43.
Application
of theory of
error.

. Every mathematical instrument, when applied to a novel purpose for which it was not originally invented, "derives as much benefit in its development as it confers through being made use of." Thus Mr Galton's application of the theory of error to the facts of distribution and variation not only enabled him to bring method and order into such questions raised by the Darwinian theory [1] as natural selection,

[1] It is perhaps premature to speak with great confidence of the actual results which have been gained by this novel branch of scientific inquiry, or of the practical importance which these results may have in the future with regard to some of the great social questions. Still, in a history of thought it is of importance to note how, through Mr Galton's writings, the problem of Inheritance has acquired quite a new aspect. This finds expression in his famous so-called "law of filial regression," which goes against "the current belief that the child tends to resemble its parents" (p. 104). In fact, all opinions and theories which had been propounded before Galton, either popularly or scientifically, were based upon a one-sided regard to the more visible portion of the ancestry—viz., the parents; whereas, if any general theory like that of "pangenesis," or of "stirps," or of the "differentiation of the germ-plasma and the body-plasma" be made the basis of discussion, the whole ancestral tree must be considered to contribute to the formation of the characters of any individual. In fact, we have before us not one pair, but an endless line of pairs which are, as the terms of a series, connected by the powers of the number two; and it is then easily seen, without going into refinements (which, however, in the further elaboration of the problem, may become very important), that the first term of the series, which represents the parents, contributes only one-half of the whole, that is, each parent one quarter. It is also evident, if each parent only contributes on the average one quarter, that an exceptional bias in any direction communicated by them would be balanced in the long-run by the opposite action of the remaining ancestry, and that, contrary to ordinary belief, inheritance would operate in the direction of bringing each individual back to the average of the whole lineage. Mr Galton first observed this law of regression to the average by definite countings with seeds and "a comparatively small number of observations of human stature": and he remarks that if it was only by these experiments and observations that the law of regression had been established, it could not have been expected that the truth of the apparent paradox would be recognised. When, however, the rule was once expressed, it was "easily shown that we ought to expect filial regression, . . . two different reasons for its occurrence" existing—"the one connected with our notions of stability of type, the other as follows: the child inherits