

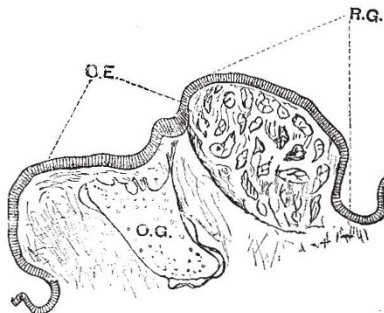
instead of cork, but air is a troublesome substance to deal with ; it leaks out very easily, and without showing any signs of having done so, which might readily lead to serious consequences. A special pump is required to make up loss by leakage.

The merit of cork is its extreme simplicity and trustworthiness. By mixing a certain proportion of glycerine with the water it will not freeze in any ordinary cold weather.

NOTE ON THE RUDIMENTARY GILLS, ETC., OF THE COMMON LIMPET (*PATELLA VULGATA*)

SPENGL, in his admirable paper "Die Geruchsorgane und das Nervensystem der Mollusken" (*Zeitschrift f. wiss. Zool.* xxxv.), figures a transverse section of one of the rudimentary gills and its surroundings. This appears to be incorrect in one or two particulars. In the first place the gill is figured as projecting freely at the surface. The examination of numerous sections has, however, convinced me that the epithelium is continued over the gill, being very high where continuous with the olfactory epithelium over the ganglion, but gradually getting lower, and passing into the ordinary epithelium, which lines the nuchal chamber. Consequently the rudimentary gill is *beneath* the surface, and moreover the sensory tract is partly extended over it, not being confined to the region immediately superjacent to the olfactory ganglion. Cunningham (*Q. J. M. S.*, xxii.), calls attention to the true relations of the gill, but gives no figure.

Spengel also represents the rudimentary gill as being full of large blood-sinuses, but carefully-prepared specimens show that these are in reality traversed by numerous fine strands of connective-tissue. The entire organ is made up of trabeculae of



Transverse Section of Rudimentary Gill, &c., of *Patella vulgata* (x 90). R.G. Rudimentary gill ; o.e. olfactory epithelium ; o.g. olfactory ganglion.

connective-tissue, amongst which connective-tissue corpuscles abound. In some of the lacunae masses of blood-corpuscles may be found.

Several small nerves run from the olfactory ganglion to the olfactory epithelium, and in some specimens nerve-fibres can almost be traced into the sense-cells. Gibson ("Anatomy of *Patella vulgata*," *Trans. R. S. E.*, xxxii.) has been unable to detect an olfactory ganglion. This is, however, very evident in microscopic sections.

I have used the term "rudimentary gills," for there seems little doubt that the structures in question are, as Spengel advocates, of this nature, but, lying as they do beneath the surface, they can hardly be functional. This position, too, suggests that these organs must have been rudimentary for a very long time. As *Patella* (*Palacmæa*) occurs in the fossil state as far back as the Middle Cambrian (*Sedg.*), the pallial gills may have been developed for a considerable period.

If, as Spengel believes, the molluscan olfactory organ enables the animals of that group to perceive the quality of the water passing over the gills, it is difficult to understand its well-developed state in *Patella*, where its position would appear to prevent such a use. Hence the olfactory organ in this form probably has some other function—possibly it may have something to do with the locality-sense, though this is very improbable (see note by author on "The Habits of the Limpet," *NATURE*, vol. xxxi. p. 200). The preceding observations were made at the Scottish Marine Station.

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UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—At the annual Scholarship election at St. John's College the following awards were made to students of Mathematics and Natural Science:—Hutchinson Studentship of 60*l.* a year for two years to A. C. Seward (First Class Nat. Sciences Tripos, Part II.), to enable him to follow up his researches in Fossil Botany; Hockin Prize for Physics with especial reference to Electricity, to Stroud (First Class Nat. Sciences Tripos, Part II.); Herschel Prize for Astronomy to Fletcher (Second Wrangler); Hughes Prizes for Mathematics to Fletcher, and for Natural Science to Rolleston (First Class Nat. Sciences Tripos, Part II.); Wright's Prizes for Mathematics to Baker and Orr, for Natural Science to Lake and Groom; Foundation Scholarships in Mathematics to Middlemast, Pressland, Tate, Bradford, Flux, and in Natural Science to Lake and W. Harris; extension of tenure of Scholarships to Kirby, Mossop, Bushe-Fox, and Baker in Mathematics, and to Shore and Turpin in Natural Science; Exhibitions in Mathematics to Hill, Fletcher, A. E. Foster, Norris, Varley, H. H. Harris, Orr, Greenidge, Flux, Card, Palmer, Millard, and in Natural Science to Lake, Groom, Rolleston, Seward, W. Harris; a Proper Sizarship in Natural Science to Cowell.

The following gentlemen have obtained first-class honours in the Natural Sciences Tripos, Part II., the subject for which they were specially classed being given after the name:—Carnegie, Chemistry, Caius; Edkins, Physiology, Caius; Hawkrige, Geology, Clare; Hudson, Physics, Pembroke; F. W. Oliver, Botany, Trinity; Rolleston, Human Anatomy with Physiology, St. John's; Seward, Geology, St. John's; Skinner, Chemistry, Christ's; Stroud, Physics, St. John's. Miss Freund, of Girton, was placed in the first class for Chemistry.

Messrs. Dixon, of Trinity College, and Fletcher, of St. John's, are respectively Senior and Second Wranglers. Both were educated at New Kingswood School, Bath, under Mr. T. G. Osborn. Miss Frost, of Newnham College, was placed between the 24th and 25th Wranglers.

In a recent discussion Prof. Stuart stated that 58 students attended the engineering courses and workshops in the Lent Term. Of these 32 were to be engineers; 7 were to engage in manufactures in which a knowledge of engineering was desirable; 3 were going into the army; 2 were to become teachers. As to their University position, 9 were M.A. or B.A., 21 were ready for the Mathematical Tripos, 2 for the Natural Sciences Tripos, 18 for the Special Examinations in Applied Science; 6 had only come to the University for a year's work in the workshops; 5 were not matriculated students.

DR. ORME MASSON, a graduate of Edinburgh University, and lately Elective Fellow in Chemistry, has been appointed to the Chair of Chemistry at Melbourne, Australia.

SCIENTIFIC SERIALS

Bulletins de la Société d'Anthropologie de Paris, tome ix., fasc. 1, 1886.—The present number gives the usual annual recapitulation of the rules of the Society, the lists of members, addresses by the outgoing and incoming presidents, financial and other reports, &c.—M. Moncelon laid before the Society a *résumé* of the principal results of his observations on the half-castes of New Caledonia during his residence in the colony. He drew attention to the evils resulting from the practice commonly followed by the native mothers of half-castes, of going back with their children to their native tribes, amongst whom these half-whites grow up in slavery as savages.—On certain Hova and Sakalava skulls, by M. Trucy. Both of these cranial groups are dolichocephalic, with an index of about 74, which is nearly the same as that of the Arabs of Algiers and the pariahs of Bengal. The Hovas and Sakalavas appear to be more intelligent than any other tribes of Madagascar, but while the Sakalava queen, the ally of France, submitted with her husband to be made the subject of careful anthropometrical observations, she enjoined upon the French officers to punish with death any one who opened or rifled a grave. It was consequently only by artifice and extreme circumspection that M. Trucy was able to obtain crania or other human bones. In the discussion which followed, regarding the mixed characters of the Hova crania, MM. Topinard, Dally, and others entered warmly into the question of typical and other distinctions of race.—On the development, in the adult, of supernumerary digits, by M. Fauvelle.

This paper, which supplies some suggestive and not uninteresting matter, is based upon observations on the abnormal development in a full-grown axolotl of a fifth digit at the base of the fourth, and the gradual reparation, by multiplication of the parts, of various injuries to the other phalanges. Dr. Fauvelle considers at length the conditions on which the formation of supplementary parts in the adult may possibly depend, and whether we may not refer such abnormal manifestations of activity to a reversion in the cells of the connective-tissues to an embryonic condition, in which segmentation is possible. M. Avia, in confirming the views of Dr. Fauvelle as to the influence of heredity in the human species on the appearance of supernumerary organs, instanced the family of the Fodli, which for several centuries had exercised patriarchal supremacy over a tribe of the Arab Hyamites. In this family, whose members are not allowed to marry beyond the limits of their own kindred, polydactylism has become an established hereditary character, and is considered as an indispensable evidence of legitimacy, and right of succession. M. Avia has personally examined various Fodli, all of whom had twenty-four phalanges on their hands and feet.—On heredity, by Dr. Fauvelle. In this, as in the preceding paper, the author draws attention to the injury done to scientific inquiry by the constantly increasing recklessness with which physiological and anatomical conditions, whose causes we are ignorant of, are indiscriminately referred to so-called "atavism." It must be confessed, however, that the author himself in his exposition of the significance of the phenomena of heredity, as given in this paper, and in his more recent communication to the Society of his views regarding the real or assumed existence of atavism, exhibits the same want of accuracy and close definition which he condemns in others, and the vagueness of the opinions which he has enunciated with such dogmatic temerity excited a lively controversy, in which MM. Laborde and Sanson, and Mme. Cl. Royer, with other members, took part.—On primitive forms of numerations, by M. Letourneau. In this paper, and in the discussion which followed its reading, attention was drawn to the development, among some peoples, of a decimal system of numeration from the natural counting of the fingers, while according to Bachofen and others, the decimal method was preceded, in those earlier periods of civilisation in which the matriarchal principle was still in force, by the octomal system. Curious evidence of the prevalence of this practice of counting by 8 is afforded in Sanskrit, and in Greek and Latin, as well as in several modern European forms of speech, by the close affinity, if not identity, of the words signifying nine and new, as, e.g., the French "neuf," thus showing that the numeral following eight was of more recent acceptation than the final term of the octomal form of numeration.

Bulletin de l'Académie des Sciences de St. Pétersbourg, vol. xxi. No. 1.—List of the members of the Academy on March 1, 1886.—Diagnoses of new plants from Asia, by C. J. Maximowicz, part 6 (Latin), containing a good many new species.—Report on new linguistic materials contained in the "Codex Comanicus," by Prof. Radloff (German).

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 10.—"A Minute Analysis (experimental) of the various Movements produced by stimulating in the Monkey different Regions of the Cortical Centre for the Upper Limb, as defined by Prof. Ferrier." By Charles E. Beevor, M.D., M.R.C.P., and Prof. Victor Horsley, F.R.S., B.S., F.R.C.S.

The following investigation was undertaken as prefatory to a research into motor localisation of the spinal cord.

Anatomy.—(1) Attention is drawn to some minute details of the topographical anatomy of the upper limb centres as defined by Prof. Ferrier.

(2) Outlines of the shape and arrangement of the fissure of Rolando, the præcentral and intra-parietal sulci.

(3) Proof adduced in support of the authors' opinion that the small horizontal sulcus named X by Prof. Schäfer really corresponds to the superior frontal sulcus of man.

Previous Researches.—Ferrier's results are then given in full.

Method of Experimentation is explained in detail, as also the mode of subdivision of the part of the cortex investigated into centres of about 2 mm. square.

From the results of excitation are then deduced the two following axioms:—

Axiom I.—Viewing as a whole the motor area of the central cortex for the upper limb, as defined by Prof. Ferrier, we find that the regions for the action of the larger joints are situated at the upper part of the area, i.e. closer to the middle line, while those for the smaller and more differentiated movements lie peripherally at the lower part of the area.

Axiom II.—As a broad result, extension of the joints is the most characteristic movement of the upper part of Ferrier's arm centre; while flexion is equally characteristic of the movements obtained by stimulating the lower part. Finally, between these two regions there is a small portion where flexion and extension alternately predominate, a condition to which we have given the name of *confusion*. (Here both flexors and extensors are contracting at the same time, and consequently the joint is usually fixed in a neutral position, each group of muscles alternately drawing it in opposite directions.)

Priority of Movements is found to take place, and follows the "march" first indicated by Dr. Hughlings Jackson as existing in epileptic seizures.

This *march* is in accordance with Axiom I., since the shoulder commences the series of movements in the uppermost part of the area, the thumb at the lowest part, and the wrist in the intermediate part.

Summary.—(1) That X is the superior frontal sulcus of man.

(2) That the movements of the joints are progressively represented in the cortex from above down.

(3) Localisation of sequence of movements.

(4) Localisation of quality of movements.

(5) That there is no absolute line of demarcation between the different centres.

Mathematical Society, June 10.—J. W. L. Glaisher, F.R.S., President, in the chair.—At a special meeting the following resolution was unanimously carried:—"That the Council be empowered to take the necessary steps to obtain a charter of incorporation for the Society."—At the ordinary meeting Messrs. A. R. Forsyth, F.R.S., R. Lachlan, and the Rev. J. J. Milne were admitted into the Society.—The following communications were made:—Reciprocation in statics, by Prof. Genese.—On the theory of screws in elliptic space (third note), by A. Buchheim.—Some applications of Weierstrass's elliptic functions, by Prof. Greenhill.—Formula for the interchange of the independent and dependent variables with some applications to reciprocants, by C. Leudesdorf (second paper on reciprocants), by L. J. Rogers.—On the motion of a liquid ellipsoid under the influence of its own attraction, by A. B. Basset.—Electrical oscillations on cylindrical conductors, by Prof. J. J. Thomson, F.R.S.

Chemical Society, May 20.—Dr. Hugo Müller, F.R.S., President, in the chair.—The following papers were read:—Sources of error in the calorimetric study of salts, by Prof. W. A. Tilden, F.R.S.—On the action of aldehydes and ammonia on benzil, by Francis R. Japp, F.R.S., and W. Palmer Wynne, B.Sc.—On imabenzil, by the same.—On ammonia-derivatives of benzoïn, by Francis R. Japp, F.R.S., and W. H. Wilson, Ph.D.—On compounds from benzil and benzoïn and alcohols, by Francis R. Japp, F.R.S., and Julius Raschen.—On the action of phosphoric sulphide on benzophenone, by the same.—The separation and estimation of zirconium by means of hydrogen peroxide, by G. H. Bailey, D.Sc., Ph.D.—An apparatus for the determination of the temperature of decomposition of salts, by the same.—The retention of lead salts by filter-paper, by L. Trant O'Shea.

June 3.—Dr. Hugo Müller, F.R.S., President, in the chair.—The following papers were read:—Notes on Sir W. Fairbairn's experiments on re-melting cast iron, by Thomas Turner, Assoc. R.S.M.—Some ammonium compounds and other derivatives of α -1' hydroxyquinoline, by C. A. Kohn, B.Sc., Ph.D.— β -sulphophthalic acid, by Prof. C. Graebe and A. Réé, Ph.D.—Compounds obtained by the aid of β -sulphophthalic acid, by the same.—Derivatives of taurine (part 2), by J. William James.

Anthropological Institute, June 8.—Mr. Francis Galton, F.R.S., President, in the chair.—The election of Mr. Joseph J. Mooney was announced.—Mr. C. H. Read read a paper on the ethnological exhibits in the Colonial and Indian Exhibition, in which he reviewed briefly the collections to be seen in the various courts, and described in detail some of the objects. The author dwelt especially upon the meagreness of the collection sent from the Dominion of Canada, where there is such a vast