SCIENCE

VOL. LXV[illegible] MARCH 11, 1927 No. 1680

CONTENTS

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa. Garrison, N. Y.

New York City: Grand Central Terminal.

Annual Subscription, $6.00. Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

THE GRAPHIC REPRESENTATION OF RELATIVE VARIABILITY[1]

IT has been the generally accepted biometric practice to use the coefficient of variation as the measure of the *relative* variability or scatter of frequency distributions. This constant is

$$V = \frac{100\ (\text{standard deviation})}{\text{Mean}}$$

It gives the standard deviation of the distribution in terms of the mean value of the varying character. By expressing the scatter of the distribution in this way it becomes possible to compare the relative variabilities of characters measured in different absolute units.

But the coefficient of variation has never been an entirely satisfactory constant to biologists, at least. While formally correct enough, within the limits of its definition, it does not readily or instantly call up in the mind an adequate picture of the real degree of scatter of the distribution. This is, in part at least, because two things, the mean and the standard deviation, are involved in it. When one reads the value of the standard deviation of a particular distribution he recalls that roughly three times this quantity on either side of the mean includes the entire frequency and this gives at once some concept of the biological extent and meaning of the variation, in the particular case.

There would seem to be a place of usefulness for an adequate graphical method of depicting relative variability for comparative purposes, so that one may *see* the difference or likeness in the variation of a man and a mouse, for example, in respect of body-weight. It is the purpose of this paper to describe such a graphic method, and to illustrate its applications.

The method may best be approached through a concrete illustrative example. We have lately been studying in this institute the normal variation and correlation of the relative cell volume of human blood, in relation to age, body-weight and stature.[2] The present situation regarding the measurement and graphical depiction of variation in these four charac-

[1] From the Institute for Biological Research of the Johns Hopkins University.

[2] *Cf.* Pearl, R., and J. R. Miner. "A Biometric Study of the Relative Cell Volume of Human Blood, in Normal and Tuberculous Males." Johns Hopkins Hospital Bulletin. In press.