highest test concentration (1,000 p.p.m.) eliminated the possibility of direct toxicity of IV to the test insects. The activity of compound IV was superior to MTDD (3,7,11-trimethyl-7,11-dichloro-2-dodecenoate) which arrested development of *T. castaneum* at 100 p.p.m. in the flour diet[6].

These results suggest that stored product pests could be controlled by compounds possessing juvenile hormone activity. They also suggest that compound IV exerts its morphogenetic action through contact and/or ingestion. Compound IV is being tested in other laboratories and already the data indicate morphogenetic and sterilant effects in a variety of insect species including mosquito, tobacco budworm, cotton boll weevil, Indian-meal moth, stable flies, livestock ticks and body lice. Rats, on the other hand, seem to be unaffected by compound IV: when dosed orally with 4,000 mg kg^{-1}, no adverse effects were observed during a 14 day observation period.

Bearing the potential of these chemicals as pest control agents in mind, tests were conducted to obtain information on the influence of environmental factors on their chemical stability. Compound IV was spread in thin films on glass plates to determine the effects of light and air on stability, and known amounts were suspended in tap water to determine hydrolytic effects. At the end of each exposure, compound IV was rinsed off the glass plates with acetone or extracted from water and appropriate aliquots were bioassayed in the *Tenebrio* test. These tests indicated that compound IV is stable to sunlight and air for at least 12 h and that it does not hydrolyse in water in 24 h. These results are encouraging since they indicate that these mimics of juvenile hormones are sufficiently stable to act in a natural environment.

We thank H. Lee, K. Tseng and F. Kamienski for technical assistance.

FERENC M. PALLOS

Stauffer Chemical Company,
Western Research Center,
Richmond, California 94804

JULIUS J. MENN
PETER E. LETCHWORTH
JOHN B. MIAULLIS

Stauffer Chemical Company,
Agricultural Research Center,
Mountain View, California 94040

Received February 1; revised April 7, 1971.

1 Bowers, W. S., *Science*, **164**, 323 (1969).
2 Stauffer Chemical, Belgian Patent 734,904 (1969).
3 Bowers, W. S., and Thompson, M. J., *Science*, **142**, 1469 (1963).
4 Bowers, W. S., *Science*, **161**, 895 (1968).
5 Chase, A. M., *Nature*, **215**, 1516 (1967).
6 Thomas, P. J., and Bhatnagar-Thomas, P. L., *Nature*, **219**, 949 (1968).

Natural Selection and the Evolution of Proteins

Jukes and King[1] have attacked my article[2]. They do not quote my published criticism of their arguments[3]. Many of the points are discussed therein, and so a detailed reply is hardly necessary. They do, however, raise one additional matter of importance. They maintain that a selectionist hypothesis would predict radical changes to be favoured over conservative changes. The compelling arguments against this interpretation were clearly stated by Fisher in 1930 (ref. 4). He demonstrated that selection is very unlikely to favour extreme changes.

BRYAN CLARKE

Genetics Laboratory,
School of Botany and Zoology,
University Park,
Nottingham NG7 2RD

Received June 6, 1971.

1 Jukes, T. H., and King, J. L., *Nature*, **231**, 114 (1971).
2 Clarke, B., *Nature*, **228**, 159 (1970).
3 Clarke, B., *Science*, **168**, 1009 (1970).
4 Fisher, R. A., *The Genetical Theory of Natural Selection* (Oxford University Press, London, 1930).

Deepest Photographic Evidence of an Abyssal Cephalopod

THE bathymetric distribution of marine organisms collected during oceanographic expeditions is often difficult to ascertain because retrieval methods (nets, dredges, and so on) do not always indicate the precise depth at which an organism is entrapped. The level at which organisms dwell can, however, be accurately defined by deep ocean bottom photography.

On a recent Caribbean cruise of USNS Lynch, 340 exposures of the sea floor were obtained at seventeen stations. A modified Alpine multi-exposure camera system was used consisting of two 35 mm cameras mounted on a single frame and actuated by a bottom contact switch. Both cameras utilized the Hopkins water corrected 33 mm *f*/4.5 lenses. An oblique view of the ocean floor was obtained by tilting the lower camera's viewing angle to 40° with respect to the camera frame.

Among the records was the deepest photographic observation yet made of a marine cephalopod[1], a benthic species belonging to the family Cirroteuthidae (Fig. 1). Except for the thin web which unites all arms for part of their length, much of the

Fig. 1 Ocean bottom photograph of a cephalopod belonging to the family Cirroteuthidae. Taken 325 miles north-east of Barbados in an Abyssal Hill Province at station Lynch 33–14, latitude 17° 28.7′ N, longitude 56° 13′ W, depth 5,145 m on April 12, 1970. The specimen is approximately 1 m above the ocean floor.