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AN ASSESSMENT OF INNOVATIVE DATING IN RECENT STUDIES OF ANCIENT CIVILIZATIONS

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In the modern world, organized knowledge has become increasingly differentiated and specialized. Many, perhaps most, domains of knowledge are the focus of one explicit and defined discipline or science, whereas others (possibly fewer) are pursued by two or more. Certainly, the study of civilizations falls within the second type; i.e., it is surely multi-disciplinary. Many but not all of its representatives are in academia. As in other domains of knowledge, some are unattached (unaffiliated, free, independent), and a few even defined as marginal.

The membership of this Society (ISCSC) and the readership of this Review resemble those in other domains of knowledge in having interest in new, fresh, innovative--some even in unconventional--ideas as these apply to study of problems of civilizations.

Perhaps, even those who are primarily concerned with the inquiry into ancient civilizations in their most archaic, ancestral, or primordial form must also be interested in innovation, especially in challenges to conventional dating systems. I propose to explore the relevant portions of four books (three in the 1990s and one later) of six authors and to subject them to a critique.

Graham Hancock, author of *Fingerprints of the Gods* (1995), has been a well-known British economic journalist for two major periodicals and more recently a historically-oriented author. He and Robert Bauval, an engineer with expertise in astronomy, are the authors of the second book, *The Message of the Sphinx* (1996). Colin Wilson and Rand Flem-Ath, authors of *The Atlantis Blueprint* (2001), are, respectively, a British best-selling author and Canadian librarian-author. William Ryan and Walter Pitman, American authors of *Noah's Flood* [1998], are professional marine geologists at the Lamont-Doherty Earth Observatory at Columbia University, and experts in their field. All of these authors, whether academic or non-academic, are clearly independent thinkers.¹

Graham Hancock's *Fingerprints of the Gods* is substantially an account of the author's journey from one to another of various sites of ancient American (Toltec, Aztec, Olmec, Mayan, and Incan) and Egyptian civilizations. His and Bauval's book expands knowledge of the structures of the Giza plateau, especially the Sphinx.² Analysis of

those parts of both books as relevant to the introduction of innovative dating comprise Part I of this paper. Because Hancock's position and that of Colin Wilson and Rand Flem-Ath are basically similar on several points, and particularly on the necessity to develop a new dating approach, their positions are compared in Part II. Part III is a summary of Ryan's and Pitman's study of the Black Sea Flood, and especially their dating of the event, along with remarks about extinct civilizations on its shores. A summary assessment of the innovative dating efforts constitutes Part IV.

I. Hancock's Justification for Attempting to Develop an Innovative Dating Technique

A comparative interest in the study of civilizations pervades the whole of Hancock's first volume. But even before turning his primary attention to ancient Egypt, he announced his commitment to a more temporally distant antecedent civilization (a third party option) existing prior to the emergence of the more recent American civilizations and even prior to that of ancient Egypt (i.e., before the fourth millennium BC) [Hancock, 135-7]. Its great antiquity seems to necessitate a concern with innovative dating, which in turn, requires aid from intellectual resources of other disciplines, especially certain natural sciences.

Hancock first supported his third party thesis by citing those whom he claimed were like-minded authorities, particularly Professors Walter Emery and Sir E. A. Wallis Budge, both (British) Egyptologists [136-7]. He reiterated his view that Egyptian civilization began without evident antecedents [135-6] and thus was more ancient than many Egyptologists would accept. (Acknowledging that the stimulus of the third party failed to flourish for centuries--if not millennia--in the Americas [137], he turned his attention to the early conditions of Egypt.)

Like a few others, Hancock later attempted to add substance to the claim for the antiquity of his third party option by citing evidence that the Sphinx on the Giza plateau was considerably older than Egyptologists conventionally held [345-9]. He rejected the view of 20th century Egyptologists as misconstrued or otherwise defective that Khafre was the Sphinx builder (and thus part of conventional history). In addition, he denied that the Sphinx would likely have been built in the present era of dry, wind-blown sand incessantly threatening to cover its body on the Giza plateau (at any time over the last 5000 years). Rather, it is more plausible that the Sphinx would have been construct-

ed during a much earlier era when the Giza area had been wet and green, with topsoil held by roots of grass and shrubs [413-41].

He noted that crucial evidence was offered by the investigation of Professor Robert Schoch, a Boston University geologist with specialty in rock erosion, who studied the weathering of the Sphinx and the walls of its surrounding enclosure. Its markings were not compatible with wind-blown sand erosion. Rather, Schoch concluded that the combination of vertical fissures and undulating horizontal coves were a result of a long period of enormous quantities of rainfall opening up weak spots in the rock. His dating of some 5,000 to 7,000 BC was publicly announced at a 1992 professional geological convention at which it received considerable support [Hancock, 1995, 357, 421-23; see also his notes 4-15, 548-9; Hancock and Bauval, 1996, 17-21].

The Egyptologists ignored his analysis. Conversely, John Anthony West argued that the dating was conservative and could more readily be attributed to a rainy period of about 10,000 BC [Hancock, 357, 423 and Hancock and Bauval, 17-21]. Hancock apparently agreed. In any event, a more precise dating device was needed.

Actually, the question of the dating of the Sphinx led Hancock into an extended inquiry, at the end of which he was in a position to propose a new dating scheme. A number of logically distinct steps are involved:

1) He denied the legitimacy of associating the pharaohs, who are conventionally held to be the builders of the pyramids, especially Khafre, with the building of the Sphinx and thus by implication, with a conventional dating of the pyramids [348-9, 313, 456].³

2) He rejected the mainline Egyptological contention that the pyramids generally have a (pharaonic) burial, mortuary, or entombment function. Though he did not reject this claim for some (possibly many) pyramids, he asserted that no bodies have been found in the sarcophagi of the three pyramids at Giza [294-302]. To the common retort that they were stolen by grave robbers, he notes that the pyramid of Sekhemket (at Saqqara), which was opened for the first time in 1954 (no one had ever entered since it was initially constructed), did have a sarcophagus but it contained no body [Hancock, 313]. Thus, the common function could be countered--and surely at Giza.

3) Conversely, he developed arguments and offered considerable circumstantial evidence to show that function of these pyramids is basically astronomic (or substantially contributory to astronomy). The data include:

a) The character of the geography of the Giza plateau. On the high

ground, a half mile to the west of the Sphinx and on which the three main pyramids are located, is a faultless 360-degree circular horizon for observing the rising and setting points of the sun and stars for the entire year [Hancock and Bauval, 60].

b) The precision of the placement and orientation of the monuments on the Giza plateau is so utterly startling that they could not have been accidental. The Great Pyramid, with its four-star-targeted shafts, is so placed that it is exactly one-third of the way between the equator and the north pole. It is so aligned on a north-south axis that it is more accurate than the Meridian Building of the Greenwich Observatory in London [Hancock and Bauval, 60; for its unique pyramid/earth ratio, see Hancock, 434-6].

Furthermore, Robert Bauval, a Belgian engineer with a flair for astronomy and later an associate of Hancock, discovered in 1993 that the three Giza pyramids were so located in relation to one another that the Great Pyramid (Khufu), the Second Pyramid (Khafre) and the Third (Menkaure) respectively terrestrially mimicked the placement of the belt stars of the Orion constellation. The two lower stars, Al Nitak and Al Nilam were perfectly diagonal to one another, but the more eastern Mintake was offset [Hancock, 307-8, 355-6]. Even the Sphinx functions as an equinoctial marker [Hancock, p. 442-8, also 455-8].

c) The Hancock and Bauval volume also argues that a segment of the priesthood (the followers of Horus operating as an invisible college) assumed a number of significant semi-differentiated religious roles, one of which was the observation of the stars in conjunction with an awareness of equinoxes, solstices, and meridians, and the twelve visually-changing signs of the zodiac across considerable blocs of time [Hancock and Bauval, 213-220]. In effect, the transmission and accumulation of basic Egyptian astronomical knowledge through a vast number of years, at first orally and later hieroglyphically, was probably one of their contributions [Hancock and Bauval, 154, 194].

d) What is most important to recognize is that the passage of the signs of the zodiac in time was interconnected with not only myth and religion but is now known naturalistically to be related to the basic but difficult-to-observe (archaeo-)astronomical process of precession [Hancock, 228-245, 256-60; Hancock and Bauval, 65-6, 195-6].

Precession basically derives from the wobble of the earth on its axis, which--among other factors--leads to a movement of the earth on a journey opposite to the earth's rotation. Though the earth rotates around the sun annually, the precessional journey (cycle) requires a long

or Great Year of 25,920 (solar) years from the beginning of its cycle to the end, using the star Al Nitak (of the Orion set) as marker from its lowest to highest point and return.

e) Finally, it must be noted that with the advent of computers (and information from archaeo-astronomy) modern astronomers can simulate the various positions of star constellations to run forward and backwards across millennia of time. [See Hancock and Bauval for the important illustration, 67-71; confirmation, 71-8].

Simply stated, Hancock's new dating technique combines evidence from a vast array of data from archaeo-astronomy, including the process of precession, and contemporary computer-simulation. (This undertaking entails an extraordinarily complex process--with some dubious implications.)⁴

The two dates, one of 10,500 BC and the other of 2,500 BC, are significant for the structures on the Giza plateau. The first of the two (10,500/10,450 BC) is the date at which, according to Hancock and Bauval, the planning and perhaps the layout of construction had been undertaken [Hancock, 356]. The second and more recent (i.e., 2500 BC) is the date by which construction had presumably been completed [Hancock, 450-1; Hancock and Bauval, 242]. But perhaps the most important consequence of this ability to plan and perhaps to lay out where the Giza structures were eventually to be built is that the very early date presupposes that those who did the planning and layout already were in possession of a culture that was fully civilizational in its character [Hancock, 450-1]. So, a deduction implies an older ancestral source later equated with Atlantis, [Hancock, 462, 465], but subsequently ignored in Hancock's and Bauval's 1996 book.

II. A Comparison of Hancock's and Flem-Ath's Dating Innovations

This reasoning raises the empirical problem of the relative temporal proximity of this 10,500 BC date to the deglaciation of the Ice Age and all that it implied. Because Hancock was aware of the cataclysmic climatic changes of that time, his explanatory scheme included geology-climatology [212-223, 411-14, 471-5]. He acknowledged the contribution of Flem-Ath and Charles Hapgood and accepted as an ultimate civilizational source the (alleged) vastly earlier temperate Atlantis, without any further empirical critique, even though he and they regard its present location as part of an ice-bound and submerged Antarctica [461-486]. Thus, this source remains temporally indeterminable and

locationally non-confirmable.

Like Hancock, Rand Flem-Ath (with his joint author, Colin Wilson in their book *The Atlantis Blueprint* [2000-2001]) holds that ancient civilizations have their roots much earlier in time than do many conventional scholars and researchers. Wilson and Flem-Ath both assume--as did Hancock-- that certain earlier (more often regarded as mythic) accounts may have some basis in earlier actual socio-cultural reality.

Because Hancock, Wilson, and Flem-Ath accept the view that antecedents stem from an era or eras prior to recorded history (and temporal dating), some resort must be made to much more encompassing multi-millennial demarcations as revealed by astronomy and geology. For Hancock, it was distinctive planetary-stellar constellations as associated with the process of precession and computer simulation. But for Wilson and Flem-Ath, it was alleged shifts in the locations of the poles, e.g., the North Pole prior to the last Ice Age or even earlier, that became the basis of large-scale multi-millennial demarcations.

They developed an analytical scheme that is allegedly a device for empirically studying societies across major epochs of time far distant from the present. Flem-Ath compiled a list of almost seventy sites of such societies-civilizations in which religion had been so central that they are termed *sacred sites*. They include most of the sites of the societies studied by Hancock, plus others scattered throughout the Mediterranean, the Middle East, even the Far East.

Because Flem-Ath was convinced that such sites really extend farther back into the past than is conventionally accepted, he sought to devise a set of periodizing categories using Charles Hapgood's notion of the shifting locations of the North Pole at different time intervals [pp. 38-9]--admittedly without any indication of how widely accepted Hapgood's views were among expert geologists and climatologists.

Hapgood has proposed four different locations of the pole in the geological past: the current pole location (extending back to some 12,000-14,000 BC), the Hudson Bay location (c. 15,000?-45,000 BC), then the Greenland Sea site (50,000-80,000+ BC), and finally the Yukon location (90,000 BC and back to an indefinite past?) The Hudson Bay Pole was located at 60 degrees north, 83 degrees west; the Greenland Sea at 73 degrees north, 10 degrees east, and the Yukon at 63 degrees north, 135 degrees west of its present location. But the most important point to note is that the different North Pole locations signify increasingly distant multi-millennial time intervals.

Through a series of transpositional formulae, plus a limit to the

variations, it became possible beginning with the longitudes/latitudes of the sites (and then recalculated as distances in nautical miles) from the present Pole to work out the appropriate locations of the sites for the (increasingly older) Hudson Bay, Greenland Sea, and Yukon Poles. A tremendous number of calculations was involved. Some sixty-plus sites were noted for the Hudson Bay Pole, only nine for the Greenland Sea., but some forty for the Yukon Pole [331-2, 333-5; 324; 336-9]. Some thirteen different tables were presented [see also 60-1, and 340-44, all in the Appendices].

I see the following problems with this proposal:

1) Only those socio-cultural characteristics associated with the present North Pole position can be said to have any reality; those claimed for the other older pole positions are unknown or even unknowable. The latter are only points on the globe, without specified geological-climatic basis and recognizable habitability.

2) Just how temporal socio-cultural continuity is between the present sites and those extrapolated for the past is never clearly argued. The three earlier polar positions function as blocs or categories of time. The only way continuity can be realistically introduced is to pose the notion of generations of community inhabitants as associated with the sites. Can the number of generations even be realistically calculated?

In remarking that Atlanteans established (i.e., as founders and their successors) more than sixty sites over the world [311], authors Wilson and Flem-Ath have only asserted, but not demonstrated, continuity.

3) By raising the association of civilization with the bio-psychic origin of Cro-Magnons [175-180 and 313-18], the authors do seem to pose a basic question of just whether they mean by *civilization* or even *culture* what specialists in cultural anthropology, sociology, and (the specialized branches of) ancient history accept and require.

4) Nothing in the authors' work reveals that they have rigorously attempted to examine critically the implications of the features of Plato's notion of Atlantis in order to separate out what is ethnographic fact from fiction, the imaginary from the ancient historical past, or the mystical from any empirical socio-cultural reality. It is not that Plato's notion should be dismissed out of hand, but it must be critically assessed. [See Richard Ellis, *Imagining Atlantis*, 7-27, 224-262]⁶

5) The existence of Atlantis as a socio-cultural reality with the specific features of an ancestral civilization will depend on the notion of what a civilization is and on what related empirical features are revealed to exist. More than a similarity in geography and/or topography

between the ancient map of Athanasius Kircher and Landsat images of Antarctica near Ross Sea must be offered to satisfy critics [32-7, 317-18].

Finally, it must also be acknowledged that invoking Atlantis as the ancestral origin of civilization (ultimately spawning Egyptian and American descendants), without substantial empirical proof, renders Hancock vulnerable to the same criticism as was just raised against Wilson and Flem-Ath.

III. William Ryan's and Walter Pitman's Black Sea Flood Discovery

With the title apparently chosen to evoke popular response, Ryan's and Pitman's *Noah's Flood* (1998) must be judged in relation to the concerns of this paper and not by a reaction to the title. The book does have a unique relevance to this paper, which derives from four features: 1) the authors, their professional disciplinary association, and their interests and eminence; 2) the particular problem addressed in the book and its pertinence to the concern of this paper with innovative dating; 3) how the authors define, compile and analyze the data of their study; and 4) the uniqueness of the (geological) dating technique, the dates so derived and what could or could not be concluded. Each of these features requires further consideration and analysis.

Ryan and Pitman are marine geologists, with appropriate training and experience such that they are now on the staff of the Lamont-Doherty Earth Observatory at Columbia University. Though the title of their book may seem to invite religious controversy, any such involvement would not be germane to the paper.⁶ Indeed, the four introductory (historical background) chapters reveal a pronounced secular and naturalistic stance. Further, the general intellectual orientation displayed is of a current geology-climatology, which encompasses much more than a slow, gradual, continuous, incremental evolutionism, but rather one that now recognizes and includes rapid, disjunctive, spasmodic, catastrophic-cataclysmic change as well.

The earth is now to be conceived of an outer shell (or crust and outer mantle) shifting (or sliding) around its softer mantle and inner core, a continental drift theory, plate tectonics (or tectonic plates), which impact or encroach or displace one another.⁷ For various forms of life, including humans, cataclysms could have drastic consequences. So, in a very real sense, such theoretical ideas provide support for some of the broader, more encompassing theories of Hancock and Wilson and

Flem-Ath, though without any endorsement of Hapgood's crustal displacement theory or a shifting of the poles in geological time.

The second impressive feature of the Ryan and Pitman book is its interest in the far-distant Ice Age, which is indirectly connected with, but still of some consequence for, the Black Sea Flood. Most importantly, the two marine geologists can speak with some authority about the impact of the meltdown of the last Ice Age and the dates which geology now ascribes to that development. The two geologists remark that the total Eurasian ice cap melted in two brief, rapid spurts which were separated by a millennium plus and during which the climate returned to nearly that of the Ice Age [156]. As dated by Fairbanks and Bard, the first pulse began about 12,500 BC. It fed dozens of great lakes that no longer exist and eventually vastly affected the Aral, Caspian, and Black Seas [156-7].

The second meltdown spike began about 9,400 BC. The sideway escape route that had been created directed melt-water away from the Black Sea and to the west, across Poland and over to the North Sea. Shut off from further substantial increases, by 10,000 BC, the Black Sea began to evaporate. By 5,600 BC, its shore was 350 feet below the top of the Bosphorus dam [156-7]. Eventually, that dam was breached and an enormous flood followed. This, then, is the context for the research which Ryan and Pitman undertook as recounted in the three central chapters [11, 12, 13; i.e., 118-143].

With the help of their young assistant, Ryan and Pitman took core samples from the submerged Black Sea shore, which revealed a three-layer sequence of top, middle, and bottom. At the top was a homogeneous mass of olive gray mud; at bottom a layer of dry clay; and in between a layer of gravel [133-4, 136-7]. But ultimately most important were the various mussels and mollusks, some from fresh and others from salt water, for specifics.⁸ When analyzed, they revealed that much earlier the Black Sea had been a fresh-water lake undergoing evaporation and desiccation, while the later Black Sea was salt water.

Upon return to the United States, the authors used the relatively new Accelerator Mass Spectrometry (AMS) to analyze the crushed, powdered contents of the cores, i.e., the mollusks. In this process, the carbon atoms were turned into a plasma and stripped of their nuclei. They were then bombarded by millions of volts of electricity, powerful magnets were introduced to separate out the atomic masses of 12 and 14, and ultra-sensitive detectors were used to calculate the relative abundance of the two kinds of nuclei [144].⁹ With this definition now

offered, the fourth feature, that of the derived dates, can now be considered.

As arranged from the shallowest to deepest depths of the Black Sea shelf, the analyzed samples of the cores revealed the following ages in calendar years: 7470, 7510, 7510, and 7580 years (before the present). With one sigma error of a plus or minus 35 to 50 years, the readings are statistically identical [149]. Ryan had expected dates at least two millennia earlier, i.e., 9,000 to 10,000 years before the present [p. 150] and thus approaching, but not coinciding with, West's estimate of the date of construction of the Sphinx.

What these data thus signify is that the intruding salt water (from the Bosphorus and ultimately from the Mediterranean) roared in as a catastrophic flood, extinguishing the organic life in what had been a lake. Anoxia would and did occur and--not as many experts assumed over several millennia--but perhaps in little more than a century [149].

Still, it must not be assumed that human inhabitants on its shores would have been subjected to immediate annihilation. Indeed, Ryan and Pitman claim that on the wide shelf west of the Crimea and with the shore dipping seaward at the rate of two feet per mile, anyone endeavoring to escape would have had to travel no more than a half-mile per day, though one's village might have disappeared in a matter of weeks. Accordingly, it surely is appropriate to raise the question of just what kinds of people might have been on the shores then and thus to point to the relevance of Ryan and Pitman for the major problem of the present inquiry. To date, no actual evidence of such people on the shores exists.

Nevertheless, an entire chapter was devoted to a survey of the peoples who might have been alive. The anthropologists (or archaeologists) involved were V. Gordon Childe, Ian Hoder, Andrew Sherratt, Andrew Moore, David Harris, Ofer Bar-Yosef, Nigel Goring-Morris, Kay Kenyon, and James Mellaart. The sites included Vinca, Lepenski Vir, Abu-Hureyra, Jericho, Hasan Dag, and Catal Huyuk [165-187]. In turn, the cultural features of the sites were summarized, the geographical-geological-climatic traits indicated, and the significant anthropological interpretative issues raised and argued. As a conclusion, the authors attempted a summary presentation of the distinguishing socio-cultural traits: village-town settlements, practice of agriculture, basics of irrigation, differentiated crafts, artisans, specialists, trade-exchange within and without, appearance of social stratification, and emergent religio-ritual-healing roles [187, compare also 193- 200].

In my view, the specifics may well suggest what many features of

proto-civilization, i.e., a primordial or ancestral civilization, might have been. But at best it remains a conjecture until such time as confirmed or denied by actual evidence of a marine artifact, such as Robert Ballard's recent *National Geographic* expedition has endeavored to supply. Yet, all that he has found so far seems to be an early tool; this raises hope, but is not yet a fully substantiated fact.¹⁰

IV. Conclusion

Manifestly, the comprehensive conclusion of this paper must be an admission that efforts to assess innovative dating techniques in three of the four inquiries are seriously defective or flawed. In the fourth, the resort to AMS (Accelerator Mass Spectrometry) seems to have the support of marine geology-geologists, but marine archaeologists or other investigators have yet to provide persuasive evidence of actual civilizational remains from the flood-submerged Black Sea shores--as noted explorer Robert Ballard proposes to do. But it must be cautioned that however serious past problems may have been, the outcome for future dating attempts by marginal authors might not necessarily be the same.

Notes

1. As used within the context of this study, the terms marginal and marginality are to be construed descriptively, not evaluatively. They involve persons: 1) who lack the requisite credentials or professional experience to enable them to participate in or be associated with a relevant discipline (e.g., Hancock, Wilson and Flem-Ath as journalists or writers); 2) who have professional training or experience in an external discipline or science but who have chosen to contribute to one of the relevant disciplines (e.g., Bauval, a construction engineer; and Ryan and Pitman as marine geologists); or 3) who are associated with one of the relevant disciplines but whose interests are not mainline (e.g. anthropologist Thor Heyerdahl, who is interested in experimentally replicating ancient technology, as is exemplified in his *The Ra Expeditions*).
2. *The Message of the Sphinx* is organized completely differently from the earlier *Fingerprints of the Gods*. It is true that some of the major questions in the earlier volume are revisited and summarized in the second, but they are presented more abstractly, i.e., omitting (Hancock's) travel or journey context of the first.
3. Actually, three reasons are given by 20th century Egyptologists--all contextual. The first involves a reference to the cartouche of

Khafre on line 13 of the Sphinx Stela erected by (Pharaoh) Thutmosis IV, who had been a restorer of the Sphinx (from sand encroachment?). He in turn recognized Khafre (the cartouche) as an earlier restorer-- not a builder. The second defective reason is based on the proximity of the Sphinx to the (nearby) Valley Temple also attributed to Khafre; i.e., if the builder of one, then also the nearby other? The third reason is that the face of the Sphinx is conventionally considered to resemble the statue of Khafre as discovered in the pit of the Valley Temple. But this view does not rest on the judgment of a recognized professional expert in facial restoration as is noted by Hancock [348-9]. Finally, Hancock has also warned that certain 19th century Egyptologists had concluded that the Sphinx is considerably older than any of the three Giza pyramids. The shift in opinion about the Sphinx's age occurred in the 20th century [Hancock, 347].

4. What all of this means is that 10,500 BC as the bottom of the cycle in relation to Al Nitak in the Osiron constellation is only a point on a continuous trip backwards in time--indefinitely at least to c. 23,000 BC, if not further. The difficulty with this last date is that the (northern hemisphere) Ice Age is encountered. So, presumably, it must be a logically, i.e., rationally, derived impossibility for the basis for claiming pyramidal planning and layout and is, hence, deniable. Only the earlier date is possible as the beginning of planning and layout. (Or is contact with another but undiscovered civilization equally an option?)
5. Even the location has been a matter of dispute for many years. Recently a French geologist and prehistorian, Jacques Collina-Girard, contended that Atlantis may have been located on a small midchannel island in the Strait of Gibraltar, just rediscovered, and which was swamped by the rising seas at the end of the Ice Age (article by Guy Gugliotta, *The Washington Post* and reprinted in *The Columbus Dispatch*, December 30, 2001, p. C5).
6. In J. N. Wilford's report in the *New York Times* (January 9, 2001, p. D6), it was clear that the appearance of some archaeologists and historians and the two marine geologists at the annual Meeting of the Archaeological Institute of America found the linkage of the Black Sea flood with the biblical Noah's deluge contentious and thus inadvisable.
7. Consult Ryan and Pitman, 78, 94-6. For a more complete technical exposition, see C. Plummer, D. McGeary, D. Carlson, *Physical*

Geology (1998), [15-21, 414-433, 458-492].

8. Their scientific or taxonomic names are: *Mytilis galloprovincialis*, *Alba ovata*, *Parvicardium exiguum*, *Retusa truncatula*; *Modacna caspia*; *Dreissena polymorpha*, *Dreissen rostriformis*, *Cardium edule*, *Mytilaster lineatus* (Ryan and Pitman, *Noah's Flood*, 131-2).
9. Unfortunately, it will not be apparent to the non-expert just how age is detected by this complex procedure.
10. In a report entitled "Ballard Finds Traces of Ancient Habitation Beneath Black Sea," (from *National Geographic News*, September 13, 2000), Lisa Krause noted that not only had Ballard identified a wooden structure but recovered a cultural artifact (apparently a stone tool)--which would encourage continuing efforts for a future expedition to find actual evidence of a submerged civilization.

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