

mathematical relations of their parts; for we never can be sure that their æsthetic value does not rest upon an associative or other factor rather than upon the direct mathematical proportions; and the freedom in the choice of parts to be measured must throw considerable doubt upon the results of all measurements. Such attempts have proved no more than a limited æsthetic value of the proportion 1:1, while for the various other simple mathematical relations nothing decisive has been shown. A better method than Zeising's or Fechner's affords a choice not limited to a set of arbitrary proportions, but opens to a series of figures whose mathematical proportions vary in a constant ratio between the proportion of 1:1 and 1: x (x being any desired large number). This method permits of an easy observation of the relative increase or decrease in the æsthetic feeling attaching to the regularly increasing proportions. For all groups of figures and for all positions of the figure there are but two pleasing proportions: the ratio 1:1, or perfect symmetry, and a ratio which lies between 2:3 and 1:2, the most pleasing proportion. The proportion 1:1 is æsthetically so far from all other proportions that a comparison between it and any other proportion on the same terms as between the other proportions among themselves is impossible. The most pleasing æsthetic proportion subsumes itself under æsthetic contrast; the æsthetic value does not lie in a pleasing and complex equality of the relations of the parts of a figure, but in a pleasing *difference* of parts. The proportion is therefore not clearly discoverable in complex designs and objects, as the demand for the best contrast of parts may easily give way to other considerations.

Dr. Alexander Bain's paper was entitled "The Respective Spheres and Mutual Helps of Introspection and Psycho-Physical Experiment in Psychology;" the recognized sources of our knowledge of mind are first and foremost *introspection* with the aids of outward signs; to which succeed the study of infancy, of abnormal and exceptional minds, and of the lower animals; also the workings of society collectively; next physiology; and last psycho-physical experiments. The metaphysical problem of knowing and being, and that of the tracing of the origins of our mental furniture, have hitherto been the leading ones where introspection has been mainly employed. Neither of these are utile in the ordinary sense. Introspection takes the lead in qualitative analysis of mental facts; the next consideration is quantitative analysis, or the mensuration of psychological quantities; here psychophysics can render important service. The following is a list of researches where both methods concur: (1) The economy of muscular mechanism; (2) the fundamental laws of the intellect, more especially as regards memory acquisitions; (3) the fluctuation of our ideas in consciousness; (4) the conditions of permanent association as against "cram;" (5) plurality of simultaneous impressions in all the senses; (6) the fixed idea; (7) similarity in diversity. In all these experiment can come in aid of introspection, but cannot supersede it without loss and failure.

Professor Theodore Ribot's paper concerning concepts had for its object an inquiry as to the immediate state of mind at the instant a concept is thought, to determine whether this state differs in individuals. One hundred persons of every class and degree of culture were interrogated by announcing to them abstract terms (not letting them know the purpose beforehand) and noting the immediate state of consciousness which these terms evoked. The results were: 1. With the majority a general term awakened a concrete idea or representation, ordinarily a visual image, rarely a muscular image. 2. Many saw the word as printed, purely and simply, without any concrete representation. 3. Others (fewer in number) had only the word in the mind as heard, perhaps with motor images of articulation but without concrete image; without vision of the printed word. 4. The highest concepts, such as cause, relation, infinite, etc., did not give rise to any representation whatever in the case of the majority. Even those persons belonging to the pure concrete type declared they had nothing in their mind. There are therefore certain concepts to which an *unconscious* state corresponds. Hoping to penetrate into the nature of this unconscious state, Dr. Wizel continued the investigations on certain hysterical cases at Salpêtrière; they were interrogated first in the hypnotic state, then when awake, thus permitting a compari-

son of responses. The results were more numerous and explicit in the hypnotic state than in the normal.

In speaking of the future of psychology, Richet said that psychology is one of the elements of physiology, and the most obscure; the first question is to know the connection which unites mind and body; at present we know nothing about it. An idea, a reasoning, a passion, are phenomena which do not seem to have the power of being reduced to a material phenomenon. It is certain, however, that there is a connection: without brain, or rather without nerve-cell, there is no intelligence. The first problem of psychology is therefore a most complete physiology of the brain: relations of ideation with cerebral circulation, with chemical changes in nerve-cells, with electric phenomena; localization of psychical acts in this or that part of the brain; in other words, a physiological *résumé* of the brain. We must recognize that brain physiology is little developed compared with the physiology of the heart or muscles. Physiology, properly speaking, is a study of sensations: relations of sensation with peripheral excitation, differential perceptive sensibility—the threshold of excitation; these are investigations more difficult to pursue than the general physiology of the nerve-cell.

Comparative psychology treats of the relations of man with other beings, and with the insane and criminal, from the intellectual point of view. One cannot admit that the human soul is stationary; it evolves, and therefore can be perfected through a sort of natural selection. The data for this problem are wanting, yet the future of humanity depends upon it. In transcendental psychology we have numerous data (often or almost always imperfect), which permit us to suppose that human intelligence has extraordinary resources and forces of which we have no conception. The future psychology will give us the key to clairvoyance and presentiments. If it should be proved that these are all illusions, a service would be rendered; sooner or later we will be able to say whether transcendental psychology is a reality or an illusion.

LETTERS TO THE EDITOR.

**.* Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

The Libyan Alphabet.

I SHALL make no reply to the letter of Professor Keane in *Science*, Nov. 4, as there can be no advantage in discussing scientific questions in either the tone or the method which he adopts.

As the general subject, however, is one of great interest, I have secured permission to bring it before the Oriental Club of Philadelphia at its December meeting, when I expect to prove the following positions:

1. That certain able French scholars maintain that the Libyan alphabet antedates the foundation of Carthage, and probably had other than a Semitic origin.

2. That the first form of every letter, simple and compound, of this alphabet, as given by Hanoteau in his "Grammaire Tamachek," contains no curved lines.

3. That the only similarity noted by Hanoteau in that work between the Tuareg and Semitic writing is that they are both read from right to left.

4. Abundant documents in "Tifinar" to prove that this is not the case will be laid before the club.

5. Proof will also be presented that Prof. Keane's assertion in his last letter that "the Tuaregs never made any extensive use of this script" is utterly erroneous.

An official report will be made to *Science* of this meeting. As the president of the club is Mr. Talcott Williams, not only an excellent Arabic scholar, but the only American who, so far as I know, has collected Berber manuscripts in North Africa and brought to this country the only originals we have, readers of *Science* may expect a fairer statement of the case than in a discussion where personal irritation may be suspected of obscuring scientific fact.

D. G. BRINTON.

Philadelphia, Nov. 4.