

## ABSTRACTS OF MEMOIRS

### RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

#### A MODIFICATION OF TEORELL'S METHOD FOR DETERMINING OF SMALL QUANTITIES OF AMMONIA

By M. Buljan

*Arh. Hem. Farm.*, T. 23, 1951, pp. 119-22

The use of Teorell's method (*Biochem. Z.*, Bd. 248, 1932, p. 246) is not satisfactory, since subsequent titrations of the hypobromite solution by means of a solution of naphthyl-red do not produce reproducible results. This is due to the interference of oxidation products of naphthyl-red. A way of eliminating this difficulty is given.

If hypobromite is not added in sufficient quantity to destroy the ammonium salt to be determined, another difficulty is encountered. This is a change in the direction of the titration curve, and owing to this the consumed volume of naphthyl-red is no longer in a direct relation to the quantity of ammonia actually present. An attempt is made to explain the behaviour of hypobromite when there is a surplus of ammonia by the production of hyponitrous acid radical, which, in an acid medium, has oxidizing properties and decolorizes the solution of naphthyl-red.

In order to eliminate these difficulties encountered when applying the original method, it is proposed to use a solution of potassium-indigo-disulphonate for the titration of the surplus hypobromite in an alkaline medium, instead of a naphthyl-red solution in an acid medium, as recommended by Teorell. M.B.

#### SULLA PRESENZA DI UN ORMONE D'ACCRESIMENTO IN UN CROSTACEO DECAPODE, LA *LYSMATA SETICAUDATA* RISSO (ON THE PRESENCE OF A GROWTH HORMONE IN A DECAPOD CRUSTACEAN, *LYSMATA SETICAUDATA* RISSO)

By D. B. Carlisle and P. F. R. Dohrn

*Ric. sci. suppl.*, 1953, pp. 95-100

In this paper, read before the Convegno di genetica e di scienze affine, held in the Genetics Institute of the University of Naples in June 1952, the discovery of a moult-accelerating or growth hormone in a decapod crustacean was first announced. A fuller account was published later in the *Pubbl. Staz. zool. Napoli*, Vol. 24, 1953, pp. 69-83 (abstracted in Vol. 32, No. 2 of the *Journal*), which, however, appeared in print before this account. D.B.C.

## STUDIES OF THE MESOGLOEA OF COELENTERATES.

## I. HISTOLOGY AND CHEMICAL PROPERTIES

By Garth Chapman

*Quart. J. micr. Sci.*, Vol. 94, 1953, pp. 155-76

Evidence of the collagenous nature of the mesogloea of coelenterates is provided by histological and chemical methods.

A description is given of the arrangement of the fibrous material forming the mesogloea in various medusae and in the actinians *Calliactis* and *Metridium*, where the crossed fibrillar structure is regarded as being determined by mechanical forces acting on the tissue.

The role of the mesogloea in the life of the animal is discussed; in particular its viscous-elastic properties are thought to be well adapted to its skeletal functions.

G.C.

## STUDIES ON THE MESOGLOEA OF COELENTERATES.

## II. PHYSICAL PROPERTIES

By Garth Chapman

*J. exp. Biol.*, Vol. 30, 1953, pp. 440-51

The physical properties of the isolated mesogloea of *Calliactis* and *Metridium*, which are mentioned in another paper (see above), are described in greater detail and the behaviour of the tissue on loading is recorded.

It is shown that the viscous-elastic properties of the body-wall which have been ascribed by previous authors to the muscles are the attributes of the mesogloea.

The thermal contraction of the mesogloea of *Calliactis* is compared with that of vertebrate collagen.

It is shown that the physical behaviour of the material is consonant with the crossed fibrillar collagenous nature of the mesogloea described in the other paper.

G.C.

## UPWELLING IN THE BENGUELA CURRENT

By Ronald Currie

*Nature, Lond.*, Vol. 171, 1953, pp. 497-500

In 1950 the R.R.S. *William Scoresby* carried out two surveys of the Benguela Current, which is one of the major features of the circulation of the South Atlantic Ocean. This current is a region where cool, nutrient-rich subsurface

water is upwelled to the surface and gives rise to a great production of planktonic plants and animals.

The observations indicate that the current is composed of a series of eddies, similar to those which Gunther had postulated in the Peru Coastal Current. In those eddies the upwelled water moving offshore converges sharply with interlocking tongues of warmer offshore water. In March upwelling was mainly in abeyance, but in September–October there was an active offshore transport of upwelled water. This is related to the more active coastal winds in the latter months. Analysis of the distribution of specific volumes of the water suggests that the mechanism of the upwelling is of a similar nature to that which occurs on the Californian coast.

The waters on the continental shelf have a very high inorganic phosphate content. It is suggested that this is partly due to local regeneration, as at some 'stations' the phosphate content was higher than that of the water being upwelled.

A deposit of diatomaceous mud, extending for some 400 miles along the coast, is populated with sulphate-reducing bacteria. It is overlain by water of a very low dissolved oxygen content. In March the oxygen depletion was much greater than in spring, and this is probably associated with the more quiescent state of the current in March. It is suggested that the O<sub>2</sub> depletion may to some degree be associated with mass mortalities of fish which frequently occur in the summer months.

R.C.

#### MICRODETERMINATION OF PHOSPHORUS IN BIOLOGICAL MATERIAL

By H. W. Harvey

*The Analyst*, Vol. 78, 1953, pp. 110–14

An absorptiometric method for determining the phosphorus content of small quantities of material within the range of 1–70  $\mu\text{g}$  of phosphorus has been devised and tested for precision. The material, collected by centrifuging, is decomposed in the centrifuge tube with sulphuric acid and hydrogen peroxide; pyrophosphoric acid is converted to orthophosphoric and any residual hydrogen peroxide decomposed with sulphite. The contents of the tube are diluted and the orthophosphoric converted to phosphomolybdic acid which is determined by the molybdenum blue method after controlled reduction with stannous chloride.

Experimental data are given to show the effect upon the blue colour formed due to (i) the concentration of stannous chloride, (ii) the temperature, (iii) acidity, and (iv) the time of reaction with stannous chloride. The effect of interfering substances is considered and experimental data are given which show the effect of traces of copper on the formation of the molybdenum blue.

H.W.H.

## THE DENSITIES OF SOME COMMON AQUATIC MOLLUSCA FROM PLYMOUTH

By A. G. Lowndes

*Ann. Mag. Nat. Hist.*, Ser. 12, Vol. 6, 1953, pp. 950-2

The density, sinking factor, and load carried when swimming or crawling are given for sixteen species of common Mollusca from the Plymouth district. The greatest density theoretically possible is something just short of that of aragonite, 2.95, while the lowest theoretical density is that of protoplasm, 1.05 (in the absence of fat).

*Ocenebra erinacea* L. attains a density of 2.07 while *Aplysia punctata* Cuvier has a density of 1.04. There is no apparent connexion between swimming ability and density. *Chlamys opercularis* (L.), whose density is 1.49, swims freely while *Aplysia* shows no sign of doing so. When *Chlamys opercularis* does swim it carries a load of 31% of its weight. The load carried by a typical teleost with a swim bladder is less than 0.2%.

A.G.L.

OBSERVATIONS ON CERTAIN MECHANICAL PROPERTIES OF THE  
LIGAMENT OF *PECTEN*

By E. R. Trueman

*J. exp. Biol.*, Vol. 30, 1953, pp. 453-67

The conditions of the opening and the closing of the valves of *Pecten maximus* and *Chlamys opercularis* have been illustrated by drawing stress-strain curves for the intact ligament and for isolated parts of the inner layer of the ligament. These curves form a hysteresis loop, the area enclosed in that of *Pecten* being markedly less than that of other lamellibranchs, indicating the greater efficiency of this ligament. This is attributed to the inner layer of the ligament, calcified uniformly in most lamellibranchs, but which in *Pecten* (and associated forms) has a large central non-calcified region. The modulus of elasticity in compression of this region is approximately one-seventh of that of the inner layer of *Ostrea* or *Lutraria*, which are calcified structures. Thus the inner layer of the ligament of *Pecten* has less resistance to compression but greater efficiency than that of most lamellibranchs. These properties are important in relation to swimming, in which the valves of *Pecten* open and close rapidly and frequently.

E.R.T.