be apt to suspect they might be the Off-spring of some European Father: But besides that the Europeans come little here, and have little Commerce with the Indian-women when they do come, these white People are as different from the Europeans in some respects, as from the Copper-colour'd Indians in others. And besides, where an European lies with an Indian-woman, the Child is always a Mostesa, or Tawney, as is well known to all who have been in the West-Indies; where there are Mostesa's, Mulatto's Etc. of several Gradations between the White, and the Black or Copper-colour'd, according as the Parents are; even to Decompounds, as a Mulatto-Fina, the Child of a Mulatto-man, and Mostesa-woman, Etc.

But neither is the Child of a Man and Woman of these white Indians, white like the Parents, but Copper-colour'd as their Parents were. For so Lacenta (an Indian chief) told me, and gave me this as his Conjecture how these came to be White, That 'twas through the force of the Mother's Imagination, looking on the Moon at the time of Conception; but this I leave others to judge of. He told me withal, that they were but short-liv'd.

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AGE OF SHAD ESTIMATED FROM EXAMINATION OF SCALES

AN estimation of the age of fish by counting the number of annular rings on the scales has been possible in the case of numerous species. For the shad (*Alosa sapidissima,* Wilson), however, this appears not to have been done up to the present time; although considerable success has been attained in age estimation of certain *Clupeidae* other than shad, for example, the herring.

The investigation, authorized by the Connecticut State Legislature and undertaken by the Board of Fisheries and Game for the purpose of discovering the cause and cure of the decline of Connecticut River shad, necessitated an extension of the meager existing knowledge of shad migrations. Age determinations were required for this phase of the work.

The annular rings (annuli) of the shad scale are rather difficult to see and to differentiate from other circular markings on the scale. I have therefore undertaken a systematic study of the scales from shad of various sizes, studying all the scale markings. Preliminary experience with staining and other methods of preparation to bring out the annular markings gave unsatisfactory results. It therefore appeared necessary to make use of other markings. Of these, the transverse grooves running completely across the scale were found to have a constant relation to the annuli in those scales in which the latter were sufficiently distinct to be counted. The relation is: two *complete* grooves (omitting incomplete ones) to one annulus. In young shad of known age, less than one year, there are one or two complete transverse grooves on the scale. Although annuli should be counted when possible, the counting of the grooves gives supplementary information and may even be relied upon when the annuli are not distinguishable. The number of the complete grooves divided by two gives the age of the shad in years.

Age determinations by this method have been confirmed by examination of the otoliths of shad. Mr. R. L. Barney, who has made these examinations, finds that the size and markings of the otoliths give age estimations which agree with the scale readings.

The scales selected for observation should be of regular shape and should show no distortion of scale markings such as apparently result from the effects of external injuries. I have used scales from the anterior part of the body at a point about half way between lateral line and pectoral fin.

Examination of shad ascending the Connecticut River during the present season shows that males are of ages four, five, six, seven and eight years, females, seven, eight, nine and ten years. Adult shad of both sexes of sizes less than 32 cm in length occur, as a rule, only in the sea.

This report is preliminary. A more extended account with drawings and microphotographs of the scales and with tabulated data will be published later.

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THE FRESH-WATER JELLYFISH (CRASPEDACUSTA SOWERBYI) IN KENTUCKY AGAIN

THIS fresh-water medusa, for many years regarded as a rarity by zoologists, appears to have become permanently established in Kentucky. In 1916 and 1917[1] it was found by the writer in great numbers in Benson Creek, but in subsequent seasons (of 1918 to 1923, inclusive) it was not found and thus seemed to have remained true to its history of infrequent appearances at widely separated points on the globe. But a visit made September 5, 1924, to the spot where it was discovered in 1916 showed it to be still there. Many were collected; hundreds could have been obtained. On the twelfth of this month a second visit to the locality showed it less common at the surface of the water, but in several hours spent in the search it was learned that it had retreated to a depth of several feet and could be brought up in some numbers by stirring the water with the oars of a rowboat. Its movements are stimulated by sunlight, and as the day was cloudy but few were attracted toward the

[1] SCIENCE, Vol. XLIV, 1916, p. 858; Vol. LVI, n. s., 1922, p. 664.

surface and within reach of my dip-net, though a good many were brought up by use of the oars. This habit of retreating from the surface when weather conditions are unfavorable explains the apparent absence of the medusae on some of my previous visits to the creek. It has become evident that cloudy weather is unfavorable to finding it. The best conditions, judging by the character of the three seasons when it has now been found, are settled, clear days, when the water is low, free from silt and there is little current in the creek.

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THE PEANUT PLANT

SINCE the peanut plant (*Arachis hypogea* L.) has become of such economic importance as to demand a description in every text-book on field crops, attention should be called to a mistake that was made by the early writers so that in the future the blossoms of this important plant might be correctly described.

Arachis hypogea is one of the Leguminosae and has sessile papilionaceous blossoms. The calyx consists of a tube about an inch in length crowned by the five sepal tips. On the throat of calyx tube are situated the five bright yellow petals. The calyx tube was mistaken for a peduncle and so described by the early authors, and the whole structure was termed a "sterile" blossom. After the blossom withers and falls off, the ovary, by the rapid growth of the internode between it and the receptacle, is lifted from between the bracteoles in the leaf axil and responding to geotropic influence turns toward the earth and the seeds are further developed and ripened only after it has been pushed below the surface of the ground. The early writers looked upon and described this gynophore with its ovary as a "cleistogamous" blossom.

Poiteau in 1805 first correctly described the blossom of the peanut. Robert Brown in 1816 confirmed Poiteau's description. In 1839 Bentham wrote of *Arachis hypogea* as a plant with dimorphic flowers, one with calyx and corolla which is always sterile, the fertile flowers having "neither calyx, corolla nor stamens . . ." and when Neisler in 1865 reconfirmed Poiteau's description, Bentham in the same year defended his paper of 1839. Corbett as a contributor to the "Cyclopedia of American Agriculture" (1907) describes the plant as having dimorphic flowers and *illustrates* the "fertile" and "sterile" blossoms.

Notwithstanding the works of Poiteau, Brown and Neisler, the majority of our modern publications, including scientific papers, agricultural bulletins and text-books on farm crops, in referring to the peanut plant seem to quote from the earlier writers and speak of it as having fertile and sterile blossoms, whereas it has complete blossoms and is self-fertilized.

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SCIENTIFIC BOOKS

Neurological Foundations of Animal Behavior. By C. J. HERRICK, H. Holt & Co., New York, January, 1924, xii + 324 pp.

Physiological Foundations of Behavior. By C. M. CHILD, H. Holt & Co., New York, January, 1924, xii + 330 pp.

THE "Neurological Foundations of Behavior," by C. J. Herrick, and the "Physiological Foundations of Behavior," by C. M. Child, were written, in close collaboration and were issued from the press at the same time. They represent, so to speak, twin volumes; they appear, as twins commonly do, in the same garb, and they are of nearly the same size. But in addition to these superficial features of likeness, there are many other points of resemblance due to common hereditary factors. The writers appear to be in essential agreement in regard to their fundamental concepts. The notion of metabolic gradients which Child has elaborated in several volumes and a multitude of papers is adopted also by Herrick, and it forms the keynote of both volumes. The gradient idea, according to the authors, gives not only an interpretation of organic form, but it affords the basis for a science of behavior.

Both authors regard form and behavior as intimately and essentially correlated. It is the structure and physiological properties of the nervous system that form the neurological foundations of behavior, and Herrick's volume is devoted largely to describing the various types of nervous organization in different groups of animals, and in showing the significance of these types in relation to the kinds of behavior which the animals exhibit. After Herrick's first two chapters, which are mainly introductory, there is a description, in chapters 3 and 4, of the different types of receptors. Then follows in chapters 5 to 16 a survey of the types of nervous systems with their correlated kinds of activity from the protozoa to the higher vertebrates. For the reader who wishes to obtain a comprehensive idea of the architecture and evolution of the nervous system, these chapters will prove most useful. Throughout the volume, structure is interpreted from the standpoint of function. To show how the mechanism works is the constant aim.

For many readers, perhaps the most interesting of the series of chapters mentioned are those dealing with the "Evolution of the forebrain and functional factors in forebrain development." The forebrain is