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result of the developmental theory, and must be so, if we can compare the growth of an individual to the progressive existence of a species or a group in time. To do this, however, my old age theory becomes almost as important as development itself, or else the entire period of decline in the different groups and series, and many characteristics of their early beginnings, as well as the resemblances which exist between the forms at the beginnings and at the ends cannot be accounted for. In fact I am now sure that the proportions between the different periods of the life of any one individual may be compared with accuracy to the life of the group to which it belongs; in youth to what the group is in the beginning, in the adult to what it is now, and in old age to what it is to be in the future."

Another point of interest that engaged the author's attention was the discovery of the ancestral form of the Tetrabranchiate Cephalopods. Such a form he is disposed to think occurs in *Endoceras*. Giving his reasons in full he concludes that "it is in this group, therefore, or in some closely associated genus, that we must look for the ancestors of the Tetrabranchiate Cephalopods." The genus is a subdivision of *Orthoceras* (belonging to the group *Vaginati*), a straight-shelled Cephalopod figured in all the text-books. Barrande's opinion is also cited. That distinguished palæontologist has also "settled upon *Ascoceras* as the prototype, regarding the *Vaginati* as the nearest allies of *Ascoceras*."

We may safely say that this is one of the most thorough palæontological essays that have appeared for many a day. The author seems to have had unusual facilities for study, as he acknowledges his indebtedness to the liberal views pervading the management of the museum by which he was allowed to break up valuable specimens in the course of his investigations. The four lithographic plates illustrating the present Bulletin are exquisite.

LIFE HISTORIES OF OUR BUTTERFLIES AND MOTHS.*—These are carefully elaborated accounts of the metamorphoses of some of our common moths (*Sesia diffinis*, *S. Buffaloënsis*, *Thyreus Abbotii*, *Philampelus Achemon*, *Smerinthus geminatus*, *Daremma undulosa*, *Platarctia Parthenos*, *Euprepia Americana*, *Euchaetes egle*, *Lagoa crispata*, *Hyperchiria Io*, *Eacles imperialis*, and *Anisota senatoria*) which in some cases were raised from the egg. We find many

*Entomological Contributions, No. II. By J. A. Lintner. From the twenty-fourth Annual Report on the New York State Museum of Natural History, for the year 1870. 8vo. pp. 66.

remarks on the habits of these insects, their mode of constructing their cocoons and the food plants of the caterpillars. The author describes quite fully two sexes of the larva of *Thyreus Abbotii*, which is "peculiarly interesting from the fact that its two styles of ornamentation, in marked contrast one with the other, indicate the sex of the insect, no other instance of which among the Lepidoptera is known to us. The dorsal and lateral series of spots, yellow as described above, but frequently and perhaps usually of a pale green color, denote the male; the female being brown, without any trace of the above spots, but with interrupted, dark, subdorsal and stigmatal bands and numerous small longitudinal patches." The remarks on the varieties of *Smerinthus geminatus* Say will attract the attention of entomologists, since the author found among some moths of this species, "a female, having but a single blue pupil on the black ocellated spot of the secondaries. The occurrence of this variety is peculiarly interesting from the fact that upon specimens differing from the type of *S. geminatus* mainly in having but a single pupil, two other species seemed to be based, viz., *Sphinx ocellatus Jamaicensis* of Drury and *Smerinthus Cerisyi* of Kirby. . . A careful comparison of Drury's figure with our variety leaves scarcely a doubt of their identity." Other specimens show "quite an approach" to *S. Cerisyi*, which Mr. Lintner thinks "is, in all probability, a simple variety of *S. geminatus*." We are glad to see that the specific name *Io* is restored to what Walker called *Hyperchiria varia*. The reviewer acknowledges the correctness of Dr. Speyer's decision. The author advocates the rearing of caterpillars upon growing plants, which is becoming a favorite method with lepidopterists. In conclusion, we must confess ourselves greatly pleased with this brochure as it considerably advances our knowledge of the lives of our butterflies and moths.

As we are going to press with this notice, the first series of "Entomological Contributions" comes to hand. It is replete with new and interesting details concerning the life of our butterflies and moths. The history of *Hemileuca Maia* occupies twenty pages. We have also elaborate descriptions of the early stages of *Melitæa Phaeton*, *M. Nyceteis*, and *Pieris oleracea* and descriptions of three new species of Nisoniades, and a new *Ellema*. The other notes of times of capture, etc., are of practical importance.

Collectors will find some useful hints regarding field work. We quote the following passage :—

“Mr. Meske’s collections are made with unusual care. A gauze net is used by him, of so delicate a texture that the captured insect, in its efforts to escape, may brush against its sides without the loss of any of its cilia. As quickly as possible it is withdrawn from the net in a wide-mouthed bottle, and speedily quieted by a few drops of chloroform, poured on some cotton contained in a glass tube passing through the cork. When the insect is dead, or nearly so, it is carefully turned out on the palm of the left hand, and in that position pinned, without taking it as is usually done between the fingers.

I have found a lump of cyanide of potassa, secured by a piece of gauze to the stopple of a bottle (a French mustard jar with its hollow screw stopple forms an excellent collecting bottle), to be more convenient for use than chloroform, and nearly as prompt in its effects.”

We are quite well satisfied with the use of cyanide of potassa.

A HAND-BOOK OF BRITISH FUNGI.*—The increasing interest in the study of the Fungi, especially their microscopic forms, leads to the frequent inquiry for some compact and trustworthy manual of this somewhat puzzling class of plants. Mr. Cooke is well known as an enthusiastic and experienced author on the subject, and this treatise is the best which the English or American student can employ to assist him in his home researches. References to United States habitats are largely given, and the measurements and descriptions by Greville, Fries, Berkeley, Smith, etc., added to Mr. Cooke’s own observations on almost every species. In classification, the author has endeavored to simplify the arrangement, as much as the great influx of new discoveries would permit. To have succeeded, however imperfectly in this, is to have earned the gratitude of every student of the Fungi—for no branch of botany has been in greater confusion and embarrassment of nomenclature. The extremely plastic character of fungus life is perhaps an excuse for this, but Mr. Cooke seems to have taken hold of the difficulty with courage and to have worked with decided views of his own, which it is to be regretted that the proposed limits of the volumes left him no room to explain at length. The references are very full, much more so than the size of the work would prom-

* Hand-book of British Fungi, with full Description of all the Species, and Illustrations of the Genera. By M. C. Cooke, M.A., London and New York: Macmillan and Co. 8vo, 2 vols., pp. 982. Price \$12.