II.—*Combined Portraits, and the Combination of Sense Impressions Generally.*

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[Read before the Society, November 13th, 1879.]
(Abstract.)

A description was given of Fechner's law, from which it follows that the intensity of sense impressions, when they are neither very faint nor very strong, receives approximately equal increments when the producing cause is changed in a geometrical ratio. This was illustrated for sight impressions by a series of tablets having white spots distributed on a black ground, the appearance of a uniform graduation of tint resulting from the doubling of the number of spots on successive tablets. The same law for sound impressions was verified by means of an instrument striking a succession of blows on a sounding board with one, two, four, &c., hammers simultaneously.

With regard to the quality of sense impressions, it was stated that from a number of compound sense impressions, alike in some particulars, but differing variously in others, we obtain a distinct impression, which is the resultant, and may be regarded as the type of the components that go to form it. The resultant conveys the general idea underlying the particular cases more clearly than any one of its components, individual variations being eliminated, and the common similarities strengthened by repetition. This general law was clearly shown to hold by camera illustrations of composite portraits. The illustrations were of a very varied character, and comprised such instances as the combination of photographic portraits derived from ancient medals or sculpture, or from individuals belonging to more or less distinctly marked types of modern life.

The author also dealt with the subject of "the faculty of visualising," and submitted to the Society a schedule of questions, drawn up with the view of obtaining statistical results. The questions referred to the following points:—1, illumination; 2, definition; 3, completeness; 4, colouring; 5, extent of field of view. Different kinds of imagery:—6, printed pages; 7, furniture; 8, persons; 9, scenery; 10, geography; 11, military movements; 12, mechanism; 13, geometry; 14, numerals; 15, card-playing; 16, chess. Other senses:—17, tones of voices; 18, music; 19, smells; 20, tastes; and had attached the following explanatory remarks:—

"The object of these questions is to elicit the degree and manner in which different persons possess the power of seeing images in their mind's eye.

"From inquiries I have already made, it is certain that remarkable variations exist both in the strength and in the quality of this faculty, and it is highly probable that a statistical inquiry into them will throw light upon more than one psychological problem.

"Before answering the questions 1 to 5, think of some definite object—say your breakfast table, as you sat down to it this morning—and consider carefully the picture that rises before your mind's eye. 1. *Illumination.*—Is the image dim, or fairly clear? Is its brightness comparable to that of the actual scene? 2. *Definition.*—Are the objects sharply defined, or are any or most of them little more than blotches of light and shade? 3. *Completeness.*—Are all the details of the breakfast-table seen with equal clearness, like a real scene, or do some parts obtrude themselves while others are barely visualised? 4. *Colouring.*—Are the colours of the china, of the toast, bread crust, mustard, meat, parsley, or whatever may have been on the table, quite distinct and natural? 5. *Extent of field of view.*—Does it correspond in breadth and height to the real field of view?

"The questions 6 to 16 refer to definite kinds of mental imagery. 6. *Printed pages.*—When recalling passages in a book, is the actual print clearly conspicuous? How much of a

page can you mentally see and retain steadily in view? 7. *Furniture.*—Can you judge with precision of the effect that would be produced upon the appearance of a room by changing the position of the furniture in it? Could you rely on your judgment in purchasing furniture that should prove suitable in size, shape, and colour? Can you carry in your mind's eye the colour and pattern of your wall-paper and of your carpets? 8. *Persons.*—Can you recall with distinctness the features of persons whom you know well? Can you at will cause your mental image of them to change position, as to sit, stand, or turn slowly round? Can you deliberately seat the image of a well-known person in a chair and retain it, and see it with enough distinctness to enable you to sketch it leisurely (supposing yourself able to draw)? 9. *Scenery.*—Do you preserve the recollection of scenery with much precision of detail, and do you find pleasure in dwelling on it? Can you easily follow the descriptions of scenery that are so frequently met with in novels and books of travel? 10. *Geography.*—Do you readily follow the geographical descriptions in ordinary newspaper letters from foreign correspondents? 11. *Military movements.*—Can you realise the changing position of troops, as though you actually saw them on the march, when reading the description of battles or of manœuvres? 12. *Mechanism.*—Can you visualise any machinery at work? If you are a mechanician, describe one of the most complicated machines that you can clearly and completely imagine? 13. *Geometry.*—If you have experience in this, state fully your power of visualising plane and solid figures. 14. *Numerals.*—Are any mental figures associated in your mind with the various numerals? That is to say, if the words 'fifty-six' be spoken, do you mentally see those figures in any shape or not? Can you picture to yourself many lines of figures and hold them fast in the mental field of view, and peruse them when there? (If you happen to have decided powers of mental arithmetic, describe your process and mention the most you can do.) If you are a mathematician, how far do you visualise your formulæ? 15. *Card-playing.*—Have you

a good recollection of the cards that are out, and how far does your recollection consist of a mental image of them? 16. *Chess.*—Can you foresee far ahead the effects of a contemplated move? If so, is it by means of a mental image of the board? (If you happen to be able to play chess blindfold, please describe fully the limits of your powers.)

"As regards the other senses—17, *Tones of voices*, and 18, *Music*—explain themselves. 19. *Smells.*—Think of tar, verbena, otto of rose, shoe blacking, chloroform, ditch water, hay, seaweed, jessamine, turpentine, a fur coat, &c., and consider whether in any or all of these cases your representation of the smell is vivid, and how far it may compare in vividness to that of the objects you visualise. 20. *Tastes.*—Proceed on a similar principle as regards these with salt, sugar, lemon juice, currant jelly, castor oil, raisins, mustard, ink, Epsom salts, blackberries, &c.

"Any further information as to your visualising powers will be acceptable."

A paper giving an analysis of replies sent by members of the Society and others will be found in "Nature," January 15th, 1880; in "Mind," July, 1880; and in the forthcoming part of the Journal of the Anthropological Institute for 1880.