causes." The existential dichotomy, first described by Schaeffer (1968, 1976; 1968, 1977; 1972, 1976; 1976), has brought us to this present marvelous state of affairs in the history of science.*

Introduction

The creationist and Flood geologist Carl Froede, Jr. (1995, p. 92) envisioned the formation of a Commission of Creationist Stratigraphy responsible for defining and refining a concept of stratigraphy reflecting the world-wide catastrophic Flood event set within the context of the young Earth model. In his historic analysis of sequence stratigraphy, Froede (1994) announced his intent to follow his early attempt at understanding the sequence stratigraphic approach with studies of specific sites and their interpretation in terms of sequence stratigraphic concepts. These concepts, Froede (p. 142) suggested, are potentially "relevant and easily adapted for use by creationists."

What followed, however, was Davison's (1995) two-year study emphasizing field work in South Africa and secularly published data of additional sites on five continents. Ultimately, Davison concluded in favor of the importance of unconformity-bounded sequences (the Exxon approach) in what he termed "Flood stratigraphy": The presence of five inter-regional unconformities are world-wide in extent indicating the possibility of regionally or globally-controlled tectonic (including volcanic), tidal, eustatic, and hydraulic activity which controlled sedimentation during the Genesis Flood.

Froede (1994) and Davison (1995) appropriately rejected the constraints of uniformitarian time evident in the modern, secular sequence stratigraphic approach. However, it may surprise Froede and Davison and Flood advocates in general to find that sequence stratigraphy is a non-time dominant method of doing geology. Indeed, according to the original Exxon team (Van Wagoner et al., 1988, p. 39), the overview, fundamentals, and key definitions behind the sequence approach are time independent: i.e., the amount of time during which strata form is *not* used to define rock relationships within a chronostratigraphic framework (essentially *any* timescale) wherein the succession of rocks is cyclic and composed of genetically related stratal units (sequences and systems tracts): "Absolute thickness, the amount of time during which they form, and interpretation of regional or global origin are *not* used to define sequence-stratigraphic units.'' (Van Wagoner et al., 1988, p. 39—italics mine.) This may be interpreted as an admittance by the originators of sequence stratigraphy, many of whom indicate influence by creationist-Flood scientific studies, that time, as it pertains to the study of geology, is only an inference. Treating time as an inference is the first dismissal 4 of substantive geologic time (rate) implying extraordinarily long duration or remoteness of the past (with no precise limitations) as irrelevant, i.e. philosophically separated (dichotomized) from material process. The resulting dichotomy is diagrammed as:

$$\frac{\text{time}}{\text{process}}$$

In accounting for lithological variation in vertically stacked sequences, sequence stratigraphy emphasizes cyclic (repetitive) processes (not necessarily environments) of deposition behind independently occurring, scalarly (quantitatively) differentiated sedimentary packages evidencing distinct, abrupt, non-transitional boundaries (Figure 1). In this context, sequence stratigraphy is remarkably non-time domi-

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nant. The Exxon approach (see Appendix I) to sequence stratigraphy is the greatest secularly orientated theoretical breakthrough useful to creationist/Flood advocates since the appearance of modern plate tectonics. Creation/Flood advocates are able to learn from the *presently* dominant secularist opposition albeit well within the principle of young Earth dynamics.

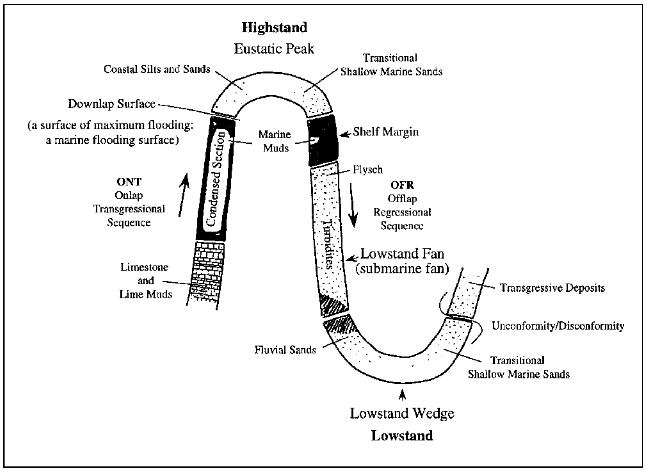

Figure 1. The sequence curve. A model of key surfaces and the corresponding distribution of lithofacies. The sequence curve occurs in; varying scales from the continental to puddle (Weimer and Posamentier, 1994, p. 10). the emphasis is upon sedimentary or hydrodynamic processes rather than upon time or ecological environment. (Adapted from Loutit et al., 1988, p. 203; fig. 24A).

Froede's (1994) and Davison's (1995) declaration rejecting the uniformitarian context of sequence stratigraphy emphasized the secularist's dependence on the evolutionary geologic timescale. Indeed, Froede (1995) proposed a creationist geological timescale including whole new units, groups, divisions, and timeframes. However, a new system of time reference is wastefully repetitious.[6] Likewise, Davison's (1995, p. 224) suggestion that "creationists need to reinterpret the *rocks*, and not the evolutionists' interpretation of these rocks" moves us dangerously back to square one—to the days preceding William "strata" Smith (1769-1839).

Instead of proposing a new geological timescale or starting the discipline anew from some obscure position further convoluting the creationist appeal, creationist/Flood advocates should seize and take control of the present secularist debate regarding *global catastrophe*—a philosophic appeal—having made its official debut in the uniformitarian (quietist) literature with the proposal offered by the Alvarez group (Alvarez, Alvarez, Asaro, and Michel, 1979; 1980). In this sense, the above citation of Van Wagoner et al. (1988, p. 39) is only partially correct. Time should *not* be used to define sequence-stratigraphic units. *Interpretation of global origin should now be used to define and describe sequence-stratigraphic unit types.* This interpretation should include the development of a mechanism in opposition to exclusivistic extraterrestrial causes (hypervelocity meteoritic impacts). It should be comprehensive in scope and involve a method of rapid subsidence or limited uplift of continental margins in tandem with rapid vertical expansion (sea-level rising) or abrupt contraction (sea-level lowering) of mid-oceanic ridges (thermo-tectonics[1]) and accompanied during (but not confined to) the Pleistocene by worldwide climatic change. In this sense, uniformitarianism should now be understood not as a declaration of *time* but as an epistemology, a philosophy of *katastrophe* emphasizing periodicity. From the creationist/Flood perspective this position is still incorrect, but the appearance of the "Alvarez hypothesis" and recently its extension with Shaw's (1994) application of nonlinear dynamics (chaos science) and celestial mechanics to resonances of the cosmos[2]—a new theory of earth—with emphasis upon global catastrophe and extinction is nevertheless an improvement upon the *quietism* of Charles Lyell (1797-1875). How did we get to this marvelous present state of affairs?

What's the History of Sequence Stratigraphy?

Sequence Stratigraphy: Talking Points. Andrew D. Miall (1986, p. 131) was among the first to suggest that "Peter Vail and his colleagues at Exxon have brought about a revolution in stratigraphic thinking; during the last ten years" (see Vail, Mitchum, and Thompson, 1977b; Vail et al., 1977c). In a pivotal publication, Richard K. Olsson (1988, p. 289), suggested that "the development of sequence stratigraphy" began with Vail et al. (1977b). To the contrary R. J. Weimer (1993, p. 1578; 1994, p. 1446) incongruously wrote: "Sequence stratigraphy was originally defined by L. L. Sloss[3] as the study of genetically related strata that are bounded by unconformities."

Henry W. Posamentier and Paul Weimer (1993, p. 731; n. 4) reported that many different concepts and definitions exist for *sequence stratigraphy* and they ask, 'of what does it consist?' Among these, to name a few, are genetic stratigraphic sequences (Galloway, 1989a; 1989b), depositional episodes (Frazier, 1974), allostratigraphy (North American Commission on Stratigraphic Nomenclature, 1983; Walker, 1990), and transgressive-regressive cycles (Embry, 1990) (see Appendix I). These stratigraphic concepts and associated nomenclature have been merged in the literature, causing confusion among workers, especially in their application to exploration and field development problems.

Zhang, Wornardt, and Vail (1992, p. 1472) wrote:

> Sequence Stratigraphy has evolved [Vail, Mitchum, and Thompson, 1977a; Wilgus et al., 1988; Posamentier and Vail, 1988; Posamentier, Jervey, and Vail, 1988] from a theoretically controversial model into a practically accepted method. Currently there is a tremendous amount of interests [sic] in practicing sequence stratigraphy with different approaches being employed by various researchers [see Appendix I].

Posamentier and Weimer (1993, p. 731) elaborated that for purposes of clarity and simplicity, in their work, the term "sequence stratigraphy" would be returned to its *original* sense outlined by Posamentier and Vail (1988) and Van Wagoner, Mitchum, Campion, and Rahmanian (1990)—the Exxon approach.

To realize the full potential of the sequence stratigraphic approach, Posamentier and Weimer (1993, p. 739) recommended the following readings: Vail et al. (1977a); Haq, Hardenbol, and Vail (1987); Jervey (1988); Posamentier et al. (1988); Posamentier and Vail (1988); and Van Wagoner et al. (1990). Posamentier and James (1993) provided an overview of sequence stratigraphic concepts, uses and abuses. Answering critics,[4] Weimer and 9 Posamentier (1994) focused on refining the conceptual model of sequence stratigraphy and documented the revolution in stratigraphic analysis as entering "a phase of intense application" (p. 3) in the petroleum industry. Extensive compilations of case studies using the sequence stratigraphic approach include MacDonald (1991), Einsele Ricken and Seilacher (1991), Posamentier et al. (1993), Loucks and Sarg (1993), and Weimer and Posamentier (1994).

Sequence Stratigraphy: What is it?

Bilal U. Haq, Jan Hardenbol, and Peter R. Vail (1987, p. 1165; n. 9)—the fathers of the revolution known as *sequence stratigraphy*—cite Mitchum, Vail, and Sangree (1977), as the earliest, most salient treatment of sequence stratigraphy in answer to the question, "What is it?" Haq et al. (1987, p. 1165; n. 9) characterized the word *sequence* in *sequence stratigraphy* in terms of cyclic sedimentation:

> Sequence is a widely used term in earth science, but here sequence refers specifically to the depositional sequence or the succession of sediments deposited during a complete sea level *cycle*, that is, from a sea level fall to subsequent rise and ending with the next fall [see, p. 1157; Figure 1].[5] Sequence stratigraphy is broadly defined as the branch of stratigraphy that deals with depositional sequences of genetically related strata deposited during the different phases (lowstand, transgressive, and highstand) of sea level *cycles*. (Italics mine.)

Van Wagoner et al. (l988, p. 39)—discussing the definition of sequence stratigraphy (the classical Exxon approach) with subsidiary aspects—noted that:

> **Sequence stratigraphy** is the study of rock relationships within a chronostratigraphic framework of repetitive, genetically related strata bounded by surfaces of erosion or nondeposition, or their correlative conformities. The fundamental unit of sequence stratigraphy is the **sequence,** which is bounded by unconformities and their correlative conformities. A sequence can be subdivided into **systems tracts,** which are defined by their position within the sequence and by the stacking patterns of **parasequence sets** and **parasequences** bounded by marine-flooding surfaces. Boundaries of sequences, parasequence sets, and parasequences provide a chronostratigraphic framework for correlating and mapping sedimentary rocks. Sequences, parasequence sets, and parasequences are defined and identified by the physical relationships of strata, including the lateral continuity and geometry of the surfaces bounding the units, vertical and lateral stacking patterns, and the lateral geometry of the strata within these units. Absolute thickness, the amount of time during which they form, and interpretation of regional or global origin are not used to define sequence-stratigraphic units.

Van Wagoner and Hill (1994, p. 1168) reported that the importance of sequence stratigraphy is its predictive element: the effects of relative sea-level changes on lithofacies (rock suites) distribution and stratal stacking patterns are more easily, more correctly inferred. "These effects have been well documented in paralic and shallow-marine strata." Also, Shanley and McCabe (1994, p, 544) wrote, "The popularization of sequence-stratigraphic concepts during the last 15 or so years has given the geologic community powerful new tools with which to predict the occurrence and geometry of sedimentary strata."

New Truth From Old Discoveries: the Death Knell for Strict Uniformitarianism

Since the mid-1920s and 1930s geologists—Julia Gardner (1923; 1924; 1925; 1927a; 1927b; 1928; 1931; Gardner and Arthur C. Trowbridge, 1931), Esther R. Applin, Alva C. Ellisor, Hedwig T. Kniker (1925), Ellisor (1929; 1930), Helen J. Plummer (1926, 1927; 1932), Nelson H. Darton, L. W. Stephenson, and Gardner (1932), and others—have struggled with the complexities of regional correlation including problematic downdip and lateral lithofacies changes primarily through the study of foraminifera faunal types.

Other geologists since that period have puzzled over the original uniformitarian interpretations which have produced the philosophic framework referred to here as traditional *formation-scale*[6] (Davidoff and Yancey, 1993), deposition-interpretative method. This framework is loaded with paleoecologic implications used to reconstruct sedimentary environments: e.g., flood plain, swamp, beach-ridge barrier, delta-front platform mouth bar, prodelta slope, open shelf, etc.

Since the development of sequence stratigraphy (Vail et al., 1977a), however, geologic focus has shifted from formation-scale depositional history—the environments of deposition including change of rates and material conditions set within the context of strict spatial and temporal invariance—and is presently returning to "the cycles of sea-level change within which sequences are deposited" (Olsson, 1988, p. 289):

> Vail and Hardenbol (1979) used onlap-offlap sequences to derive a sea-level curve showing relative changes in sea level for the Tertiary [see Appendix II]. These relative changes in sea level are interpreted by Vail and others (1984) and Haq and others (1987) as due to eustatic changes superimposed on a long-term eustatic sea-level curve [see Vail et al., 1977b, p. 84; Figure 1:…Relative Change of Sea Level During (the) Phanerozoic; Wilgus et al., 1988, pl.: Mesozoic-Cenozoic Cycle Chart].[7] If stratigraphic sequences develop during cycles of eustatic rise and fall of sea level, knowledge of the magnitude of eustatic change is important to understanding the mechanism(s) that cause the change. Estimation of the magnitude of eustatic change relative to present sea level has been the most elusive data of all to obtain in analyzing sequence stratigraphy.

For better or for worse, the scientific investigations of the sequence stratigrapher add a whole new descriptive, more easily conveyed geologic vocabulary (see Van Wagoner et al., 1988, pp. 39-45) to the study of geology. This new vocabulary, expressive of the ideas behind sequence stratigraphy, provides a broader overview of the accurate, acceptable fundamentals of the discipline set within the context of a less contrived more forthcoming philosophy—the sequence stratigraphic approach. This revolutionary focus is generating great interest in demonstrating the cyclic and episodic nature of much of the stratigraphic record including the discovery of an acceptable theoretical mechanism driving the cycles of sea-level change.

A Timely Scientific Revolution

What were the conditions that led to this timely revolution[8] in the geological sciences? Peter M. Roth (1993, p. 1568), reviewing Einsele, Ricken, and Seilacher (1991), suggested that:

> Perhaps it was a minor revolution in stratigraphy and sedimentation, a return to Cuvillier's [sic] [Georges Cuvier's (1769-1832)] ideas of multiple floods and away from Lyell and Darwin, the gradualists with their peaceful view of earth's history.

Cuvier's Multiple Catastrophism. Georges Cuvier (1769-1832), professor of comparative anatomy at the Museum of Natural History, Paris, and the founder of modern vertebrate paleontology was a man of immense learning and reputation. Whitcomb and Morris (1961, 1973, p. 92) reported that Cuvier's opposition to Flood geology (the dominant paradigm of early 19th century geology) was subtle, because while he insisted that the superficial deposits of the Earth had been laid down by the Biblical Flood, he also taught that the major fossiliferous strata had been deposited by a series of great floods separated by immense periods of time, long before the creation of man. After each of these catastrophes, the few surviving animals spread out over the Earth again (a sort of "punctuated" approach to variable populations)1 only to be nearly annihilated by another great flood. The last of these aqueous catastrophes was the Noahic Deluge, concerning which Cuvier, in notes for the third edition (1836, p. 133) of his *Discours sur les Révolutions de Ia Surface du Globe*, patronizingly wrote:

> If there be a fact well ascertained in geology, it is this, that the surface of our globe has suffered a great and sudden revolution, the period of which cannot be dated further back than 5 or 6000 years.

Neokatastrophism and Periodicity. Roth (1993, p. 1568) was not the first to point out the apparent renewal of cuvierism with the modern, secular interest in rhythmicity of sedimentary depositional cycles evident in both the Vail curve (Figures 2, 3) and subsidiary/oppositional Milankovitch band cyclostratigraphy (Schwarzacher, 1993). David M. Raup (1986, p. 18), noted—among others, including Otto Schindewolf (1963) (with M. W. de Laubenfels [1956]: the sometimes fathers of extraterrestrial neokatastrophism)—his own conversion. Raup and Sepkoski (1984, p. 805) suggested that "many of the major biological crises of our past, the mass extinctions, were evidently caused by the environmental shock of what is known in the trade as 'large-body impact'." Cornet orbits were deflected in random, periodic ways by an as yet unseen small solar companion star (Nemesis) on a highly eccentric (non-circular) orbit—an orbit that carries the companion through the Oort Cloud once per revolution about the sun Accidental, recurrent disturbance of comet orbits in the Oort Cloud then produces a comet shower on earth and the comet impacts cause mass extinction (Davis, Hut, and Muller, 1983; 1984; Whitmire and Jackson, 1984). Stanley (1987, p. 7) noted:

> . . . During the 1980s [Alvarez et al., 1980; Ganapathy, 1980; Hsü, 1980; Kyte, Zhou, and Wasson, 1980; Smit and Hertogen, 1980; Alvarez, Alvarez, Asaro, and Michel, 1982; Alvarez, 1983; Alvarez, Alvarez, Asaro, and Michel, 1984a; Alvarez, Kauffman, Surlyk, Alvarez, Asaro, and Michel, 1984b] the question of what ended the dinosaurs' reign on earth has been much in the news because of the hotly debated hypothesis that calamitous changes wrought when a giant meteor struck the earth killed off the largest land animals of all time.

Raup (1986, p. 31) indicated: "As many readers will already have realized, the debate and argument about Nemesis is a revival of the Lyell-Cuvier argument." Indeed, John Maddox (1984, p. 685), the editor of *Nature*, concluded by commenting: ". . . It is proper to acknowledge that the intellectual climate has changed in favour of catastrophism.

An important component in this revolution was Stephen Jay Gould's (1965) decisive but flippantly titled paper, "Is Uniformitarianism Necessary?"[9] Gould's critical analysis of the cornerstone of modern geology opened the way for the discussion of uniformitarianism as a philosophic dichotomy.[10] Elsewhere, Gould (1967, p. 51) wrote: "I [maintain] that uniformitarianism is a dual notion with two strictly separable aspects. …" Gould's (1965) dichotomy may be set out diagrammatically as:

$$\frac{\text{substantive uniformitarianism}}{\text{methodological uniformitarianism}}$$

This diagram may be amplified as follows, to show what is included on the two different levels:

substantive uniformitarianism:

(a testable theory of geologic change postulating uniformity of rates or material conditions)

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methodological uniformitarianism:

(a procedural principle asserting spatial and temporal invariance of natural laws)

Francis A. Schaeffer documented the origin of humanist *philosophic dichotomy* or the existential principle[11] in his trilogy: *The God Who is There* (1968, 1976), *Escape from Reason* (1968, 1977), and *He is There and He is not Silent* (1972, 1976). Schaeffer's studies represent a thorough understanding of the history of philosophy from the gifted Christian perspective. To comprehend the humanist principle one must also be familiar with Schaeffer's book *How Should We Then Live? The Rise and Decline of Western Thought and Culture* (1976) (see chapter 9; topical index, s.v.: "dichotomy"; "story, upper and lower"). Gould's (1965) dichotomy proved the empirical reality of Schaeffer's existential principle: whatever a man *today* dichotomizes, he is about to give up *tomorrow.* The entire history of modern (humanist) western philosophy and religion is testimony to this fact.

Familiar with the philosophy of science (i.e., intellectual revolution and *factio* paradigm) originally offered by Kuhn (1962, 1970), S. J. Gould (1965, p. 223) profanely suggested:

> *Substantive uniformitarianism…is false and stifling to hypothesis formation*. Methodological uniformitarianism…belongs to the definition of science and is not unique to geology. *Methodological uniformitarianism* enabled Lyell [Charles Lyell (1797-1875)][12] to exclude the miraculous from geologic explanation; its invocation today is *anachronistic* since the question of divine intervention is no longer an issue in science. (Italics mine.)

Indeed, Gould's historic paper provided the professional impetus for further questioning of the quietism of Lyell, Darwin, and modern geology in general.

More recently, Gould (1987, pp. 176-177) provided an endorsement of the Alvarez hypothesis—a post-modernist challenge to Lyell and to the tradition of modern quietism (uniformitarianism)—when he wrote:

> . . . Lyell's rhetorical confusion might stifle legitimate research, I note Lyell's [1830, 1:39] harsh dismissal of the seventeenth-century scientist William Whiston [1696, 1708], because he dared to promote comets, and not earthly agents alone, as sources of geological change. Comets, I note, are now a favored mechanism for mass extinction under the Alvarez hypothesis [Urey, 1973; Alvarez et al., 1979; 1980; Silver and Schultz, 1982; Alvarez and Muller, 1984]: "He (Whiston [1696, 1708]) retarded the progress of truth, diverting men from the investigation of the laws of sublunary nature, and inducing them to waste time in speculations on the power of comets to drag the waters of the ocean over the land—on the condensation of the vapors of their tails into water, and other matters equally edifying . . ."

The Return to *Katastrophism,* but in Secular Attire

Besides the revolution in stratigraphy and sedimentology begun in 1977, a return to the philosophy of *katastrophe* (Gk.: to overturn)—this time expressed in terms of "extraterrestrial causes"—was first accepted after the proposal offered by Luis W. Alvarez (a Nobel laureate in physics), Walter Alvarez, Frank Asaro, and Helen V. Michel (1979; 1980). Gradualistic, earth-based causes were now out of the question. Any *true* Lyellian would have poured contempt upon the "Alvarez hypothesis." But, so it seemed, the tables were turned. A new dichotomy was evident, expressed as:

$$\frac{\dfrac{\text{substantive uniformitarianism}}{\text{methodological uniformitarianism}}}{\textit{katastrophism}}$$

Indeed, the principle was emerging: *that which is placed in the lower has consumed the upper.* Schaeffer (1968, 1977, p. 38) wrote:

> The lesson is: whenever you make such a dualism and begin to set up one autonomous section below, the result is that the lower eats up the upper. This has happened time after time in the last few hundred years.

Introduced here as evidence of philosophic "consumption," Gould (1965, p. 223) concludes that: "Substantive uniformitarianism, an incorrect theory, should be abandoned. Methodological uniformitarianism, now a superfluous term, is best confined to the past history of geology." I propose a new title for Gould, the neo-katastrophists, and

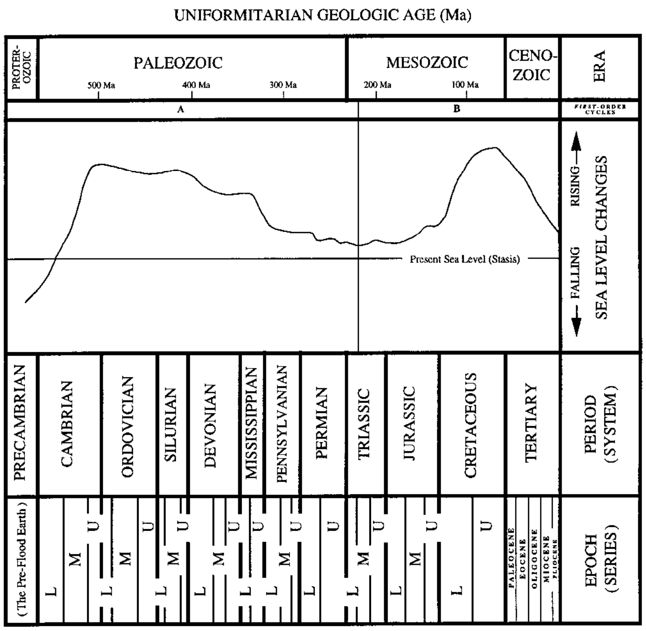

Figure 2. The sequence curve (systems tract)-the Vail curve-for the Phanerozoic (the "long-term" curve): two *type 1* depositional sequences (megasequences) first-order peaks of major transgression (during the Early Paleozoic and the Late Cretaceous). Note: (1) sea-level lowstand during the Late Precambrian; (2) distinct regression occurs throughout the Middle to Late Paleozoic and into the Mesozoic; (3) distinct regression is evident throughout the Tertiary; (4) a return to near-stasis or "bounding" (Genesis 9:11; Psalm 104:9) occurs at the end of the Tertiary. *Second* -order cycles comprise these *first* -order curves (see Figure 2).

Flood geology does not attempt to discredit the longstanding Vail curve (Vail et al., 1977b, p. 84; fig. 1), nor is there a need for reconciliation with the philosophy of Cuvier (the multi-flood approach). Instead, *first* -order cycles are viewed potentially as components of a yet much larger sequence curve (systems tract). Separate megasequences are incorporated into a *single* supermegasequence of broad worldwide extent. Evidence of this event defies descriptive accounts by uniformitarians heretofore non-forthcoming. (Adapted from Vail et al., 1977b, p. 84; fig. 1.)

the sequence stratigraphers to ponder: "Whatever Became of Uniformitarianism?"

Conclusion

Modern geology is founded upon the philosophy of uniformitarianism-the tradition of quietism. The founders of quietism were James Hutton (1726-1797), John Playfair (1748-1819), and Charles Lyell (1797-1875). "Uniformitarianism" was a word coined by William Whewell(l832). The concept, essentially naturalistic, presupposes that, "during unlimited expanses of time, the Earth has undergone slow, ceaseless changes by processes we can [presently] observe in operation" (Marvin, 1990, p. 147) (see II Peter 3:4b). Uniformitarian geology as a system defines the stratigraphic record in terms of time units. Modern geology is fundamentally time dependent. The tradition of quietism disallows things beyond the naturally occurring, denies intervening actions other than the observable and present, and refuses extraordinary events as an explanation of the common.

Stephen Jay Gould (1965) dichotomized the formerly secure system of uniformitarian geology into strongly contrasting views of invariance. The nature-versus-grace problem[13] so long plaguing universalist liberal "Christian" theology has now visited modern geology. As an example, Gould (p. 223) writes: "Substantive uniformitarianism...is false and stifling to hypothesis formation" (someone's imagination wishes to fly beyond the stars), and "Methodological uniformitarianism...is anachronistic" (since, in the view of the naturalist, God is dead). The problem is *existential* dichotomy. The result is philosophic tension. Gould's *methodological uniformitarianism* (space-time invariance) is potentially fatal to his *substantive uniformitarianism* (rate, material conditions, and ultimately periodicity) since in an existential universe there is no regularity, no uniformity (beyond the moment) to describe. This situation is not producing rationality in geology-post-modern geology. Only confusion has arisen from Gould's dichotomy, a disorderliness of the post-modern mind inflicted upon secular, geologic science.

Implications for Flood Geology. In an environment of intellectual despair-the rational end of uniformitarianism-a non-time-invariance or a time-independent geology appeared. Then sequence stratigraphy entered as a whole new way of doing geology.

Sequence stratigraphy offers to the flood geologist the concept of cycles *within* cycles of sea-level change. Far from a return to Cuvierism as some charge, large-scale sea-level changes described on the Vail curve (Figure 2) should be potentially viewed by the Flood geologist as components of a yet much larger sequence curve (supersystems tract). The overall curve incorporates large-scale sea-level change *(megasequences)* into a single *supermegusequence* (Figure 4) covering "all the high hills" (Genesis 7: 19).[14] This single event of such broad world-wide extent has until the secular development of sequence stratigraphy eluded forthcoming description by rationalistic, uniformitarian geologists. In understanding the theme of the illustration (Figure 4)-cycles within cycles comprising a still larger cycle, the idea behind each graphic presented with this paper-the Genesis Flood, the sedimentary rock record, is interpreted. Here is a powerful tool for *Diluvialists* (Woodmorappe, 1978, pp. 189-190)-the sequence stratigraphic approach: cyclic (repetitive) processes (material conditions) developed distinct scalar (quantitative) and modular (qualitative) sequence lithofacies; these lithofacies-parasequence, sequence, supersequence, megasequence, *supermegusequence* (proposed)-are evidenced (easily referenced) in the rock record from the global to continental to puddle.[15]

Creationist sequence stratigraphy describes cyclic (repetitive) processes (material conditions) overlapping into progressively larger-scale cycles. Each depositional cycle con-

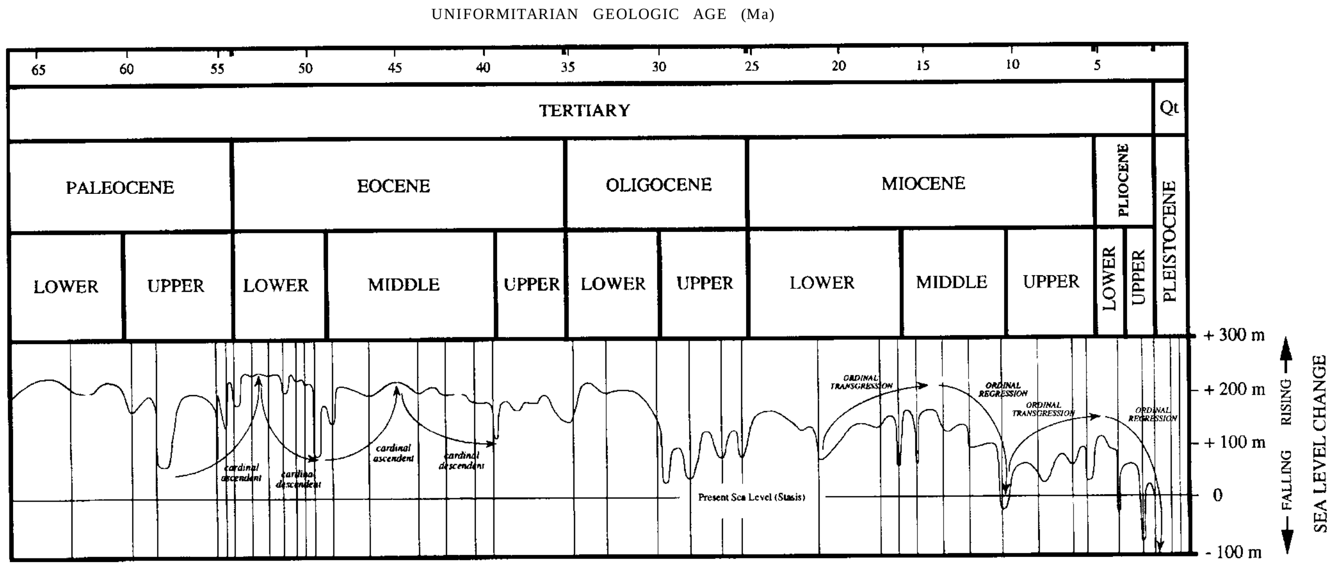

Figure 3, The sequence curve (systems tract)-the Vail curve-for the Tertiary Period only. Note the overall or general regression of sea level: ". . . The waters were abated" (Genesis 8:3,8, 11).

The lower to middle Miocene and the upper Miocene to upper Pliocene represents separate *type 2* depositional sequences (supersequences)-individual second-order cycles of *ordinal transgression* and *ordinal regression* (larger peaks and valleys). The smaller curves represent third-order *cycles* (sequences) of *cardinal ascendent* and *cardinal descendent* sea-level change: "and the waters returned from off the earth continually [in going and returning]" (Genesis 8:3a). It is the smaller *cardinal* curves (exemplified in the upper Paleocene to lower Eocene and lower to middle Eocene) that comprise the larger *ordinal* cycles, and the *ordinal* curves that constitute the broader systems tract *first-* order cycles (megasequences) depicted in Figure 2. The concept that comes forth is one of 'cycles within cycles' (Ezekiel 10:10). (Adapted from Prothero, 1990, p. 263; fig. 11.17 citing Haq et al., 1987, p. 1158; fig. 2; 1988, p. 95; fig 14.)

sists of four phases of relative accommodation change ultimately related to a fundamental change in sea level. These four phases are rising, highstand, falling, and lowstand (see Figure 1). Significant predictions and reinterpretations governing dominance of lithofacies (rock suites) associations-Paleozoic-Mesozoic-Cenozoic-may now be made with increasing success. For example, the dominance of muds occurring in the Early to Middle Mesozoic (see Figure 2) need not be considered a totally transgressive aspect (systems tract) of changing sea level. Indeed, should the definition of *condensed section* (see Glossary) always apply to massive mud deposition? Early to Middle Mesozoic mud regimes should now be viewed as shelfally derived, i.e. offlap regressional (see Figure 1). Thus, by way of example (using but one case), Woodmorappe's (1978, 1993, p. 104) adopted misuse of the term "condensed" is corrected, but his conclusion regarding "the high proportion of [mud] beds in mountains (especially the Alps) . . ." reflecting "disturbed Flood-burial patterns caused by floodwater *flow-off* variability around emerging mountains" (italics mine) is moved dramatically to a position of geologic reality. Early to Middle Mesozoic marine muds (see Figure 2) indicate an emergent, geosynclinial continental-shelf margin and therefore *offlap* regression (see Figure 1: *The sequence curve).*

Implications for Uniformitarian Geology. In surroundings of doubt governing the honesty of the uniformitarian principle, a shift in "truth' occurred. But, in fact, what post-modern geology is now saying has already been said but in a different way by the Christian creationist and Flood geologist (e.g., William Whiston [1667-1752] 1696, 1708). Gould (1987b) has suggested this in his criticism of the Alvarez hypothesis. Nevertheless, with Alvarez et al. (1979; 1980), indeed, the concept of *katastrophism* revived.

It is interesting that the Alvarez hypothesis (Alvarez et al., 1979; 1980) appeared a mere two years after the introduction of sequence stratigraphy (Vail et al., 1977a; 1977b; 1977c). Both represent revolutionary understandings, reinterpretive departures (Kuhn, 1962, 1970) from the modern view of geology. This is why I refer to the new understandings as post-modern. Further, it may be said that post-modern geology characteristically arose just 13 years after Gould's (1964) important essay.

Warnings for Creationists. Yes, *katastrophism* has revived. But it is rationalistic, humanistic *katastrophism*- geologic, world-wide upheaval in secular attire. Indeed, a close review of current literature on the impact hypothesis (Shaw, 1994) reveals a new epistemological strategy for uniformitarians: if periodicity (cosmic resonances or chaos theory) is demonstrable in the larger equation of catastrophe, then catastrophe as known by the revelationist is not catastrophic. Catastrophe becomes part of the naturalistic order of things. As Ager (1973, p. 100) said, "The history of life contains long periods of boredom and short periods of terror." From Ager's compilation and from many other contributions, the

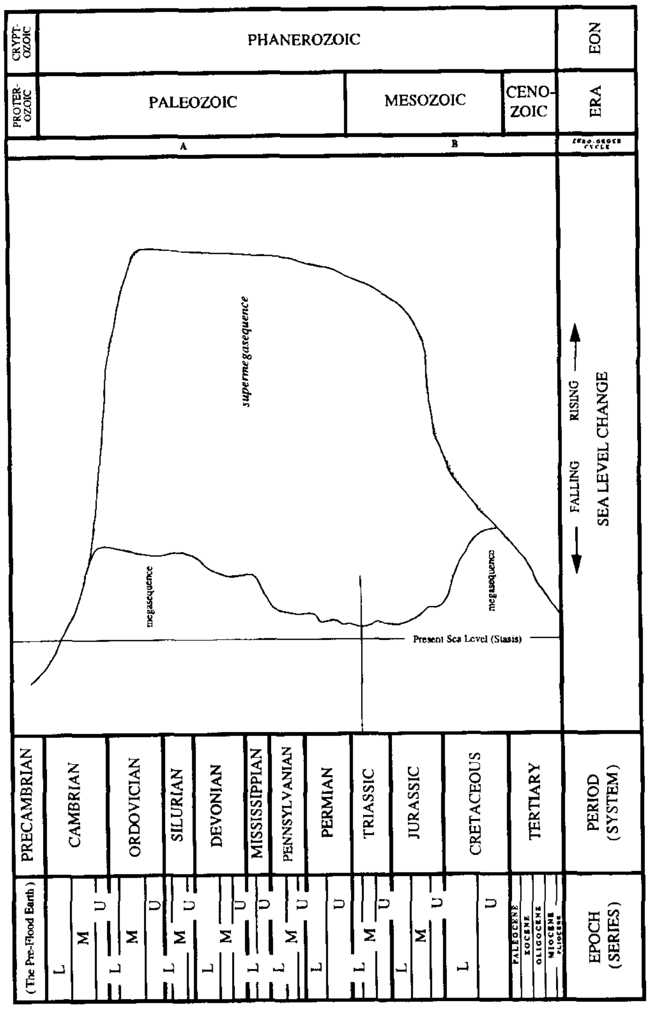

Figure 4. The historic sequence curve. Far from a return to Cuvierism as some charge, large-scale sea-level change described on the Vail curve (Figure 2) should be potentially viewed by the Flood geologist as components of a yet much large sequence curve (supersystems tract). The overall curve incorporates large-scale sea-level change *(megasequences)* into a single *supermegasequence* covering "all the high hills" (Genesis 7:19). The *supermegasequence* or zero-order cycle is a one-time, historic (non-periodic) event. This single event-of such broad world-wide extent-has until the secular development of sequence stratigraphy eluded forthcoming description by rationalistic, uniformitarian geologists (Romans 1:28a; 20-21). In understanding the theme of the illustration-cycles within cycles comprising a still larger cycle, the idea behind each graphic presented with this paper-the Genesis Flood, and thus the rock record, is interpreted.

The *supermegasequence* (zero-order cycle) is proposed as part of an ongoing program of research adaptively idealized from parameters common to standard normal (bell-shaped curve) distribution. Numerous reconstructions on a best-fit numerical scale, beginning with two known megasequences, repeatedly indicated a positive skewness to the Flood curve.

Some critics of Flood geology maintain, because at present there exists no conclusive naturalistic evidence regarding the cause or mechanics of zero-order change in sea level, that the event never occurred.

following conclusion is inescapable: "episodic processes play an important role in geology" (Gretener, 1984, p. 78). This is well and fine, but the creationist Flood geologist adds: ***"episodic*** (repetitive) processes, perhaps; but not ***periodic*** (repetitive) events."

Hypervelocity meteoritic impact or "extraterrestrial causes" for periodic extinction is presently the cloak of the rationalists,[16] Yet, and with irony (because of the criticism expressed by the post-modernists regarding their own cloak), creationists in general and Flood geologists in particular are in a good position not only to reveal the motives of mistaken theory or method (aberrant epistemological process) but to seize the moral highground of presentation-

> Hypervelocity meteorite impact is an extraordinary event, originating from outside the earth, and wreaking change instantaneously. Such a process violates every tenet of uniformitarianism...Impact processes, which have recently been cited to account for cataclysmic events such as massive tsunami deposits, incinerating wildfires, and global extinctions, carry genuinely revolutionary implications that are fatal to the uniformitarian principle itself. (Marvin, 1990, p. 147.)

Uniformitarianism is dead. Quietism is dead. Lyellian, modern geology is dead. ***Hic Jacet.***

Ex cathedra- geology and biology may now be returned to creationist roots. Genuine curiosity, the expressed rational, heartfelt honesty, are now reintroduced to discovery. This ***is*** creation discovery.

Our present call is nullification. Our job is that of a preserving influence (Matthew 5: 13). We nullify the intellectual indecencies-the miscarriage of reason. Yet our immediate concern is occupation (Luke 19:13d). This is the moral highground: (1) the annulment of the uniformitarian-evolutionary hypothesis, (2) increased involvement in the "discovery" disciplines, and (3) consequent submission of creation studies and Flood geology to a public presentation of the discovery process. It must at last be recognized, the battle is not for a ***science*** "falsely so called" (I Timothy 6:20c)-i.e., a naturalistic method towards knowledge historically occultic or hidden, gnostic or secret-but for ***epistemology.***[17]

Post Obitum. Sequence stratigraphy represents a breakout from the intellectual-philosophic Bastille of uniformitarian time.

It is not necessary for Christian creationists to revise the generalized discipline or divisions of secular geology founded upon the principle and orthodoxy of uniformitarianism. Uniformitarian geology has fallen apart from within. Of "itself"-perhaps providentially guided-the discipline of geology is transforming its own into proponents of catastrophism. The reintroduction of the Genesis Flood is soon to follow.

It does not fall to the Christian creationist to revise the uniformitarian timetable or to create a new timescale as Froede (1995) proposed. The uniformitarian-evolutionary timescale represents a corruption of and an affront to human reason offensive to creationists and secularists alike. The record of this offense, formerly buried deep within the naturalistic sciences, has surfaced. Geology seems to be embracing a "new open-mindedness."

Secularists agree that uniformitarianism is false and stifling to hypothesis construction as well as scholarly discussion. In the past, the issue was the burial of the question of divine intervention. The whole issue involves recognition of and submission to the Christian God-Jesus Christ. "We will not have this *man* to reign over us" (Luke 19:14c) was the clarion battle cry of Enlightenment scientism.

Neo-katastrophism- a belief in periodic extraterrestrial catastrophic causes (Shaw, 1994)-thinks to open a door to a post-Enlightenment or post-modernist "scientism." It *will* do this if Christian creationists fail to seize this unique moment in the history of science.

Glossary

Sequence Stratigraphy: (a) that branch of stratigraphy which subdivides the rock record using a succession of depositional sequences composed of genetically related strata as regional and interregional correlative units (Haq et al., 1988, p. 83); (b) the study of rock relationships within a chronostratigraphic framework wherein the succession of rocks is cyclic and is composed of genetically related strata1 units (sequences and systems tracts). (Posamentier et al., 1988, p. 110.)

Sequence stratigraphy...combines detailed analysis of sedimentary facies and depositional geometries, and defines a hierarchy of stratigraphic units that stack into progressively larger scale cycles. Each depositional cycle consists of four phases of relative accommodation change which can be related to relative water level change, such as sea level. These four phases are rising, highstand, falling, and low stand [see Figure 1], and the rocks deposited during each phase are called systems tracts. (Armentrout, 1995, p. 1195.)

Systems Tract: a linkage of contemporaneous depositional systems (Brown and Fisher, 1977, pp. 213-248). Each [system tract] is defined objectively by strata1 geometries at bounding surfaces, position within the sequence, and internal parasequence stacking patterns. Each is interpreted to be associated with a specific segment of the eustatic curve (i.e., eustatic lowstand-lowstand wedge; eustatic rise-transgressive; rapid eustatic fall-lowstand fan [Figure 1], and so on), although not defined on the basis of this association. (Posamentier et al., 1988, p. 110.)

Sequence: a relatively conformable succession of genetically related strata bounded at its tip and base by unconformities and their correlative conformities (Vail et al., 1977c, pp. 49-212). It is composed of a succession of systems tracts and is interpreted to be deposited between eustatic-fall inflection points. (Posamentier et al., 1988, p. 110.)

Parasequence: a relatively conformable succession of genetically related beds or bedsets bounded by marine-flooding surfaces and their correlative surfaces (Van Wagoner, 1985, pp. 91-92). (Posamentier et al., 1988, p. 110.)

Condensed section: Van Wagoner et al. (1988, p. 44) and Loutit, Hardenbol, Vail, and Baum (1988, p. 183) suggested that a condensed section or mud facies-consisting of thin, marine beds of hemipelagic or pelagic sediments-is deposited at slow rates. This is remarkably similar to the descriptions and proposals offered by a plethora of preceding uniformitarian authors, of which, the Diluvialist, Woodmorappe (1978; 1993, pp. 103-104) outlined with considerable detail (but profound reinterpretive criticism) suggesting:

> The "Condensed" sequences have an infinitely greater significance [in demonstrating]. . .mixing biostratigraphic horizons. Once "condensed" sequences are seen to be rapidly deposited, the result is nothing less than the complete collapse of all the uniformitarian time-claims ascribed to the fossil record. "Condensed" beds may potentially become the most powerful overall evidence for the cataclysmic, mutually contemporaneous, short-duration burial of the entire fossil record. (p. 104.)

Although Woodmorappe's description of mixed ammonoid populations indeed indicates condensed bedding-"correlation of these 'condensed' beds may 'condense' most of the Mesozoic, deflating its sedimentation time from hundreds of millions of years to only several weeks (the closing phases of the Noachian Deluge)" (see Figure 2)-his conclusion that "the high proportion of condensed beds in mountains (especially the Alps) reflects disturbed Flood-burial patterns caused by Floodwater flow-off variability around emerging mountains" (italics mine) is more descriptive of marine muds indicative of an emergent geosynclinal continental shelf margin and therefore *offlap regression* (see Figure 1: *The sequence curve).*

Loutit et al. (1988, p. 183) surmised that *condensed section* deposits represent a physical stratigraphic link between shallow- and deep-water sections *limited* to a single depositional sequence (a rather large depositional unit more closely related, in the traditional formational scale, to the group system) from the shelf or slope break *landward* to the distal edge of inner-neritic sand deposition.

Van Wagoner et al. (1988, p. 44) correctly pointed out that *condensed sections* are most extensive during the time of regional *transgression* of the shoreline: "The condensed section...occurs largely within the *transgressive* and distal *highstand* systems tracts" (italics mine). (See Figure 1: *The sequence curve.)*

Baum and Vail (1988, p. 317) defined *condensed sections* of coastal plain physiography as characterized by marine shales or micrites and by anomalously high concentrations of planktonic organisms, glauconite, sulfides, phosphate, and exotic elements such as iridium (see Baum, Blechschmidt, Hardenbol, Loutit, Vail, and Wright, 1984; Donovan, Baum, Blechschmidt, Loutit, Pflum, and Vail, 1988, pp. 300, 302-306; figures 1, 5, 6, 7, 8, 9, 10 at *maximum flooding surface* [MFS]).

Downlap surface: the top of the transgressive systems tract (Posamentier and Vail, 1988, p. 128; fig. 4) or transgressive sand and mud (condensed section) deposit of the sequence curve (see Figure 1; in this context limited to type 0 (supermegasequence (Figure 4)] or composites—type 1 (megasequence (Figure 2)] and type 2 [supersequence (Figure 3)] deposition); the top of the ordinal transgression *preceding* the highstand (Systems Tract, I or II [Posamentier and Vail, 1988, pp. 126, 128; figs. 1, 5) (see Figures 3, 1) and general regression.

Van Wagoner et al. (1988, p. 44) described the *downlap surface* as a marine-flooding surface onto which the toes of prograding clinoforms in the overlying highstand systems tract downlap. This surface marks the change from a retrogradational (moderate terrigenous influx: the backward [landward] movement or retreat [advance] of a shoreline or a coastline by wave erosion; retrogradation produces a temporal, slight steepening of the areal coastal beach section at the high-energy zone) to an aggradational (high terrigenous influx) parasequence set and is the surface of maximum flooding.

Unconformity: a surface separating younger from older strata, along which there is evidence of subaerial erosional truncation (and, in some areas, correlative submarine erosion) or subaerial exposure, with a significant hiatus indicated. (Posamentier et al., 1988, p. 110.)

Accommodation: the space made available for potential sediment accumulation. (Jervey, 1988.)

Endnotes

1. *Thermo-tectonics:* the vertical movement of basement rocks—the rigid crust, especially subsea basaltic plates—in response to transfer of magma from the asthenosphere upward to the ductile crust (Ewing, 1965; King, 1983, p. 29; figure 13). King (p. 29) wrote: ". . . the tectonics involved are vertical in expression and are activated by the accumulation of levitated ([high pressure, compressed hydrogen] gas-impregnated) upper mantle rock that rises and is injected, probably up a preexisting megashear, into the lower crust."
2. Carey (1976, p. 324) portrayed the solar system as vibrant with resonances, tones, and overtones,

   > . . . like a random tray of sand…perturbed by vibrators…long enough to develop complex systematic patterns. As every grain of sand has jostled its position in relation to its neighbors, so every body in the solar system has varied all elements of its motion in response to the perturbations of its fellows. The dominant directors have been the sun-jupiter binary, and if any such a binary started with a random field of associated bodies, reiterative perturbations through the aeons would have produced a resonant system such as we see, in the plane of the dominant binary. But every particle in the system has contributed its tittle in determining the motions of all the others.
   >
   > These conclusions have great significance in the palaeotectonics of the earth [Psalm 82:5c]. It is false to assume that any of the elements of motion of any of the bodies have been constant [the *variability* of uniformity: ". . . few of the fundamental 'constants' are indeed constant . . ." (p. 119), e.g. "The nexus of ephemeris time and atomic time, equated by definition today, may have converged thither during the past, and may diverge thence in the future" (Ibid.)]. All have been modulated by the symphony of the whole. Variation of the gravational constant, G, adds another factor to the variation.…The mathematically intractable stabilities and instabilities of the multi-body gravational problem pollutes with uncertainty retrospection of the history of the solar system. Rare unstable configurations seem probable, analogus to systematic instabilities in radioactive nuclei. Such an unstable configuration would cause significant regrouping. . . .
   >
   > Such astronomic spasms may be the answer to some of our present enigmas. . . .

3. In an impassioned plea, Sloss (1988) himself stated: "The principles and practice of sequence stratigraphy are of ancient heritage" (p. 1661). However, Sloss (p. 1662) cites his own work (Sloss, Krumbein, and Dapples, [1948] 1949) ". . . as the first explicit reference to the sequence concept. . . ." Other significant works include: Sloss (1950), Krumbein and Sloss (1951), and Sloss [1959] (1963). Sloss (1988, p. 1663) characterized his own thoughts presented to the Pittsburgh meeting of the Geological Society of America, 1959, and later published as "Sequences in the Cratonic Interior of North America" (1963) (*Geological Society of America, Bulletin*. 74, pp. 93-113) as—the ". . . paper that most workers tend to quote as *the* earliest exposition of the modern-era sequence concept."
4. Criticism of sequence stratigraphic concepts originated with Brown and Fisher (1980), Miall (1986; 1991; 1992), Summerhayes (1986), Hubbard (1988), and Kendall and Lerche (1988). Compelling arguments concerning difficulty in proving glacial eustasy remain. Indeed, glacial eustasy may not play a significant role in overall sea-level change; it is not possible to consistently employ glacial-interglacial activity beyond the Eocene (Paleogene); only since the Miocene (Neogene) is direct evidence seen for significant climate change approaching regularity. Nevertheless, the program of sea-level change proposed by the Exxon group does not depend entirely or even significantly on glacial eustasy or climatic change; other probable causes exist for *first*- through *sixth*-order cycles, these include: (1) breakup and rebounding of the continents, (2) intermittent, rapid volume changes in world-wide ocean basalt beds induced by changing spread rates at mid-Oceanic ridges, (3) short-term (extraordinarily rapid) volume changes at mid-oceanic ridges, (4) climatic changes due to subsea volcanic expulsion of smoking aerosols with resultant glacial-interglacial episodes. Reactionist statements abound; e.g., Miall (1992, p. 790)—a strict uniformitarian and perpetual critic of sequence stratigraphy—stated that "the existing Exxon cycle chart should be abandoned—it is too flawed to be fixed…we should start again, by building a framework of independent sequence stratotypes…without preconceptions as to the results"; Walker (1990, p. 780), an advocate of allostratigraphy (see Appendix I), stated that "sequence stratigraphy as presented by the Exxon group…is a theoretical concept that was introduced without specific worked-out examples" and that the current stratigraphic schemes of Vail and his colleagues (the Exxon group) and W. E. Galloway (Bureau of Economic Geology, Austin, Texas: genetic stratigraphic sequences: an emphasis upon flooding surfaces) (see Appendix I) are "largely conceptual, with little or no consideration of scale of application, or actual geological examples" (see Weimer and Posamentier, 1994, p. 10). Walker (1990) and R. J. Weimer (1992), 1991-1992 president of the American Association of Petroleum Geologists, expressed concern that sequence stratigraphic concepts are accurate only when applied to passive margins like the Gulf coast of the southern United States. Weimer and Posamentier (1994, p. 8) reported that some of the early critics of the Exxon approach (e.g., Brown and Fisher, 1980; Summerhayes, 1986) have now grasped the power and significance of the approach, having applied the Exxon method—emphasizing erosional unconformities (see Appendix I)—to their work.

5. In the broader sequence curve (Systems tracts)—a *type 1* depositional sequence (incorporating a complete program of transgression and regression [see Fig. 2A; B] *or,* as in the case of lower to middle Miocene and the late Miocene to late Pliocene, *ordinal transgression* and *ordinal regression* [a *type 2* depositional sequence]) (Fig. 3)—Vail and Hardenbol's (1979, p. 72) analysis includes the definitions:

   Highstand: "the interval of time when sea level is above the shelf edge . . ."

   Lowstand: "the interval of time when sea level is below the shelf edge."
6. Sequence stratigraphy portends to replace the uniformitarian framework or traditional *formation-scale* timeframe of proper geographic-geological names (standard chronostratigraphy: eons, eras, periods, and epochs) with a more impersonal scale of uppercase letters and numbers (megacycles, supercycle sets, and supercycles) and numbers with decimals (*third*-order cycles). The replacement-scale is known as *sequence chronostratigraphy*. This more dynamic and flexible timescale is already appearing in the professional literature. Versions of a revised standard—the Vail sequence chronostratigraphy chart (Wilgus et al., 1988, pl.: Mesozoic - Cenozoic Cycle Chart [finalized in 1986])—are designated by a floating appropriation of numbers, decimals and uppercase letters (e.g., version 3.1A [January 1987]) (Haq et al., 1988, pp. 96-97; Figure 15).
7. The statistical record of eustatic change—based upon more than 100 years of field work supported by 60 years of seismic stratigraphic methods and now interpreted by the new discipline of sequence stratigraphy—was portrayed by Wilgus et al. (1988, pl.: Mesozoic - Cenozoic Cycle Chart [finalized in 1986]) as short-term *third*-order cycles superimposed upon and subsidiary to long-term *second*-order cycles (*type 2* depositional sequence: supersequence) (see Figure 3).
8. It was Thomas Kuhn (1962, 1970, p. 92) who defined revolutions or turning points in scientific knowledge as "those non-cumulative developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one."
9. Gould (1967, p. 51), for personal amusement, borrowed the idea of a title for his paper from James Thurber and E, B. White's 1929 impertinent locution, "Is Sex Necessary?" (New York: Harper, 197 pp.):

   > In titling that article "Is Uniformitarianism Necessary?" I did not suggest, as some critics have stated (Longwell, 1965 and Hay, 1967 in the *Journal of Geological Education*) that the *concept* of methodological uniformitarianism is unnecessary (since it is only the *term* that I wish to abandon), but rather that it is every bit as inevitable as the phenomenon which provided, via the analysis of James Thurber and E. B. White, a source for [their] title (Thurber and White, 1929).

   Yet, Gould (1967, p. 51; 1970) admits that uniformitarianism should be "dismissed as untrue"—at least *substantive uniformitarianism* (consistency of material conditions or rates of processes). Elsewhere, *methodological uniformitarianism* invokes "a set of two procedural *assumptions…*basic to historical inquiry in any empirical science" (italics mine): (1) "natural law's are constant in space and time," (i.e., exhaltation of unimaginative reason shall be raised to the place of scientific *law*) and (2) "that no hypothetical unknown processes be invoked if observed historical results can be explained by presently observable processes" (i.e., the philosophy of naturalism shall reign supreme despite common sense).

   Nevertheless, Gould (1967, p. 51; 1970) regards the philosophy of uniformitarianism as every bit as inevitable as sex! This, despite the fact that ". . . It leads students to the false idea that our science [humanist geology] possesses a unique philosophical tool [all humanistic disciplines use it] and thus obscures the relationship of geology to other empirical sciences."

   Gould is often too smart for his own good. He is too willing to debase the "secure" sandy foundations of his own world-life view. The Christian creationist ought to take full advantage of this author's no doubt heavily pondered philosophic caprice. Gould, writing from the perspective of an uncertain agnosticism concerning uniformitarianism (or almost so), provides the Christian creationist with untold hours of entertainment *and* inspiration. We could have no greater secular friend!
10. Indeed, there would be no need to restate uniformitarianism as a philosophic dichotomy except to address apologetically the critics of quietism, chief among them for this period—Henry M. Morris. Had Gould been reading Morris (1946; 1951; 1957; 1963; 1964a; 1964b) or Whitcomb and Morris (1961, 1973)? Perhaps Christian creationists are more influential than the secularists are willing to admit.
11. Francis A. Schaeffer (1968, 1976, p. 178) defined the *existential* as "relating to and dealing with moment by moment human existence." Essentially, it is "empirical reality as opposed to mere theory."
12. In perhaps the most pivotal work in the modern study of the earth—*Principles of Geology* (3 volumes, 1830-1833)—Charles Lyell emphasized the uniformity of natural causes in a closed system (time invariance) in the field of geology. This idea, borrowed from John Playfair (1748-1819)—*Illustrations of the Huttonian Theory* (1802)—and James Hutton (1726-1797)—*Theory of the Earth with Proofs and Illustrations* (2 volumes, 1795)—suggested there are no forces in the past except those that are presently active.

    Stephen Jay Gould, in *Time's Arrow, Time's Cycle: Myth and Metaphor in the Discovery of Geological Time* (1987a, pp. 104-105), has written that the first volume of Lyell's *Principles of Geology* (1830-1833) begins with five chapters on the history of geology and its lessons for establishing a proper approach to a modern study of the earth. Roughly characterized, Lyell holds that geological truth must be unraveled by strict adherence to a methodology that he did not name, but that soon received the cumbersome designation of "uniformitarianism" (in a review by William Whewell, written in 1832). Lyell captured the essence of uniformity in the subtitle to his treatise: "An Attempt to Explain the Former Changes of the Earth's Surface by Reference to Causes Now in Operation."

    Henry M. Morris—in a critical examination of the historic and contemporary roots of uniformitarian-evolutionistic philosophy and its destructive influence in all fields of study and in all areas of human life (1989, 1990, pp. 25-27)—offered that the famous Lyellian principle of *uniformitarianism* ("the present is key to the past") is nothing more than the old philosophy of naturalism, as applied to the study of earth history. Uniformitarianism by itself, however, does not provide a history, but only the naturalistic framework (time invariance) within which that history is assumed to have taken place. Thus, naturalistic evolution, or evolutionary uniformitarianism, provides the basic interpretive framework for the earth sciences as well as the life sciences. Without the assumption of evolution, modern geology is without any objective basis for the whole system of geological ages.
13. Francis A. Schaeffer (1968, 1977, pp. 9-18) documented the origin of the *nature-vs.-grace problem*. Grasp of Schaeffer's concept—the *existential dichotomy*—first portrayed with the nature-vs.-grace problem introduced by Thomas Aquinas (1225-1274) is fundamental to understanding the modern mind, modernism (humanism) in general, and the failure of modern humanist theory. The despair evident in post-modernist worldviews is symptomatic of the collapse of reason and science as final descriptors of human content, meaning, or experience. Post-modernism stresses the need to make vital life-fulfilling or life-saving choices by using unlimited freedom in a contingent and apparently purposeless world: an existential world without a rational or scientific base for morals, ethics, or standards. Personal (particular) or social (universal) convenience is the final standard. Elsewhere, Schaeffer (1976, pp. 55, 52) wrote:

    > This problem is often spoken of as the nature-versus-grace problem. Beginning with man alone and only the individual things in the world (the particulars), the problem is how to find any ultimate and adequate meaning for the individual things. The most important individual thing for man is man himself Without some ultimate meaning for a person (for me, an individual), what is the use of living and what will be the basis for morals, values, and law? If one starts from

individual acts rather than with an absolute, what gives any real certainty concerning what is right and what is wrong about an individual action? The nature-and grace tension or problem can be pictured like this:

> ***Grace, the higher:*** *God the Creator;* heaven and heavenly things; the unseen and its influence on the earth; *unity,* or universals or absolutes which give existence and morals meaning.

> ***Nature, the lower:*** *the created;* earth and earthly things; the visible and what happens normally in the cause-and-effect universe; what man as man does on the earth; *diversity,* or individual things, the particulars, or the individual acts of man.

Beginning from man alone, Renaissance humanism—and humanism [modernism] ever since—has found no way to arrive at universals or absolutes which give meaning to existence and morals.…Thomas Aquinas (l225-l274] brought this Aristotelian emphasis on individual things—the particulars—into the philosophy of the late Middle Ages, and this set the stage for the humanistic elements of the Renaissance and the basic problem they created.

In his important book *Escape from Reason* (1968,1977, p. 13), Schaeffer outlined the significance of the nature-vs.-grace problem and its continuance with the humanistic (modernist) philosophers:

> The vital principle to notice is that, as nature was made autonomous, nature began to 'eat up' grace. Through the Renaissance, from the time of Dante to Michelangelo, nature became gradually more totally autonomous. It was set free from God as the humanistic philosophers began to operate ever more freely. By the time the Renaissance reached its climax, nature had eaten up grace.

14. The Hebrew word *har* is a short translation of the longer *hârâr* meaning, to *loom* up—as a *mountain,* hill, or mount; essentially, *har* implies a *mountain* or mount, or *range* of hills or the hill country proper.

Whitcomb and Morris (1961, 1973, p.1) wrote:

> One of the most important Biblical arguments for a universal Flood is the statement of Genesis 7:19-20:
>
> And the waters prevailed exceedingly upon the earth; and all the high mountains that *were* under the whole heaven were covered. Fifteen cubits upward did the waters prevail; and the mountains were covered.

In *A Commentary: Critical, Experimental, and Practical on the Old and New Testaments* (Jamieson, Fausset, and Brown, 1864-1870; 1946, v. 1, p. 97; Gen. 7:19-20), Robert Jamieson (1802-1880) explained: estimating the Biblical cubit at 18 inches, then it is possible to conclude that Flood waters lapped 23 feet above the peaks of the highest mountain range. This accurate measurement of the depth by a sounding plum, indicates that not only were careful observations made, but a record was kept by Noah and his family (observational recordation is a fundamental of "science"). Jamieson (Ibid.) wrote:

> But according to *Delitzsch,* "this, statement, that the water rose fifteen cubits above the mountains, is probably founded upon the fact that the ark drew fifteen feet of water, and that when the waters subsided, it rested on the mountains of Ararat [eastern Turkey], from which the conclusion would very naturally be drawn as to the greatest height attained."

Whitcomb and Morris (1961, 1973, pp. 1-2) suggested that one need not be a professional scientist to realize the tremendous implications of the Biblical statement; if only one (to say nothing of all) of the high mountains were covered with water, the Flood should indeed be considered absolutely universal: the present Mt. Ararat (Büyük Agri), on or near which the Ark was said to have grounded is 16,945 feet above present sea level. However, it is not necessary to assume that ante- or immediately post-Diluvian mountains were this high.

Referring to the geological mechanism of isostasy (Pratt vs. Airy hypothesis) Whitcomb and Morris (1961, 1973, p. 268) wrote:

> Presumably before the Flood, the earth's crust was in a state of general equilibrium, although the great pressures of the fluids locked within the "great deep" made it a *precarious* state of equilibrium. The principle of isostasy ("equal weights") requires that, at some datum level deep in the crust, pressures due to superincumbent materials be everywhere constant in order for crustal equilibrium to be maintained. Thus, regions of high topography must be regions of low density and vice versa [Pratt hypothesis]. Probably there were no very substantial regional differences in land densities [Airy hypothesis] before the Flood, and correspondingly, no very large regional differences in elevation. Mountains were relatively low and ocean beds relatively shallow as compared with present conditions.

Indeed, on the early pre-Flood Earth, the great Cordilleran orogen of the Tethys (an equatorial geosyncline expressed in *three* fold-phases) and the Tethyan orogen proper (an intracontinental, globe-girdling deformation of original basement rock) were but a zone of high hills dividing the single megacontinent in half (the Earth's great orogens were each initiated as equatorial rifts). The conjugates to the Tethyan orogen—the Caledonian-Appalachian-Tasmanide tectogenesis (now dispersed on four continents)—developed as a predecessory series of low hills. A good contrast between these two related orogenic systems—*low* and *high* hills—is, today, viewed *in* and *near* the old Canal Zone of Panama, Central America (see Carey, 1988, p. 310). It is here that each of Earth's original topographic highs—long since subjected to continued uplift—intersect. It is significant that the highest peaks immediately adjacent to the old Canal Zone—Cordillera de San Blas—are but a little over 3,000 feet above sea level.

15. Among the most important offerings of the sequence stratigraphic approach is the development of the study of geology in scales—*macro-meso-* and *microscale* (see Posamentier, Allen, and James, 1992); a graphical portrayal would include cycles within cycles—". . . a wheel in the middle of a wheel" (Ezekiel 1:16; 10:10 NKJV) or wheels within a wheel, or largest "cycle" to smallest cycle—

*macro*scale:
- supermegasequence (proposed)
  - megasequence.
    - supersequence (*ordinal transgression – regression*)

*meso*scale:
- sequence (*cardinal ascendent – descendent*); (*third*-order scale)
  - parasequence set
    - parasequence
      - bedset ┐
        - bed ├ "local" geologic column
          - lamina set ┘

*micro*scale:
- lamina

Significant, here, is the discussion of sequence stratigraphic principles applied to other settings besides marine and at all spatial and temporal scales.

16. Francis A. Schaeffer (1968, 1976, pp. 179, 178) defined *rationalism* and therefore the *rationalist* as synonymous with humanism:

> There are two meanings: (1) Any philosophy or system of thought that begins with man alone, in order to try to find a unified meaning to life; (2) That part of humanistic thinking in the above wider sense that stresses the hope of an optimistic future for mankind.

17. Schaeffer (1968, 1976, p. 178) defined epistemology as: "That part of philosophy concerned with the theory of knowledge, its nature, limits and validity." In the popular book He is There and He is Not Silent (1972, 1976. pp. 37, x), Schaeffer, wrote:

> Epistemology means the theory of the method or grounds of knowledge—the theory of knowledge, or how we know, or how we know we know. Epistemology is the central problem.…Unless our epistemology is right, everything is going to be wrong.

Appendix I:
Sequence Stratigraphy: Various Schools

Many different concepts arid definitions exist for what constitutes sequence stratigraphy, including genetic stratigraphic sequences (Galloway, 1989a; 1989b), depositional episodes (Frazier, 1974), allostratigraphy (North American Commission on Stratigraphic Nomenclature, 1983; Walker, 1990), and transgressive-regressive cycles (Embry, 1990), to name a few. These stratigraphic concepts and associated nomenclature have been merged in the literature, causing confusion among workers, especially in their application to exploration and field development problems. For the purpose of clarity and simplicity, the term "sequence stratigraphy" will be used in the sense of Posamentier and Vail (1988) and Van Wagoner et al. (1990). (Posamentier and Weimer, 1993, p. 731; n. 4.) (Italics mine.)

School 1: Classical Sequence Stratigraphy:

The Exxon Approach: an emphasis upon erosional unconformities:

Posamentier, H. W. and Vail, P. R. 1988. Eustatic controls on clastic deposition II—sequence and systems tract models. In Wilgus, C. K., Hastings, B. S., Posamentier, H., Van Wagoner, J., Ross, C. A., and Kendall, C. G. St. C. (editors). Sea-Level Changes: an Integrated Approach. Soc. Econ. Paleontol. Mineral. Tulsa, Oklahoma. Special Publication No. 42, pp. 125-154.

Van Wagoner, J. C., Mitchum, R. M., Jr., Campion, K. M., and Rahmanian, V. D. 1990. Siliciclastic sequence stratigraphy in well logs, core, and outcrops: concepts for high-resolution correlation of time and facies. Am. Assoc. of Petroleum Geologists Methods in Exploration Series 7, 55 p.

School 2: The Bureau of Economic Geology, Austin, Texas:

Genetic Stratigraphic Sequences: an emphasis upon flooding surface:

Galloway, W. E. 1989a. Genetic stratigraphic sequences in basin analysis I: architecture and genesis of flooding-surface-bounded depositional units. *Am. Assoc. of Petroleum Geologists Bull.* 73(2):125-142.

________. 1989b. Genetic stratigraphic sequences in basin analysis II: application to northwest Gulf of Mexico Cenozoic basin. *Am. Asso. of Petroleum Geologists Bull.* 73(2):143-154.

Depositional Episodes:

Frazier, D. E. 1974. Depositional episodes: their relationship to the Quaternary stratigraphic framework in the northwestern portion of the Gulf basin. The University of Texas at Austin. Bureau of Economic Geology. Geological Circular 74-1, 28 p.

School 3: Allostratigraphy:

Allostratigraphic unit: a mappable body of sediments bounded by discontinuities:

North American Commission on Stratigraphic Nomenclature. 1983. North American stratigraphic code. *Am. Assoc. of Petroleum Geologists Bull.* 67(5):841-875.

Bergman, K. M. and Walker, R. G. 1988. Formation of Cardium erosion surface ES and associated deposition of conglomerate: Carrot Creek field, Cretaceous western interior seaway, Alberta. In James, D. P. and Leckie, D. A. (editors). Sequences, stratigraphy, sedimentology: surface and subsurface. Canadian Society of Petroleum Geologists Memoir 15, pp.15-24.

Walker, R. G. 1990. Facies modeling and sequence stratigraphy. *Jour. of Sed. Petrology* 60(5):777-786.

School 4: Transgressive-Regressive Cycles:

Embry, A. F. 1990. Depositional sequences—theoretical considerations, boundary recognition and relationships to other genetic units. In Mørk, A. (editor). Sequence stratigraphy field workshop, Svalbard. Continental Shelf Institute. Trondheim, Norway. pp. 1-26. Cited by Posamentier, H. W. and Weimer, P. 1993. Siliciclastic sequence stratigraphy and petroleum geology —where to from here? *Am. Assoc. of Petroleum Geologists Bull.* 77(5):731; n. 4; 740.

Appendix II:
Present-Day Sea Level:
Datum for Determining Eustatic[1] Change

Haq et al. (1987, p. 1158; fig. 2; 1988, pp. 94-100; figs. 14-17) in determining sea-level change used as a datum present-day sea level (see Figure 3 [Tertiary Period]) respective of the land surface. Allowing for modern (Holocene) fluctuations as well as tidal effects, this is an acceptable starting place in developing a program (the sequence stratigraphic approach) of reconstruction of sea-level changes.

The record for the Cenozoic is developed first (Figure 3). The record is then researched farther back into geologic history (Figure 2). Essentially, the program (with modifications) offers a tool for characterizing various components of rising and falling in the sea-level curve (the Vail curve) and therefore transgressive-regressive depositional cycles: all cycles (*zero*-order [the Genesis Flood] [see Appendix III] to *fourth*-and higher orders) despite size or effect are here characterized by a geologic fundamental: varying depositional environments (not necessarily varying paleoecologic zones) develop distinct scalar (quantitative) or modular (qualitative) sequence lithofacies (rock suites); these lithofacies—

[1]*Eustasy* was defined by Mitchum (1977, p. 206) as a *global* or *relative* change in sea level (an apparent rise or fall of ocean-water level—on a local, regional, or global scale—respective of the land surface) produced by either a change in the volume of sea water (additions of water to, or removal of water from, the continental ice caps) or a vacillation in the surface area of the ocean basins, or both.

parasequence, sequence, supersequence, megasequence, supermegasequence—are evidenced (easily referenced) in the rock record (Figure 1).

Some scientists mistakenly assume that Burton, Kendall, and Lerche (1987) condemned the idea of eustatic sea-level charts because *no official datum exists in the rock record from which to measure eustatic sea-level change;* however, Burton, Kendall, and Lerche only stated that "an accurate eustatic sea-level variation chart…cannot be made," meaning that—"absolute values remain elusive" (p. 265); nevertheless, they concluded that:

> …when *relative* sea-level charts (combining tectonic and eustatic effects) are tied to wells [providing generalized stratigraphic control through reflection or refraction data and well cores], it is still possible to project sedimentary sequences related to the relative sea-level events across a basin on seismic cross-sections after the manner of Vail et al. (1977) [1977c] and Hallam (1981).

For this reason, Kendall and Lerche (1988) were chosen by the Vail proponents to write the introduction to the premier work on sequence stratigraphy—*Sea Level Changes: an Integrated Approach* (Wilgus et al., 1988). This important work introduced the Mesozoic - Cenozoic Cycle Chart (pl. l)—the final version (1986) of the original Vail curve (Vail et al., 1977b, p. 84; fig. 1 [see Figure 2]) depicting global changes or cycles of sea level—prerequisite to the additional refinements, presented as *eustatic* curves or *global* changes in sea level, of Haq et al. (1987, p. 1158; fig. 2; 1988, pp. 94-100; figs. 14-17) (see Figure 3 [Tertiary Period]).

Second, Burton, Kendall, and Lerche (1987, p. 237) defined *eustasy* as:

> …a change in elevation in sea level on a worldwide basis relative to the stationary datum at the center of the earth.

This definition is remarkably similar to one offered for the expanding earth (Egyed, 1956a; 1956b; 1963; Carey, [1956] 1958; 1976; King, 1983), i.e. the diameter of the earth has grown progressively larger through geologic time, perhaps by as much as 33 percent; the overall increase in diameter is attributable to changes in atomic and molecular structure (phase changes) in the core and lower mantle; the resultant expansion did not add actual mass; instead of lateral (or horizontal) movements on the surface of a sphere (continental drift or plate tectonics), earth expansion implies vertical (centrifugal) levity *within* the sphere; the stationary center of the earth's core is used as a datum for change (see Irving, 1969, p. 111; 1964; Van Andel and Hospers, 1969).

Appendix III: Creationist Sequence Stratigraphy: the *Zero*-Order Cycle

In an experimental program of creationist sequence stratigraphy, the *zero*-order cycle is the starting point for the investigation of the rock-stratigraphic record. This is the lowest frequency sea-level cycle or *order* subject to testing (verifiability - falsifiability) through successive evaluation of each sub-order sea-level cycle.

Each sub-order sea-level cycle—*first*- through *sixth*-order and below (high frequency range: daily and annual cycles) is evaluated on its own merits without considering any previous sea-level cycle. However, *there is no difference* as the concept of scale is purely applied.

Generally, the *zero*-order cycle is a statement that any particularized cycle or *type* depositional sequence has a specific value, i.e. a specific verifiable - falsifiable reckoning on a graduated scale of events.[1] There are four types of depositional sequences:

(proposed) **type 0** depositional sequence
(*supermegasequence*):
zero-order cycle: the Genesis Flood
type 1 depositional sequence\
(megasequence):
first-order cycles: the Vail "long-term" line (Haq et al., 1988, p. 95; fig. 14)
type 2 depositional sequence
(supersequence):
second-order cycles:
ordinal transgression - ordinal regression
(proposed) **type 3** depositional sequence (sequence):
third-order cycles:
cardinal ascendent - cardinal descendent

If a sea-level cycle has a different value, either scalar (quantitative) or modular (qualitative), it has that specific value in relation to the *zero*-order cycle.

The *zero*-order cycle is an existing arithmetical potential (denoting the absence of exponents) placed as the lowest verifiable order expressive of the Phanerozoic rock record (generally sediments resting atop the Cambrian basement) and reckoning all value of successive, naturalistically occurring cycles simultaneously from within *and* outside itself.

The *zero*-order cycle is a non-naturalistic (denoting the absence of the ordinarily uniform or naturally occurring), allo-superior, unique *event* (moment) with an obscurely apparent absence of quality (modulation)[2] if time—in part or

[1]*Processes* are open to both scalar (quantitative) or modular (qualitative) influences; *time* is not. Time is open neither to scalar or vector quantities or qualities. Time is neither momentum or energy. Thus, the time-independence of creationist sequence stratigraphy.

[2]A graphical variation in the amplitude of a source frequency or phase carrier wave (supermegasequence) when compared to other more immediate signals (megasequence, supersequence, sequence, parasequence set, parasequence, bedset, bed, lamina set, lamina).

in whole (synecdoche)—is the only consideration. In this respect, the *zero*-order cycle is conspicuously absent, null, or at least elusively missed. If time, subject neither to varying quantitative scales or varying qualitative models,[3] is the emphasis, the *zero*-order cycle (the Genesis Flood) is easily rejected as worthless or of no account.

The rejection of the *zero*-order cycle (the Genesis Flood) implies the exclusive acceptance of naturalistically occurring long-term, ordinal, and cardinal cycles. But, these suborder cycles have no inherent meaning outside of themselves if the zero-position is rejected.

What we see in the rock record—the evidence of oscillation of sequences—may be so mixed with the very real component of the *supermegasequence* signal that genuine, insightful perception may prove obscure or even impossible. The problem is an epistemological one.

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[3]Time is time. Time comparisons to time or varying descriptions of time exist; but in a real world (not subjected to theoretical, fanciful distortions), time is time; i.e., time proceeds with regularity (uniformity) not open (naturalistically) to ascension or descension, acceleration or deceleration. Time is neither scalar (magnitude without direction) or vector (direction and magnitude). Time is *zero*-order: i.e., any particular moment has specific value outside of or beyond scalar (quantitative) or modular (qualitative) values; time derives from time, time reverts to time; all things were created from the moment, all things revert to the moment: this is otherwise known as Perfect Cosmological Principle (Colossians 1: 16-17).

Second, despite Posamentier, Allen, and James' (1992, p. 310) ingenious attempt at describing high resolution sequence stratigraphy at the East Coulee Delta (a naturally occurring scale-model delta), Alberta, Canada, temporal (time) scales *do not* exist. Spatial scales *are* dimensional. A variable, oscillating scale for time is a violation of methodological uniformity. *Process* might be subject to *rate* (quantitative or qualitative scales of varying degrees), however, time (limited to studies in the geologic record) is not.

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LETTERS TO THE EDITOR

Animal Death and the Curse

Did animals die before the curse of Genesis 3? This is the position of old earth creation, the gap theory, day age theory, and theistic evolution. However, Romans 5:12 declares that death first entered the world through sin. The usual explanation is that the death of Romans 5:2 describes physical or spiritual death of humans, not animals. However, this explanation is not convincing. Those who promote pre-curse animal death need to answer these nine questions:

1. Why is there no mention of animal death prior to the curse? To the contrary, Genesis 1:3 describes the Creation as very good. This would logically exclude survival of the fittest, suffering, and death in the animal world.

2. Does not Genesis 1:29-30 teach that people and animals had exclusively vegetarian diets at the Creation? This would exclude predation or any carnivore nature.

3. Does not the dominion mandate of Genesis 1:26 conflict with prior long ages of animal death and extinction?

4. The old earth view assumes many animal extinctions before man appeared, such as the dinosaurs. How then could Adam in Genesis 2:20 name all the created animals?

5. Why is animal death first implied only after the curse, in Genesis 3:21, when God provided skins to cover Adam and Eve?

6. Romans 8:20-22 teaches that the present world, including animals, is cursed and no longer in its original perfect state. If not death, what then is this additional curse upon animals?

7. Does not Ecclesiastes 3:19 teach the similarity of human and animal death, thus implying a common origin for death?

8. Isaiah 65:24-25 describes the millennial period when the wolf will lie with the lamb; they will "neither harm nor destroy." Does not this mean that animal death will be abolished, as originally intended?

9. If physical suffering and death existed in nature before the Fall, does not this make the Creator the author of evil?

The burden is upon long-age adherents to resolve these fundamental conflicts which they
promote.

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Home erectus — A Fabricated Class?

I have read Lubenow's letter (Lubenow, 1994) in which he states that "I believe that ALL of the *Homo erectus* material represents true humans."

May I be allowed to differ?

The classification was originally made to combine the Java man finds of Dubois and von Koenigswald (Bowden, 1988, p. 138f) and the Pekin man finds of Black, Teilhard de Chardin and Weidenreich (Bowden, 1988, p. 90). The "ape-men" fossil hunters also badly needed to link these two sites and appear to have fabricated this by "discovering" numerous teeth linking the sites in a cave: (Bowden, 1988, p. 152)

The Java man fossils consisted of a large ape type skull cap and a human leg bone. The Pekin man fossils were all apes.

These early members of this classification, therefore, were far from being fully human as Dr. Lubenow insists.

When true humans were found in the "Upper Cave," it took five years before they were reported, and then not in the journal that recorded all the main finds at the site. When ten human skeletons were found in 1939 at the site, the discovery was briefly blazed around the world, and then quick