ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

NOTE ON THE USE OF DIPHENYLBENZIDINE FOR THE ESTIMATION OF NITRATE IN SEA WATER

By W. R. G. Atkins

J. Cons. int. Explor. Mer, 1954, Vol. 20 (2), pp. 153–55

It was shown in 1932 that this reagent, once recrystallized from boiling toluene, can be used for years. The sensitivity is adequate and the colour stable even in bright daylight. All nitrate reagents used in strong sulphuric acid may give low results in presence of organic matter. This error is reduced when 20 mg. of the solid is dissolved in strong sulphuric acid and 7·5 ml. is run into a tube. The sample, 2·5 ml., is then added and is well stirred. The blue colour produced is an oxidation, not a nitration. The reaction is useful also in testing river and well waters and is quicker than the production of picric acid—a nitration product—in the usual test. Methods for the removal of traces of nitric acid from sulphuric acid were cited. Ramachandran heats with a very little formaldehyde, which goes to formic acid, or Pfeilsticker's ammonium chloride method may be used. With known amounts of potassium nitrate a relation may be found between concentration and intensity and this allows for impurity in the sulphuric acid also. W.R.G.A.

USE OF THE GLOBE PHOTOMETER

By W. R. G. Atkins and H. H. Poole

Nature, Lond., 1955, Vol. 175, p. 1003

The illumination in a shaded site may be expressed as a percentage of the use light received, from the whole sky, upon a horizontal plate or one may sure the effect at a point, by the action of light on uranium oxalate solution flask. The latter is preferable when studying the effect upon plant th. We had used a selenium rectifier cell under the usual opal diffusing plate, surmounted by an opal hemisphere and an opal globe, so as to render the disc equally sensitive to light at any angle. More recently we assembled a globe photometer with a thin-film caesium-on-silver-oxide vacuum photo cell, a type proved constant in sensitivity for over three years on a roof. This is free from temperature error and always gives a rectilinear relation between current and illumination. W.R.G.A.

Identification of Water-Masses by their Suspended Matter

By W. R. G. Atkins and Pamela G. Jenkins

Nature, Lond., 1955, Vol. 175, p. 951

For such identifications temperature, salinity and oxygen concentration have been used, also in special cases silica or hydrogen ion concentrations. Jerlov has shown the value of the visual determination of scattering in the Tyndall beam, which Poole and Atkins have measured using a photomultiplier tube. From September 1951 to July 1954 we filtered water from station E 1 through collodion discs. The albedo of the discs gave a good measure of the suspended matter. Apart from the living cells, the basis of the suspension was an amorphous mud, grey, yellowish or chocolate. The albedos were determined with a photo-electric disc, or visual comparisons were made by matching against Klincksieck's or Ridgway's plates. A. G. Lowndes examined the suspended particles using a petrological microscope, and especially important was his finding of microcline on discs from E 1 on 29 March, 1954. It was most abundant on the 5 m disc, which suggests that it had come out in fresh water and was slowly settling. The colour tests suggested the Permian Red Sandstone between Torquay and Exmouth as the source of suspensions found in October (1952 and 1953). W.R.G.A.

Observations on Luminescence in *Renilla* (Pennatulacea)

By J. A. C. Nicol

J. exp. Biol., 1955, Vol. 32, pp. 299–300

A study has been made of the luminescent responses of the sea pansy *Renilla köllikeri*. This is a pennatulid found in shallow water along the Californian coast. The responses take the form of light-waves which run over the surface of the rachis. They are controlled by an unpolarized nerve net, and are subject to facilitation.

By photo-electric recording it has been possible to analyse certain details of the luminescent response. At moderate rates of stimulation, several electrical shocks are usually necessary to evoke a luminescent wave, and subsequent flashes increase in intensity (facilitation). By lowering the frequency of stimulation, it is found that more stimuli become necessary to produce the first flash, owing to decay of facilitator.

Maximal estimates of latent period and flash-duration are of the order of 0·5 and 0·9 sec. respectively.

With repeated stimulation the luminescent response of *Renilla* becomes fatigued. Luminescence, furthermore, is inhibited by illumination. After exposure to light the ability to luminesce is lost and slowly recovers over the course of an hour.

Facilitation normally occurs terminally, at the level of the photocytes. By cutting the animal in various ways it has been possible to produce preparations in which neuro-neural facilitation becomes evident. This is occasioned by internuncial fatigue at residual interneural junctions. Normally, however, transmission is 1:1 throughout the nerve net. J.A.C.N.

BOOK REVIEW

The Chemistry and Fertility of Sea Waters

By H. W. Harvey Sc.D., F.R.S.

Cambridge University Press 1955

This forms a useful companion to two earlier books by the same author and deals with the physics and chemistry of sea water, especially as these affect or are affected by plant and animal life. The aim throughout is to deal with factors affecting the productivity of the sea and it contains much hitherto unpublished information.

The first part has a short introduction on the composition of sea water and the currents which cause transport and mixing. The changes caused by plants and animals are described, especially the carbon, phosphorus and nitrogen cycles, as well as the role of bacteria in effecting these changes. There is an account of the influence on plant growth of various physical factors. Of special interest is the section dealing with nutrients including those less known such as vitamin B_{12}. The dependence of animal communities on plant production is outlined.

The second part deals with the chemistry of sea water, including both major and minor constituents and the dissolved gases; there is a full account of the carbon dioxide system. A very useful section (in conjunction with F. A. J. Armstrong) gives details of the methods for estimating silicate and the different forms of phosphorus and nitrogen.

There is a good bibliography covering the most important recent literature.

A.P.O.