'Induction' (pub. 03.02.13-18:45). Quote in M. Bergman & S. Paavola (Eds.), *The Commens Dictionary: Peirce's Terms in His Own Words. New Edition*. Retrieved from http://www.commens.org/dictionary/entry/quote-theory-probable-inference-4.

Term: Induction

Quote: The principle of statistical deduction is that these two proportions–namely, that of the *P*'s among the *M*'s, and that of the *P*'s among the *S*'s–are probably and approximately equal. If, then, this principle justifies our inferring the value of the second proportion from the known value of the first, it equally justifies our inferring the value of the first from that of the second, if the first is unknown but the second has been observed. We thus obtain the following form of inference:

FORM V

Induction.

S', S", S"', etc. form a numerous set taken at random from among the *M*'s,
S', S", S"', etc. are found to be–the proportion {r} of them–*P*'s;
Hence, *probably* and *approximately* the same proportion, {r}, of the *M*'s are *P*'s.

The following are examples. From a bag of coffee a handful is taken out, and found to have nine-tenths of the beans perfect; whence it is inferred that about nine-tenths of all the beans in the bag are probably perfect. [—]

When the ratio {r} is *unity* or *zero*, the inference is an ordinary induction; and I ask leave to extend the term "induction" to all such inference, whatever be the value of {r}. It is, in fact, inferring from a sample to the whole lot sampled. These two forms of inference, statistical deduction and induction, plainly depend upon the same principle of equality of ratios, so that their validity is the same. Yet the nature of the probability in the two cases is very different. In the statistical deduction, we know that among the whole body of *M*'s the proportion of *P*'s is {r}; we say, then, that the *S*'s being random drawings of *M*'s are probably *P*'s in about the same proportion–and though this may happen not to be so, yet at any rate, on continuing the drawing sufficiently, our prediction of the ratio will be vindicated at last. On the other hand, in induction we say that the proportion {r} of the sample being *P*'s, probably there is about the same proportion in the whole lot; or at least, if this happens not to be so, then on continuing the drawings the inference will be, not *vindicated* as in the other case, but *modified* so as to become true. The deduction, then, is probable in this sense, that though its conclusion may in a particular case be falsified, yet similar conclusions (with the same ratio {r}) would generally prove

approximately true; while the induction is probable in this sense, that though it may happen to give a false conclusion, yet in most cases in which the same precept of inference was followed, a different and approximately true inference (with the right value of {r}) would be drawn.

Source: Peirce, C. S. (1883). A Theory of Probable Inference. In C. S. Peirce (Ed.), *Studies in Logic by Members of the Johns Hopkins University* (pp. 126-181). Boston, MA: Little, Brown, and Company.

References: CP 2.702-703

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