

them is very great. It is not generally known that all the better institutions are developing so rapidly that their large revenues are inadequate.

It is often thought that in America there is an excessive expenditure on buildings and grounds, but this expenditure has been greatly exaggerated, and as to equipment, many American institutions are far behind the best of those in Europe. The number of professors is large, and in many cases this fact arises from excessive teaching or too much specialisation. In the best schools, however, it is due to an effort to encourage close relations between teacher and student. The administrative side of American institutions is highly developed, and, in fact, in matters of organisation and administration American institutions differ markedly from those in other countries. In the best schools a strong effort is made to avoid an excess either of "theory" or of "practice." The length of the course is usually four years, with a tendency to establish fifth-year courses for post-graduate study. Great importance is attached to means for keeping the schools in close touch with industry. One means of effecting this is the custom of encouraging professors to take an active part in the practice of their profession.

The Massachusetts Institute of Technology is described in detail. The property of the institute is valued at about 800,000*l.*; its annual expenditure is about 100,000*l.* There are about 1500 students, and the annual fee is 50*l.* The teaching staff consists of about two hundred men, of whom nearly half are professors. The programme of studies involves thirteen different courses, each leading to the degree of Bachelor of Science. The student is free to choose whatever course he names, but in any given course most of the work is prescribed, although there is always a considerable number of options. The studies are not purely "professional"; a certain amount of modern languages, literature, history, and even of political economy is provided for. Prof. Maclaurin directs attention to special features of the institution, such as the facility offered for researches in chemistry, physics, and sanitary science. For this research work special laboratories are provided. The chemical laboratories are planned to hold about a thousand students. The chemical department occupies forty-five rooms, including twenty-five laboratories, four lecture-rooms, a library, three rooms for weights and measures, and so on. The laboratory of chemical research occupies six separate rooms, and the chemical library has 10,000 volumes.

Prof. Maclaurin doubts the wisdom of separating science and technology. He thinks that a properly managed institute of technology should be an admirable training ground even for the man destined to devote his life to the advancement of "pure" science. It would avoid that separation of head and hand that is so bad for both. Science is sometimes in danger of becoming preoccupied with abstractions; its detachment from practice deprives it of a much needed stimulus, and makes for the detriment both of science and technology.

SOME BIRD-PAPERS.

OBSERVATIONS made in the neighbourhood of Tunbridge Wells have led Messrs. C. J. and H. G. Alexander to conclude that in the case of many of our migratory species of birds, each pair occupies a definite and restricted area during the breeding-season, into which other pairs of the same species do not intrude. This has led to the formulation of a scheme for mapping the individual distribution of such migratory birds in their breeding-haunts, the details of this plan being explained by the authors in the March number of *British Birds*. In noting on the map the nesting-area of any particular pair of birds, the authors generally relied upon the singing of the cock in one special spot. A reproduction of the Ordnance Survey map on the 6-inch scale of a small district in the neighbourhood of Tunbridge Wells, on which have been marked the nesting-areas of the individual pairs of migratory birds, serves to illustrate the plan.

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Japonenses, Mr. M. Ogawa contributes a hand-list of the birds of Japan, arranged on the same plan as the British Museum "Hand-list of Birds."

In a paper on the kingfishers commonly known under the generic designation of *Pelargopsis*, published as No. 1657 of the Proceedings of the U.S. National Museum (vol. xxxv., p. 657), Mr. H. C. Oberholser proposes to abolish that name, on account of insufficient definition, and to replace it by *Ramphalcyon* of Reichenbach. If the innovation be adopted, it may be hoped that the spelling of the name will be amended, and also that ornithologists will not follow the author in using the absurd designation *Ramphalcyon capensis capensis* for the typical race of a species restricted to the Malay Islands. Ornithologists have generally considered the sexes of these kingfishers to be externally indistinguishable, but this Mr. Oberholser points out is incorrect, the females being generally larger than the males, with the back and wings, and sometimes also the tail, duller and browner or greener in colour.

The January number, vol. viii., part iii., of the *Emu* contains the second part of a paper, by Mr. A. H. E. Mattingley, on the malleo-fowl (*Lipoa ocellata*), which is largely devoted to the eggs, young, and nesting-mounds of these remarkable birds. The *Lipoa* does not commence to lay until two years old, and during the first half of the breeding-season the eggs are laid regularly every third or fourth day, after which the intervals between the deposition of the eggs increase according to the disposition of the individual birds and the amount of food available. Hot and dry seasons have a noticeable effect on these birds, which under such conditions lay fewer eggs than usual. Laying usually commences early in September, but may be deferred until December is well advanced, and the total number of eggs laid by the individual hens in a season varies from one to a score. The eggs have unpolished shells of a delicate salmon-pink or pinkish-red colour when first laid, but soon fade to earthy-brown. They are laid in the mound in tiers, with four in the basement tier; between each tier is a layer of sand 3 or 4 inches thick, and the eggs in the same time are separated from one another by from 6 to 12 inches of the same material, and placed near the solid wall of decaying vegetable matter bounding the egg-chamber. The eggs are always placed with the narrow end downwards, so that when hatching the head of the chick, which occupies the larger end, will be uppermost.

In the *Times* of March 3 Mr. P. McKenzie announces the shooting in the Polela district of Natal of a white stork, which bore on one leg a metal band with the inscription "Ornith. Kőspont, Budapest, Hungaria, 209." To this letter there appeared in the same journal for March 17 a reply from Dr. O. Hermann, director of the Royal Hungarian Central Bureau for Ornithology, stating that the bird in question was liberated in Transylvania in July, 1908. This, taken with another event of the same nature, serves to settle the disputed question whether European storks cross the equator on their winter migration.

To the February number of the *Victorian Naturalist* Mr. A. J. Nuth contributes notes on the habits of Australian bower-birds. After alluding to the fact that the species of the genera *Ptilonorhynchus* and *Chlamydotera* adorn their bowers chiefly with bones, next to which come shells, stones, berries, and fragments of metal, while *Prionodura* uses flowers alone, and thus approaches the Papuan gardener-bird (*Amblyornis*), the author points out that the tooth-billed *Scenopoetes denticostis* forms a connecting link, in the matter of habits, between the more typical bower-birds and the cat-birds (*Æluretus*). In place of constructing a bower, the tooth-billed species merely clears a space, which it decorates with leaves, usually placed with the under surface uppermost; cat-birds, on the other hand, neither build a bower nor clear a space. Special attention is directed to the bowers of Newton's bower-bird (*Prionodura newtoniana*), some of which are stated to be more than 8 feet in height, and are decorated with flowers, generally orchids. At the larger bowers males alone are usually seen during the nesting-season, as the females are engaged elsewhere.