

mechanism. In the determination of a defect of motion animal experimentation has been called upon to supplement observations in man, a possibility which is open in a most limited way, when we come to the measurement of sensation. In this field man must serve as the object of experimentation, since he alone is capable of describing his feelings.

Practically, as physicians, we are much less conscientious in our attempt to determine alterations of sensation in various morbid conditions of the nervous system than of motion. The latter is palpable, the former is time-taking, and subject to many possibilities of error, and the consequence is, we are apt to neglect any attempt at accuracy in our routine work on the side of sensation. It is therefore with satisfaction that we welcome any careful investigation designed to bring out facts and formulate laws relative to exact measurements of sensations. Arthur MacDonald, of the United States Bureau of Education, has recently presented a paper before the American Psychological Association, in which he adds many new experiments to those he has previously reported in 1895 and 1896, on "Measurements of Pain."

In his early experiments, on 1,412 persons, he found the following facts: That women are more sensitive to pain than men; that American professional men are more sensitive than American business men; that the laboring classes are much less sensitive to pain than the non-laboring classes; that the women of the poorer classes are less sensitive than those in more comfortable conditions; that the wealthy classes, in general, are more sensitive than the poorer classes, and that the left hand is more sensitive to pain than the right hand.

In the newer series of experiments the writer used as an instrument of precision what he terms a "temple algometer," designed by himself. The

instrument is pressed against the temple of the subject until a disagreeable sensation is aroused, the amount of pressure being registered on a scale arranged for that purpose. With this instrument, which is one of great delicacy, Mr. MacDonald claims to be able to approximate very nearly to what he calls the "threshold of pain." In each case the least sensibility to pain was noted. His experiments extended over a great variety of social conditions and ages, including in all 899 persons. Of these some were Public School girls, others Private School girls, boys in Public Schools, University women, washerwomen, business women, and self educated women. We give his conclusions in detail, as of great interest, though not covering so many cases as is desirable for statistical study:

(1) In general the sensibility to pain decreases as age increases. The left temple is more sensitive than the right. This accords with former experiments that the left hand is more sensitive to pain than the right hand. There is an increase of obtuseness to pain from ages 10 to 11; then a decrease from 11 to 12; then an increase from 12 to 13. From 13 to 17, while the right temple increases in obtuseness, the left temple increases in acuteness. This is in the post pubertal period. There is a general variation, which experiments on larger numbers might modify.

(2) Girls in Private Schools, who are generally of wealthy parents, are much more sensitive to pain than girls in the Public Schools. It would appear that refinement and luxuries tend to increase sensitiveness to pain. The hardihood which the great majority must experience seems advantageous. This also accords with our previous measurements, that the non-laboring classes are more sensitive to pain than the laboring classes.*

* By "laboring classes" is meant artisans and unskilled laborers: by "non-laboring classes," professional and mercantile men.