

proceed to make a nest. I believe that in all cases, in the first instance, one cock and one hen, having paired, select the site and make the nest.

The nest is simply a hollow depression, more or less deep according to the nature of the soil. It is made by the pair together. The cock goes down on to his breast, scraping or kicking the sand out backwards with his feet, cutting the earth with his long and powerful nails. The hen stands by, often fluttering and clicking her wings, and helps by picking up the sand with her beak, and dropping it irregularly near the edge of the growing depression.

LAYING AND SITTING.

When satisfied with their work (and they are easily satisfied, often too easily) the hen begins to lay an egg in the nest, every other day. During the laying period the nest is often unattended, and is not slept on at night. A nest in which only one hen is laying contains on the average about fifteen eggs; but she often begins to sit before she has laid her full complement. Sometimes she will lay four or five after beginning to sit, though not often so many; sometimes only one or two; while sometimes she will lay her full complement. The hen generally begins the sitting; she will occasionally sit for one or two days and nights before the cock takes his turn. When sitting assumes its regular course, the hen sits from 8 or 9 a.m. to about 4 p.m., and the cock from 4 p.m. to about 8 or 9 a.m. The bird whose turn it is to be on the nest keeps its seat until the other arrives to relieve it, when they at once change places.

It is quite incorrect to say that the cock alone sits, or that during the day the eggs are left to the heat of the sun. The cock and hen sit alternately, regularly and steadily, night and day, during the whole period of incubation.

PROTECTIVE COLOURATION.

The colour of each is admirably adapted to the time spent on the nest, and furnish interesting examples of protective colouration. It is scarcely possible to conceive a more effective disguise than the sober brownish grey of the hen for day sitting, and the black of the cock for night. When on the nest, the ostrich lays its head, neck, and tail flat along the ground; its naked "thighs" are covered by the wings, the plumes lying close together on the earth almost hidden against the bird's body. Thus only the low, long-curved body projects above the surrounding level. The cock, at night, is, of course, almost perfectly hidden; while the hen, at day-time, closely resembles a stone, bush, ant-heap, or any little inequality of the veld. One is surprised to see how close such a large bird can lie to the ground, and how even an ostrich-farmer may almost walk over a sitting hen in full daylight without seeing her. The cock is simply indistinguishable at night, except to a practised eye, and then only at a few yards distance.

IS THE OSTRICH POLYGAMOUS?

Every authority that I have consulted holds that the ostrich is polygamous, but the evidence against polygamy is very strong: a pair make the nest; the hen lays all her eggs (a full sitting) in that nest; the hatching of the eggs and the care of the chicks are shared equally by cock and hen; the cock loses his sexual vigour and ceases his attentions to the hen, soon after beginning to sit; and one hen to a nest yields the best results.

I do not, however, think it can be maintained that the monogamy of the ostrich is proved absolutely, but I decidedly think that the arguments in its favour are much stronger than those in support of polygamy.

CURIOUS AND EXCEPTIONAL RELATIONS.

Finally, it must be allowed that, while all the facts at my command point strongly to the conclusion that the ostrich is not only often monogamous, but that monogamy is the only condition perfectly favourable to the successful hatching and rearing of young; and that all the arguments in favour of polygamy break down on examination: yet the fact remains that there are a large number of curious and exceptional circumstances connected with the nidification, sexual relations, and parental habits of ostriches that I am not yet exactly able to account for, either on the supposition of fully organised monogamy or polygamy.

NATIONAL MEMORIAL TO JENNER.

THE meeting held on Wednesday, in last week, gave coherence to the scheme for raising a national memorial to Edward Jenner, in celebration of the centenary of the discovery of vaccination. "It was surely high time," said the Duke of Westminster, who presided over the meeting, "that this his native land should rise to the occasion, and at last, after 101 years have passed since the first successful vaccination, take active and effective steps to carefully preserve his great legacy to the world, and to do more—to give every facility for the promotion of science in the direction of the prevention of diseases that afflict mankind." Lord Herschell, in moving the first resolution—"That the present is an appropriate time to inaugurate a work of national utility in honour of Edward Jenner," pointed out that Jenner was the first to illustrate a principle which seemed destined to play an important part in the history of preventive medicine. Surely this alone is a high tribute to Jenner and the value of his discovery. His name is held in reverence by the highest men of science and the most civilised countries in the world. Some of these countries have already commemorated his centenary. Are Englishmen to be behindhand in testifying their admiration of the man, and their sense of the benefits he has conferred on humanity? The resolution was seconded by Prof. Michael Foster, who gave instances of the extension of the Jennerian principle to other diseases by Pasteur and other observers. Sir Alfred Lyall, in supporting the resolution, referred especially to the blessings which vaccination had already conferred upon the people of India. The resolution was then carried unanimously.

Lord Lister moved the next resolution:—"That a subscription be set on foot with a view of promoting, in connection with the British Institute of Preventive Medicine, but in a manner distinguished by Jenner's name, researches on the lines which he initiated." In speaking to the resolution (reports the *British Medical Journal*), Lord Lister referred to a mistake in his address to the British Association at Liverpool. The statement was to the effect that smallpox was unknown in the German army as a result of the revaccination of all recruits. If he had stated that fatal smallpox was absolutely unknown in the German army, it would have been the literal truth. A recent instance of the application of the principle discovered by Jenner was Dr. Koch's discovery that by using the bile of an animal which had died of rinderpest to inoculate a healthy animal, that animal was rendered immune to the pestilence for some months at least, time could alone decide for how long. This was an exact parallel to the discovery of Jenner, and the simplicity of the method was such that it places in the hands of any farmer the possibility of protecting the whole of his herd on the appearance of the first case. Another example was the work now being done in India with regard to plague. Two such examples, both taken from a period so recent, and so brief, were sufficient to prove the practical importance of work of this kind. And it was such work which the British Institute of Preventive Medicine was doing. That Institute had been the first in this country to supply the diphtheria antitoxic serum, the use of which had effected so remarkable a reduction in the mortality of the disease in those cases in which it could be employed early. The Institute had never ceased to improve the serum, until that which was issued now had six times the curative power of that first employed. The Institute also prepared tuberculin, which was capable of rendering such important services to the public health by facilitating the early diagnosis of tuberculosis in cattle; and mallein, which rendered similar services in the case of glanders. The Institute might claim, therefore, to be a work of utility, and it was a national institution, for it had upon its governing body representatives of public bodies in all three kingdoms. Thanks to the generosity of their Chairman, the Institute was in possession of a site upon which, owing also in part to his generosity, it had now nearly completed the erection of a suitable building for carrying on its work. But its income was only some 700*l.* a year; the scope of its work was thus cramped, its officers, who gave their services in the true spirit of scientific devotion, were inadequately remunerated, and, unless a large measure of public support was accorded, the full benefits which the Institute was capable of rendering to the country could not be realised. If the response to the movement inaugurated by that meeting was as liberal as it should be, the Council of the Institute were prepared to agree that its name should be changed to that of the "Jenner Institute." If the response were less generous, they might still hope that the sum received would be sufficient to

found a Jenner professorship of bacteriology, and in addition, or as an alternative, of a Jenner scholarship.

The resolution having been briefly seconded by Lord Davey, and supported by Mr. Brudenell Carter, was put to the meeting and carried unanimously.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Mr. H. M. Vernon, of Merton College, has been elected Radcliffe Travelling Fellow for the year 1897. Mr. Vernon took a first class in the Natural Science School in 1891.

EX-MAYOR WILLIAM R. GRACE, of New York City, and his wife and daughter have given two million dollars to establish in that city a school of manual training for women and girls.

THE first Huxley medal and prize of 10*l.*, open to students of the Charing Cross Hospital Medical School at the end of their second winter session, has been awarded to Mr. Arthur Gentry Pitts. The awards were founded last year, in memory of the late Prof. Huxley—a former student of the school.

It has been decided that the memorial to the late Rev. William Rogers shall take the form of a physical laboratory, to be erected and fitted up in connection with the Charterhouse Schools, which were inaugurated by the Prince Consort, and were the first schools with which Mr. Rogers was connected on his entry into parochial work in London.

THE state of chemical industries in Germany, France and England, and the position of chemistry in higher education, forms the subject of an article, by M. M. A. Haller, in the *Revue Générale des Sciences* for March 30. Referring to the efforts which are made in this country to obtain a fuller recognition of the value of chemistry to manufactures, the author says: "Industriels et Professeurs prennent part à cette campagne, sans que les pouvoirs publics s'émeuvent." It is this lack of interest shown in scientific matters by State authorities that astonishes men of science on the continent.

By the will of the late Mr. John Crerar, of Chicago, who died October 19, 1889, the residue of his estate, after the payment of numerous bequests, both private and public, was given for the creation and endowment of a free public library, to be called the John Crerar Library, and to be situated in the city of Chicago. Having sympathetically reviewed the library section of John Crerar's monumental will, and carefully considered the library facilities and needs of the city, the directors unanimously decided to establish a free public reference library of scientific literature. This library was opened on April 1. Its special field is that of the natural, the physical, and the social sciences, with their applications, the adopted classification being into general works, social sciences, physical sciences, natural sciences, applied sciences. The directors propose, however, to make the library exceptionally rich in scientific periodicals, American and foreign. The total endowment is estimated to be over 2,500,000 dollars, and the income should be sufficient ultimately to allow the making of a good collection within the proposed limits. At present the library has 15,000 volumes ready for use, and nearly 7000 more in process of preparation. The number of periodicals in the reading-room is 800, with 400 others to be added. By the end of 1898 it is expected that there will be 40,000 volumes on the shelves.

THE following are among recent announcements:—Dr. A. F. Dixon, senior demonstrator of anatomy at the School of Medicine of Dublin University, to be professor of anatomy at the University College of South Wales and Monmouthshire, Cardiff, in succession to Prof. A. W. Hughes, now professor of anatomy in King's College, London; Dr. Classen, of the Polytechnic Institute at Aachen, to be professor of chemistry in the University at Kiel; Dr. A. Palladin to be professor of plant anatomy and physiology at the University of Warsaw; Dr. de Vries to be professor of geometry in the University of Utrecht; Prof. von Kries, who had been offered the chair of physiology in Berlin in succession to Dr. du Bois Reymond, has decided to remain in Freiburg; Dr. Ernst Gaupp to be associate professor of embryology at Freiburg; Dr. Wernicke to be associate professor of hygiene at Marburg; Dr. Karl Bohlin, of Upsala, to be director of the Stockholm Observatory; Dr. James Clark to be professor of agriculture at the Yorkshire College, Leeds, in succession to Prof. James Muir; Dr. Karl

Fütterer to be associate professor of mineralogy and geology in the Polytechnic Institute at Karlsruhe; Mr. Louis M. Dennis to be professor of analytical chemistry in Cornell University; Mr. Henry S. Jacoby to be professor of civil engineering; Mr. John Henry Barr to be professor of machine design; and Mr. Joseph E. Trevor to be professor of physical chemistry in the same University (Cornell); Dr. Karl Kaiser to be associate professor of physiology in the University of Heidelberg.

THE *Journal* of the Society of Arts gives the following particulars with reference to the fourth meeting of the Congrès International de l'Enseignement Technique, to be held this year in London. The previous meetings of the Congress were—in 1886 at Bordeaux, in 1889 at Paris, and in 1895 at Bordeaux. The meeting will be held at the invitation of the Society of Arts, and of the Worshipful Companies of Drapers, Fishmongers, Goldsmiths, Merchant Taylors, and Clothworkers. The Congress will be opened at 11 o'clock, on June 15, by an address from the President, the Duke of Devonshire, K.G., and from the President of the last Congress, M. le Président Léo Saignat. The meetings will be held on Tuesday, Wednesday, Thursday, and Friday. The subjects for discussion at the Congress will include:—Technical Education: (1) Advanced Instruction. Polytechnics, Universities, Colleges. (2) Secondary Instruction. Higher Technical Schools; Secondary and Intermediate Schools; Evening Schools. Commercial Education: (1) Advanced Instruction. Colleges; High Schools and Institute of Commerce. (2) Secondary Instruction. Commercial Schools; High Schools; Classes for Adults. It is not proposed to deal with elementary technical or commercial education. The education of both sexes will be included. The proceedings of the Congress will be reported in English. Papers intended for the Congress may be in French, German, or English, and speakers may make use of any of these languages. All communications relating to the business of the Congress should be addressed to the Secretary, Society of Arts, John Street, Adelphi, London, W.C.

CHILDREN are always interested in natural history, and with a little help and encouragement they become keen collectors and quick observers. Prof. W. A. Herdman relates, in the tenth annual report of the Liverpool Marine Biology Committee, how the aquarium at Port Erin is used as an educational influence. "For example," he says, "if a boy brings us a light-coloured shanny, caught in a shallow exposed pool, we can place the little fish in a deep vessel in semi-darkness under a table, or cover it with some brown sea-weed, the result being that when the boy comes next day to look for his specimen, he has been known to exclaim, 'Hullo! where is my shanny? There is only a black one here.' It is then easy, by putting the fish into a shallow white dish in the bright sunlight, in a short time to turn the black shanny into what he recognises as the light-coloured one he caught. You can then tell him of the beautiful pigment cells of the skin, and show them to him under a microscope in a small living fish, in a watch-glass full of sea-water. You can show him a speckled shrimp hiding in sand and a mottled shrimp in gravel, and the little prawn *Virbius*, which may be almost any colour according as you change its surroundings from green to red or to dark brown sea-weeds. You explain the difference in pigmentation on the upper and lower sides of a flat fish, you remind him of the chameleon, tell of Lord Lister's observations on the change of colour in the skin of the frog, and—most beautiful experiment of all—show him the 'blushing' of the newly-born cuttle-fish. From this there opens up a wide range of physiology, of the influence of light and the controlling action of nerves, not to mention natural selection and evolution in general. This is only one of many examples that might be taken. Almost any of the common marine animals, if carefully watched as to structure and habits, show us interesting cases of adaptation to their surroundings and mode of life."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 4.—"Second Report on a Series of Specimens of the Deposits of the Nile Delta, obtained by Boring Operations undertaken by the Royal Society." By John W. Judd, C.B., LL.D., F.R.S., Professor of Geology in the Royal College of Science. Communicated by desire of the Delta Committee. Received February 11.