

*The Theory of Errors of Observation.*

—Mr. C. S. Peirce, in an interesting article on the laws of errors of observation, and the nature of the so-called personal equation, gives the results of some experiments made upon an entirely untrained observer, a young man about eighteen years of age, who had had no previous experience whatever in observations. He was required to answer a signal consisting of a sharp sound like a rap, his answer being made by tapping upon a telegraph operator's key, nicely adjusted. Both the original rap and the observer's tap were recorded by means of a delicate chronoscope, and five hundred observations were made on every week day during a month. It was found that on the first day the observations were scattered through a very large range of error, the difference in time between the records of event, and of the observation varying in fact between the extreme values from 0.16 to 0.98 of a second. The personal equation proper on the second day was between 0.2 and 0.3 of a second, and from that time it steadily decreased until it amounted only to one seventh of a second; it then gradually increased until the twelfth day, when it amounted to 0.22 of a second. While this variation in personal equation occurred, the range of error or discordance was constantly decreasing, until on the twenty-fourth day the probable error of the result did not exceed one eightieth of a second. This is considered to clearly demonstrate the value of such practice in training the nerves for observation; and he recommends that transit observers be kept in constant training by means of similar observation of an artificial event, which can be repeated with ease and rapidity, it not being essential, he thinks, that those observations should very closely imitate the transit of a star over the wires of a telescope, inasmuch as it is the general condition of the nerves which it is important to keep in training more than anything peculiar to this or that kind of observation.