

- 7 Ager, Derek V. 1973. The nature of the stratigraphical record. Wiley, New York. See especially pages 23-26, and 83.
- 8 Cook, Melvin A. 1966. Prehistory and Earth models. Max Parrish and Co., Ltd., London.
- 9 Schindewolf, O. H. 1950. Grundfragen der Paläontologie. Schweizerbart, Stuttgart.
- 10 Kerkut, G. A., 1960. Implications of evolution. Pergamon Press.
- 11 Petrunkevich, Alexander 1949. Study of Palaeozoic arachnida. Shoe String Press, Inc., 995 Sherman Ave., Hamden, Conn. 06514
- 12 Crick, F. H. C., and L. E. Orgel. 1973. Directed panspermia, *Icarus*, 19 (3): 341-346.
- 13 Ohno, S. 1970. Evolution by gene duplication. Springer Verlag.
- 14 Walker, Evan Harris 1970. The nature of consciousness, *Mathematical Biosciences*, 7, pp. 131-178. See also the item "Quantum Psycho-Physics" in the section "Panorama of Science" in this issue of the *Quarterly*, and the bibliography provided.
- 15 Birsell, Joseph B. 1972. Human evolution. Rand-McNally and Company. (Second Edition, 1975)
- 16 Macbeth, Norman 1971. Darwin retried. Gambit, Inc., Boston. (1973. Dell Publishing Co., New York. Paperback.) See book reviews in C. R. S. *Quarterly*, 9 (3): 187-188; 193 and 194, December, 1972. (Also see book review in *Systematic Zoology*, 24 (2): 269 and 270, June, 1975 and letter to the editor by Norman Macbeth in same issue, pp. 276-279.)
- 17 Blum, Harold F. 1965. Dimensions and probability of life, *Nature*, 206: 131-132.
- 18 Lerner, Michael I. 1954. Genetic homeostasis. Wiley, New York.
- 19 Moorhead, Paul S. and Martin Kaplan Editors. 1967. Mathematical challenges to the neo-Darwinian interpretation of evolution. Wistar Institute, Philadelphia.
- 20 Waddington, C. H. 1968-1970. Progress towards a theoretical biology Three Volumes. Aldine Pub. Co., Chicago. See especially pages 109-110 of Vol. 1 and footnote 10 on pages 123-124 of Vol. 2.
- 21 Hardin, Garrett. 1959. Nature and man's fate. New American Library. See especially page 246.
- 22 Nilsson, Heribert. 1953. Synthetische Artbildung. Two volumes. Verlag C. W. K., Gleerup.
- 23 Eldredge, Niles and Stephen Jay Gould. 1972. Punctuated equilibria: an alternative to phyletic gradualism, (in) Thomas J. M. Schopf, Editor. Models in paleobiology. Freeman, San Francisco, pages 82-115. Contrast especially Figure 5-9 (p. 109) and 5-10 (p. 113).
- 24 Helmick, Larry S. 1975. Origin and maintenance of optical activity, *Creation Research Society Quarterly*: 12 (3), 156-164.

- 25 Lewontin, Richard C. 1974. The genetic basis of evolutionary change. Columbia University Press.
- 26 Kimura, Motoo and Tomoka Ohta. 1971. Theoretical aspects of population genetics. Princeton University Press.
- 27 Cavalli-Sforza, L. L. and W. F. Bodmer. 1971. The genetics of human populations. Freeman, San Francisco.
- 28 Maynard Smith, John. 1972. On evolution. Edinburgh University Press. See especially pages 96 and 111.
- 29 Calder, Nigel. 1973. The life game. Viking. (Dell, 1975.) See especially pages 28 and 97.

Supplementary References

(Added in Proof)

- 1 Kimura, M. 1969. The rate of molecular evolution considered from the standpoint of population genetics. *Proceedings of the National Academy of Science*, 63: 1181-1188.
- 2 Kimura, M. 1968. Evolutionary rate at the molecular level. *Nature*, 217: 624-626.
- 3 Kimura, M. and J. F. Crow. 1964. The number of alleles that can be maintained in a finite population. *Genetics*, 49: 725-738.
- 4 Kimura, M. 1968. Genetic variability maintained in a finite population due to mutational production of neutral and nearly neutral isoalleles. *Genetic Research*, 11: 247-269.
- 5 Smith, J. Maynard. 1970. Population size, polymorphism and the rate of non-Darwinian evolution, *American Naturalist*, 104: 231-237.
- 6 Edwards, A. W. F. and L. L. Cavalli-Sforza 1964. Reconstruction of evolutionary trees (in) V. E. Heywood & J. McNeill, Editors. Phenetic and Phylogenetic Classification, Systematics Association (Publication No. 6). London.
- 7 Cavalli-Sforza, L. L., I. Barrai, and A. W. F. Edwards 1964. Analysis of human evolution under random genetic drift, *Cold Spring Harbor Symposium of Quantitative Biology*, 29: 29.
- 8 Cavalli-Sforza, L. L. and A. W. F. Edwards 1963. Analysis of human evolution (in) S. J. Geerts, Editor. *Genetics Today*, 3 (Proceedings of the 11th International Congress of Genetics, The Hague, September 1963.) N. Y., Pergamon Press, 1965.
- 9 Cavalli-Sforza, L. L. and A. W. F. Edwards 1967. Phylogenetic analysis: models and estimation procedures, *American Journal of Human Genetics*, 19 (3): 233.
- 10 Smith, J. Maynard 1961. The limitations of molecular evolution (in) I. J. Good, Editor. The scientist speculates. London, Heinemann.
- 11 King, J. L. and T. H. Jukes 1969. Non-Darwinian evolution, *Science*, 164: 788-798.

SOME MEDIAEVAL THOUGHTS ON THE ARK

The shape and structure of Noah's Ark are subjects on which something has been written from time to time, both in the C. R. S. *Quarterly* and in other creationist literature. It may be of interest to notice some early writings on the subject.

Hugh of St. Victor, a theologian and teacher who lived around 1100 A. D., seems to have been much interested in the Ark. Some of his views have been set forth by Zinn, Grover 1971. Hugh of St. Victor and the Ark of Noah: a new look, *Church History*, 40 (3): 261-272. There is also a book: Hugh of St. Victor: selected spiritual writings. Translated by a Religious at C. S. M. V. Published 1962 by Faber and Faber, London. See especially pages 60-63.

Early in the Christian era Origen had set forth his views on the Ark. He considered that it was a sort of pyramidal structure. For a long time people were content to accept this view. St. Augustine, in accepting it, granted that such an Ark would have been most unseaworthy. But he supposed that it was kept safe by God's intervention.

Hugh, however, maintained that, where it is not stated that there was a miracle, then no appeal should be made to a miracle, until more understanding can be gained of what could be done in the order of nature. Apparently he studied the construction and use of ships, and came up with a completely different interpretation.

In fact, the Ark as Hugh envisaged it seems to have looked rather like the Arks of Noah which used to be so com-

mon as toys. He considered it to have been something like a house boat; it was a boat below, but had a house-like, or at least roof-like top. Hugh had some thoughts about the arrangement of the interior; one idea, which later writers do not seem to have taken up, was that aquaria for such animals as seals were in parts of the interior. He also suggested some considerations about the size, and how it would contain all the animals.

It is true that Hugh's interest in the Ark was not primarily along lines of naval architecture. Like most mediaeval theologians, he was very interested in the allegorical meanings of Scripture; and was able, of course, to find many in the account of the Ark. That there was a tendency for the mediaeval writers to be carried away by their allegories can hardly be denied.

It should be noticed, though, that they held, in theory at least, the validity of allegorical meanings was derived from the literal. Thus anyone who wanted to draw allegorical meanings from Scripture needed to be sure that the accounts were true to literal meanings; and, of course, Hugh and his contemporaries never doubted the literal truth of Scripture, including the story of the Ark.

In investigating how these accounts, accepted as literally true, can be in harmony with the nature of things, Hugh seems to have been a pioneer in the work which has later been taken up by modern creationists.

—Editor Armstrong