3. Hardness.

I could not *feel* 3 without 1 and 2.

The law of the increase of sensation is of importance in mental science. This law, known as Weber and Fechner's, is as follows:

While the stimulus increases in geometrical ratio (1, 2, 4, etc.), the sensation increases in arithmetical ratio (1, 2, 3, 4, etc.), or sensation increases proportionally to the logarithm of its exciting cause; *e. g.*, if I hold one lb. in my hand and add one lb. to it, I feel considerable increase of weight; but if I hold 10 lbs. and add one lb., I feel very little.

The law holds of the *quality* as well as of the *quantity* of sensations. The same stimulus will produce a sensation now of cold, now of heat, according to its place in a series of sensations. For example: I have three jars of water near me—one the same heat as my hand, one hotter and one colder. I put my right hand in the jar of hot water and my left in the jar of cold; then I put both in the jar of tepid water. My right hand will feel cooler and my left warmer, because of the sensations which preceded. This may be called the Law of Relativity, and is stated as follows: The character a sensation, both quantitative and qualitative, is determined by its place in the sensational series. We distinguish sensations as those of general sense and those of special sense. In the first we must distinguish sensations that are strictly general from those which are connected with some one organ.

General sensations are connected with the nervous system as a whole; for instance, weariness or lassitude, and freshness and sensations of temperature. These are strictly general. Then there are sensations connected with some organ, as (1) pulmonary sensations, (2) alimentary sensations, and (3) muscular sensations. The third were formerly identified with the sense of touch, but they are in reality sensations connected with the movements of the muscles. When I raise my hand I feel it, not by the sense of sight, but by the *muscular sense.*

The sensations of special sense are (1) Touch, (2) Taste, (3) Smell, (4) Hearing, (5) Sight. Each of which has a specially contrived organ. Touch is the transition-sense from the general to the special sensations. Spencer and others say that all the other senses can be evolved from the touch, which is the *fundamental sense.* In all the senses there must be *contact:* in sight the ether-waves touch the visual organ, in hearing the sound-waves, in smell the odoriferous particles touch the mucous membrane of the nostril, and in taste the palate must be touched by the food. Sensations have a presentative or cognitive side, and an affective or subjective side; the former is the objective meaning of the sensation, the latter its pleasant or painful feeling.

(*b*) Perception or Intuition (merely as distinguished from Attuition).

Sensations are elements or data. In sensation the work of appreciation has already begun, but in perception it first becomes obvious. Perception is the work of synthesis. It is the active manipulation of data into objects. The object perceived in the unity of many sensations. For instance, in this sheet of paper, the size, color, etc., are sensations. In perceiving the object I unify these sensations. I *seem* to *see* this paper, but it is *not* actually *sight* that tells me all about it. The infant mind is probably a blur of sensations. I attribute *color* to the *thing colored.* The infant has sensations but not perception, only vague, fleeting, ever-changeful sensations. The infant mind must feel its way laboriously through the mass, break it up gradually and analyze it. The question is often asked: How does knowledge begin? Does it proceed from simple to complex, or vice versa? Neither. Vague, indefinite sensations form the primitive cognition, which is a confused and sensational mass, though with the beginnings of order in it. Perception develops out of this mass a world of objects by the process of selective attention. When an interesting nucleus is selected, uninteresting sensations are grouped around it and rendered interesting by association.

There are three stages of perception:

1. Recognition (*a*) discrimination.
   (*b*) assimilation or identification.
2. Fixation (*a*) in space.
   (*b*) in time.
3. Reification (res-facio), making of objects, or Intuition of things or Objectification; 1 is analytic, 2 and 3 synthetic.

Of these, in education we deal first with recognition in its two-fold character. This is begun in the Kindergarten.

We educate the perception of space by Geography and Geometry, the former dealing with concrete space and the latter with abstract. Geometry, indeed, deals with the ideal, but bears on the real by applied Geometry.

We educate the perception of time by History. The historian possesses the most perfect idea of time.

Finally we develop Reification by means of the physical sciences, teaching how to arrange and synthesize the objects presented to us.

We should be extremely careful in whom we confide. Our confidences of to-day may be public topics to-morrow.