

CORRESPONDENCE

DDT and Pelicans

SIR,—*Nature* (240, 248; 1972) reports Dr Robert Risebrough's allegation that reproductive failure of the brown pelican in 1969-72 on Anacapa Island was due to DDT pollution "from a Los Angeles factory which in 1970 was discharging 500-1,000 lb of DDT daily into the sea".

This is a charge that Dr Risebrough has been making against Montrose, the factory he is referring to, for the last two years. I have sent letters to a California legislative committee and to Dr Risebrough himself outlining Montrose's treatment of its effluent since its start of manufacture more than 25 years ago. We have always settled DDT effluents in a settling pond, hauling the DDT sediments to a dump that accepts such wastes once or twice a year. The effluent to the county sewer line has contained entrained DDT equivalent to about 10-15 pounds per day. In May 1971, Montrose achieved essentially total recycle of its wastes and its discharge is about 1 oz of DDT per day.

The discovery of brown pelican reproductive failure was made shortly after the large oil-spill at Anacapa in 1969. W. Hazeltine (*Nature*, 239, 410; 1972) and Switzer and Wolfe (*Nature*, 240, 162; 1972) point out the invalidity of the attempted correlation of DDE residues and eggshell thinning.

At recent Washington DC DDT hearings, cross-examination of Dr Risebrough and others who hold to this correlation theory clearly demonstrated that without exception they used unreliable statistical approaches. Others, who have applied valid statistical analysis, such as Switzer for terns, demonstrated no such correlation.

Dr Risebrough's charges are becoming entrenched in the scientific literature. When such charges are referenced often enough, they become irrefutable "facts". I would hope that *Nature* will not allow itself to become part of this process.

Yours faithfully,

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Creation in California

SIR,—Although I hesitate to claim to be an expert "in a field of science bearing on the evolutionary theme", and therefore have not been able to take up your offer (*Nature*, 239, 420; 1972), I have recently been involved in teaching and research on chemical taxonomy, and

this has enabled me to look afresh at the subject of evolution. This has been done against a background of work on biogenesis which has certain similarities to evolution, for in it an attempt is made to determine how simple molecules have evolved into more complex ones during the life of the plant. Fifty years ago phytochemists speculated on possible pathways of biogenesis, some most fruitfully, but no one accepted these ideas as fact (or "truth") till innumerable experiments, checking and rechecking claims, have established some pathways with reasonable certainty. Looking therefore afresh at evolution, the most striking feature I find is the highly speculative nature of the topic; the situation phytochemists (in their obviously much more limited sphere of interest) were in 50 years ago.

For instance, one would have expected that classification of plants and animals would have been one of the first subjects to benefit from Darwin's ideas, as here at last was the basis for a "natural classification". Some modern plant taxonomists do not agree and feel that nothing has been fundamentally effected. "What is the impact of Darwin's ideas on taxonomy? It is commonly stated, or implied, that they were revolutionary. No taxonomist who has ever given a moment's thought to what he is doing in comparison to his predecessors can believe this. He knows that taxonomy in its broad outlines and in its more detailed practice has hardly been affected by evolutionary ideas. There is a curious dishonesty about this in much biological writing. Either the fact is denied, or it is glossed over, as if it is something to be ashamed of"¹. In fact some seem to suggest that evolutionary ideas have been a hindrance to taxonomy. "In the absence of complete fossil records, so-called 'phylogony' is deduced from taxonomy. Attempts to base taxonomy on 'phylogenetic criteria' generally involve circular arguments, and it is now belatedly coming to be realized that evolutionary speculation has had a deleterious effect on practical taxonomy"². I find it difficult therefore to accept your opinion that "Darwinism occupies a place in science at least as strong as that of Newton's laws"³.

Clearly, the situation is no fault of the biologists; if adequate facts are not available they have to do with what they have. But it amazes me why biologists seem wedded to the rather limiting assumption that God must have created life only once. Could He not have

repeated the operation, on various scales of complexity, several times, thus explaining the great gaps between phyla and such insoluble problems as the origin of the angiosperms? I should guess that one of the motives behind the "Californian Creationists" is to ensure that young people are aware that the Bible, *inter alia*, at least suggests this possibility. Like many of the people referred to by Dr Hayward³ I treat the Genesis account of creation with as much respect as that of the biologist. Perhaps we are not too far removed from Darwin, who ended his *Origin of Species* with these words: "There is a grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one whilst this planet has gone cycling on according to the fixed law of gravity. . . ."

Yours faithfully,

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¹ Walton, S. M., in *Chemical Plant Taxonomy* (edit. by Swain, T.), 6 (Academic Press, London and New York, 1963).

² Watson, L., Williams, W. T., and Lance, G. N., *J. Linn. Soc.*, 59, 492 (1966).

³ Hayward, A. T. J., *Nature*, 240, 577 (1972).

Doctrine of Creation

SIR,—The argument as between the theory of evolution in general and Darwin's theory of natural selection in particular on the one hand, and the account of the creation in the book of Genesis on the other, is surely of no religious interest. But that such an argument should exist is of profound significance for science.

All scientists know that it is not the purpose of science to arrive at ultimate truth. Science is nothing more than a systematic description of phenomena by means of "theories", commonly expressed in the form of "laws". None of these theories and laws is sacrosanct; all are provisional.

As a small boy, early in the century, I was brought up in an old-fashioned school. We were taught that the biblical story of the creation and the subsequent events in the garden of Eden was an allegory. The allegorical truth of that story still remains unshaken. That is so in spite of the fact that I sometimes feel I can detect certain ideological overtones in the writing.

That scientists should still be arguing

about these things is saddening. It betrays a pathetic lack of scientific faith¹.

Yours faithfully,

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Cambridge

¹ Wigglesworth, V. B., *Ann. Appl. Biol.*, **60**, 1 (1967).

Noah's Haemoglobin

SIR.—In the ecumenical interest (*Nature*, **239**, 420; 1972), we wish to point out that the latter portion of Genesis is consistent with current theory of molecular evolution.

Kimura (*Nature*, **217**, 624; 1968) and King and Jukes (*Science*, **164**, 788; 1969) propose that protein evolution has occurred mainly through neutral mutations which have no effect on molecular function and no selective advantage. Haigh and Maynard Smith (*Genet. Res.*, **19**, 73; 1972) have examined this theory with respect to the published data on human haemoglobin variation. They conclude that if the theory is correct the human population must have passed through a period of drastically reduced size prior to the more recent rapid population increase. The

population bottleneck is necessary to give initial genetic homogeneity, a requirement for agreement of theory and observation.

Genesis, chapter 6, contains a full description of events causing a reduction in the human population to eight individuals; Noah, his wife, their three sons, Shem, Ham and Japheth, and the sons' wives. It seems entirely plausible that this small population could be homogeneous for haemoglobin genes. Thus the book of Genesis documents a series of human population changes which are consistent with changes required from consideration of amino-acid sequences alone.

Yours faithfully,

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Titles and Reprints

SIR.—As a librarian, I can easily answer the puzzle postulated by Briggs and Briggs¹ as to why more requests were received for a paper published in *Contraception*² than for the one in

*Nature*³. *Nature* is more readily available. Virtually all scientific libraries have at least one subscription to *Nature*; whereas relatively few subscribe to the highly specialized *Contraception*.

Even though photocopying is cheaper than mailing a request, without the journal at hand a reprint is necessary.

Also as a librarian, I want to admonish the editor of *Nature* for publishing a paper with a deliberately misleading title. This paper will turn up as a false drop for years to come. The use of titles has become a powerful literature searching technique⁴. It is bad enough that uninformative titles are still being written through ignorance, but to write phoney titles intentionally is just outright perverse.

Yours faithfully,

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- ¹ Briggs, M. H., and Briggs, M., *Nature*, **240**, 490 (1972).
- ² Briggs, M. H., Briggs, M., and Austin, J., *Nature*, **232**, 480 (1971).
- ³ Briggs, M. H., and Briggs, M., *Contraception*, **3**, 381 (1971).
- ⁴ Windsor, D. A., *J. Chem. Document.*, **11**, 227 (1971).

Announcements

University News

Dr William Robert Dearman, Newcastle upon Tyne, has been appointed to a professorship in engineering geology from August 1, 1972.

Dr Alan Williams, Leeds University, has been appointed Livesey professor and head of the Department of Fuel and Combustion Science from January 1, 1973.

Dr G. C. Morrison, Illinois, USA, has been appointed to the Chair of Nuclear Structure at the University of Birmingham.

Professor Roger Penrose, Birkbeck College, London, has been appointed to the Rouse Ball Professorship of Mathematics, at the University of Oxford, in succession to Professor C. A. Coulson, Oxford.

Appointments

Dr Edwin Clarke, MD, FRCP, has been appointed Director of the Wellcome Institute of the History of Medicine as from October 1, 1973.

Miscellaneous

The **Lomonsov Gold Medals for 1972**—the highest award of the Soviet Academy of Sciences, awarded annually for out-

standing achievements in the natural sciences to one Soviet and one foreign scientist—have been awarded to **Academician Nikolsi Ivanovich Muskhelishvili** for his work in mathematics and mechanics, and to **Professor Max Steenbeck** (German Democratic Republic) for his research on plasma physics.

Professor Arpad I. Csapo, Washington University, has been awarded the 1972 award of the **International Health Foundation** on "Prospects for Practical Application of Prostaglandins".

International Meetings

The University of Texas Health Science Center, Houston, announces the Tenth Symposium on Biomathematics and Computer Science in the Life Sciences to be presented at Houston, Texas, March 1973. (Dr Stuart Zimmerman, University of Texas.)

Reports and Publications

not included in the Monthly Books Supplement

Great Britain and Ireland

Agricultural Research Institute of Northern Ireland. Forty-fifth Annual Report, 1971/1972. Pp. 43. (Hillsborough, Co. Down: Agricultural Research Institute of Northern Ireland, 1972.) [2910]
Towards a Future for Inland Shipping. (Comments by the Inland Waterways Association on the Future of Inland Waterways Transport in the Light of the Proposed Regional Water Authorities.) Pp. 12. (London: The Inland Waterways Association, 1972.) 20p. [2910]
Bulletin of the British Museum (Natural History), Entomology. Vol. 27, No. 5: On European Pteromalidae (Hymenoptera): a Revision of *Cleonymus*,

Eunotus and *Spaniopus*, with Descriptions of New Genera and Species. By Z. Bouček. Pp. 265-315. £1.85. Historical Series. Vol. 4, No. 3: Charles Darwin's *Queries About Expression*. By Richard Broke Freeman and Peter Jack Gautrey. Pp. 205-219+1 plate. 65p. Zoology. Vol. 23, No. 1: The Gunong Benom Expedition 1967. 1: Introduction. By Lord Medway. Pp. 1-7+4 plates. 75p. Vol. 23, No. 2: The Gunong Benom Expedition 1967. 2: An Outline Description of the Forest Zones on North-East Gunong Benom. By T. C. Whitmore. 3: Bryophytes and Filmy Ferns from Gunong Benom. By Anne Johnson. Pp. 9-20+8 plates. £1.15. Vol. 23, No. 4: The Gunong Benom Expedition 1967. 5: Reptiles and Amphibians of Gunong Benom with a Description of a New Species of *Macrocalamus*. By A. G. C. Grandison. Pp. 43-101. £2.55. Vol. 23, No. 7: The Gunong Benom Expedition 1967. 8: Ticks (Ixodidae) of Gunong Benom and Their Antitropical Distribution, Hosts and Medical Relationships. By H. Hoogstraal, B. L. Lim, M. Natchatram and G. Anastos. Pp. 165-186. 75p. Vol. 23, No. 8: The Gunong Benom Expedition 1967. 9: A Collection of Chiggers from Gunong Benom (Prostigmata: Trombiculidae). By M. Natchatram. 10: Phthiraptera (Insecta) Chewing and Sucking Lice. By Theresa Claxey. Pp. 187-200. 65p. (London: British Museum (Natural History), 1972.) [2910]
Philosophical Transactions of the Royal Society of London. A: Mathematical and Physical Sciences. Vol. 273, No. 1233: Dynamics of the Liquid Core of the Earth. By C. L. Pekeris and Y. Accad. Pp. 237-260. (London: The Royal Society, 1972.) 65p; \$1.80. [2910]
BBC Handbook 1973. Pp. 294+75 photographs. (London: BBC, 1972.) 75p. [3110]
Imperial College. Royal School of Mines Research Report 1969-72. (Geology, Mining and Mineral Technology, Metallurgy.) Pp. 64. (London: Imperial College of Science and Technology, 1972.) [3110]
Procter and Gamble Limited. Annual Report for the year ended 30th June, 1972. Pp. 12. (Gosforth, Newcastle upon Tyne: Procter and Gamble, Ltd., 1972.) [3110]
Post Office Investment for the Future. Pp. 24. (London: Post Office, 1972.) [311]
Geological Society of London. Special Report No. 2: A Correlation of Cambrian Rocks in the British Isles. By John Watson Cowie, Adrian Williams, Amsler Rushton and Cyril James Stubbsfield. Pp. 42. £1.20; \$3. Special Report No. 3: A Correlation of Ordovician Rocks in the British Isles. By A. Williams, I. Strachan, D. A. Bassett, W. T. Dean, J. K. Ingham, A. D. Wright and H. B. Whittington. Pp. 74. £1.20; \$3. (Edinburgh: Scottish Academic Press, Ltd., 1972.) [311]
Forestry Commission. Research and Development Papers. No. 87: Production and Use of Ball-rooted Planting Stock in Sweden and Finland. By A. J. Low and R. M. Brown. Pp. 25. No. 88: Dissemination and Application of Research Information in the Field. By O. N. Blatchford. Pp. 4. No. 89: Formulation and Implementation of Forest