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THE DISCOVERY OF QUASI-HUMAN ICHNOFOSSILS IN THE GLEN ROSE DOLOMITE, PALUXY RIVER, TEXAS.

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INTRODUCTION

The Paluxy River Controversy centers on the identification of certain Ichnofossils (that is, Trace Fossils) which for more than 50 years have been reported to accompany dinosaurian footprints in the dolomite beds of the Lower Glen Rose Formation, near Forth Worth, Texas. The formation has been assigned an approximate age of 100 million years, according to its position in the Chronostratigraphic Geologic Column. The dolomite beds are separated by clay beds, making it an ideal lithological sequence for the preservation of footprints.

The nature of the reports of these Ichnofossils has varied from testimonies by local residents from the nearby town of Glen Rose, to comments in reports by the famous excavator of dinosaur footprints from the American Museum of Natural History, to spokesmen for the Scientific Creationist Movement, and individual witnesses with some type of background in the sciences.

What the reports have described as unusual has also varied from single, oblong depressions or holes in the dolomite layers, to trails of elongate footprints ranging in length from 8-24 inches in right and left strides, to single footprints which resemble those of human beings in a non-trivial way, and which align with other less detailed elongate footprints contiguous to easily identifiable dinosaurian footprints. Therefore, it is not possible to generalize with respect to the multitude of claims which have been made about odd discoveries in the river. And it is not true the most detailed footprints can be easily explained away, even though some claims over inferior prints have been naive. These most detailed footprints are the subject of this lecture.

It can be said at the outset that never have the reported trace fossils received a serious, well planned, technically supported excavation and systematic study to scientifically corroborate their validity. The research on human-like (or quasi-human) footprints has been generally motivated by a desire to discredit the evolutionary approach prevalent in the American educational system today, or to try to defend Christianity from the infiltration of atheistic influence.

So the research has gone only as far as this goal has required. That is, as long as the investigations appear to be scientific, and as long as some sort of data is to some extent inconsistent with the views of the opposition, and found to be consistent with the views of the subculture represented, the research stops, speculation fills-in the gaps as to what the data means, and a great victory is announced.

WHAT ABOUT CARL BAUGH?

Of all the people who have devoted their energies to excavating for quasi-human trace fossils at the Paluxy River banks, no one has gotten his hands dirtier than Rev. Carl Baugh. No one has uncovered more of the footprints in question, and no one knows as much as he does about the location of important trails. In Baugh's excavations, at least 3 footprints showing non-trivial resemblance to the modern human foot have been excavated, casted, and witnessed independently by people trained in the sciences See Table 1 and 2). So Baugh's lack of credentials in science is not enough to explain away the discoveries. The principal qualification to be an explorer for footprints is to be a digger. Not much can be done from an arm-chair position. Baugh has been in contact with fresh data. No one has sacrificed his personal life for the sake of the research as much as Carl Baugh.

And yet, today no one seems to mention the great discoveries this man has made. When no one was willing to continue the exploration of quasi-human trails at the Paluxy River, this man gained permission at great personal expense to slowly and frugally remove dolomite slabs, and to expose new quasi-human footprints. Unfortunately, his primitive methods almost obliterated the footprints, so that only a few of them remained detailed enough to be useful. For three years we have been documenting and carefully analyzing some of his most important discoveries. Seen objectively, the discoveries signify that the human-like footprints are probably REAL after all, and point to the need for a more technical approach to the research.

Of particular importance in the debate over the identification of the so-called human footprints is the work of Glen Kuban. Together with co-workers, he mapped coloration patterns superimposed on deep, elongate footprints heretofore identified as human footprints by excavators sponsored by Films For Christ. The excavation was later illustrated in the widely-circulated film Footprints in Stone. The site was called the Taylor Site. Coloration patterns resembling dinosaur toes have appeared recently on the long exposed dolomite bed. These patterns are interpreted by Kuban as the outline of infilling material which is of slightly different composition than the surrounding host rock.

It can be said the elongate footprints at the Taylor Site now show little resemblance to human footprints. But then, 10 years of exposure and erosion destroyed many original features which are now not being taken into account. And, more important, erosion has produced certain features which may not be part of the original footprint. For instance, what Kuban describes as "long, shallow groves at the anterior of the footprints, at positions that were incompatible with a human foot", could very well be the result of 10 years of fluvial erosion. It is now more obvious that elongate footprints in themselves do not constitute satisfactory indication of human origin. But then, it never has. I would not altogether discount the possibility of forgery at this point in the research of the Taylor Site footprints. Access to the exposed footprints is uninhibited, unguarded, and the site screened from public view.

(See The Taylor Site "Man Tracks" by Glen Kuban, Origins Research, Vol.9, No.1, Spring/Summer 1986, Published by Students for Origins Research, P.O. Box 203, Goleta, CA 93116-0203)

The new colorations appearing on the footprints need to be better explained. Detailed petrological analysis of the alleged infilling material have not been carried out. It is unreasonable the infilling material was relatively soft in most of the footprint but not at the toes. Yet at the same time, in some instances, none of the infilling material in the print was soft enough to produce a depression. How can this be?

The infilling material has not been mapped elsewhere apart from the footprints. How thick is that layer? How is it chemically different? Where is it? Why did the colorations appear only within the last two years, and not in the first 8 years of exposure to air and water? Ferric Oxide stains can develop within days from the alteration of Pyrite in the dolomite. What do fresh footprints look like, yet to be excavated at extensions of the trails still under the outcrop? Why base the conclusions only on highly eroded remains of footprints, and consistency arguments? There are still many unresolved questions. The surface data presented so far certainly should not impede further excavation.

But now that the Taylor Site trails look dinosaurian and are highly eroded, the discoveries of Baugh on a higher dolomite bed take-on special importance. His finds were freshly excavated and were not merely elongate footprints. His most important find shows 5 proportionally sized toe tips on a 12-inch long footprint with a well-outlined, rounded heel as in the modern human foot. The similarity to a modern human foot is striking. Not only that, these kind of footprints look very unlike those of a dinosaur. They are also shallow compared to contiguous dinosaurian footprints.

But it is not enough to excavate and find crucial data. "You have to have "credentials" and people claim you have to "document" your finds according to "scientific protocol". Unreasonable as it may seem at first thought, I think at this point such desirable attributes are irrelevant, for the implication is not that quasi-human footprints have been corroborated beyond doubt, but that the findings should now be followed into the undisturbed outcrop in a systematic way, in order to carefully corroborate the discovery. Now that the location of a trail has been reported and roughly documented, it is the turn of technically-minded scientists to apply their talents to the investigation, and to do so in a manner which is in-line with the significance of the finds to Science. The most difficult stage, the location of a trail has already been done for them.

TECHNICAL REQUIREMENTS FOR PALUXY RESEARCH

In general it can be said those who oppose to further research on quasi-human trails, pretend to represent the scientific community. But they have been willing only to investigate claims which would detract from the credibility of such significant finds as Baugh has made. Never have they pursued any systematic excavations as they require Baugh to do. Some visit the Paluxy River to evaluate highly eroded remains so they can then report they were there at the critical time to witness an excavation. But never does it occur to them that following the trails into the outcrop would be the proper scientific way to test for what is really there. Instead, they recur to credibility arguments to discount further investigation. They do have the credibility and tools with which to apply the methods of science. But they are not out to do original research.

In-depth knowledge of Petrology, a branch of Geology, has become an essential qualification for the investigation of the Paluxy River quasi-human footprints and other trace fossils. At first-sight it appears that a background in Anthropology or Paleontology would be critical. But because the footprints are impressed within rocks of uncommon makeup, and the preservation of detail depends on the mineralogical character of the host rock, no interpretation can be made without a good understanding of the petrological properties of the rock layers under question. In this respect sceptics have unwarily shown their ignorance. Since neither knows about Petrology, neither senses the faults in each other's arguments.

In preparation for pursuing a technically supported excavation following preliminary data into the undisturbed outcrop, we spent considerable time devising solutions for certain problems which stand in the way of a definitive excavation. These problems can be classified as:

1) Accessibility
2) Credibility
3) Preservation of detail of discoveries
4) Analysis and documentation
5) Funding

These problems will have to be confronted to proceed with the investigation at a level of success higher than current. If these problems are not solved, there will be no more progress, but merely more destruction of critical footprints. We gladly offer solutions to the technical problems as a contribution to the ongoing project. We may never have the opportunity to try these solutions in practice, for funding is the greatest problem. Nevertheless, perhaps our analysis will be helpful to others who may be in the position to proceed with the research.

PREREQUISITES FOR SCIENTIFIC CORROBORATION OF THE QUASI-HUMAN FOOTPRINTS

A discordant discovery requires the most rigorous substantiation. That is reason enough to treat the corroboration of the finds with utmost seriousness. There is a great difference between discovering a dinosaur footprint next to dinosaur footprints, and discovering a quasi-human footprint along with dinosaur footprints. The first corroborates something already corroborated, except perhaps for a few final details. But the second restructures the scenario thought to be already corroborated. Original research is critically evaluated. Researching more dinosaur footprints is not.

The Paluxy quasi-human trails have been almost obliterated during excavation through primitive techniques, they have been documented mostly by word of mouth and some casts, and speculation about their significance carried beyond reasonable limits. It will be very difficult to surmount the credibility problem such an approach has created. Further investigations must corroborate the finds through measurements and through objective methods alone.

For a successful investigation, one that meets the strict demands of the scientific community, and would readily be published in a secular geologic journal of wide distribution, any investigation should accomplish the following tasks:

* The degree of similarity between the finds and the modern human foot should not be expressed verbally, but should be recorded quantitatively through stereo photographs, actual measurements, and casts. The stereo photograph has the advantage that it records not only the outline but the depth at every point, and it can be published. We have acquired special equipment for this type of documentation.

* The exact horizontal and vertical location of the find must be mapped to the nearest inch, using permanent markers as reference points. A professional surveyor and aerial photographer local to Glen Rose,TX is ready to help us in this matter. Aerial photography is also useful to describe the general locality with respect to existing terrain features.

* It is important to detect footprints before excavation by high frequency sounding through the overlying dolomite slab. The necessary technology falls within my central area of expertise. With adequate equipment it is possible to know the general route a trail takes underground, and this information would help plan for the arrival of important witnesses and technicians. The application of this geophysical technique to Ichnology (the study of trace fossils) would increase the opportunities for publication. One source for this equipment is the Stanford Research Institute.

* The separation of the soft clay (marl) from the hard rock containing the prints is critical to the preservation of detailed information. The petrology of the host rock is such that no water should be used to remove the clay. The host rock contains Illite, a mineral which often deteriorates upon exposure to water. Thus, it is not surprising to find a hard boundary defining the surface of the quasi-human footprint, and find the boundary will deteriorate as the Illite within the previously hard host rock comes into contact with water. This does not mean the footprint is within the marl above the dolomite slab, for then there would not be a hard boundary defining the footprint. What it means is that there is a need to maintain chemical stability. We have proposed removing both layers, exposing it to cycles of freezing and thawing, and thereby separate the highly porous marl from the solid dolomite through differential thermal expansion, without the use of foreign water. Further petrological studies are critical to the research.

* Preservation of the original specimens is essential for corroboration. It is the only way to objectively establish the location of the discovery. The block containing the original specimen is sampled by thin-section analysis, and the microscopic details of it (cross-sections of fossils, outlines of pebbles, etc.) are compared with similar studies on the corresponding faces of the remaining host rock in-situ. Micro-photography can offer some additional information to verify the exact point of discovery. Note that casts, or snapshots cannot provide this critical corroboration.

* The identification of the quasi-human footprints should not be based merely on a few resemblances, but should take advantage of mathematical methods of correlation. Thus it is possible to actually measure the resemblance in a systematic way, and avoid the problem of debating whether the footprints are indeed of human origin. There is always going to be a certain degree of dissimilarity due to incomplete preservation, and motion of the foot at the time of impression.

* All these demanding procedures are necessary to have something to publish. But the task of preparing the manuscript for publication is almost as much work. Library research for reference material is an important and costly aspect of a scientific publication. An important geologic journal readily published my positive comments on the human-like footprints. Secular editors will not generally reject a well-supported report on an investigation, for they are constantly in search for significant contributions. So no speculation should accompany the report of the discovery, every claim should be supported by data or descriptions, and objections should be foreseen and answered.

Adhering to these requirements is the only way in which the Paluxy River finds will be considered by the scientific community as a serious call for reconsideration.

FINAL COMMENTS

No definitive human footprints have been excavated at the Paluxy River. All that can be said is that some specimens show a great resemblance to modern human footprints. But the modern human foot may be somewhat different to primitive human feet, or perhaps the 5-toe footprints from the Paluxy River were due to some other non-human creature. It is important to search for other signatures which can constrain the identification more. That calls for systematic research.

The new data offered by Kuban has drawn much attention and has resulted in diverse reactions. Some have published that reports of human-like footprints are therefore now all unbelievable. Some correctly point out that the findings at the Taylor Site were insufficient to make a statement against the accepted view of geological history. Some use this shortcoming to ad-

vance the charge that positive claims about the human-like footprints are always made with a religious prejudice against well established and sensible scientific paradigms.

The only proper response now is quality research. The lesson taught is that any ill-founded assertions are bound to be shown wrong by further research. But it is further research and excavation which has pointed to the need to maintain a positive attitude toward the authenticity of human-like footprints at the Paluxy River. The critical discoveries are the result of persistent efforts by Carl Baugh and co-workers. And much more can be done to preserve detail in subsequent excavations. Hugh Miller was a direct witness in the excavation of a 5-toe quasi-human footprint. Photographs of that find in-situ and stereo photographs of its cast are available for inspection at our booth, along with information on how you can help promote future research.

APPENDIX - SIGNIFICANCE OF THE FINDS

The significance of finding human-like footprints alongside those of any kind of dinosaur has been appraised from a multitude of angles. Some have announced the finds are totally incompatible with evolutionary thinking, some view the finds as affecting the credibility of secular Natural History, some tie it to their claims that Radiometric Geochronology is ill-founded, some use it in their anti-intellectualism, or in their political or social struggle with respect to science education, and even in apologetics and evangelism. The topic is very versatile in application, for it is discordant with certain ideas many people have taken for granted. As the Supreme Court reviews the balanced act on the teaching of Evolutionism and Creationism in public schools, the topic takes even greater social and political significance.

But what is the scientific significance of the finds? If the finds are genuine, how can their discovery imply anything but progress to anyone? It is true that the finds would be disruptive to conventional interpretations of biological history, but that does not reflect on the methods of Natural History per se. Excavation and discovery are methods of Natural History, and through these methods it progresses, step by step.

The finds could never dismiss evolutionary interpretation once and for all, for Evolution can adapt to a large extent to whatever is found in the geological record, as it has already demonstrated in certain instances of public record. For instance, it could be said that all dinosaurs did not become extinct at the end of the Cretaceous Era. That some of them survived in small isolated regions until the evolution of Man. That would imply an error in the present age dating of the Lower Glen Rose Formation, but that could be modified without negating Evolution.

Evolution and Creation are not simply current scenarios or models about our origins. These are philosophical premises which serve to interpret the data found in the geological record. Even more important, the premises serve to separate information which is labeled as evidence, from information which is attributed to the fallible nature of data collection and interpretation. So Evolution will always be around as a naturalistic concept, just as Creation will always be around as the negation that we can ever arrive at a believable and testable explanation for the origin of life from a purely mechanistic point of view. If new data cannot be incorporated into the current scenario for Evolution, then the current scenario for Evolution is modified. The basic view remains, nonetheless.

If the finds are well documented and show definite human traits, then scientifically, the finds mean there should be a further search for human fossils in the area. It is illustrative about the nature of science as a method to knowledge, that in today's geological research human fossils are not searched for along with those of dinosaur fossils. The prior conclusions and preconceptions of what fossils the earth should contain in certain rocks limits the search for evidence. But in the case of the quasi-human footprints, the reason they are not expected is merely that human and dinosaur remains or traces have never been reported as discovered together. In turn, reports of such occurrence are not accepted because they go against accepted conclusions. Such circular thinking would condemn us to live in an unchanging state of partial ignorance. Successful scientists try to minimize their preconceptions as much as is practical. Otherwise they would never learn from discoveries that come their way. And much is learned from "accidents" in science. But preconceptions are essential in research, for they serve to design meaningful experiments. It is when philosophical preconceptions, those not based on data but on dogma, blind the investigator that progress is stopped. It happens to all of us.

From a geological point of view, the documentation of contemporaneous human and dinosaur footprints would require reconsideration about the use of dinosaurian traces or fossils as definite markers of a certain era in history (Index Fossils), and the same would apply to hu-

man fossils. There would be a need to investigate via direct geochronological methods what time in history the lower Glen Rose Formation pertains to. In summary, it would take away a certain bias which has kept the geologic region from being studied on the basis of the signatures it contains, not just via extrapolations of unifying, and general geological concepts which has developed into a model into which all regions must fit.

Thus, successful corroboration of the nature of the human-like footprints would raise important questions which would lead to progress in Natural History. Such progress would begin to show whether the true history of Life on Earth, really is consistent with what the General Theory of Organic Evolution would predict. At the same time it would permit deriving an alternative naturalistic scenario to Evolution, one that is suggested by the data, and that would finally free our institutions to pursue research without evolutionary philosophical restrictions.

TABLE 1
McFALL SITE PALUXY QUASI-HUMAN FOOTPRINTS

CO-WORKER	SUPPORT	ACADEMIC BACKGROUND	FOOTPRINT SIZE	MAXIMUM DEPTH
HINDELITER	CAST,TESTIMONY	PH.D. PHYSICS	16.0" LONG	1.50" AT BALL
MILLER	CAST,PHOTOS,TESTIMONY	CHEMIST	11.5" LONG	.75" AT BALL
"Reserved"	CAST,PHOTOS,TESTIMONY	PH.D. BIOLOGY	11.5" LONG	.50" AT BALL
DETWILER	CAST,TESTIMONY	NATURAL HISTORY & BIOLOGY	14.0" LONG	.75" AT BASE

TABLE 2
McFALL SITE PALUXY QUASI-HUMAN FOOTPRINTS

CO-WORKER	DATE	STRIDE DELINEATION	FOOT	TOE TIPS	TOE GROOVES	HEEL
HINDELITER	AUG 20/82	R,L,R=45"	RIGHT	5	1	ABRUPT
MILLER	JUL 06/86	L,-,L= 4 ft.	LEFT	5	2	ABRUPT
"Reserved"	JUL 11/84	N/A	LEFT	5	5	GRADUAL
DETWILER	JUL 06/84	N/A	RIGHT	4	2	GRADUAL

BIOGRAPHICAL INFORMATION

John W. DeVilbiss is an evangelical Christian with a strong background in Geosciences. He received his Ph.D. from Stanford University in 1980 for original research on the acoustic properties of rocks. His M.S., also from Stanford, dealt with geophysical data processing and techniques useful in seismic exploration. His B.S. is in Geosciences with High Distinction is from the University of Arizona, where he completed an honors thesis in Radiometric Dating and studied Petrology. His industrial background is with Gulf Oil, 5 years as Research Geophysicist.

He has studied Geology for the sake of Geology, but with the practical objective to contribute to the base of knowledge on the relationship of Science and Christianity.

He has followed the Paluxy River Controversy for 5 years, and is well read on the concepts of Scientific Creationism. His views on Creationism prompted him to establish The Office for Research on Origins, which is devoted to documenting data neglected by other geologists which bears on the question of The History of Life, and thus on Organic Evolution.