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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