areas. The evidence is abundant that the climate was much different not long ago.

The book contains much information on the people who lived in the Great Basin during the late Pleistocene and Holocene. The people as well as the animals very likely came from Eurasia across the Bering Land Bridge. They continued southward along the east slopes of the Rockies between the Cordilleran and Laurentide Ice Sheets. The Clovis people hunted mammoths as indicated by projectile points found in the bones of mammoths. The timing of man in North America is especially controversial. The author documents several major dating blunders by those who believe man has been in the Americas for a long time.

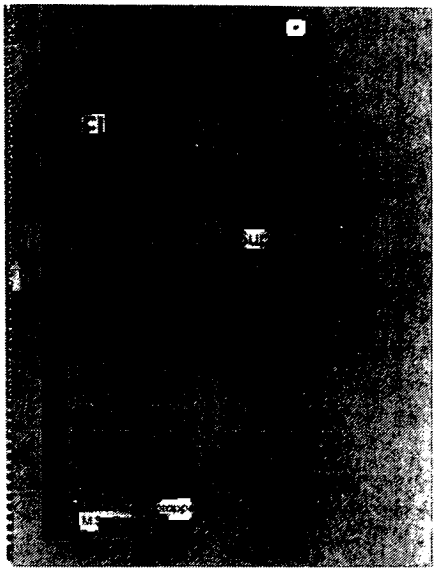
Much has changed in the Great Basin since late Ice Age times. This change coincides with the period of time called the Holocene. Many types of small mammals that cannot survive the hot, dry desert climate at low elevations have been left stranded in the higher mountains. The Devils-Hole pupfish is especially intriguing. Devils Hole is a narrow crevice in hills 30 miles (48 km) east of Death Valley. This crevice contains a pool that is 23 feet by 10 feet (7 m by 3 m) in area and is fed by an underground aquifer. The pupfish lives in this pool. How did it get there? The author reasonably surmises that it is a living remnant of the recent pluvial period.

The book contains many tidbits of information, such as the exploration history of the Great Basin, that have little relevance to Creationism**.** These tidbits add interest to the book and make it easy to read. The well-documented climatic and biological mysteries also relate to other areas of the world that contain similar mysteries of the recent past.

# Studies in Flood Geology

***by John Woodmorappe***
***Institute for Creation Research, 1993***

**Reviewed by Andrew A. Snelling**



Sub-titled 'A Compilation of Research Studies Supporting Creation and the Flood', this spiral-bound book is a collection of reprints of nine technical papers written by John Woodmorappe between 1978 and 1990. John has degrees in both biology and geology, including a Masters degree in the latter. Seven of the papers were originally published in the Creation Research Society Quarterly, while the other two come from the Proceedings of the First and Second International Conferences on Creationism.

Undoubtedly, John has made, and continues to make, a valuable contribution to the creationist cause as exemplified in these nine papers. He has demonstrated that he is not one to avoid dealing with the difficult issues and 'problem' areas facing us, as he does so in these papers. His arguments are well reasoned, persuasive and thoroughly documented, reflecting his remarkable capability for searching through the scientific literature and digging out copious relevant data and supporting references.

The papers have been arranged in reverse chronological order of publication. As a guide to potential readers, let me list and summarise each of these papers in that order:–

(1) *Causes for biogeographic distribution of land vertebrates after the Flood.*

In this paper, Woodmorappe suggests that in the immediate post-Flood world the interior regions of the continents were very cold due to blockage of the sunlight by volcanic aerosols released during the Flood. Thus the animals did not freely spread in all directions upon their release from the Ark, but would naturally choose the narrow bands of land warm enough to support them, ultimately causing very different animals to end up on different continents. Furthermore, as a result of their dispersion from Babel, people probably introduced different animals to new lands as they migrated. [The Australian Aborigines definitely brought the dingo here.] It is also possible, indeed likely, that the flightless birds on some islands [including Australia's emu] resulted from genetic variation, and mutational loss of information for the development of flight capabilities, in birds that originally flew to the islands.

(2) *The antediluvian biosphere and its capability of supplying the entire fossil record.*

The focus of this paper is to refute claims that the enormous quantity of organisms now found as fossils in the geological record could not all have been alive together on a recently created earth. To the contrary, John skilfully demonstrates that the world's coal, oil,

fossil crinoids, vertebrates in the South African Karoo Formation, and components of limestones could all have come from the remains of plants and creatures that lived in the long time (1,650-1,700 years) between creation and the Flood, and then been buried during the Flood. I found this paper very helpful when dealing with the deposition of the chalk beds.[1]

(3) *A diluviological treatise on the stratigraphic separation of fossils.*

John here attempts to analyse in great detail how one flood could account for the different fossils that are found in the different rock layers around the world. Using more than 9,500 fossil localities, he examines the apparent tendency for some 34 different fossil types to overlie each other in the rock record. Based on his findings, John then proposes a model to explain the relatively few cases where rocks bearing many different kinds of fossils overlie each other. His suggested mechanism combines proposed pre-Flood biogeographic zones of living things with the evidence that the Flood was a tectonic event in which there was crustal downwarping to produce depositional basins, compressional folding of strata in 'mountain-building' episodes, etc. He maintains thereby that this explains why there are fewer fossil types from the lower layers that have any representatives alive today, and that evolution through long geological ages is neither the sole nor even the best explanation for this trend.

This is not a paper for the faint-hearted or geologically uninitiated. It is difficult even for those with geological training to gauge just how successful Woodmorappe's so-called *T*ectonically-*A*ssociated *B*iological Provinces (TAB) model is. Mehlert has subsequently tried to explain the model[2,3] out of his frustration that no creationist appeared to be taking up Woodmorappe's TAB concept, but his attempt has still not generated, much apparent interest. However, this is not an implied criticism of either John or his model. The fact is that the breadth and volume of both the fossil and geological records, and the wealth of literature on the subjects, makes it almost impossible for any one investigator to fully encapsulate all the complexities involved, so while John's achievement on the one hand is remarkable, on the other it is difficult to assess. Perhaps the planned global geological database will eventually help.

In this paper Woodmorappe also attempts an explanation as to the lack of pre-Flood human fossils in Flood strata, suggesting via calculations that the pre-Flood human remains were so dispersed in the great volumes of sedimentary rock that it is extremely improbable that any of them would ever be discovered. He may be correct in part, except that it still begs the question as to why not even one has been found, when 'a needle in a haystack' could eventually be recovered. It seems inadequate for him to imply that any such potential infrequent find is misidentified, ignored or discounted by evolutionists.

(4) *An anthology of matters significant to Creationism and diluviology: Report 2*

In this collecting together of various topics, John gives his assessment of claimed evidences against organic evolution, and deals with the claimed existence of ancient reefs buried in ancient rocks as implying long ages for their prior development. His treatment here of evidence against overthrust faulting explaining 'away' instances of fossils overlying each other in the wrong order (according to evolution) is limited to only two little-known examples, with a few comments by geologists about some features of them that place doubts on the overthrust interpretation. There is also an impressive section where John tabulates 200 examples of fossils he documents from the conventional literature that were apparently found in the 'wrong' (according to evolution) rock strata. He then argues that there is usually no evidence to support the usual evolutionary rationalisation that these are all situations where fossils from older rocks were washed out and redeposited in younger strata.

(5) *The essential nonexistence of the evolutionary-uniformitarian geologic column: a quantitative assessment.*

By overlaying world maps of rocks attributed by evolutionary geologists to the different ancient geologic periods, Woodmorappe shows in this paper just how small a percentage of the earth's land surface has rocks of many of the alleged geologic periods all in one place. He also calculates that the rocks of the geologic periods, that are supposed to have succeeded each other in time, rarely succeed each other as layers of rock. From this analysis John concludes that *'this* [geologic] *column basically does not exist* and that

> *'Since only a small percentage of the earth's surface obeys even a significant portion of the geologic column, it becomes an overall exercise of gargantuan special pleading and imagination for the evolutionary-uniformitarian paradigm to maintain that there ever* ***were*** *geologic periods. '*

Strong language indeed!

However, his analysis, while useful, is fatally flawed as far as its ability to derive from it such conclusions. All John has succeeded in doing is to perpetuate the creationist 'myth' that the geologic column is the product of an evolutionary/uniformitarian 'conspiracy' and so essentially doesn't exist/isn't real. His analysis divided the earth's land surface into 406 $km^2$ squares and then only compared the stacked strata within each square, ignoring the fact that the tilting of strata can often result in particular sequences continuing to build on top of one another from region to region. This should not be taken as a criticism of John's brave and bold attempt, but what is required for full analysis of strata globally is the assistance of computers (now about to be attempted). However, the physical reality of the strata of the geologic column cannot be ignored, as they do exist. The early geologists in Europe, for example, were able to physically trace the stacking of the continuous sequences of strata from country to country, and then later similar (and often

identical) stacking of sequences was found on other continents. It is time for creationists to bury their 'myth', face up to the reality of the geologic record (not the timescale imposed on it, of course), and tackle the exciting task of building the Flood model of earth history based on that record.

(6) *An anthology of matters significant to Creationism and diluviology: Report 1*

Many topics are covered here. John documents a number of instances where fossils once thought by evolutionists to have been restricted to certain rock strata have now been found in many other rock layers. Such increased stratigraphic ranges for some fossils are not always the embarrassment to evolutionists as creationists often suppose. John also provides more evidences against the claims by evolutionists, based on their interpretation of the effects seen in the rocks, that certain geologic processes have taken a long time to happen. His section critiquing, by use of quotes from the geological literature, claims of ancient sedimentary environments such as reefs and deltas being 'visible' in the rock strata is helpful.

(7) *Radiometric geochronology reappraised.*

The cornerstone of this paper is Woodmorappe's extensive tabulation and documentation of over 350 published instances of serious discrepancies between the radiometric (isotopic) ages of rock units and the expected ages based on the contained or associated fossils (according to standard evolutionary thought). John then seeks to thoroughly and systematically refute the radiometric dating methods by suggesting that these numerous documented geologic discrepancies somehow demonstrate the invalidity of radiometric dating more than questioning the underlying assumptions, and that even internal consistence in obtained dates and agreement between results of different dating methods are not proof of their validity.

However, this is only the negative side of radiometric geochronology. No young-earth creationist would disagree with John that there are gross contradictions in the millions-of-years results obtained by these dating methods, but what of the many, many other rocks that yield concordant results, similar or identical results from different isotopes, and even results that agree with fossil 'ages'? No, it is *not* heresy to admit this, but it is 'burying one's head in the sand' to ignore the reality of the majority of results that are consistent within the evolutionary scheme's timescale. However, once we have faced up to this reality (and for some, recovered from the shock!), we are then ready to take on the challenge of seeking an explanation for the overall pattern of *all* the isotopic ratios (radiometric 'dates'). It is likely that the explanation has little to do with the 'absolute ages' of rocks, but does a better job than the 'age interpretation' by dealing with *all* the data, not just some. Better explanations in science have a habit of displacing poorer ones!

(8) *The cephalopods in the creation and the universal deluge.*

This group of invertebrate animals, which includes the squid and octopus, is used by evolutionary geologists, possibly to a greater extent than any other fossil group, to subdivide the rock strata into the different claimed geologic periods. Woodmorappe maintains that this practice is fallacious and that there is an even greater absence of expected evolutionary transitions among the cephalopods than is the case among the vertebrates. Yet there is a pattern of fossil cephalopod occurrence in the geologic record that requires explanation, so John suggests that it is the ecological differences amongst the cephalopods which explain this burial pattern. One flood, he says, would produce the order. Such research results are invaluable.

(9) *A diluvian interpretation of ancient cyclic sedimentation.*

The world's coal layers occur sandwiched between other sedimentary rock layers, and often there is a repeated cyclical pattern of rock types called a cyclothem. Under Virginia (USA) there are upwards of 150 such cyclothems. Standard evolutionary geology interprets these as repeated cycles of tens of thousands of years of swamps being buried by sand and mud before re-establishing themselves. However, there is a better explanation within the context of the Flood, so John's model has vast sheets of repeatedly rising and falling Flood waters burying floating vegetation (which later became the coal) in between layers of mud and sand (later shale and sandstone respectively).

So those are the summaries of Woodmorappe's nine papers that make up this book. They are unchanged from when originally published and are definitely only for the serious student of flood geology. Of course, there have been some developments since. Even though I don't necessarily endorse everything contained in these papers, as I've already partly outlined in the summaries above, those with the background and motivation should find the careful study of these papers both stimulating and rewarding. John is of course absolutely correct when he writes that Flood geology will grow in explanatory power only through careful and intense scholarship. He is to be commended for these landmark contributions, which should serve as a springboard for further creationist research by those who are prepared to make use of them.

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