

## ABSTRACTS OF MEMOIRS

### RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

#### PHOTOELECTRIC MEASUREMENTS OF THE SEASONAL VARIATIONS IN DAYLIGHT AT PLYMOUTH, FROM 1938 TO MARCH 1941, COMPARED WITH THE YEARS 1930 TO 1937

By W. R. G. Atkins and M. A. Ellison

*Proc. Roy. Soc., A*, Vol. 191, 1947, pp. 467-84

Measurements were made throughout with a vacuum sodium photoelectric cell and a Cambridge 'thread recorder'. The illumination during the last three years was below the average, but the three were closely similar. Of the eleven, 1930 was much the brightest, followed by 1934. The remainder were rather uniform. Of the eleven years May was brightest in six, June in four, July in one—1930. The mean value of the December illumination, found from the area of the intensity-time curve, is 1.37%, with May 15.61% and June 15.59%, calculated on the light of the year. The range of the monthly means lies between 20% for June and 59% for November.

There is no simple relation between the illumination integral and the number of hours of sunshine, rainfall, number of days with rain or wind direction. Calm days are never exceptionally bright; such days usually have wind force 3.

The illumination on days showing complete cloud cover throughout was during 1930 and 1936, 0.326 and 0.304 respectively of that on the brightest days, calculating on a month-to-month basis. Illumination on sunless days of 1930 was above that on similar days in 1936, a year of average illumination. On comparing Plymouth records with those got near Stockholm by Aurén it is seen that similar wide ranges in light intensity, within the same month, were found in both.

W.R.G.A.

#### NOTE ON THE SPECTROSCOPIC AND BIOLOGICAL DETECTION OF POTASSIUM IN SEA WATER AND 'POTASSIUM-FREE' ARTIFICIAL SEA WATER

By W. R. G. Atkins

*Journ. Conseil*, Vol. XV, 1948, pp. 169-72

Using sea water evaporated in silica dishes Moore and Philpot of Scientific Instrument Research Association showed lines 4044 and 4047 Å were less effective for detecting potassium than were 7699.0 and 7664.9 sought on F. Twyman's advice. After reducing glare by careful cleaning the latter pair

were detected in sea water supposedly potassium free. Glare was best eliminated by a selenium red glass. In the 'potassium free' water the ratio of potassium to sodium by weight was about 7 to 100 million, as found by a biological method of analysis. When the water was exhausted by maximal diatom growth potassium was still detectable spectroscopically in the filtrate, but this is not diatom free and accidental breakage of a centrifuge tube may have liberated some potassium. War prevented further work. W.R.G.A.

#### DAYLIGHT AND ITS PENETRATION INTO THE SEA

By W. R. G. Atkins

*Trans. Illuminating Eng. Soc. (London)*, Vol. X, No. 7, 1945, 12 pp.

A lecture delivered at the Annual General Meeting of the Society, summarizing work on the variation of daylight throughout the year and with latitude; the measurement of submarine illumination; and the consequent changes in the phosphate and oxygen of the sea which give a measure of the production of phytoplankton. W.R.G.A.

#### A SUGGESTED REPELLENT FOR SCHISTOSOME CERCARIAE

By W. R. G. Atkins

*Journ. Hygiene*, Vol. 45, No. 4, 1947, p. 468

Attack by cercariae of *Schistosoma haematobium*, *S. mansoni* and *S. japonicum* causes in man debilitating diseases which in certain countries are widespread. Infection is mainly through the skin. In U.S.A. and Canada a dermatitis only is caused by cercariae liberated from *Stagnicola emarginata* and other freshwater snails. Possibly copper oleate, stearate or palmitate might be effective repellents when applied in 1-5% dilution in mineral jelly or crude lanoline for cercariae and could be tried first against the relatively harmless species. Such copper compounds have been useful as anti-fouling agents and preservatives for ropes, etc. W.R.G.A.

#### THE NUTRIENT BALANCE IN THE SEA

By L. H. N. Cooper

*Research*, Vol. I, pp. 242-7

The interdependence of changes in the chemical composition of sea water and of variations in plant and animal production is reviewed. The account, not intended to be 'popular', is largely based on papers published from the Plymouth Laboratory during the past twenty-five years. L.H.N.C.

## THE DISTRIBUTION AND BIOLOGY OF HAKE

By T. John Hart

*Biol. Rev.* Vol. 23, 1948, pp. 62-80

Recent advances in our knowledge of the general biology, taxonomy and economic importance of the genus *Merluccius* are described by way of introduction to a detailed discussion of its distribution.

It is shown that all the species conform to the same distributional pattern in relation to major hydrological features, within the limits of their normal range. Where relatively cold currents flow towards the equator in the warmer half of the normal habitat of any one of these species, its range is extended in that direction; but if a relatively warm current is flowing pole-wards, the range in the direction of the equator is restricted. In the colder half of the normal habitat of each species the converse relationship holds good.

Surface isotherms have been used as the most reliable general criterion symptomatic of the environmental complex that leads to this type of distribution because in many parts of the world more detailed hydrological data are not yet available; but it is emphasized that other factors, more or less intimately interrelated with the direct effect of temperature, are also involved.

The distribution of the genus offers a good example of the wider aspects of the phenomenon of 'organic polarity' discussed by Wimpenny (1941), while the bionomics of the better known individual species show some more detailed aspects of it with great clarity.

T.J.H.

THE GIANT NERVE-FIBRES IN THE CENTRAL NERVOUS SYSTEM OF *MYXICOLA*  
(POLYCHAETA, SABELLIDAE)

By J. A. C. Nicol

*Quart. Journ. Micr. Sci.*, Vol. 89, 1948, pp. 1-46

A study of the giant axon in the central nervous system of *Myxicola infundibulum* has shown that this structure possesses many peculiar features. It occupies a large volume of the nerve cord and extends throughout the length of the animal. Its diameter is greatest anteriorly, about 1 mm., and tapers off posteriorly. In each segment it gives off branches to the longitudinal muscle fibres in the body wall. The giant fibre is connected with nerve cells in the supra-oesophageal ganglia, and with nerve cells in each segment. It is concluded that the giant fibre of this animal is a large syncytial structure extending throughout the nervous system and body wall.

Added evidence for its syncytial nature has been adduced by cutting it and examining the axon after 16 days. The giant axon failed to degenerate in front

of or behind the cut owing to the existence of nerve cells at all levels. The giant axon is similar in the related species, *M. aesthetica*.

The large diameter, rapid conduction velocity, and through nature of the axonic pathway have been correlated with the sedentary mode of existence and quick withdrawal reflex of these animals, and are regarded as having survival value.

J.A.C.N.

PURE AND ALLIED SCIENCE OF THE SEA  
(being the Ludwig Mond Lecture, delivered at the University of  
Manchester on 11 March 1948)

By F. S. Russell

*Science Progress*, Vol. XXXVI, 1948, pp. 423-35

Some aspects of marine research are reviewed historically to show how advances in our knowledge of the sea have been much influenced by the interdependence of pure and applied science.

F.S.R.

FURTHER EXTENSION OF THE RANGE OF *CREPIDULA FORNICATA* (L.)

By G. M. Spooner

*Journ. Conchology*, Vol. 22, 1947, p. 243

During the war years the Slipper Limpet, *Crepidula fornicata* (L.) spread into Weymouth Bay and by 1946 had become a dominant member of the fauna. In spreading westwards down the English Channel coast, the species had taken about twenty years to cross the gap between Studland Bay and Weymouth Bay.

G.M.S.

THE BRITISH SPECIES OF PSENINE WASPS (HYMENOPTERA: SPHECIDAE)

By G. M. Spooner

*Trans. R. Ent. Soc. London*, Vol. 99, 1948, pp. 129-72

Existing knowledge of the British species of the genera *Psenulus*, *Psen*, and *Mimesa* (slender fossorial wasps which prey on aphides and jassid plant-bugs) is summarized, covering both taxonomy and general biology. Much hitherto unpublished matter is incorporated, including records of prey kindly supplied by Dr O. W. Richards. New identification keys for the two sections of *Mimesa* are given. *M. bruxellensis* Bondr. is recorded as British for the first time, and *M. celtica*, a form inhabiting sand dunes in the west, is split off from *M. unicolor* (Lind.) as a new species.

G.M.S.

## REPORT ON THE SEA FISHERIES OF SIERRA LEONE

By G. A. Steven

London: Crown Agents for the Colonies, Millbank. 1947. 66 pp.

This Report is based on work carried out by the author on behalf of the Government of Sierra Leone for their guidance in developing the fisheries resources of the colony. It includes a survey of the methods of fishing already fully established, together with recommendations for their improvement. The results of experiments with methods new to that region, e.g. trawling and trammel-netting, are also described. Trials with a motor trawler based on Freetown gave very encouraging returns in regard to both the quantity and quality of fish available.

Most of the work was done during the recent war when fishing gear was hard to obtain. Ropes and twines made by hand by the natives themselves from local fibres had largely to be used but proved unsatisfactory. A hand-operated ropemaking machine was therefore introduced and local fishermen taught to use it. This proved a great boon and saved the beach-seining industry from collapse in particularly difficult times.

Fish preservation and transportation are two problems of special difficulty and importance in tropical regions. Native methods are crude and effective for only short periods. Recommendations are therefore made for exhaustive and prolonged experimentation so that new and improved techniques, appropriate to the commodity and the climate, may be devised and perfected. Particular attention is directed to the potentialities of dehydrated fish products for native use.

The report concludes with proposals and recommendations for the formation of a Fisheries Department, and the building of a local Fisheries Laboratory on a site already available on the outskirts of Freetown. The difficulty of recruiting well-qualified and adequately trained staff is fully realized, but it is pointed out that even a single energetic and competent fisheries biologist, assisted by educated and intelligent native helpers, backed by an enlightened public and supported by courageous Government policy, could do much to plan, prepare and initiate further development.

G.A.S.

## THE BRITISH RAIIDAE

By G. A. Steven

*Science Progress*, Vol. XXXV, 1947, pp. 220-36

Fishes of the genus *Raia* (Rays and Skates) collectively make an important contribution to the total landings of British food fishes. Just over a dozen species occur in British waters, and of these no less than eleven are present on the fishing grounds around Devon and Cornwall where they are caught with

little variation in numbers over the whole year. This indicates a minimum of migratory movement which is strikingly confirmed by marking experiments. In over 60% of the recaptures of marked *Raia clavata* (on which most work has been done) the fish were caught in precisely the same place as they were liberated, after periods varying from 12 days to over  $3\frac{1}{2}$  years. Because of this, the same fish can often be recaptured several times after marking. The record so far is held by a fish living in a depth of 25 fathoms that was captured five times within a year.

It is found that on the various grounds where different kinds occur there is a fairly rigid segregation of the species and at certain times, a segregation also of the sexes.

Growth rates have been obtained for *Raia clavata*. In fishes over a size-range of 20–50 cm. disc width an increment of from 4 to 8 cm. in width takes place in one year, chiefly in the summer and autumn. Male fish reach maturity when about 7 years of age but females are several years older before becoming sexually mature.

G.A.S.