

Aldrovandi's works, including several volumes published after his death, are in themselves a striking monument to his prodigious industry and encyclopædic knowledge; his wealth and long life were given up to an attempt to realise his ideal—"nothing is sweeter than to know all things."

The committee appointed under the patronage of the King to carry out the arrangements for the Aldrovandi celebrations had as honorary presidents the Marchese Tanari (Prosindaco del Comune) and the Rector of the University, Prof. Puntoni. Prof. Capellini, whose geniality is well known to many English friends, filled the office of acting president, and it is mainly to his labours and to those of the general secretary, Sig. Sorbelli, that the success of the meeting is due. On arriving at Bologna delegates were met at the station by members of the reception committee, from whom they received useful literature and information as to the lodgings provided for them. A general meeting was held in the Archiginnasio in the afternoon of June 11, at which Prof. Capellini welcomed the guests and gave an account of the order of procedure; in the evening a conversazione was given by the Marchese Tanari in the municipal buildings. The morning of June 12 was devoted to the most important business of the meeting; the delivery of discourses by Prof. Capellini, the Minister of Public Instruction and Agriculture, Prof. Costa and others, was followed by the presentation of addresses, accompanied by a few remarks by selected delegates. A feature of special interest was a speech by Count Luigi Aldrovandi—connected through fourteen generations with his illustrious ancestor. Prof. Ferguson, of Glasgow, was chosen by the British delegates as their spokesman. Oxford University was represented by Mr. Ashburner; Cambridge University, the Royal Society, the Linnean and Geological Societies of London, by Prof. Seward; St. Andrews, by Dr. Steele; and Glasgow University by Prof. Ferguson, who had previously taken part in the celebration of the octocentenary of the Bologna University. Among other delegates who spoke were Prof. Péliissier, of Montpellier; Prof. Schüick, of Upsala; Dr. Wieland, of Newhaven; Prof. Entz, of Budapest; Prof. Richter, of Kolozsvár; and Prof. Brusini, of Zagabria (Agram, Croatia). The unveiling of a memorial tablet to Aldrovandi in the courtyard of the Archiginnasio terminated a somewhat lengthy programme.

In the evening delegates were afforded an opportunity of seeing the new Italian Opera—"John the Baptist"—in the Municipal Theatre. A cordial reception was given to the composer, a young priest from Turin, as he appeared before the curtain with those who took the parts of Christ, John the Baptist, Herod, and Salome. On June 13 the delegates were present at the inauguration of the Aldrovandi Museum. This was the most striking event during the meeting. A large collection of well-executed wood-blocks, together with the original specimens, shelves filled with volumes of unpublished manuscripts, a collection of coloured drawings of natural objects, and a series of herbaria formed a most impressive demonstration of the industry and whole-hearted devotion with which Aldrovandi applied himself and his means to the pursuit and organisation of knowledge. The fact that a catalogue of the unpublished manuscripts, specially printed for the celebrations, consists of 300 pages affords some measure of what Aldrovandi accomplished. Each delegate received a bronze medal bearing a bust of Aldrovandi and the following inscription on the reverse:—

Cui natura parens
Quaerenti tota refulsit

Virum post tria saecula meritas et gloria florentem
civitas et universitas
Bononiensis doctorum totius orbis adsensu rite
concelebrant. Prid. id. iun. MDCCCXVII.

In the afternoon a visit was paid to the Istituto Rizzoli at San Michele, in Bosco. Within the building devoted to orthopaedic treatment were seen strange machines in motion to which were attached patients in various attitudes. The view from the grounds of the institute of Bologna and the plain beyond could not easily be surpassed.

An enjoyable banquet at the Hotel Brun in the evening brought the celebrations to a conclusion.

The presentation of several specially compiled volumes to those attending the meeting afforded another proof of the pains taken to render the meeting a success, and supplied a permanent interest to a thoroughly enjoyable reunion of nations. The volumes included "Intorno alla vita e alle opere di Ulisse Aldrovandi—Studi di A. Baldacci, E. de Toni, M. Gortani, F. Morini, A. C. Ridolfi, A. Sorbelli"; "Chartulorum Studii Bononiensis"; "Catalogo dei Manoscritti di U. Aldrovandi a Cura di Ludovici Frati con la collaborazione di A. G. e Albano Sorbelli."

NATIONAL POULTRY CONFERENCE AT READING.

THE second national poultry conference was held at University College, Reading, last week, July 8-12, under the presidency of Sir Walter Palmer Bart.

In addition to papers and discussions, there was an exhibition of pairs of about 150 breeds of poultry, both English and foreign. Several breeds of the latter had not been seen in this country previously.

Mr. C. C. Hurst read a paper on Mendel's law of heredity and its application to poultry breeding. After briefly alluding to Mendel's work on peas, he went on to describe the Mendelian pairs of characters in fowls, such as rose and single comb, white and coloured plumage, colours of legs, and others. The "law of segregation" was then explained and illustrated by reference to crosses between rose-combed *Hamburgh* and single-combed *Leghorn*, and between white *Leghorn* and black *Minorca* and other coloured varieties.

The rose-combed are dominant over the single-combed varieties, and the first cross are all rose-combed birds. Bred among themselves they produce on the average three rose-combed chicks to one single-combed bird. The latter mated with a similar one breeds true. The nature of the blue *Andalusian* fowl was then discussed, and the want of fixity of colour, in spite of more than fifty years of breeding and separation of "rogues," was pointed out. Pedigree "blue" birds produce only one-half blue like the parents, the remainder being black and splashed white birds in equal proportions. The black and white breed true, but when crossed produce all "blue" birds. The necessity of the determination of what characters are Mendelian was emphasised, and the practical value of Mendel's law in enabling breeders to calculate what the results of particular crosses will be was referred to in conclusion.

The next paper in the section dealing with breeding problems was by Dr. J. Llewelyn Thomas, on "Hybridisation Experiments with the Ceylon Jungle-fowl." These experiments were undertaken in 1903-4 with the view of solving the following questions:—(1) Will the Ceylon jungle fowl (*Gallus stanleyii*) breed with the domestic fowl? (2) Will the hybrids breed with the jungle fowl and with the domestic fowl? and (3) will the hybrids breed among themselves? The view that the black-breasted jungle fowl of India (*Gallus bankiva*) is the parent stock of the domestic game fowl is generally accepted, and Darwin, in his "Animals and Plants under Domestication," says that the Ceylon jungle fowl "may in all probability be rejected as one of the primitive stocks of the domestic fowl," a statement which he based on information supplied by a Mr. Mitford that two hybrids raised by the latter proved sterile. It was felt that the evidence just mentioned was not sufficient to establish a conclusion one way or the other, and experiments were undertaken to obtain further information on the matter. Wild Ceylon jungle fowls were obtained after much trouble and placed in specially built runs with domestic fowls in various parts of the island.

The mating of jungle hens with the domestic cock was a complete failure. The jungle cock, however, mated readily with domestic hens! The eggs laid proved fertile, and about thirty chicks were raised from them. The hybrid cock crossed with the domestic hen gave fertile eggs, and the offspring was fertile not only with the domestic parent, but also with the hybrid parent and with one another. No chickens were obtained from the crosses

(1) hybrid cock × jungle hen, (2) hybrid hen × domestic cock, (3) hybrid hen × jungle cock.

From the cross-bred cock × hybrid hen several addled eggs were obtained, four more had chicks dead in the shell, and from two of the eggs live chickens were hatched out. The latter were apparently sturdy and robust enough for a short time, but died on the twelfth and eighteenth day respectively after hatching. The sterility of the hybrids cannot, therefore, be adduced as evidence that the Ceylon jungle fowl is not a parent stock of the domestic fowl. It was pointed out that the Ceylon jungle fowl has a reddish-brown breast, and when reversion occurs among domestic fowls, even those of pure bred black-breasted types, the males usually have red or brown breasts and not black like *Gallus bankiva*.

Mr. F. V. Theobald gave an account of a parasitic liver disease in fowls, specimens of which had been sent to him during the last three or four years. Although previously unrecorded, it is probably quite common, and due to a protozoon *Amoeba maleagridis*, Sm. Diagnosis is somewhat difficult, but the *post-mortem* appearances of the liver with yellow spots along with swollen cæca are characteristic. The life-cycle of the parasite is not yet fully worked out.

Mr. Theobald incidentally referred also to an infectious disease among poultry in South America, produced by a Spirochæte, which passes part of its life-cycle in a fowl tick (*Argas miniatus*).

J. P.

HYDROLOGY IN THE UNITED STATES. PURIFICATION OF SEWAGE.

WE have on several previous occasions noticed the papers issued by the United States Geological Department on Water Supply and Irrigation.¹ Recently we have been favoured by the receipt of nineteen further papers bearing on this subject.²

The greater part of these, although containing a great deal of information bearing on water supply, are yet chiefly of local interest.

Paper No. 180 of the series now sent deals with the efficiency of turbine water-wheels, and consists of a compilation of data derived from tests and from manufacturers' power tables of American stock sizes, and is intended principally for the use of the hydrological surveyors in cases where the turbine is used for gauging streams.

Paper No. 179 gives an account of investigations carried on for the purpose of discovering means for preventing the pollution of streams by distillery refuse. Paper No. 189 further deals with the disposal of the waste liquors resulting from the manufacture of strawboard, an important problem connected with the prevention of stream pollution in the districts where this industry prevails.

Paper No. 187 deals with the measurement of streams when they are frozen over, and with the modifications of the ordinary methods of gauging these streams when they are covered with ice.

Paper No. 182 describes the various wells in use for municipal or domestic supply in Michigan, and the means adopted for raising the water from these wells.

Paper No. 185, on investigations into the purification of

¹ Water Supply and Irrigation in the United States, January 7, 1904; July 28, 1904; November 3, 1904; December 22, 1904; January 26, 1905; December 21, 1905; March 2, 1906; May 24, 1906.

² Reports issued by the Department of the United States Geological Survey. Water Supply and Irrigation Papers. (Washington: Government Printing Office, 1906.) No. 185, Purification of Boston Sewage; No. 179, Prevention of Stream Pollution by Distillery Refuse; No. 180, Turbine Water Wheel Tests and Power Tables; No. 159, Summary of Underground Water Resources of Mississippi; No. 161, Quality of Water in the Upper Ohio River Basin; No. 162, Destructive Floods in the United States in 1905; No. 164, Underground Waters of Tennessee and Kentucky; No. 172, Progress of Stream Measurements, Missouri River; No. 174, Progress of Stream Measurements, Western Gulf of Mexico; No. 175, Progress of Stream Measurements, Colorado River; No. 177, Progress of Stream Measurements, California; No. 179, Means of Preventing Pollution of Streams by Distillery Waste; No. 181, Geology and Water Resources of Owens Valley; Nos. 182 and 183, Flowing Wells and Municipal Water Supplies in the Southern Peninsula of Michigan; No. 184, Underflow of South Platte Valley; No. 187, Determination of Stream-flow during the Frozen Season; No. 188, Water Resources of the Rio Grande Valley in New Mexico; No. 189, The Prevention of Stream Pollution by Strawboard Waste.

Boston Sewage, with a history of the sewage disposal problem, is of much more general interest, and contains a great deal of information of value to sanitary engineers and chemists engaged in sewage disposal. It therefore deserves a more extended notice in this Journal.

The origin of the paper was as follows:—An anonymous friend of the Massachusetts Institute of Technology, moved by the magnitude and gravity of the sewage disposal problem as it concerns householders and communities, in 1902 presented to the institute a sum equal to 1000*l.* a year for three years, afterwards extended to five years, for the purpose of making experiments on sewage purification and giving the widest possible publicity to means or methods by which the present too often crude and imperfect systems may be improved.

The report now under review, which contains 162 octavo pages, has been drawn up by Messrs. Winslow and Phelps in consonance with the wishes of the donor, and consists of a popular statement of the history of the several methods that have been tried for the purification of sewage, and a record of the results obtained at the laboratory of the Massachusetts Institute. It is claimed by the authors that the paper is written in a popular style and in language so simple that citizens, boards of health, and sewerage commissions may readily avail themselves of the information contained in it.

The sewage experimental station at the institute is situated adjacent to the City of Boston, U.S.A. Within the last few years the whole of the sewage of this city has been collected into two large main outfall sewers, and is discharged into the harbour on the ebb tide. The station is connected with one of these outfall sewers. The sewage is pumped directly from the sewer through 2½-inch galvanised pipes into a series of twenty-five tanks having an area of 24 feet each, the depths varying from 3 feet to 6 feet. In these tanks the sewage is treated by intermittent sand filtration; the septic process; contact filtration through coke, stone, and brick of various diameters; and by trickling filters. The result of the effluent from the different tanks, as obtained by analysis, is given.

Under the conditions of these experiments crude sewage has been successfully filtered through a 2-foot bed of sand with an effective size of 0.14 millimetre at a rate of 0.4 million gallons per acre per day, divided into four doses in the twenty-four hours. The effluents were clear, bright, and well purified.

With single contact beds of stone 1½ inches in diameter, passed at the rate of 1.2 million gallons per acre per day, the effluent of the crude sewage was only partially purified. The beds clogged rapidly, and the surface required much attention.

The double contact system in primary beds of 2-inch material, and secondary beds of ½ inch, yielded a fairly well-purified and stable effluent at the rate, on the combined double system, of about 0.7 million gallons per acre per day with beds 6 feet deep.

The most practical of the methods that have been studied appears to be the treatment of the sewage either sedimented or subjected to a very short period of septic action in double contact beds.

The process of trickling filtration remains to be considered in a further report, but, so far as the present experiments indicate, this method will probably prove superior to any so far tested.

In the report is also given a summary of the history of sewage purification in England, Germany, the United States, and other countries, and the gradual development of the processes at present in operation. Starting from the discharge of the crude sewage into the sea or rivers, broad irrigation or sewage farming is described, and also chemical precipitation, intermittent filtration through sand, septic tanks, contact process in beds of coarse material, and continuous trickling over coarse material.

With regard to the first, it is shown that, although where the conditions are favourable sewage may be discharged into the sea without creating a nuisance, there yet remains to be considered its effect on shell-fish. With regard to the discharge into rivers, the conclusion arrived at by the River Pollution Commission of 1874 is given, that sewage mixed with twenty times its volume of pure