of small-pox and typhus were mainly due to these causes. (3) The cheapness of food, clothing, and fuel had, of course, diminished the tendency to disease, and the ease with which fresh fruit and vegetables were to be got had abolished the taint of scurvy which was so fatal to our ancestors. (4) The water-supply had been improved, and the intake of the water companies was now removed to a portion of the river less tainted with sewage than that formerly in use. (5) Although the system of sewage disposal was an undoubted evil, and had given us three or four epidemics of cholera, and was the foster-mother of typhoid, still it was probable that so far the balance for good was in its favour, because it had removed a good deal of filth from dwellings.

The outlook in the future was dashed by three considerations :—(1) Our system of sewerage and water-supply had increased overcrowding by enabling us to build houses of any height without inconvenience to the occupant, and without any curtilage whatever, and since all sanitarians recognized that overcrowding was the greatest of all sanitary evils, it was impossible to shut one's eyes to this danger.

(2) There was an expensive and menacing "loose end" to our sanitation in the shape of 150,000,000 gallons of sewage pouring into the Thames every day. The only proper destination of organic refuse was the soil, and it was not possible to see the end of the gigantic blunder we had committed in throwing it into the water.

(3) The rapid increase of population along the Valley of the Thames where sewage disposal is on the same lines as in London, must make us apprehensive for our water-supply, because the various tricks played with sewage in the shape of precipitations, &c., were not probably of a kind to make the effluent a desirable or a wholesome beverage. If the evil effects of free trade are to be counteracted, it will be by returning the refuse of our towns free of cost to the impoverished agriculturist. "If we go on as we are going," said the lecturer, in conclusion, "and if our brethren in the colonies follow our bad example, as they appear to be doing, it will be a Chinaman rather than a visitor from New Zealand who will sit in contemplation on the ruins of London Bridge."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Among the scientific lectures this term, we may note the following :—

Prof. Clifton, Acoustics and Magnetism ; Mr. Selby, Theory of Electrical Measurements.

Prof. Odling, Four-carbon Compounds ; Mr. Veley, Physical Chemistry ; Mr. Vernon-Harcourt, Quantitative Analysis.

On the Biological side, the Linacre Deputy-Professor, Mr. Hatchett Jackson, lectures on the Morphology of the Invertebrata, Mr. P. C. Mitchell on the Morphology of the Cell, and Mr. Barclay Thompson on the Osteology of the Sauropsida. Prof. Burdon-Sanderson's subject is the Nervous System. Prof. Green is giving two courses of lectures on Geology, and Prof. Gilbert lectures on the Rotation of Crops and the Feeding of Animals.

On the Mathematical Lecture List we find that Prof. Sylvester is treating of Surfaces of the Second Order (illustrated by models), Prof. Price of Hydromechanics, and Prof. Pritchard of the Elements of the Planetary Theory.

SCIENTIFIC SERIALS.

THE *Quarterly Journal of Microscopical Science* for December 1888 contains the following :—Note on a new organ, and on the structure of the hypodermis, in *Periplaneta orientalis*, by Edward A. Minchin (plate xxii.). The new organ consists of two pouch-like invaginations of the cuticle lying close on each side of the middle line, between the fifth and sixth terga of the dorsal surface of the abdomen. They are covered by the fifth tergum ; when exposed they are seen to open by two slit-shaped openings, which open backwards. They are lined by a continuation of the chitinous cuticle, which forms within the pouches numerous stiff, branched, finely-pointed hairs, below which are numerous glandular epithelial cells. As to their function, it is suggested that they are stink glands.—On certain points in the structure of Urochæta, E.P., and of Dichogaster, nov. gen., with further remarks on the nephridia of earthworms, by Frank E. Beddard (plates xxiii. and xxiv.). The important facts recorded about the anatomical structure of the species of these two genera, and on the nephridia in earthworms, do not admit of being further condensed. *Dichogaster damonis*, nov. gen. et sp., is described from Fiji.—On the development of *Peripatus novæ-zelandiæ*, by Lilian Sheldon (plates xxv. and xxvi.). A further supply of living specimens was obtained in January 1888. Twenty-seven out of forty-nine were females. The uteri of all but nine of these were filled with embryos. The stages of development did not allow of all the gaps left in Miss Sheldon's previous paper being filled up, but this paper is a welcome addition to our knowledge. A useful summary of the author's investigations is appended.—Note on the development of Amphibians, chiefly concerning the central nervous system ; with additional observations on the hypophysis, mouth, and the appendages and skeleton of the head, by Dr. Henry Orr, (plates xxvii. to xxix.).—Studies on the comparative anatomy of Sponges, ii. on the anatomy and histology of *Stelospongus flabelliformis*, Carter ; with notes on its development, by Arthur Dendy (plates xxx. to xxxiii.). This interesting paper may be regarded as the first-fruits of Mr. Dendy's researches into the anatomy and embryology of recent Australian Sponges, and we hope to be long favoured with such. The embryos, "each as large as a small pea," of *S. flabelliformis*, Carter, were found in abundance. Though varying in diameter from about 3 to almost 5 mm., they exhibited nearly the same stage of development. Doubtless we may expect at some future time the whole story of their evolution. The membrane connecting the fringes of the "choanocytes," which have been so clearly demonstrated by Sollas in the Tetractinellida, and the occurrence of which in *Leuconia aspera* has been described by George Bidder, also occurs in this Sponge, and has been called by Mr. Dendy "Sollas's membrane."—On some points in the natural history of Fungia, by J. J. Lister.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 24.—"On the Influence of Carbonic Anhydride and other Gases on the Development of Micro-organisms." By Percy F. Frankland, Ph.D., B.Sc. (Lond.), F.C.S., F.I.C., Assoc. Roy. Sch. of Mines, Professor of Chemistry in University College, Dundee.

Carbonic anhydride, hydrogen, carbonic oxide, and nitrous oxide, were the gases employed in a series of experiments for observing what action was exerted by them on pure cultivations of Koch's comma Spirillum, Finkler's comma Spirillum, and the *Bacillus pyocyaneus*. It was found that hydrogen had the least, and carbonic anhydride the most, prejudicial influence upon these micro-organisms. There is, therefore, no longer any doubt that in the anaërobic culture of organisms hydrogen is by far the most suitable medium for the expulsion of air, whilst carbonic anhydride is not only ill-suited owing to its markedly deleterious action upon many forms of Bacteria, but in many cases is quite unfit for such a purpose.

With carbonic oxide and nitrous oxide it was found that although the development of the *B. pyocyaneus* was checked, yet on removing the cultivations to an *air*-chamber almost the same number appeared as were developed on the original air-control plates. This was not, however, the case with Koch's comma Spirillum and Finkler's comma Spirillum, only a comparatively small number of the organisms surviving the exposure to these gases. Similar experiments made with nitric oxide, sulphuretted hydrogen, and sulphurous anhydride resulted in the complete destruction of the above organisms.

January 31.—"Auto-Infection in Cardiac Disease." By L. C. Wooldridge, M.D., Assistant-Physician, Guy's Hospital.

The author had previously described the fact that the lymph and chyle produce a poisonous influence when injected into the blood. The symptoms so produced have been described by the author as "fibrinogen intoxication." The chief symptoms of this condition already described are intravascular clotting, delay in clotting of the shed blood, great tendency to hæmorrhages, occasionally marked fever. In the present paper the author shows experimentally the following :—

(1) To affect the blood a certain quantity of the fluid of lymph, or the fibrinogen solution, must reach the blood in a given time or no poisoning is produced. A small quantity of the fluid, injected rapidly, will cause instant death. The same quantity, diluted and injected during three or four minutes, instead of suddenly, has no effect at all. The author regards