

from the outer walls, and are composed of parallel longitudinal fibres enclosed between two membranous layers, do not reach the stomach sac in any part of their course, and that eight strong muscular bundles pass symmetrically through the whole length of the body cavity, being attached at one end to the disc which carries the tentacles, and at the other to the floor of the body cavity, while they are free in their intervening course.

Attached along the length of about the posterior half of each muscular bundle is the long sinuous generative band, with its chord-like craspedum loaded with thread cells. Just before terminating at the lower opening of the stomach sac each of the eight generative bands enters a most remarkable pectinated organ, which appears to be quite unrepresented in any other group of the Cœlenterata. It was difficult to suggest the true significance of these organs; their relation to the generative bands might lead to the belief that they are testes, or they may be analogous to the so-called cement glands which exist near the outlet of the oviducts in some of the lower animals. In this case they might supply some additional investment to the ova at the time of extrusion.

The author regarded *Edwardsia* as presenting a very distinct type of actinozoan structure, which occupies an intermediate position between that of the zoantharian and that of the alcyonarian polypes. He also compared it with the extinct rugose corals of the palæozoic rocks to which it corresponds in the numerical law of its body segments, and of which it might in some respects be regarded as a living non-coraligenous representation.

*On the Structure of Cyphonantes*, by Prof. Allman.

This remarkable little organism, whose structure and ultimate destination have been variously described by different observers, was obtained by the author in considerable abundance in Moray Firth. The animal is enveloped in a mantle, and the whole enclosed in a delicate, transparent, structureless test formed by two valve-like triangular plates which are in contact along two edges, and separated from one another by a narrow interval along the third. Its form is thus that of a very much compressed cone or pyramid. The author distinguishes by the term base the broader edge where the two plates of the test are separated from one another; while the other two edges are distinguished as the anal and ab-anal edges. The apex is the angle opposite to the base, and here a narrow passage exists through which the fleshy walls of the mantle are brought into immediate contact with the surrounding water.

In the base are two large oval openings, one, the larger, situated towards the anal edge, and the other towards the ab-anal. The former leads directly into the cavity of the mantle. Its edges are prolonged by a membranous lobe ciliated on its margin, and uninterruptedly continued round the anal side of the opening, but deficient on the opposite side. The interior of the lobe is occupied by a cavity.

A large part of the mantle cavity is occupied by the pharynx, a spacious thin-walled sac which opens into the mantle cavity by a long curved somewhat S-shaped slit with thickened and ciliated margins, which, at one side, are continued beyond the large opening situated near the anal side of the base in the form of two short ciliated tentacles. Towards the apex the pharynx becomes suddenly narrow, and is here lined by vibratile cilia, and marked by circular striæ which possibly indicate the presence of sphincter fibres. It now turns towards the anal side, and then bends downwards towards the base, and enters a thick-walled sub-cylindrical stomach. This runs towards the base parallel to and a little within the anal edge of the test, and is ultimately continued into a short straight intestine, which terminates by an anal orifice in the mantle cavity near the outer opening of the latter. From the upper part of the walls of the pharynx a narrow bundle of fibres passes to the apex of the mantle cavity.

Upon each side of the pharynx and lying against the stomach and intestine is a large oval mass. Its situation would suggest the probability of its being a hepatic organ, but it is altogether so enigmatical that it would be rash with our present knowledge of it to insist on assigning to it any special significance.

In contact with each of these enigmatical organs is a small tubercle, from which a bundle of short fibres pass off in a radiating direction. The resemblance of these bodies to a pair of nervous ganglia is obvious, but the author was more inclined to regard them with Schneider as indicating points of attachment of the contained animal to the two valves of the test.

The smaller of the two openings in the base, that, namely, which is situated near the ab-anal edge of the animal is, like the

other, surrounded by a hollow membranous lobe with ciliated margin. This is uninterruptedly continued round the ab-anal side of the opening, but is deficient on the opposite side. The opening leads into a special chamber entirely shut off from the cavity of the mantle and from the pharynx. The walls of the chamber are lined with cilia, and it has within it, or in immediate connection with its walls, two peculiar structures. One of these is a somewhat pyriform organ which, with one end close to the orifice of the chamber, extends from this point into its cavity; it is composed of a mass of spherical bodies. The other extends over the roof of the chamber in form of a cap; it consists of two portions, one of which lies directly on the walls of the roof, and has a transversely laminated structure, which, however, disappears towards the ab-anal side of the chamber; the other is an oval mass of globular cell-like bodies and lies on the free convex surface of the laminated portion.

Here again this part of the *Cyphonantes* is in the highest degree enigmatical, and yet it is difficult not to believe that in the structures just described we have an ovary and testis with associated accessory structures.

The author observed no further fact which might tend to throw light on the ultimate destination of *Cyphonantes*, and more especially nothing which might tend to confirm the remarkable views lately published by Schneider, who believes that he has traced its development into the polyzoal *Membranipora pilosa*. The structure is considerably more complicated than Schneider seems to be aware of, while the opinion of this observer that the whole of the proper *Cyphonantes* structure becomes absolutely obliterated and the body of the animal converted into an amorphous mass of cells from which the *Membranipora* becomes evolved not by a process of budding but by a differentiation of structure is so startling that notwithstanding the partial assent lately given to it by Nische we are compelled to wish for further confirmation of the evidently careful observations of the German zoologist.

If the ab-anal chamber described above with its associated structures really belongs to the generative system—and it is hard to say what else it can be—the view that *Cyphonantes* is a polyzoal larva is scarcely tenable.

## SOCIETIES AND ACADEMIES

### PARIS

Academy of Sciences, Aug. 19.—M. Faye in the chair. MM. Jamin and Richard read the second part of their paper on the laws of cooling, and the cooling power of gases. The authors have determined the amount of heat abstracted by a gas from a warm solid placed in its midst.—A. and P. Thenard presented a memoir on the action of ozone on indigotic sulphate and on arsenic acid. The authors find that ozone decolorises three times as much indigo as the law of equivalents would lead one to suppose, and that this reaction takes place in two well-marked periods. Two-thirds of the indigo are decolorised, in the first of these periods, almost instantaneously, and one-third in the second period after the lapse of several hours. The authors ascribe this second action to hydric peroxide (*eau oxygénée*) formed by the ozone. The authors are led to doubt whether ozone is really a triple atom molecule, or whether it is simply oxygen in which is condensed a powerful selective force. They intend to thoroughly investigate this question.—M. Daubrée reported his examination of the meteorites which fell at Lancé and at Anthon (Loir-et-Cher) on the 23rd July, 1872. The Lancé stone weighed 47 kilogrammes; the one which fell at Anthon, 12 kilometres from Lancé, was much smaller. Their structure was granular, and some of the grains acted strongly on polarised light; they were evidently portions of the same mass. Specific gravity, 3.8. Elements found: iron, cobalt, nickel, copper, sodium, sulphur, chlorine, silicon, and oxygen.—Max Marie followed on the determination of the perimeter of the region of convergence of the series of Taylor, &c.—M. Mallard read a paper on the action of silicic anhydride and analogous oxides on sodic carbonate at a high temperature.—On the combined use of morphia and chloroform during surgical operations, and on a new mode of administering the latter. M. Demarquay, the author, convinced of the great danger incurred by the combined use of these agents, has abandoned it and devoted himself to the improvement of the apparatus employed for the administration of chloroform. The apparatus in question consists of a flannel mask stretched on a wire frame; the chloro-

form is poured drop by drop on its surface.—Observations on a note by Prof. Respighi on the solar protuberances, by S. Tacchini. The author asserts that no dependence can be placed on the details of any drawings of the prominences except when made with a telescope of large aperture.—M. Trève, in a paper on the magnet, mentions some experiments from which he deduces that the “transformation” of a bar of soft iron into a magnet requires a mechanical work and a molecular action of a kind as yet unknown.—“On the compressibility of Air and Hydrogen at high temperature” by M. Amgat. The author asserts that up to 320° these gases follow the law of Mariotte. M. Berthelot followed, on the distribution of a base between several acids in solutions. “On the aptitude of certain gases to acquire persistent active properties under the influence of electricity” by M. Chabrier. The author finds that hydrogen when acted on by electricity possesses the power of uniting directly with the nitrogen of the air and of reducing newly precipitated oxide of silver, even after it has travelled some distance from the point where the electricity was allowed to act on it. M. G. Lechartier, in a paper on the reproduction of pyroxene and peridot, stated that he had succeeded in preparing these minerals by heating mixtures of their constituents.—M. P. Bert followed with “Experimental researches on the effects of changes of barometric pressure on the phenomena of life.” In a very interesting paper of great practical importance as regards miners and divers working under great pressure, the author cited the case of an English company who in a single year lost ten divers out of twenty-four three of these died suddenly on coming to the surface, *i.e.*, at the moment of sudden release, from a high pressure and seven after several months of suffering from paralysis also died. The author concludes (from a series of experiments of cats and dogs) that up to five atmospheres two or three minutes should be allowed for the pressure to decrease, above that much more time must be allowed, and at nineteen atmospheres five minutes per atmosphere at least is required. If the pressure is allowed to decrease more rapidly than this death is certain.—“Comparative researches on the absorption of Gases by the blood: estimation of Hæmoglobin,” by M. N. Gréhaunt. The author describes a method of estimating Hæmoglobin by observing the quantity of carbonic oxide the blood will absorb. Application of Meteoric Metamorphism to the study of the black crust of grey meteorites, by M. S. Meunier.—M. A. Cheux describes a white Aurora Borealis observed at La Baumette near Angers on August 8, 1872, and says that great disturbance was observed on the sun on the morning of the 9th; he gives a view of the sun showing twenty-four spots.—Extracts from two letters from Messrs. Guiscardi and H. de Saussure relative to the late eruption of Vesuvius.—Appearance of a meteor in the department of Vienne, July 23, 1872 (extract of a letter from M. Daurée). This was the meteor of which portions fell in the Canton of St. Amand, Loir-et-Cher, Vienne is forty kilometres distant from the places where the two portions of the meteorite fell.—M. Tellier read a note on the supersaturation of water. Water may be cooled 3° or 4° below zero in a glass vessel and still remain liquid in which state it may be violently agitated but a very sudden blow often causes its solidification. M. J. Gerard exhibited photographs of the interior of an aquarium.

August 26.—M. Faye, president.—Determination of the mutual actions of Jupiter and Saturn to serve as a base for the respective theories of the two planets, by M. Le Verrier.—In a note on the action of carbon and iron on carbonic anhydride at a high temperature, by M. Dumas, the author refutes a statement lately made by M. Durmfaut that these bodies do not react unless hydrogen is present.—Mr. C. Peters announced the discovery of two new planets, 122 and 123. The planets are of the 11.5 and 12th magnitudes respectively.—New researches on the propyl compounds, by MM. Is. Pierre and E. Puchot.—In new experiments on spontaneous generation, by M. Donné, the author supports the well-known views of M. Pasteur.—Elementary theory of simple integrals and of their periods, by M. Max Marie.—On the physical constitution of the sun, by M. E. Vicaire. The author returns to the old theory of a comparatively cold nucleus which he regards as most probably liquid. He considers that the tremendous explosions of which the sun is the seat could not occur from the midst of a mass of disassociated gases.—Notes were received from M. Brachet relating to the improvement of microscopes; from M. Lanale, relating to aerial navigation; from M. Clarke, relating to cholera; from M. Roussett, relative to certain questions concerning medicine.—On the spherical representation of surfaces, by M. A. Bibancour.—

Letter from M. Gasparis, on a new mechanical theorem.—On ozone and hydric peroxide (*eau oxygénée*). M. F. Le Blanc sent a note relating to the paper by the Messrs. Thenard in No. 8 *Comptes Rendus*, 1872. The author states that in 1854 he discovered that ozone acted on water with the production of hydric peroxide.—Industrial employment of ozone for the destruction of the empyreumatic taste of whisky, and in the manufacture of vinegar, by M. Widemann. The author established a factory at Boston, U.S., where whisky was thus treated at the rate of 12,000 gallons per week. He also converted maize whisky into vinegar by diluting it with seven volumes of water, and then treating it in the same way.—On the divisions of a base between several acids in solution, dibasic acids, by M. Berthelot.—Action of cupric sulphate on normal urine, by M. Ramon de Luna.—M. P. Bert communicated a seventh note on the influence of change of barometric pressure on the phenomena of life.—On noctilucine, by Mr. T. L. Phipson. Noctilucine is the substance which is secreted by the various animals which are phosphorescent in the dark. The author believes that the same substance is secreted by certain plants (*Agaricus, Euphorbia, &c.*) and that it is also produced by the fermentation and decomposition of various vegetable and animal matters. The spectrum of this substance lies entirely between the lines E and F of the solar spectrum.—On the iodide of nitrogen, by Husson, *fil.*—M. Le Verrier presented observations of the August meteorites, from Greenwich, Lisbon, and at Volpeglino.—M. Chapelas announced, respecting the meteorites of the 8th, 9th, 10th, and 11th of August, that the mean hourly number was 33.5, a decrease of 6.4 on last year. The number for 1872 was only about one third of that for 1848.—A new communication from M. Pigeon, on the typhus of horned beasts, was submitted to the examination of M. Bouley.

## PAMPHLETS RECEIVED.

ENGLISH.—The Lead and Zinc Mines of the Mendips: H. B. Woodward.—What Determines Molecular Motion, the Problem of Nature: J. Croll.—A Letter to the Marquis of Salisbury on the Public Health Bill: W. Child.—The Building and Ornamental Stones of Great Britain and Foreign Countries: E. Hull.—British Association for the Advancement of Science, Report of Committee on Science Lectures and Organisation, Past and Present.—Quarterly Magazine of the Brighton Grammar School, Part II.—Science and Art, a Sermon to the Memory of F. D. Maurice: L. D. Bevan.—Economy of Fuel in the Blast Furnaces for Smelting Iron: I. L. Bell.—Quarterly Weather Report of the Meteorological Office, January to March, 1871.—The Vomiting of Pregnancy: E. Munro.—On the use of the Stethoscope of Obstetrics: E. Munro.—A Puzzle in Rain and Air.—Proceedings of Geologists' Association, July.—Quarterly Journal of Education, July.—College of Physical Science, Newcastle-on-Tyne, Prospectus for Session 1872-73.—A Discussion of the Meteorology of the part of the Atlantic lying north of 30° N. lat. for the eleven days ending February 8, 1870.—Charts and Diagrams to accompany ditto.

AMERICAN AND COLONIAL.—Canadian Naturalist, July.—Indiana Journal of Medicine: T. M. Stevens, Vol. III, No. 2.—Abstract of Reports of the Surveys of the Geographical Operations of India for 1870-71.—Abstracts of Specifications of Patents (Victoria) applied for from 1854 to 1866, No. 1.—Metals: W. H. Archer.—Report of the Coalfields, Western Part of Victoria.—Reports of Surveyors and Registrars for Quarter ending March 11, 1872, Victoria.—Notes on the Post-Pliocene Geology of Canada: J. W. Dawson.—The Popular Science Monthly, Nos. 1-4.—The Australian Mechanic, No. 7, July, 1872.—Eighth Report of the Board of Visitors to the Observatory, Victoria.—Bulletin of the Museum of Comparative Zoology at Harvard.—Notes on the Ornithological Reconnaissance of Kansas, Wyoming, and Utah: J. A. Allen.

FOREIGN.—Zeitschrift für Biologie, Vol. viii., No. 2.—Bulletin de la Société d'Anthropologie de Paris.—Classification de 250 matières tannantes: M. Bernardin.—Memorie della Società degli spettroscopisti italiani.—Matériaux pour la faune Belge, 2<sup>me</sup> part.—Myriopodes: F. Plateau.—Oversigt. af kongl. Vetenskaps Akademiens Forhandling, Nos. 3, 4, 7.—Atti della reale accademia dei Lincei, tom. 25, Ann. 25, 1871-72.—Verhandlungen des naturhistorischen Vereins, Riga, Vol. 1, 2, 1872.

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