

have inhabited deeper waters. The essentially neritic fauna does include some littoral and pelagic types as well as benthonic forms such as skates and rays. These conclusions appear to be based only on the extant genera represented in the fauna, and, while this is undoubtedly a legitimate approach, it does overemphasize the significance of the elasmobranchs. In fact members of the following families are also well represented: bream (Sparidae); mackerel (Scombridae); wrasse (Labridae); hake (Merlucciidae); and swordfish (Xiphiidae). Apart from the swordfish, which is only rarely found in British waters, these fishes are not unusual in temperate latitudes today.

Casier's conclusions on habitat and climate contrast strikingly with those of Stinton, based on the otoliths, which suggest a fauna comparable to that now occurring between 40° and 50° south and comprising fish from deeper waters. Perhaps this discrepancy would be reduced if Casier's terms of reference were to be extended to family level and include forms with no living genera. If this is done an acceptable compromise of sub-tropical to warm temperate climate results and the disparity in the authors' conclusions is thereby minimized.

The data given by Casier are markedly at variance with those supplied by Stinton, but no explanation can be gleaned from the information in the monograph. Dr. E. I. White, in his preface, draws attention to this tantalizing aspect of the volume. As he states "the two lists prepared by Dr. Casier and Mr. Stinton, instead of supporting and complementing one another, are almost completely mutually exclusive, only two genera out of one hundred and twenty, and one species out of one hundred and thirty-seven, appearing in both lists". This species, *Ampheristus toliapicus*, is the only one of which a specimen with the otoliths *in situ* is known but has been assigned to a different family by Stinton and by Casier. Furthermore, fifty-two of fifty-eight genera based on skulls are extinct while sixty of the sixty-two genera identified from otoliths are extant. Of the fifty-six families listed only eleven occur in both authors' lists. White has advanced a possible explanation for this strange state of affairs. He has suggested that if the skulls are sufficiently massive not to disintegrate they will retain their otoliths, but if fragile the otoliths will be released and the individual bones broken up and swept away. This attractive theory could, one might imagine, be tested by suitable preparation of some of the skull material, which, again according to White, is "capable of yielding, with skilled preparation, a fund of information. . . ."

A few of the differences may well be a result of the classifications employed by the two authors; for example, among the clupeoids one author lists Albulidae, the other Pterothrissidae, when the latter is a synonym of the former. On the subject of the classifications employed, although they appear to be essentially those of Regan, it would have been helpful if the same classification had been used throughout. Indeed one would have liked to have seen a rather more up-to-date systema utilized. Comparisons are made more difficult by Stinton's listing of synonyms as separate families. Furthermore, it is surprising in a work of this nature for the diagnoses of new species to be omitted. Casier generally, but by no means always, gives diagnoses of new genera and where there is only one species in the genus this is sufficient. But where there are more than one species a simple generic diagnosis is not enough. In fact there are nearly thirty new species without diagnoses, with consequent prejudice to their validity. The listing of paratypes is unnecessary and is contrary to established practice.

In view of the high cost of this work, some comment is required on the illustrations. The plates can only be described as disappointing. The impression gained is that the specimens do not easily lend themselves to photography. If this is so it is a pity that there were not more of the excellent text figures. Unfortunately the otoliths,

which can undoubtedly be satisfactorily photographed, are shown only as diagrams.

Perhaps in view of the comprehensive coverage of the subject given in this large volume, it is a little unfair to be too critical. This monograph is certainly a landmark; it is refreshing to find a work of this nature which does not purport to be the last word on the subject. All too frequently the appearance of an authoritative monograph results in a lengthy hiatus in research, because it is generally felt that there is unlikely to be much left for further study. In this instance we have a welcome change in that problems are revealed which were previously quite unsuspected. There can be little doubt that one of the important consequences of the publication of this monograph will be the stimulation of further research into the fauna of the London Clay.

L. B. HALSTEAD TARLO

## IRRADIATED RABBITS

### The Toxicology of Radioactive Substances

Vol. 3: Iron-59. Edited by A. A. Letavet and E. B. Kurlyandskaya. Translated by R. E. Travers. Pp. v + 190. (Oxford, London and New York: Pergamon Press, Ltd., 1967.) 55s. net.

THE present volume, first published in Moscow in 1962, comprises fifteen investigations on the radiotoxicology of iron-59 in rabbits and rats by ten authors. The main thesis of the investigations is that "body reaction to internal administration of small quantities of radioactive substances depends to a considerable extent on the physicochemical properties of these substances and on the means of administration".

Two main series of experiments were made, in the first of which iron was administered orally to rabbits at a dose rate of 1  $\mu$ c. of ferric chloride/kg of body weight, and in the second at a dose rate ten times greater. These dose rates are assessed as ten and a hundred times the international maximum permissible concentration for iron-59 in water ( $6 \times 10^{-7}$  c./l. I.C.R.P. II in *Health Physics*, 3, 45; 1960). The reason for this is obscure, especially as the latter is quoted as  $4 \times 10^{-6}$  c./l. in the text.

The same obscurity surrounds the assessment of the total radiation dose rate ( $\beta + \gamma$ ) to tissue. For animals receiving 10  $\mu$ c./day the total dose rate to liver is quoted as 1.35 rads/day while the  $\beta$  dose was assessed as only 0.38 rads!

While the basic conception of the experiments was no doubt admirable and the planning most comprehensive, the conclusions do not appear to be justified from the observations.

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## SCANNING LITERATURE

### Microwave Scanning Antennas

Edited by R. C. Hansen. Vol. 2: Array Theory and Practice. Pp. xv + 400. 124s. Vol. 3: Array Systems. Pp. xvi + 422. 132s. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.)

THE subject of microwave scanning antennas has developed progressively since the Second World War with undoubtedly the largest contributions coming from the United States. Dr. Hansen has been closely associated with companies responsible for many of these developments and it is particularly appropriate that the three volumes should appear under his editorship. Hitherto texts on antennas have treated scanning in a superficial manner—here is a classic work of reference to which fourteen