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"Faithful in the Little Things": Creationists and "Operation-Science"

Stanley Rice

> His master said to him, "Well done, good and faithful servant; you have been faithful over a little, I will set you over much. . . ." [Matthew 25:21]

All readers of *Creation/Evolution* are aware that creationists of the young-Earth, global-flood camp have received heavy criticism from scientists. These creationists usually attribute the criticism they receive to an anti-supernaturalistic bias on the part of scientists. And it cannot be denied that this has been one significant source of criticism. Therefore, the report by Scott and Cole (1985) that these creationists do not publish their creationist theories in standard journals is hardly surprising. But is this the only reason creationists have received such heavy criticism?

No, for two reasons. First, many scientists have a Christian, even conservative Christian, commitment and yet criticize the creationists (for example, Ramm, 1954; Vawter, 1983; Gilkey, 1983; Hyers, 1983, 1984; Young, 1982). Many prominent scientists have openly indicated their belief in God, including David Lack, the famous ornithologist (1957); Arthur Peacocke, dean of Clare College at Cambridge (1979); and Frank Salisbury, a plant physiologist (1976).

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Second, it is not just creationist theories but even the everyday, routine, non-controversial research done by creationists that have received criticism (Hitt, 1987). For instance, only a creationist would want to prove that the seeds of all extant plant species would have been able to survive the kind of prolonged exposure to salt water that would have occurred during Noah's flood. But creationist beliefs should not prevent a botanist from being able to design a perfectly adequate experiment in which salt water tolerances of various seeds are tested. Only a creationist would propose that salt and fresh water might have remained separate during a global deluge. But creationist beliefs should not prevent an earth scientist from competently designing a microcosm to investigate the mechanism that might have allowed such a separation. Only a creationist would propose that even microevolution cannot occur in natural populations. But creationist beliefs need not prevent field biologists from competently investigating changes in gene frequencies in natural populations. To use the terminology of Geisler and Anderson (1987), creationists can expect hostility in response to their "origin-science," but they should be able to adequately carry out "operation-science."

In reviewing some creationist operation-science, I will demonstrate a very interesting phenomenon: creationists, although capable of doing adequate operation-science, generally do not. The explanation of this phenomenon ought to help creationists improve their act and critics understand them better.

Creationist Plant Physiology

George F. Howe, professor and chairperson of the Division of Natural Sciences at Los Angeles Baptist College, demonstrated that he was capable of doing competent scientific research when he published his Ohio State University thesis research on plant physiology. When I met him in 1976 and corresponded with him in 1982, I saw no reason to suspect him as a less-than-compentent scientist. However, he undertook an investigation of the survival of plant seeds under supposed global flood conditions which has considerably marred this image of competence (*see* Howe, 1968).

Creationists generally believe that all of the "kinds"—whether species, genera, or families—of plants existing today were created "in the beginning" and, therefore, had to have survived the flood as seeds or resprouted from floating branches or underground organs *in situ*. A creationist prediction would be that all surviving plant species can tolerate, in some manner, the brackish water that would have resulted from the mixture of oceans with forty days of rain. A plant physiologist cannot, of course, test the salt tolerance of all plant species; instead, the physiologist should select representative samples of plant species from a variety of growth forms (trees, shrubs, herbs), taxonomic groups (mosses, ferns, conifers, monocots, dicots), life cycles (annuals, perennials), and ecological affinities (forests, deserts,

swamps). Unless this is done, generalizations about the plant kingdom cannot be made. Furthermore, since survival in a specific set of conditions (during the flood) is being hypothesized, the experiment should realistically simulate these conditions (for instance, churning of water and abrasion of seeds against rocks and sand).

Howe and his assistants did none of this. They began their investigation by collecting the fruits of five species of weeds in the Santa Barbara vicinity. They soaked the seeds for twenty weeks in calm sea, fresh, and brackish water. Thereafter, the seed coats were abraded to allow the penetration of water, and three of the five species germinated. Howe's conclusion was, "There is widespread resistance to salt or fresh water soaking among the seeds of flowering plants."

The results demonstrate nothing of the sort. The five species were all weeds. Weeds live in fields and vacant lots and are subjected to severe fluctuations of light, moisture, and temperature conditions. One of the species, *Rumex crispus*, has a geographical range that covers many climatic conditions. Weeds are more tolerant than most plants of environmental extremes. Weeds in the Santa Barbara vicinity have to be especially tolerant of salt resistance—more so than weeds that grow further inland. The investigation, therefore, had an inadequate sample size, and the sample was not in any way representative of flowering plants in general. (Darwin's research on the survival of seeds during exposure to sea water used eighty-seven species.) Furthermore, as pointed out by Moore (1983), how could the seeds have avoided abrasion of the protective seed coat during the flood? The survival of the seeds in salt water very likely would not have occurred if the salt water had penetrated to the inside of the seed. The use of city tapwater (perhaps chlorinated) in the experiment made the whole investigation inconclusive. Finally, the survival of three out of five species isn't bad, but how did the other two come to be with us today if they would have died in the flood?

Despite these shortcomings, the article was praised by Duane Gish in a review article, "A Decade of Creationist Research" (1975).

Creationist Hydrology

E. Norbert Smith was a professor of biology at Northeastern Oklahoma State University and has been elected as a member of the Physiological Society of America and as a fellow of the American Association for the Advancement of Science. Even some of his articles published in *Creation Research Society Quarterly* (1973) concerning planarian reproduction appears competent. Can better scientific be desired? Yet, when he undertook a microcosm simulation of supposed flood conditions (*see* Smith, 1979), you would never guess that he knew anything.

Many freshwater animals cannot tolerate salt water, and many marine animals cannot tolerate fresh water, and many animals (both freshwater and marine) cannot tolerate brackish water. Could all of the aquatic animals of today's earth have sur-

vived a flood in which ocean and fresh water were mixed violently together? Smith proposed that aquatic animals survived the flood in isolated pockets of salt or fresh water which were not mixed together. Salt water, after all, has a higher specific gravity than fresh water. This could occur only in a relatively tranquil flood, unlike the one that most creationists believe (Clark and Voss, 1980).

Smith placed salt water in the bottom of an aquarium, with sand and a crab to make it seem realistic. Next he *covered the salt water with a sheet of paper* and carefully placed fresh water on top of it. He placed a fish in the fresh water (with a scientist's love of precision and completeness, Smith informs us it was a 4.5-centimeter goldfish). He found, to his dismay, that the fish swam around and mixed up the water. So, he repeated the experiment, this time omitting the fish. Triumphant at last, Smith made careful measurements of salinity to show that the water layers remained fairly distinct.

This investigation was obviously meaningless. What could possibly have corresponded to the sheet of paper in a real flood? And despite the paper, the experiment didn't even work the first time. Smith is certainly intelligent enough to have done a better job.

Creationist Population Genetics

Creationists reject macroevolution but usually accept microevolution. Indeed, I have heard them boast of having been the discoverers of natural selection, since Edward Blyth was a creationist (*see* Eiseley, 1959). But if they could demonstrate that even microevolution does not occur, they would be very happy.

Walter E. Lammerts knows enough about botany and genetic variability in plants to have been a prize-winning rose breeder. He and George Howe decided to investigate genetic changes in wild populations of plants in California. They chose five species of wildflowers and made repeated observations of their phenotypic characteristics over a five-year period during which drastic differences in weather occurred. The result should have been a valuable contribution to ecological literature, but it was nothing of the sort.

Their article, "Plant Succession Studies in Relation to Microevolution" (1974), is confusing enough to thwart most readers. The title itself misleads biologists into thinking it refers to changes in species composition over time, which is what *succession* generally means. Moreover, the bulk of the information is presented in tables that appear to have been copied from raw field notes. There are six pages of these five-columned tables with entries like "3/4 [inch] orange center, and 3/8 [inch] irregular yellow margin; medium large 9 [inch] plant." Sometimes they even present conclusions in their tables, such as "Great reduction of plants compared to 1969. *No types found in 1969 have increased*" (emphasis theirs). Somewhere in this mess, we are supposed to learn something about microevolution.

Also, the authors never even state a hypothesis. If they believe that evolution is not occurring in these wild populations, then they should predict what they expect to see instead. All they do say, however, is that if evolution is true they should see "gradual shifts or evolutionary trends."

Nor does their paper clearly state their methods. I think they chose plots of land of variable size dominated by the various species of wildflowers, then chose variable numbers of individual plants which they called "selections," and labeled the locations with wire stakes within these plots. In this study of "natural selection," *they selected* "selections" from their study areas. They returned each year and recorded what they saw growing at the stakes.

They made no attempt to distinguish plant variation that is genetically based from that which is environmentally induced—which is routinely done in studies of genetic variation in wild populations (*see*, for instance, Marshall and Jain, 1968, and Wilken, 1977). Lammerts and Howe knew that some of the variability they studied had a genetic basis but could not assume that *all* of such variability was genetic.

Then they proceeded to gather data. They had an exciting time of it, including some "real shockers," as they put it. A three-year drought occurred during their study. Before the drought, their California poppy study area had about a thousand plants, only 3 percent of which were orange-flowered, the others being yellow. The plants disappeared during the drought. Then, when the rains returned, Lammerts and Howe were for some reason surprised that only three hundred plants grew back, as if this fact cast doubt on microevolution. It was indeed interesting that almost all of the post-drought poppies had orange flowers. I do not understand how they concluded from this that "no types present in 1969 have increased"; indeed, it looks like they might have caught microevolution in the act.

They were not satisfied, however, that evolution might have really occurred. The change from predominance of yellow to orange flowers in the population seemed to them to be too quick. They expected to see, if evolution is true, a more gradual change from one year to the next (even if the plants all died). In another species, they noted that a certain phenotype "did not *gradually increase* during the dry . . . seasons" (emphasis theirs). It did increase, but not gradually. To them, only extremely gradual changes qualify as evolution.

Furthermore, it appears that phenotypic variation in the populations was reduced during the drought. To Lammerts and Howe, this was evidence against microevolution. When they concluded that "natural selection does not originate variation, but *severely restricts* it" (emphasis theirs), most evolutionists would agree, after appending the word *sometimes*. The authors claimed that their data showed that natural selection will "bring populations back to a typical or normal form," but they could not say how to define the norm. To them, if variation does not increase, evolution is not occurring.

Lammerts and Howe also indicated that, because the putative genetic changes

they observed were not consistently directional, evolution was not occurring. However, it was *orthogenesis*, the mysterious upward-impelling vital force of Teilhard de Chardin and Henri Bergson, that was not occurring. Meanwhile, evolution may have been doing just fine. Moreover, the authors, although first admitting that five years was too short a time to study even microevolution, proceed to ignore their own warning and conclude that their data discredit microevolution.

Finally, Lammerts and Howe made no effort to determine the extent that their observations might have been influenced by gene flow (transport of pollen and seeds into or out of their study areas).

Despite all of these shortcomings, both theoretical (in their conception of microevolution) and practical (in the writing of the paper itself), some creationists consider this to be landmark research. Gish praised it (1975), and the editor of *Creation Research Society Quarterly* even asked Lammerts to publish the results all over again ten years later (1984).

Conclusions

How could scientists who have demonstrated their competence publish such awful pieces of research as those I have described here? I believe it is because their anti-evolutionary zeal gets the better of their judgment. They seem to grab at anything that can be made to even slightly agree with young-Earth, global-flood creationism, or to cast any doubt upon evolution, and rush it into print. They make errors that they would not make under calmer circumstances. They have not been consistently faithful in the slow work of scientific research.

When T. H. Huxley discovered that what he had thought to be *Bathybius haeckellii*, the primordial organism, was just calcium carbonate precipitate, he retracted his conclusion (Gould, 1980). When will the creationists admit that they have been hasty in their conclusions? It is not always thoroughness of data collection that creationists lack: witness the huge tables of data in the Lammerts and Howe article and the 807 references in an article by creationist John Woodmorappe (1983). Consistent faithfulness in routine scientific research requires careful thought about the data.

Perhaps the future is brightening for the creationists. Students for Origins Research publishes a newspaper which is remarkably free of the kinds of sloppiness found in past years in *Creation Research Society Quarterly* (Schadewald and Patterson, 1985). And even the latter publication may be improving. I hope the creationists accept this critique as a challenge to improve their work. If they want the respect of the scientific world—even if there is no hope that they can obtain our agreement—then they must be "faithful in the little things."

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