island an adult would approach and seize a young on the outskirts of the flock. At other times attacks would be made on young just coming up the beach from the water, while several times those that for some hours had been unmolested near the center of the island were apparently without provocation set upon and left in a dying condition. The main point of attack was the back of the head. To this region a number of severe blows were given with the point of the bill, after which it was grasped between the mandibles of the adult and the bird was pulled about until the skin and flesh were cut through to the skull. Sometimes the young fell on its back with feet convulsively kicking in the air. In this position the carpal joint of the wing and the breast seemed to be the points at which blows were mainly aimed. If the young escaped by running or was left apparently lifeless but subsequently revived and made off during the absence of its persecutor it was at once attacked by any other adult that happened to be near.

I am unable to convince myself that this destruction of their young was due to molestation of the colony, as has been suggested to me, but I have no other explanation to offer, unless it be impatience at the toll of regurgitated fish that the young levy upon the old.

I wish to inquire whether this murderous action on the part of the herring gull or of other birds has been noted in other colonies and whether any plausible explanation of it can be given.

Henry L. Ward.
Public Museum, Milwaukee.

AN UNUSUAL METEOR.

To the Editor of Science: In connection with the sinuous trail left by the meteor described by E. E. Davis in your issue for August 3 and discussed by Professor Abbe in that for September 14, I might remark that a similar phenomenon was seen and sketched in the case of a fine meteor seen in Ontario on July 5, 1898, a full account of which is to be found in the *Transactions* of the Astronomical and Physical Society of Toronto for 1898, page 74.

C. A. Chant.
Toronto, October 16, 1906.

A CORRECTION.

Mr. Bassler, of the U. S. National Museum, has called my attention to a serious error of mine on page 1,209, foot-note, of the Thirtieth Annual Report of the Indiana Department of Geology and Natural Resources. In discussing two species of corals, *Cystelasma rugosum* and *C. quinqueseptatum* Ulrich, figured and named, but without formal descriptions, by Mr. Ulrich in Professional Paper 36 of the United States Geological Survey, the foot-note states: 'These specimens are neither described nor do they have the internal structure shown.' The statement refers to both species instead of *C. rugosum*. It was intended to apply to *C. rugosum* but not to *C. quinqueseptatum*. As it is the statement is untrue, as the internal structure of *C. quinqueseptatum* is clearly and accurately shown in Mr. Ulrich's figures. This is a reflection upon Mr. Ulrich which was not intended and for which I wish to apologize.

The great accuracy with which Mr. Ulrich portrays the characters observed and his unusual powers of discrimination are well known and I would be the last one to question them, especially when I had not examined the specimens figured, as was the case in this instance. Printed slips will be sent to all those receiving copies of the separates of the paper ('Fauna of the Salem Limestone of Southern Indiana') in which the error occurs. Inasmuch as it is impossible to reach all those receiving the bound volumes, it will be a favor if those having them will note the correction in the book.

J. W. Beede.

SPECIAL ARTICLES.

A NEW ARTEMIA AND ITS LIFE CONDITIONS.

The classic observations and experiments of Schmankewitsch thirty years ago on the *Artemias* of certain salt pools near Odessa (Russia) clothe this curious phyllopod genus with a peculiar interest to zoologists and to students of species-forming. This interest has been renewed by the occasional reconsideration of Schmankewitch's data, and more rarely by the actual reexamination of *Artemia*

individuals under different environmental conditions (primarily the varying density or salt concentration of the waters in which the creatures live). In 1898 Anikin determined, to his own satisfaction at least, that the structural changes induced in *Artemia* individuals of succeeding generations by rearing these generations in salt water of differing density were not true species differences, fixed and heritable, but simply ontogenetic differences maintained only as long as the particular inducing influences (denser or less dense salt water) persisted. Certain specific characters, particularly those of the male, did not change at all, so that Anikin believed himself to be able still to recognize his original species throughout all the generations grown under modified conditions, although the species was actually plainly modified in structure in certain particulars. These structural changes, however, he found could be avoided if the changes in environment were made very gradually. When made violently the changes were marked, and could perhaps be interpreted to be those of degenerative or arrestative modification. In other words, the rearing of young in a salt water of higher concentration than that normal to the species worked injury or arrestation in the development. These modifications as noted by both Schmankewitsch and Anikin were chiefly concerned with the segmenting of the abdomen and the length and hairiness of the caudal appendages. As differences in exactly these characters were those by which the European species of *Artemia* (and partly the genus *Branchipus*) were distinguished, it is not surprising that Schmankewitsch believed himself to see *Artemia salina* transform into *A. milhausenii,* and *vice versa;* and even the genus *Artemia* change to the genus *Branchipus.* However, the correct interpretation of the affair is, probably, that the original describers of the European species had before them various 'ontogenetic species' of *Artemia, i. e.,* nutritional or developmental varieties.

In America three species of *Artemia* have been recognized; one *A. gracilis* Verrill, from barrels or casks of salt marsh water exposed (and hence much denser than the original marsh water) on a railroad bridge near New Haven, Conn.; another, *A. fertilis* Verrill, from Great Salt Lake, and the third, *A. monica* Verrill, from Mono Lake, Cal., a strongly salt and alkaline lake in the Owens River desert. All of these *Artemias* are living in salt water of a density much greater than that of ordinary sea water. The water in the New Haven casks varied in density from 1.06 to 1.065; the water in Great Salt Lake has a density of 1.17 and that in Mono Lake is certainly not less dense and is "so alkaline that it is said to be used for removing grease from clothing. It is said to contain, also, biborate of soda." I know of no experiments with the American *Artemias* except that Verrill states that *A. gracilis* 'can exist without apparent inconvenience when the water in which they occur is diluted with an equal bulk of fresh water as well as when it is much concentrated by evaporation.'

To the short list of American species I have to add a new one collected by student David Fulloway from the evaporating pools of a salt works at Redwood City (five miles from Stanford University) on the west shore of San Francisco Bay. This west coast *Artemia* differs markedly from the other American species in those characteristics upon which Verrill relies to distinguish the already known American forms, viz., the shape of the male claspers, the female egg-sac, and the character of the caudal appendages. The character of size upon which Verrill seems to have placed some reliance is a frail support, for it gives way when individuals reared under different conditions (density of salt water) are compared. The new species may be named and described as follows:

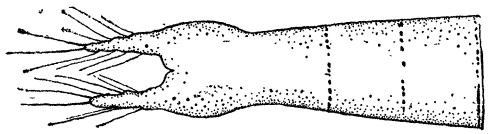

FIG. 1. Posterior tip of abdomen, showing caudal appendages of male *Artemia franciscana,* n. sp.

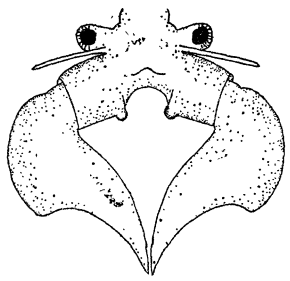

Fig. 2. Front aspect of head of male *Artemia franciscana*, n. sp., showing eyes, antennæ and claspers.

Artemia franciscana n. sp. (Figs. 1 and 2). Body slender; length of mature females (with eggs) from 6 mm. to 13 mm., males 5 mm. to 8.5 mm.; color translucent whitish to dull brick-red; claspers of male with stout median part and elongate, regularly tapering acute-angled terminal part; the suture between second and third segments is wholly lacking (this condition practically breaking down the distinction between the genus *Artemia* and the genus *Branchipus*), and there is no indication by external angle or change in direction of the outer or inner margins to indicate the point of fusion of these two segments (Fig. 1); egg-sac of female as broad as long; caudal appendages longer than broad, longer than in any of the other three known American species, and with scattered hairs all along both sides of each appendage (this character also tends to approach the condition in *Branchipus*). This species in a way serves to connect the genera *Branchipus* and *Artemia* but in all its general habitus and in the shape (very characteristic) of the claspers of the male it is much nearer the described *Artemia* forms than the *Branchipus* type. Males, females, eggs and larval stages found abundantly in the salterns (evaporating pools), density 1.08 to 1.24, at Redwood City, San Francisco Bay, in September, 1906.

As mentioned in the species description, mature specimens, both males and females, of this *Artemia* vary markedly in size and coloration. They vary also in degree of activity. All these differences are plainly correlated with the different life-conditions of the creatures. The water of San Francisco Bay has a density of 1.024. Pools of evaporating salt solution of the following densities were examined: 1.06, 1.085, 1.11, 1.137, 1.187, 1.19, 1.20, 1.207, 1.23, 1.24. Beyond this density the salt is precipitating rapidly. *Artemias* occur in all these pools from 1.08 on, most abundant, largest and most active, however, in water of 1.11 and 1.13. In water of less density than 1.11 the *Artemias* are large but not so abundant; in water of greater density they are noticeably smaller, and in the densities of 1.20 and upward they are much smaller and much less active. The color variation is also associated with the density, both males and females in the denser pools being reddish, the females alone reddish in the waters of medium density, and both males and females translucent whitish in the pools of 1.085, 1.11 and 1.137. In water of 1.24 (in which the salt is precipitating slowly) there are not many *Artemias* and they are all reddish, very small and noticeably inactive.

With special reference to the differences which Schmankewitsch and Anikin found among individuals of *Artemia salina* grown in salt solutions of various densities I may confine myself, at present (pending the outcome of more systematic observation and experimentation), to the statement that differences in proportional length of post-abdomen to rest of body, in character of the abdominal segmentation and in length and hairiness of the caudal appendages are apparent in this new *Artemia* and evidently bear a definite relation to the different densities of the pools in which the *Artemias* are living.

Vernon L. Kellogg.
Stanford University, Calif.

Some Unusual New Jersey Fishes.

During the past summer Mr. Wm. J. Fox was located at Sea Isle City, N. J., and observed or obtained the following species: *Lamna cornubica, Galeocerdo tigrinus, Myliobatis freminvillii, Clupanodon oglinum, Lucania parva, Tylosurus raphidoma, Hemiramphus brasiliensis, Albacora thynnus, Seriola lalandi, Blepharichthys crinitus, Vomer setapinnis, Palinurichthys perciformis, Bairdiella chrysura, Chætodipterus faber, Pomacanthus arcuatus, Balistes carolinensis, Alutera schœpfii* and *Echeneis alba-cauda*. A fine example of *Istiophorus nigricans* was also secured. *Stephanolepis hispidus* and *Ortho-*