

not allowing their children to be vaccinated, and then permitted to keep them unvaccinated, the children ought to be vaccinated by the public vaccinator, even in spite of their parents, who should not be allowed to risk their children's lives through their own obstinacy and ignorance; and not only their children's lives, but those of the persons around them. The recent epidemic of small-pox showed us several important things—it showed us what we knew before, that small-pox is far more fatal to unvaccinated than to vaccinated persons; it showed us that while small-pox is especially fatal to unvaccinated children, it is less fatal to vaccinated children than to other persons; thus demonstrating the necessity of re-vaccination, and it showed us that re-vaccination once performed is actually a better protection against small-pox than a previous attack of small-pox is. You know that it is not common for a person to have small-pox twice. Well, it is much less common for a person to have small-pox after he has been successfully re-vaccinated, and if he has it is almost certain to be a very mild attack. Out of nearly 15,000 cases of small-pox admitted into various London hospitals during the late epidemic, only four presented proof of having been re-vaccinated.

Let us pass on to typhoid fever. Here is a disease of the very existence of which, as distinct from certain other diseases, we have only known in recent times, but yet a disease about which, thanks to the researches of men now among us, one of whom it especially becomes me, as his pupil to mention, Sir William Jenner, we really seem to know more than about almost any other disease; a disease which we deliberately hunt down to its source, and stop just as we could stop the supply of stone from a quarry or of rifles from an armoury; a disease, the haunts and habits of which we know with such accuracy that we are able to go into a house and say, "Alter this, and alter that, or you will very likely get typhoid fever here," a disease the ways of which we know so well, that, when there has been a case of it caused by local defects in a house, we can almost predict what alterations are required without going to the place. Surely the results obtained from the study of this disease are some of the most striking results of sanitary progress in our day. I find that the idea has become widely spread that the recent epidemic of typhoid fever in London was due to the distribution of milk from a sewage farm; this was not so, and I regard it most in the light of a special providence that none of the milk sent out from that establishment came from a sewage farm: had it been so, such a fact, combined with the prejudice and ignorance which exists upon the matter, would have dealt a severe blow to the progress of one of the greatest sanitary improvements of the day. The cause of that epidemic is known with absolute certainty, the very channel by which the poison got into the dairy well having been recently unearthed.

I must allude, for an instant, to the recent sanitary legislation; it has been found fault with by many on account of matters of detail; but consider the fact that the result of it is that the country has spent a large sum of money in the employment of medical officers of health and sanitary inspectors, and that such men now exist, and you will see that in it we may find great cause for rejoicing when looking to the future of sanitary progress. In a lecture on the "History of Hygiene," which I delivered some three or four years ago at University College, London, I said, "From its very nature, hygiene interests all classes of society; but it is to those who are worst off—the poorest and most wretched—that it must direct its first attention. Civilisation has its evils as well as its advantages, as Bouchardat has well remarked; and one of the greatest of them is the over-crowding of people in the great centres of population, with the misery and disease which are the results of it. It is to better constructed houses for the working classes, to a free supply of good water, and to satisfactory sewerage arrangements, that we must look for an amelioration in these respects; and I would hasten to add, to a wider spread among those classes of such an education as shall lead them to appreciate the means used for the improvement of their condition, and to lend a helping hand for the furtherance of those means."

I feel that I cannot do better in conclusion than congratulate this town on having, through the munificence of one of its citizens, been the first to appreciate the importance of the education of the people in these subjects, and on having such an institution as this in which so much useful knowledge is imparted to the people, and congratulate myself on having the privilege of such an opportunity of spreading broadcast the great truths of sanitary science. The time is fast coming which was looked

forward to by Dr. Parkes when he wrote:—"Let us hope that matters of such great moment may not always be considered as of less importance than the 'languages of extinct nations, or the unimportant facts of a dead history.'"

### SCIENTIFIC SERIALS

THE current *Ibis* commences with the latter part of Mr. Brooke's notes on the ornithology of Sardinia, special attention being drawn to *Otis tetrax*, which is moderately common; *Phani-copteris roseus*, which occurs in large flocks during the winter and even up to June; the presence of *P. erithacus* is doubtful. *Fulica nigra* was not seen, though included in both Cara's and Salvadori's lists. In the museum there are several specimens of *Falacrocorax desmarestii*, and *P. carbo* is extremely common. *Larus audouini* is found, though very rarely.—Captain F. W. Hutton, in a note on *Rallus modestus* of New Zealand, gives evidence to show that Dr. Buller is in error when he considers *R. modestus* to be *R. dieffenbachii*, in an immature state of plumage, as the proportions of the chicks are different, and the bill of the latter more slender.—Messrs. Salvin and Elliot in continuation of their notes on the *Trochilidae*, discuss the genus *Thalurania*, which is exclusively tropical, and consists of eleven species and five sections.—In notes on Chinese ornithology, Mr. R. Swinhoe draws special attention to *Ceryle rudis* at Ningpo, *Gallinago solitaria*, *Endrominas veredus*, and other land as well as water-birds found at Shanghai.—Mr. Selater supplements Mr. Salvin's list of the birds of Nicaragua, with additions from a recent small collection made by Mr. Belt, adding seventeen species, mostly well known through Central America.—Mr. E. L. Layard gives notes of the birds observed in Para; and Mr. Selater describes and figures two new species named by him *Picolaptes layardi*, and *Thamnophilus simplex*.—Captain J. H. Lloyd on the birds in the province of Kattiawar in West India, commences the detailed account with an interesting comment on the general ornithological description of the region.

THE *Monthly Microscopical Journal* for October, commences with a description, by Mr. F. H. Welch, of the thread-worm *Filaria immitis*, occasionally infesting the vascular system of the dog, with remarks on the same, relative to Haematozoa in general, and the *Filaria* in the human blood. The specimens described were obtained from the right ventricle and pulmonary artery of a dog, from Shanghai, the male, female, and young being described. The left ventricle also contained some of the young.—Dr. Royston-Pigott fully illustrates a paper entitled "Researches in Solar Spectra, applied to test residuary aberration in microscopes and telescopes; and the construction of a compensating eye-piece, being a sequel to the paper on a searcher for aplanatic images."—Dr. Rutherford describes a new freezing microtome in which the freezing box and escape tube are much larger than in his older instrument, and the indicator is improved.—Mr. Ch. Stodder, in a letter, points out that it is inaccurate to suppose that the nominal price of American objectives is directly comparable with that of English makers, as the value of money in the two countries is so different, and duty has to be paid on entering the former.

*Annali di Chimica applicata alla Medicina*, July number, 1873.—We notice in this journal, besides a number of formulæ for pharmaceutical preparations and other details interesting to the druggist, a paper by A. Gubler, on experiments with new and old opium alkaloids, which deals, amongst others, with apomorphia.—There is also a translation of Mr. Simon's memorandum on the diffusion of cholera, and other papers from native and foreign sources. In the *Rendiconto delle sessioni dell' Accademia delle scienze dell' Istituto di Bologna, 1872-1873*, are given briefly (in about 189 pages) abstracts of the papers read before the Society, together with other matter of the usual nature.

*Reale Istituto Lombardo di scienze e Lettere Rendiconti*, Fascicolo xiii., July 1873.—This number contains several critical literary, historical, and philosophical papers, including one on Kant's philosophy, by C. Cantoni.—In the scientific section there is a paper by Prof. Cavalleri on improvements in the helioscope, and a portion of a paper by P. Cantoni on electrical adherence, which is illustrated with several tables of data.—Fascicolo xiv. contains a paper on the capacity of the nasal fossa, by P. Mantegazza, and one on cholera by G. Strambio.—C. Lombroso details some experiments on the tonic action of

maize (*guasto*) affected with the *Pencilium glaucum*. The author maintains that the maize in this state acts injuriously. G. Sangalli, who replies to the paper, maintains that the effects are due to another cause.—New comet discovered at the Royal Observatory of Milan, by G. Tempel; communicated by G. V. Schiaparelli.—The continuation of P. Cantoni's paper on electrical adherence is given.—The other papers are on the propagation of the corpuscle cornalia, by C. Gibell, and a letter on a purulent disease of one hemisphere of the brain, by L. Porta.

SOCIETIES AND ACADEMIES

PHILADELPHIA

Academy of Natural Sciences, June 3.—Dr. Ruschenberger in the chair.—“Fertilisation of *Pedicularis canadensis*.” Mr. Thomas Meehan drew attention to the structure of the flower of *Pedicularis canadensis*, in which it was evident self-impregnation was impossible, and there seemed to be no special arrangements for fertilisation by distinct agency, as there were in so many allied plants. In this case the stamens were included in the closely compressed arch of the corolla, and, with the anthers, were directed retrorsely to the pistil, which at an early stage, and long before the maturity of the pollen, was protruded beyond the corolla, rendering self-fertilisation almost impossible in this flower. But the flowers were always abundantly fertile, and though the arrangements were such as seemingly to afford no chance even for insects to aid in the fertilisation, it was also probable that in some way it was accomplished by them. Both last season and this he had devoted some time to watching the plant, but failed to find any clue to the process. A species of *Bombus* seemed to have the plant especially under its charge, visiting the flowers in great numbers; but they bored through the corolla on the outside of the tube for the saccharine matter, and the anthers or pollen did not seem to be in the least disturbed by this. Still it was so highly probable that in some way some insect aided in the cross-fertilisation of these flowers, that it might serve a useful purpose to direct attention to it, as others with time and opportunity might discover what he had failed to find.

RIGA

Society of Naturalists, April 16.—M. Tank communicated some observations on henejedew, which he thinks is an immediate excretion of the leaves due to cooling.—M. Behrmann gave reasons for doubting the supposition that certain fires which occurred almost daily from October to December last year, in a village of the Orel Government, arose from phosphuretted hydrogen out of the marshy ground.

April 23.—M. Petzholdt read a paper on the composition and formation of Imatra stones. Various hypotheses of formation have been given—the gyratory, the stalactitic, the geological, the vegetable, the animal, &c. Parrot supposed the stones to be petrified, shell-less molluscs. M. Petzholdt formulates his view thus:—In a slimy layer of fine sand, mud, and carbonate of lime, are formed, through mutual attraction of particles of the latter, several ball-heaps of lime. Next, dry deposition of the whole at a later epoch. Disturbance of the stratum by water, setting free the hard spherical masses (Imatra stones).

April 30.—M. Pfeiffer showed a small headless chick with large legs, found dead with another, which was alive in the same egg. The two were connected by a fibre. After separation the living chick throve normally.

May 21.—M. Glasenapp gave a note on blackened wood in certain trees blown down in a storm. The blackening is attributed to a kind of fungus which formed on the north side of the trees while yet standing.—M. Gottfriedt read a paper on enclosure of diamonds in xanthophyllite; the supposed diamonds he finds to be merely hollow spaces, erosion figures.—M. Teich gave an account of an excursion to North-West of Kurland.—The *Correspondenz Blatt*, No. 9, contains a description of the snakes of the Baltic Provinces, of which there are three species—*Vipera verus*, *Tropidonotus natrix*, and *Coronella lasvis*.

GOTTINGEN

Royal Academy of Sciences, Aug. 6.—Dr. Paul du Bois-Reymond communicated a paper on the representation of functions by Fourier's series.

Aug. 13.—M. Waitz compared some points in the *Annales Sithiensis*, relative to Pippin and Charlemagne, with other

annals of the time.—M. Ewald gave a paper on the passage, Ezek. xlv. 12: “Twenty shekels, five-and-twenty shekels, ten-and-five shekels shall be your maneh.” The maneh, it is known, originally contained 60 shekels (which these numbers make up), and this enumeration, he thinks, was in order to exactness and certainty, not because there were coins of these several values. The Septuagint version (rightly read) makes the maneh 50 shekels, and it is known there was such a maneh. The author advances a theory, on which the passage affords evidence of both manehs having been known in the first half of the sixth century B.C.—Dr. Voss communicated a note on the geometry of focal surfaces of congruences.

Aug. 20.—M. Minnigerode gave a long paper on a new method of solving Pell's Equation  $t^2 - D\mu = 1$ .

PARIS

Academy of Sciences, October 6.—M. Bertrand in the chair.—The following papers were read:—Note on the means used to obtain a constant temperature in rooms and on the methods of moderating it during the heat of summer, by General Morin.—On new propyl compounds, by M. A. Cahours. The author described several ethers of the propyl series.—Certain considerations on the yellow elastic tissue and its immediate organic analysis, by M. Chevreul.—Treatment of carbuncle and malignant pustule by carbolic acid and ammoniac carbonate, by M. Déclat.—Statistical tables of the losses of German armies in France during the war of 1870-1, by Capt. D. H. Leclerc.—The subcutaneous infarctus of cholera, by M. Bouchut.—On the improvement in healthfulness caused by the growth of *Eucalyptus globulus* in marshes, by M. Gimbert.—Studies on the *Phylloxera*, by M. Max Cornu.—On the action on the vine of the carbonic disulphide used to destroy the *Phylloxera*, by M. Lecocq de Boisbaudran.—On the size and variations of the sun's diameter, by S. Respighi. The author in his letter criticised Secchi's statements as to the difference between the nautical almanac diameter and his own observations by monochromatic light. He regarded Secchi's observations as erroneous.—On the theory of the thrust of earthworks, by M. J. Curie.—On the condensation of gases and liquids by carbon, by M. Melsens. The author noticed the thermal phenomena produced by the contact of the liquids with carbon, &c.—On the production of certain borates in the dry way, by M. Ditte.—Researches on tribromacetic acid, by M. H. Gal.—On the development of *Batrachians*. This was a note on the embryos of *Hylodes martinensis*, by M. Bavay.

PAMPHLETS RECEIVED

ENGLISH.—Synopsis of all the Mosses known to inhabit Ireland: David Moore, Ph.D.—Lobley's Geologist's Excursion to the Malvern District.—Proceedings of the Belfast Natural History Society for 1871-2—Leyton Astronomical Observations.—Report, Chester Society of Natural Science.—Law of Elliptic Motion deduced from the Laws of Gravitation and Compound Rotation: G. Hamilton.—Milk, Typhoid Fever and Sewage: Alfred Smece.—Contributions to the Knowledge of the Meteorology of the Antarctic Regions.—A new Method of obtaining the Differentials of Functions; Profs. Rice and Johnson.—Count Rumford, How he Banished Beggary from Bavaria: T. L. Nichols, M.D.—A Scamper across Europe: T. L. Nichols, M.D.

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