cies may act together, the first, however, slightly dominating the second. By means of these tendencies the young turtles find the water. (2) After twelve hours at the outside, their phototropism is lost. (3) Swimming and floating are congenital instincts, but diving is a process which must be learned. (4) After entering the water, there is a definite period of "getting out to sea," as it were, followed by a definite period of rest. (5) The edibility of each object encountered is tested, *i. e.*, there is no instinctive selection of a particular food.

The Experimental Control of Asymmetry at Different Stages in the Development of the Lobster: V. E. EMMEL, Harvard Medical School.

A series of experiments were made at the following stages in the development of the lobster: (1) the second larval stage, (2) the fourth stage, (3) fifth stage, (4) twelfth stage or year-old lobsters. All of these experiments attempt to determine to what extent asymmetrical differentiation of the chelæ can be controlled by the amputation of one chela, thus giving the remaining chela the greater opportunity for growth.

The results of these various experiments support the following conclusions:

1. That in the first four larval stages of the lobster, the development of right or left asymmetry can be controlled by the amputation of one of the chelæ.

2. During the fifth stage the controlling influence of such amputations disappears.

3. In later stages when the asymmetry of the chelæ has become normally established, the amputation of neither one nor both chelæ will produce a reversal of asymmetry.

4. And finally, since up to the fifth stage either right or left asymmetry of the chelæ can be produced at the will of the experimenter, this asymmetry does not appear, therefore, to be directly predetermined or inherited, but may be controlled by factors arising in the course of development. What these factors are, has not been determined, but the present results do not indicate that they are "an inverse organization" of the egg, or an "alteration in the localization of germinal substances."

The Specific Gravity of the Constituent Parts of the Egg of Chætopterus and the Effect of Centrifuging on the Polarity of the Egg: F. R. LILLIE, University of Chicago. (To be published in the Proceedings of the Central Branch.)

Instance of a New Species of Crustacean, apparently in Process of Evolution: ADDISON E. VERRILL, Yale University.

An account was given of a peculiar race of the grapsoid genus, *Sesarma,* studied in Bermuda, in 1901. The common species in Bermuda (*S. Ricordi*) lives ordinarily at and just above high-tide level, within easy reach of water. It is often seen running actively about among the stones and dead seaweeds. It may almost always be found under masses of *Sargassum* cast up on the shores, as well as under stones.

The new form seems to be a subspecies of a variety of *S. Ricordi,* which may be actually in process of development into a genuine species, by natural selection and physiological isolation.

It was found living under stones in dry upland fields and nearly barren waste lands with thin soil, where the scanty vegetation consisted of wiry grasses and dwarfed shrubs and weeds. It was associated with a few species of ants, beetles, cockroaches, spiders, land-shells, etc. When the stones were turned over it usually ran away very actively and sought shelter under other stones, but did not seek the water, as most species do. Its general appearance was very unlike *S. Ricordi.*

The carapace appears more rough and

uneven than in the ordinary form, for it is more strongly areolated and the branchial areas are more swollen, so that the vertical thickness is greater and the reticulated areas of the sides are broader, giving a larger surface for aeration of the water, and indicating larger gill-cavities and gills. The dorsal surface of the carapace is covered with more numerous and larger granules, bearing numerous short dark hairs, very evident under a lens of low power, and capable of holding adherent dirt.

The ambulatory legs are distinctly larger and longer than in the common form. The proportion of the merus joints of these legs to the breadth of the carapace is 1:1.36. In *Ricordi,* 1:1.5.

The colors, when living, appear dull or sordid yellowish brown, or mud-color, due partly to adherent dirt, but often specked or mottled with red or reddish brown.

It is not improbable that it has the habit of eating different food from its parent species, and also a somewhat different breeding season, so that the two forms may no longer interbreed. This could not be determined at the season of the year when we were in Bermuda.

The young crabs, moulting from the megalops at the shore, have evidently inherited the instinct to seek the higher and drier localities, where they probably have fewer enemies. The modifications that have taken place are in accordance with the change in habitat. The increased hairiness of the carapace and legs serves to retain the dirt that aids materially in their concealment when exposed. Probably they feed mostly at night. The larger gill capacity and longer legs have evident advantages.

That it is not a casual or transitory variation is evident from the fact that there are, in the museum of Yale University, several good, characteristic, adult specimens sent to us before 1866 (perhaps collected as early as 1855), by J. Matthew Jones, Esq., who resided in Bermuda for many years, during the colder seasons, and whose first book on Bermuda was published in 1859.

The evolution and habits of this race of crabs would furnish a good subject for investigation by some one connected with the Bermuda Biological Station. The varietal or subspecific name, *terrestris,* indicating its marked terrestrial habits, is given to it by the author.

The Meaning of the Color Variations of Litorina palliata: F. B. Sumner and Jas. W. Underwood.

This mollusk offers a striking example of apparent protective coloration, nearly all of its varieties harmonizing beautifully with one or another part of the rock weed on which it dwells. This resemblance relates not only to the general color, but to the shape of the shells, which, on their natural background, strongly suggest the floats of the weed. On analysis, however, the popular explanation of the phenomenon as due to the natural selection of the more favorably colored individuals, seems far from certain. (1) There is no tendency whatever for the mollusk to choose a background resembling its own particular color rather than one conspicuously unlike it. (2) In nature, the red and brown shells are found statistically to be present in about the same proportions on the *Ascophyllum* as on the *Fucus,* although the latter alone displays red or brown tints in its foliage. (3) The green element in the color of many of the shells, which is an important factor in bringing about the harmony with their surroundings, is found to be due to certain algæ inhabiting their superficial layers. It is thus an entirely adventitious color, and these same algæ are found in abundance on

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CHEMICAL POSITIONS IN THE GOVERNMENT SERVICE[1]

WHEN we enter the profession of chemistry our chief interest is centered on the conditions that obtain in the various fields of chemical activity. In the case of those who retain their youth by contact with student life, that interest does not lessen.

Frequent inquiries covering a broad scope are made by students and recent graduates in chemistry, and teachers, to whom they naturally turn for advice, are constantly asking for material that will enable them to supply this information. Inquiries made at the Department of Agriculture regarding opportunities for chemical work are mainly from students who are nearing the completion of their college course, or from teachers who are directing the studies of others. Often the inquiry relates to the character of work which the student should undertake in order to fit himself for a position in the department. Unfortunately the information is rarely sought with a view to increasing the equipment of men who have received broad fundamental training. The purpose is usually to substitute for a portion of a regular course in chemistry, some special study that will afford a temporary advantage.

I offer these inquiries as my apology for discussing in a few minutes a subject that would require a volume for its adequate treatment. It is my purpose to

[1] Address before Section C of the American Association for the Advancement of Science, Chicago, January 2, 1908.