

or "oceras"; but Geyerina is left as a mystifying exception, which is just as likely to refer to a brachiopod as to a cephalopod. Seven are modifications of the name of the species chosen as the type; thus Bifericeras has biferus for its type. The remainder are not so happily devised. Euhoploceras has *A. acanthodes* for its type. Would not Acanthodicerias have conveyed practically the same meaning, and been much more easily assimilated? *A. luridus* is the type for Beaniceras. What is the objection to Luridiceras?

Among the morphological terms introduced those relating to homeomorphy crystallise our knowledge of this phenomenon and will be valuable for the discussion of other groups of fossils; but the series of terms of which "angustum-bilicate" is a sample is more cumbersome and confusing than the descriptive phrases it displaces. The use of a formula to express the relative dimensions of the ammonite and its whorls cannot be excelled for conciseness and accuracy; but the omnibus terms devised to convey the same information have an average range of error of 8 per cent., and their use will render ammonite literature still more unintelligible to the average worker.

Taken as a whole, this work is a most valuable contribution to the science of palæontology.

H. H. S.

Naturforskeren Pehr Forsskål. Af Carl Christensen. Pp. 172. (Köbenhavn: H. Hagerup's Forlag, 1918.) Price 8.00 krone=9s.

THE author of this interesting volume is well known to botanists by his valuable bibliographic work, especially his work on ferns. We have now to thank him for a welcome sketch of the naturalist of the ill-fated expedition to Arabia in 1761 to 1767, which was conducted at the expense of Frederick V. of Denmark.

The volume begins with an account of the expedition and the story of the gradual reduction of the six members to one, Christen Niebuhr being the only survivor. Pehr Forsskål was a Swede, born at Helsingfors in 1732. He was inscribed as a student at Upsala University, where he attended the lectures of Linnæus, but showed so strong a bent towards Oriental languages that in 1753 he migrated to Göttingen, where the celebrated J. D. Michaelis was professor. He was thus equipped both as naturalist and interpreter.

The results of his labours in this capacity are well known, as they were published by Niebuhr on his return to Copenhagen, practically unaltered from the original papers. We have accounts of plants observed in the South of France, Malta, Constantinople, Egypt, and Arabia Felix, until Forsskål's death at Jerim on July 11, 1763, in the thirty-second year of his age.

The text of the present volume is in Danish, but the Appendix of letters from the State Archives is more accessible to most readers because thirty-six letters are in German and the remaining four in French.

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LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Weeping Forms of Elm.

A REMARKABLE elm of the variety known as *Ulmus serpentina*, apparently about sixty years old, is now vigorously growing in a Croydon garden. It has this peculiarity, that all its permanent branches are curiously contorted and reflexed, while all the shoots from one to three years old are pendulous rods, which, with the beautiful foliage, form an exterior covering reaching to the ground.

To my knowledge no pruning has been done for the last four years by human agency, and it is highly probable that the tree from its beginning as a graft on a stock of *Ulmus montana* has been allowed always to develop itself without human guidance.

Will someone kindly explain how this tree has been able for many years to maintain its contorted character, seeing that all its young shoots, year after year, are not crooked?

I may add that much dead wood of recent growth falls from the tree every winter, and I have seen that more of the same kind remains entangled in the convolutions of the upper branches.

W. H. SHRUBSOLE.

15 Chatsworth Road, Croydon.

WE are informed that there is an interesting reference by the late Prof. Meehan, of Philadelphia, to a weeping form of *Ulmus americana* in Proc. Acad. Nat. Sci. Philad., 1901, p. 356. Like Mr. Shrubsole, however, Prof. Meehan confines himself to describing facts; he does not give any explanation of them.—ED., NATURE.

"HABITAT GROUPS" IN AMERICAN MUSEUMS.

DR. B. W. EVERMANN, Director of the Museum of the California Academy of Sciences, gives an account, in the *Scientific Monthly* (New York) for January last, of some of the "habitat" or ecological exhibits of mammals and birds which have recently been installed in the museum under his charge, and explains his views with regard to the educational functions of museums. With the latter part of his subject we are not at the moment concerned; but as it is possible, owing to the kindness of the publishers of the *Scientific Monthly*, to reproduce here several of the illustrations which accompany Dr. Evermann's paper, advantage may be taken of this opportunity to direct attention to some of the beautiful results which have been achieved in the United States in exhibiting animals in their natural surroundings. Each illustration has had to have its width cut away by about an inch in order to bring it within the width of a page of NATURE, but even with this reduction the mere inspection of the illustrations in question is sufficient to induce a feeling of unqualified admiration for these efforts; and, from my own personal experiences in the United States, I am able to go

further and say that the habitat groups in some of the American museums are fully deserving of the high praise Dr. Evermann claims for them.

structured a large exhibition hall measuring 180 ft by 60 ft. This is subdivided into two galleries, devoted respectively to mammals and birds. The regulation size for a large case is 25 ft. in width,



FIG. 1.—San Joaquin Valley "Elk" (*Cervus nanodes*). Museum of the California Academy of Sciences.

The system adopted is to illustrate a particular species of animal, or a selection of species living together in the same environment, in a case of

12 ft. in depth, and 18 ft. in height, the plate-glass front measuring 15 ft. by 10 ft. The mammal hall contains eleven of these large cases, and



FIG. 2.—Steller's Sea Lion (*Eumetopias stelleri*). Museum of the California Academy of Sciences.

sufficient size to include a complete landscape, in which the animals are seen as they actually occur in the field. With this object in view, the museum of the California Academy of Sciences has con-
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the bird hall possesses six, in addition to a series of smaller cases for exhibits on a less ambitious scale.

In most museums the visibility of the objects is

interfered with by reflections from the glass fronts of the cases. A window, or a light floor, or a white dress may be reflected so distinctly that these objects appear superposed on the exhibit,

cases for the habitat groups are arranged against the walls and are lighted by large skylights, while the central part of the hall is provided with skylights of a smaller size, so calculated as to reduce

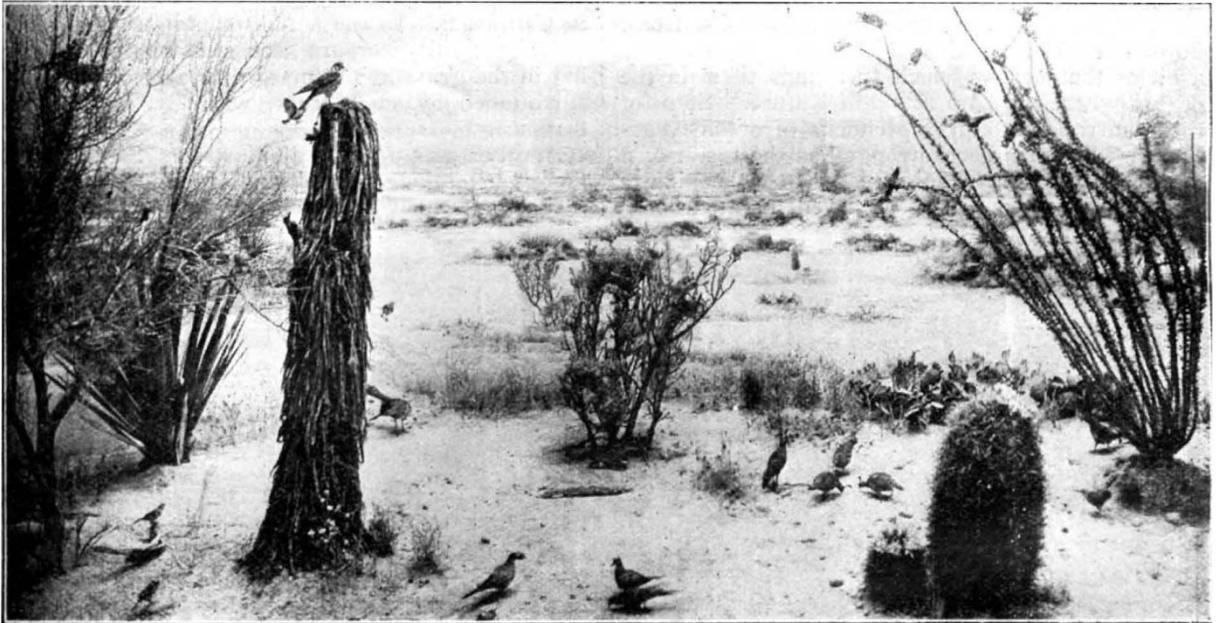


FIG. 3.—Californian Desert Bird Group. Museum of the California Academy of Sciences.

and it is often difficult, or even impossible, to obtain a satisfactory view of the specimens in the case owing to this cause, particularly when the

the illumination of objects in the space frequented by visitors to an amount which will give rise to no reflections strong enough to obscure the ob-



FIG. 4.—Black Bear (*Ursus americanus albifrons*). Museum of the California Academy of Sciences.

object inspected has a black surface, which emits so few light-rays that it is overpowered by the stronger reflections seen in the mirror-like front of the case. To avoid these inconveniences, the

jects in the exhibition cases. This is substantially the method which has long been in use for the exhibition of living animals in aquaria. Suitable arrangements are provided for reducing the

light in the central space on bright days, and for illuminating the cases at night or on dark days.

The general results of the system thus employed may be judged from the photographs here reproduced. The animals occupy the foreground of the case, and are grouped among the "shrubs, trees, flowers, rocks and other objects such as make up a bit of the scenery which surrounds them in the region where they are found in Nature." Some of these surroundings are specimens of actual vegetation, which has been arranged as the result of a careful study of a definite place, and the picture is completed by means of a curved, painted back-

a few individuals only, the species was saved from extinction by the enlightened action of the late Henry Miller, who in the early 'seventies took measures for protecting the remnant of the herds, which have since increased to such an extent that they now flourish in a dozen or more reservations in California. In the actual exhibit several individuals of this deer are seen standing or crouching in the grass at the margin of a piece of water surrounded by small trees, with low hills in the distance.

Another group (Fig. 2) illustrates Steller's sea lion (*Eumetopias stelleri*), a species which still visits the famous seal-rocks off San Francisco, al-



Nestlings.

Female.

Male.

Eggs.

FIG. 5.—Kentish Plover (*Aegialitis alexandrina*). British Museum (Natural History).

ground, "which connects so perfectly with the real objects in front as to make it difficult, if not impossible, to tell where the real ends and the painted begins." The best artists are employed for the preparation of these backgrounds, which are so effective as to complete the illusion that a piece of actual country, with its animal population, has been transferred to the museum.

Among the objects shown in the Californian museum attention may be directed to the group (Fig. 1) of the San Joaquin Valley "elk" (*Cervus nannodes*), a species which formerly occurred in vast numbers in the San Joaquin-Sacramento Valley, California. After having been reduced to

though it no longer breeds there. The animals are mounted on a ledge of rocks just emerging from the sea, which is represented with a fidelity making it appear like an actual coast-scene. The great difference in size of the two sexes is well brought out by the individuals selected, the adult male being at least twice as large as the adult female. A bird-group (Fig. 3) representing a scene in a desert region of southern California is particularly effective in bringing out the general features of the birds frequenting this region, as well as the aspect of the desert itself. It may be inferred from the descriptive label of the exhibit that the photograph fails to do justice to what is

shown in the museum, since stress is laid on the magnificent colours of the birds themselves and of the flowers which blossom in the desert after the spring rains. The last case (Fig. 4) which can be noticed contains a group of black bears (*Ursus americanus*), represented by a rocky scene, containing the entrance to a den occupied by an adult and its cubs, mounted in singularly life-like attitudes.

Without in the least seeking to take away from the American museums the credit which belongs to them for their successful representations of Nature, it may not be out of place to point out that the system adopted by them is merely the amplification of one which has for many years

illustration of the nesting habits of a species of bird.

The essential features of the natural history of a species are really as well brought out in the relatively small cases employed at the Natural History Museum as in the larger exhibits of the American museums, although they do not aim at representing an entire landscape. It may readily be conceded that both systems have their advantages. But while the selection of a smaller case permits of the illustration of the natural history of a large number of species, it is obvious that the limit in number must soon be reached in a museum, even one of the largest size, which mounts its exhibits on the scale adopted in the American museums.

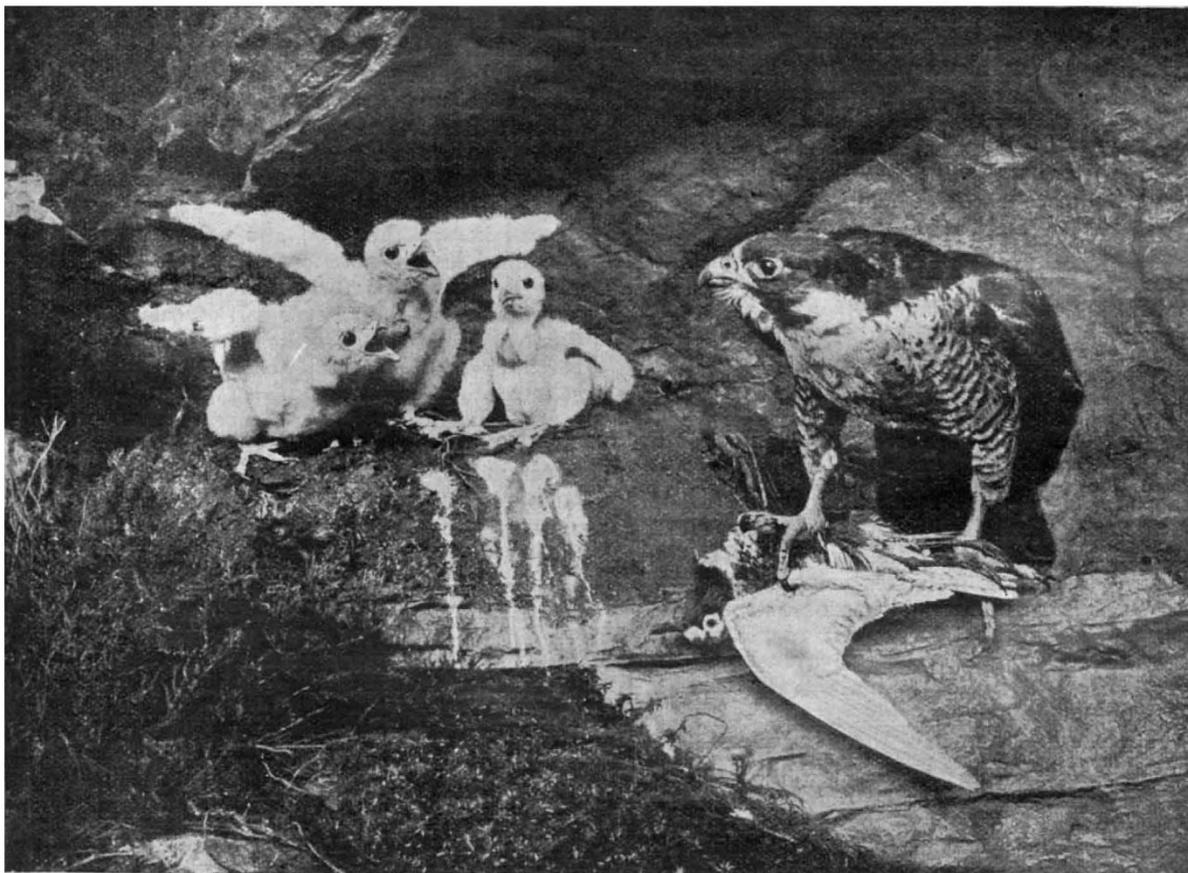


FIG. 6.—Peregrine Falcon (*Falco peregrinus*). British Museum (Natural History).

been in use in this country, particularly in the Natural History Branch of the British Museum. By permission of the trustees of the museum, two figures illustrating the nesting groups so familiar to visitors to the bird gallery in the museum at South Kensington are here reproduced, for comparison with the American exhibits. The group of Kentish plovers (*Aegialitis alexandrina*) (Fig. 5) shows adults, nestlings, and eggs among the stones where the species breeds. It requires some care to discover the nestlings (to the left of the case) or the eggs (on the right side), so closely do they resemble the stones among which they were found. The case of the peregrine falcon (*Falco peregrinus*) (Fig. 6) is another very successful

The question of cost is, moreover, one which cannot be ignored by any institution which is not provided with the most ample funds, and one would like to have been informed what has been spent in the production of the beautiful exhibits described by Dr. Evermann. It is unfortunately probable that economy in administration will be imposed on museums even after the conclusion of the war. Should it be suggested that it is the duty of museums in this country to imitate the American example, it must be remembered that the expenditure of large sums of money in this way would divert funds from other purposes which might be of more pressing importance.

S. F. HARMER.