

Royal Highness the Princess Victoria," consisting of a pair of those pretty and interesting little animals the Stanley Musk-deer. During the fifty years that have elapsed since this first-recorded mark of interest in the Society on the part of her present Majesty, the Queen and her family have never failed to show their regard for its welfare whenever any opportunity has arisen, of which the acceptance of the Presidency by the late Prince Consort, on the death of the Earl of Derby in 1851, was one of the most signal instances. The advantages which the Society has received from the numerous donations to the Menagerie, and the constant kindly interest shown in its general progress by H.R.H. the Prince of Wales, are so continually before the observation of the Fellows, that I need scarcely do more than allude to them here, beyond stating that in no year of the Society's existence has the number of visitors to the Gardens, or the Society's income, been so great as in 1876, when the large collection of animals brought from India by His Royal Highness formed the special object of attraction.

Except for the collection, necessarily of limited extent, exhibited in the Tower, and a few others having their origin in commercial enterprise (as Mr. Crosse's menagerie at Exeter Change, and the various itinerant wild-beast shows), there were, before the foundation of the Society's Gardens, little means in the country of gaining knowledge of the strange forms of exotic animal life with which the world abounds. An extensive, well-arranged, and well-kept collection, where the circumstances of exhibition were more favourable than in the institutions just referred to, seemed then to fulfil a national need, as the rapidly acquired popularity of the Society already alluded to testifies. Indeed, when we consider the amount of enjoyment and instruction which has been afforded to the 24,572,405 visitors who are registered as having entered our Gardens from their first opening in 1828 to the end of last year, it is easy to realize what a loss the country would have sustained if they had not existed. There was a period, it is true, in which they fell rather low in popular favour, the record of 1847 showing both the smallest number of visitors and the lowest income of any year in the Society's existence. A new era of activity in the management of the Society's affairs was then happily inaugurated, which resulted in a prosperity which has continued ever since, with only slight fluctuations, arising from causes easy to be understood—a prosperity to which the scientific knowledge, zeal, and devotion to the affairs of the Society of our present Secretary, ably seconded in all matters of detail by the Resident Superintendent, have greatly contributed.

One of the greatest improvements which have been gradually effected in the Gardens in recent years is the erection of larger, more commodious, and more substantial buildings for the accommodation of the animals than those that existed before. A few examples will suffice to illustrate the successive steps that have been taken in this direction. The primary habitation of the lions and other large feline animals was the building on the north side of the canal, which many of us may remember as a Reptile-house, and which has been lately restored as a dwelling-place for the smaller Carnivora. The Council Reports of the period frequently speak of the bad accommodation it afforded to the inmates, the consequent injury to their health, and the disagreeable effects on visitors from the closeness of the atmosphere. In September 1843, the terrace, with its double row of cages beneath, was completed; and the Report of the following spring, speaking of this as "one of the most important works ever undertaken at the Gardens," congratulates the Society upon the fact that the anticipations of the increased health of this interesting portion of the collection, resulting from a free exposure to the external air, and total absence of artificial heat, have been fully realized. The effects of more air and greater exercise were indeed said to have become visible almost immediately. Animals which were emaciated and sickly before their removal became plump and sleek in a fortnight after, and the appetites of all were so materially increased that they began to kill and eat each other. This, however, led to an immediate increase in their allowance of food, since which time, it is stated, no further accidents of the kind have occurred. As this structure, looked upon at that period as so great an improvement upon its predecessors, still remains, though adapted for other inmates, we all have an opportunity of contrasting the size of its dens and the provision it affords generally for the health and comfort of the animals and the convenience of visitors, with those of the magnificent building which superseded it in 1876.

In the Report of the year 1840 it is stated that the only work of considerable magnitude undertaken since the last anniversary was the erection of the "New Monkey-house," and the Council speak with great satisfaction of the substantial nature of the structure and the superior accommodation which its internal arrangements are calculated to afford to its inmates.

Many of us may remember this building, which stood on the space now cleared in the centre of the Gardens. Twenty-four years after its erection, in their Report dated April 1864, we find the Council speaking of it as "what is at present perhaps the most defective portion of the Society's Garden establishment," and the erection of a second "New Monkey-house" was determined upon. This is the present light and comparatively airy and spacious building, the superiority of which over the old one in every respect is incontestable.

Up to the year 1848 the only attempt which had been made to familiarize the visitors with the structure and habits of animals of the class Reptilia was by the occasional display of a pair of pythons, which were kept closely covered in a box of limited dimensions in one of the smaller Carnivora-houses. In 1849 the building which had been rendered vacant by the removal of the lions to the new terrace was fitted up with cases with plate-glass fronts on a plan entirely novel in this country, and which for many years afforded an instructive exhibition of the forms, colours, and movements of many species of serpents, lizards, and crocodiles. This house was a vast improvement upon anything of the kind ever seen before; but the contrast between it and the present handsome and spacious building so recently erected in the south-eastern corner of the grounds affords another illustration of the great progress we are making.

If time allowed I might also refer to the Elephant-house, completed in 1870, to the Insect-house, opened in 1881, and to various others of less importance.

The erection of these houses has necessarily been a very costly undertaking; in fact, since what may be called the reconstruction of the permanent buildings of the Gardens, which commenced in the year 1860, more than £50,000 has been expended upon them. It is only in years of great prosperity, when the Society's income has considerably exceeded its necessarily large permanent expenditure, that works such as these can be undertaken.

Much as has been done in this direction, we must all admit that there is still more required. The buildings of to-day will, we may even hope, some day seem to our successors what the former ones appear to us. The old idea of keeping animals in small cramped cages and dens, inherited from the Tower and the travelling wild-beast shows, still lingers in many places. We have a responsibility to our captive animals, brought from their native wilds, to minister to our pleasure and instruction, beyond that of merely supplying them with food and shelter. The more their comfort can be studied, the roomier their place of captivity, the more they are surrounded by conditions reproducing those of their native haunts, the happier they will be, and the more enjoyment and instruction we shall obtain when looking at them. Many of our newest improvements are markedly in this direction. I may especially mention the new inclosure for wild sheep near the Lion-house in the South Garden, with its picturesque rock-work and fall of water, and the large aviary for herons and similar birds just completed on what used to be called the Water-Fowls' Lawn.

All such improvements can, however, only be carried out by the continued aid of the public, either by becoming permanently attached to the Society as Fellows or by visiting the Gardens. I trust that this brief record of the principal events of the Society's history will show that such support is not undeserved by those who have had the management of its affairs.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—In the Natural Sciences Tripos, Part I., the following women students were placed in the first class: E. E. Field, A. J. Flavell, and M. M. Smith, all of Newnham College.

In Part II. the following men were placed in the first class in alphabetical order, the subject for which they were so placed being named:—Adie, Trinity, and Couldridge, Emmanuel (Chemistry); Durham, Christ's, and Edgeworth, Caius (Physiology);

Lake, St. John's (Geology); Melsome, Queens' (Physiology); Rendle, St. John's (Botany); Turpin, St. John's (Chemistry). No women were placed in the first class.

Mr. Lake, of St. John's, whose name appears in the above list, has been elected to the first Harkness Scholarship for Geology and Palæontology.

Dr. William Hunter, M.D., F.R.S. Edin., has been elected the first John Lucas Walker Student in Pathology.

The degree of Doctor in Science has been conferred on Mr. James Ward, of Trinity College, and Prof. F. O. Bower, of Trinity College and Glasgow University.

In consideration of this year being the two hundredth anniversary of the publication of Newton's "Principia," the Chancellor's Medal is to be given for an English poem on Isaac Newton.

The botanical teachers in the University have made a pressing appeal for the erection of a class-room for practical microscopical botany.

The Examiners for the Mathematical Tripos, Part II., have issued the following class list:—

Class I. Division 1: C. W. C. Barlow, and Bryan, Peterhouse; Dixon, Trinity; Fletcher, St. John's; Platts, Trinity. Division 2: Coates, Queens'; F. W. Hill, St. John's. Division 3: Clark, Pembroke; H. G. Dawson, Christ's.

Class II. Division 1: Askwith, Trinity. Division 2: Johnston, Peterhouse; McAulay, Caius; Nicolls, Peterhouse. Division 3: Tate, St. John's.

Class III. Division 1: Dickinson, Trinity.

The appointment of a Demonstrator of Pathology has been approved.

The proposals regarding the teaching of geography and the appointment of a University Lecturer in Geography have been confirmed.

The modified proposals to build new plant-houses in the Botanic Garden have been approved. A small research laboratory is to be built in connexion with them.

At the annual election at St. John's College, on June 18, the following awards in Natural Science and Mathematics were made:—

Foundation Scholarships:—Science: Rendle, £50; d'Albuquerque, £60; Groom, £50—Mathematics: Norris, £40; Varley, £50; H. H. Harris, £50; Rudd, £40. Scholarships prolonged or increased in value:—Science: Rolleston, £80; Shore, £60; Seward, £40; Harris, W., £50; Lake, £80—Mathematics: Fletcher, £80; Hill, £60; Tate, £40; Orr, £80; Sampson, £80; Baker, £100; Flux, £100.

Exhibitions:—Science: Grabham, d'Albuquerque, Baily, Hankin, Shaw—Mathematics: Orr, Sampson, Carlisle, Millard, Cooke, Humphries, Shawcross, Palmer. Proper Sizarships:—Science: Kellett—Mathematics: Box, Brown, Lawrenson; Shawcross, Palmer. Hughes Prizes:—Science: Lake; Mathematics: Baker and Flux, equal. Wright Prizes:—Science: Turpin, d'Albuquerque; Mathematics: Orr, Cooke. Hockin Prize (for Physics, and in particular Electricity): Turpin. Herschel Prize (for Astronomy): Flux. Hutchinson Studentship (for Sanskrit): Strong.

Among the distinguished persons upon whom honorary degrees were conferred on June 20 was Prof. Asa Gray, Professor of Natural History and Keeper of the University Herbarium and Botanical Library, Harvard University, author of the "Elements of Botany" (1836), the "Botanical Text-Book" (1842, ed. 6, 1880), "Darwiniana" (1876), "Flora of North America" (1878), &c., &c. We append the text of the speech delivered by the Public Orator, Dr. Sandys, in presenting him for the degree:—

Iuvat tandem pervenire ad historiae naturalis professorem Harvardianum, botanicorum transmarinorum facile principem. Annorum quinquaginta intra spatium de scientia sua pulcherrima quot libros, eruditione quam ampla, genere scribendi quam admirabili composuit. Quotiens oceanum transiit ut Europae herbaria diligentius perscrutaretur, virosque in sua provincia primarios melius cognosceret. In aliorum laboribus examinandis, recensendis, nonnunquam leviter corrigendis, iudicem quam perspicacem, quam candidum, quam urbanum sese praebeat. Quanta alacritate olim inter populares suos occidentales Darwini nostri solem orientem primus omnium salutavit, arbitratus idem doctrinam illam de formarum variarum origine causam aliquam primam postulare, et fidei de numine quodam, quod omnia creaverit gubernetque, esse consentaneum. Viro tanto utinam contingat ut opus illud ingens quod Americae Borealis Florae

accuratius describendae olim dedicavit, ad exitum felicem aliquando perducatur. Illum interim, qui scientiam tam pulchram suis laboribus, sua vita, tam diu illustravit, usque canam ad senectutem, ut poeta noster ait, 'vitae innocentis candidum florem gerens,'—illum, inquam, his saltem laudis flosculis, hac saltem honoris corolla, libenter coronamus.

Plurimos in annos Academiae coronam illustriorem reddat Florae sacerdos venerabilis, ASA GRAY.

### SCIENTIFIC SERIALS.

THE *Journal of Botany* for May contains the following articles:—Angolan Scitamineæ, by Mr. H. N. Ridley.—Forms and allies of *Ranunculus Flammula*, by Mr. Chas. Bailey.—Notes on British Characæ for 1886, by Messrs. H. and J. Groves.—The progress of botany in Japan, by Mr. F. V. Dickins.—Conclusion of the Rev. Mr. Purchas's list of plants for South Derbyshire.

In the number for June Mr. E. M. Holmes describes and figures two species of seaweed new to Britain, *Ectocarpus simplex* and *E. insignis*.—There are also papers on Queensland ferns, by Baron von Müller and Mr. J. G. Baker; on the genus *Potamogeton*, by Mr. A. Fryer; on plants of Northern Scotland, by Mr. F. J. Hanbury and Rev. E. S. Marshall; on Chinese ferns, by Mr. J. G. Baker; and on Australian species of *Potamogeton*, by Mr. A. Bennett.

### SOCIETIES AND ACADEMIES.

#### LONDON.

**Royal Society, June 16.**—"Abstract of Investigations upon Rabies." By G. F. Dowdeswell.

The first experiments made by inoculations with the saliva of rabid street dogs, during the outbreak of the disease in 1885, all failed to produce infection, thus confirming the reputed uncertainty of the result of the bite of a rabid animal.

Subsequently, adopting the methods recently described by M. Pasteur, it was found:—

(1) That the virus of rabies in the lower animals and of hydrophobia in man resides in the cerebro-spinal substance and in the peripheral nerves, and is not confined to the salivary secretion, as previously believed, nor is even as constantly present or as actively virulent in it as it is in the nervous tissues.

(2) That inoculation of a portion of the nervous tissue from a rabid animal upon the brain of another by trephining produces infective rabies or lyssa, much more certainly, and with a far shorter incubation period, than by subcutaneous inoculation of the same substance; but that the disease is identically the same in both cases.

(3) That the virulence of "street rabies" is usually increased and ultimately becomes remarkably constant by passing through a series of rabbits, in which animals the symptoms are somewhat different from those in others, and which are generally regarded as typical, being essentially paralytic, but that paresis to some extent is always present in this disease in dogs and others of the lower animals, and that there is no constant distinction between the so-termed "dumb" and "furious" rabies in the latter animal, the difference consisting in the preponderance of the paralytic or other symptoms.

(4) That the tissues of an infected animal do not themselves usually become infective till towards the close of the incubation period.

(5) That of a large number of drugs that were tried, both germicides and those which act specifically upon the cerebro-spinal system, including those most esteemed for the treatment of rabies and hydrophobia, none have any material effect in modifying the result of infection in the rabbit.

(6) Lastly, that with respect to the methods of protection against infection by a series of inoculations with modified virus, as advocated and practised by M. Pasteur, these are unsuccessful with the rabbit, and that his recent "rapid" or "intensive" method of inoculation is liable itself to produce infection; and that with the dog the natural refractoriness of this animal to infection with rabies by any method of inoculation, is so great, that it is exceedingly difficult to determine the effect of any remedial or prophylactic measures upon it; and that with man the statistics of the treatment must determine its effects.