APPENDIX II

A TESTIMONIAL FROM PROFESSOR EINSTEIN

Concerning the subject of the above study and, especially, matters treated in Section VI, the writer has received several answers to the questions which he has asked. All of them were valuable to him, but one is more important than any other, not only because of the personality of its author, but also as dealing with the question in a quite circumstantial and thorough manner. We owe it to the great scientist Albert Einstein, and it reads as follows:[1]

MY DEAR COLLEAGUE:

In the following, I am trying to answer in brief your questions as well as I am able. I am not satisfied myself with those answers and I am willing to answer more questions if you believe this could be of any advantage for the very interesting and difficult work you have undertaken.

(A) The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The psychical entities which seem to serve as elements in thought are certain signs and more or less clear images which can be "voluntarily" reproduced and combined.

There is, of course, a certain connection between those elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the above mentioned elements. But taken from a psychological viewpoint, this combinatory play seems to be the essential feature in productive thought—before there is any connection with logical construction in words or other kinds of signs which can be communicated to others.

[1] Questions (A), (B), (C) correspond to number 80 of the questionnaire issued by *L'Enseignement Mathématique* (see Appendix I). I have asked question (D) on the psychological type, not in research but in usual thought.
Question (E) corresponds to our number 81.

(B) The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will.

(C) According to what has been said, the play with the mentioned elements is aimed to be analogous to certain logical connections one is searching for.

(D) Visual and motor. In a stage when words intervene at all, they are, in my case, purely auditive, but they interfere only in a secondary stage as already mentioned.

(E) It seems to me that what you call full consciousness is a limit case which can never be fully accomplished. This seems to me connected with the fact called the narrowness of consciousness (Enge des Bewusstseins).

Remark: Professor Max Wertheimer has tried to investigate the distinction between mere associating or combining of reproducible elements and between understanding (organisches Begreifen); I cannot judge how far his psychological analysis catches the essential point.[2]

With kind regards . . .

ALBERT EINSTEIN

[2] As can be seen, phenomena in Professor Einstein's mind are substantially analogous to those mentioned in Section VI, with, as natural, special features in several details. A more important and remarkable difference concerns question (E), i.e., the role of fringe- or full consciousness. Professor Einstein refers to the "narrowness of consciousness": a subject which we should have spoken of in our Section II if we had not been afraid of being carried too far afield, and a treatment of which will be found in William James's *Psychology*, Chap. XIII, pp. 217 ff.

It would be interesting to compare Max Wertheimer's ideas (connected with the Gestaltist school) not only with our Section VI, but with the first part of Section VII.

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