purgative acting by irritation of the bowels might cause such peristalsis as to allow the pin to become caught in the contracting action in such a manner as to become permanently imbedded. The removal by natural action is deemed best, aided by the feeding of much bulky food to stimulate natural peristaltic action, and to form encasement for the foreign object.

In accordance with these principles the child was induced to eat as much bulk-forming food as possible, as shredded wheat, oatmeal, bread and milk, potatoes, carrots, spinach and celery. Milk was allowed after the appetite had become satiated with the solid food.

In order to make more certain the removal of the object, as well as to hasten the action, it was conceived that the addition of agar to the diet would be highly beneficial. Since agar is not digested and swells to several times its bulk its effect would be not only to hasten peristalic action by natural stimulation, but its added bulk would assist in encasing the object and in carrying it along. It was reasoned that its effect would be of especial value in those portions of the digestive tract in which the digestible food is in the state of emulsification.

At evening and morning meals therefore, there was added to a little of the prepared cereal, three heaping teaspoonfuls of chocolate-coated granular agar. This was eaten by the child readily and with relish.

As the child tended somewhat toward constipation, the removal of the previous fecal matter was hastened by the use of a glycerol suppository. The later actions were wholly normal. The first feeding occurred in the evening, soon after the swallowing of the object. Bowel action occurred as follows: 16 hours, 23 hours, 40 hours, at which time the pin appeared. The stools were copious and of a moist, compact, firm structure—an ideal consistency to carry a foreign object. As bowel action occurred twice daily, instead of the usual once; and as the bulk of each was at least twice normal; it is evident that the bowel content had been increased by fourfold, due in a large measure to the agar.

It is not to be supposed that the safe removal of the object was due wholly to the agar, though this probably at least hastened its removal. As the experiment was wholly satisfactory however it would lead to the recommendation of the use of agar for this purpose. In the case of the removal of objects more dangerous, or more difficult of removal, it might prove a decisive factor.

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AN INCONSISTENCY IN TAXONOMY

In the classification of animals we are often very inconsistent in the use and evaluation of characters as we apply them to different groups. This is more apparent between widely separated groups than closely related ones. Thus in the subgroups in one class of the vertebrates, osteological or other anatomical characters may be largely used, while in another class such internal characters may be almost entirely subordinated to external ones. Sometimes, to be sure, certain characters have not the same value in one class that they have in another, but the main reason for the inconsistency lies in the less skilful or less thorough handling of one group as compared with another. The truth is, classification became unfashionable long before the groups, especially the larger ones, were well formulated. Among groups as small as genera there are probably few cases so extreme as the following.

There are two genera of sharks, *Mustelus* and *Cynias,* that are strikingly similar in all external characters. We refer them to different genera because they differ in regard to a modification of the yolk sac in the young. In *Mustelus* the yolk sac is modified to function as a placenta by which the young forms a connection with the walls of the mullerian duct of the mother. This so-called placenta is absent in *Cynias,* or, more correctly speaking, the yolk sac is unmodified.

On the other hand, we place two mackerel together in the genus *Scomber* even though one of them possesses an entire organ that is absent in the other. *Scomber scombrus* is without a swim bladder; *Scomber japonicus* has a well-developed one.

This is a most glaring inconsistency. On one hand, to separate two genera on the basis of a mere modification of an organ that is possessed by both of them, and on the other hand, to include in one genus two forms, one of which possesses an organ that is absent in the other. Making this inconsistency more marked is the fact that in the case of the sharks it is only during a part of the life of the animals (when they are with young) that the character of the 'placenta,' upon which the genus is based, can be ascertained. In the mackerel the presence or absence of the swim bladder can be seen at any time by simply opening the abdominal cavity.

On the whole, workers in vertebrate taxonomy seem to be more chary than those in invertebrate, in making use of internal characters in classification. The fact that a character is not readily apparent should not influence its use if animals are to be arranged in their true relationship.

Such a marked structural difference as the possession of an organ as compared with the suppression of it certainly should be considered of generic weight. Therefore it would seem well to raise the subgenus *Pneumatophorus* Jordan and Gilbert, to generic rank. The American species, *Scomber colias* and *S. japonicus,* would thus stand *Pneumatophorus colias* and *P. japonicus.*

EDWIN C. STARKS

AN IMPROVED METHOD OF ESTIMATING THE NUMBER OF GENETIC FACTORS CONCERNED IN CASES OF BLENDING INHERITANCE

DR. SEWALL WRIGHT has kindly pointed out an error in the formula which I recently suggested[1] in connection with this subject. Instead of taking the direct difference between the standard deviations of F_1 and F_2, as I did, one should deal with the difference between the *squared* standard deviations. Dr. Wright bases this correction on his discussion of the fundamentals of factorial theory as developed particularly in "Systems of Mating IV.," *Genetics,* 6, March, 1921. He gives the correct formula for the number of factors (n) concerned in a case of blending inheritance as

$$n = \frac{D^2}{8(\sigma_2^2 - \sigma_1^2)},$$

in which D is the difference between the means of the parental races, σ_1 is the standard deviation of F_1, and σ_2 is the standard deviation of F_2. This method gives in general a smaller number of genetic factors than the method which I suggested, and its use is simpler. Applied to the examples which I cited, it gives, in the case of seed weight of maize, 4 or 5 factors instead of "about 15"; and in the case of weight of rabbits in three different crosses, 3, 14 and 22 or 23 factors, instead of 56, 80, and 176, respectively. I am greatly indebted to Dr. Wright for the correction.

W. E. CASTLE

1 SCIENCE, July 29, 1921.

THE CURVE OF DISTRIBUTION

TO THE EDITOR OF SCIENCE: An explanation of the irregularities in the curve of the distribution of the heights of 221,819 men, taken from insurance statistics, to which Professor Boring called attention in SCIENCE for November 12, 1920, may possibly be found in the nature of the measuring devices used by the examining physicians. One of the three leading types on the market and at least one other are graduated in inches alone instead of in feet and inches. The tendency for men who use these scales to read off the round number, 70 inches, instead of 69, and 60 inches instead of 59, might be great enough to account for the "bumps" in the Gaussian curve at 5 ft. 10 in. and at 5 ft.; and the lowering of the average height which would result from the correction of these exaggerations might change the ideal curve sufficiently to bring the bump at 5 ft. 8 in. within the normal limits of error for a curve whose unit of measurement is so large in comparison to the total range of variation.

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