

Liliana Albertazzi (ed.) (2002): *Unfolding Perceptual Continua*. Amsterdam: J. Benjamins / Philadelphia: PA. ISBN: 9789027251677, pp. 293, € 68/105, US\$ 102/158. - Liliana Albertazzi (ed.) (2006): *Visual Thought. The Depictive Space of Perception*. Amsterdam: J. Benjamins / Philadelphia: PA. ISBN: 9789027252036, pp. 380, € 110, US\$ 165.

In the 19th century, stimulated by Christian von Ehrenfels' theoretical work on the perception of tones, scholars started to research the relationship between physical stimuli on the one hand and their mental experience on the other. This relationship, of course, is far from simple. Major breakthroughs in this field came especially through the theoretical and experimental work of the founding fathers of Gestalt theory. These scholars were aiming to detect the general laws that relate physical stimuli with mental experience. Their work has been continued and the two collections under review report about present-day research; they form part of a series of books whose overall title is *Advances in Consciousness Research*. They are both edited by Liliana Albertazzi and anyone who knows her will not be surprised to find that she has assembled a series of well written, highly scholarly articles. We find contributions from cognitive scientists, linguists, philosophers, art historians and the like. However, I will not discuss each individual article. Instead I will focus on some general principles that seem to have guided the authors in their research.

The influence of the tradition of Gestalt theory is apparent, but so is modern scientific research in areas such as the functioning of the brain or the perceptual effects of artistic depictions. The up-to-date content of the two collections shows itself also in the fact that there are only a few references to the founding fathers of Gestalt theory but much more to succeeding generations of Gestalt researchers like Albert Michotte (1881-1965), Wolfgang Metzger (1899-1972) and Rudolf Arnheim (1904-2007). Mario Zanforlin and the Metzger prize winner Giovanni Vicario, regular contributors to our society, contributed each with an article.

Albertazzi, in her 2006 introduction summarizes the legacy of the founding fathers of Gestalt theory. Gestalt theory holds that „perceptual processing comprises physical, neural, and phenomenal aspects“ (p. 7). There is a perceptual stimulus which obeys physical laws, then there is the neural processing of the energy that comes from the stimulus and this neural processing obeys psychophysical laws, and finally there is the actual experience of the stimulus. If there are several levels of operating, the question arises at which level one should start one's search to the laws of nature. The answer of Gestalt theory is that we perceive rocks, lakes, trees, birds and so forth, and that these perceptions are the

base to detect the laws of nature. In other words, scientists must start their research at the phenomenological level. Another important contribution of Gestalt theory is the formulation of principles that hold at the perceptual level (like the laws of grouping and prägnanz). Moreover, Gestalt theoretical research has shown that the principles and rules of organization that govern the phenomenological level differ from the ones that govern the physical or the psychophysical level (see Albertazzi, 2006, p. 6-8). Every step, then, is controlled by its own laws and these laws are the research topic of their own sciences. Therefore, Koenderink could write: „perceptions are mental facts, rather than facts of physics or physiology“ (2002, p. 102).

However, till now Gestalt theorists, with a few exemptions, have not been interested in the differences among the sensory domains; for instance are there specific laws for organization for auditory stimuli, for visual stimuli or for haptic stimuli? These two collections, on the other hand, contain articles that explore the unique laws for particular sensory domains. Contributors to these two volumes also attack the question regarding the interaction and dependence among sensory domains, for instance by studying similarities and differences between regular language and sign language. The books also discuss the interaction and dependence among levels of processing such as between visual experience and neural activity in the visual cortex, or between perception and language.

Painters know how to create the illusion of depth and other artists, like architects, sculptors and developers of Zen gardens know also how to create experiences that are in fact false impressions. Both books include articles that utilize this knowledge of artistic traditions to evoke experiences in order to know more about the laws that human perceivers use to construct their experiences. The world as we perceive it is not like a picture. Nonetheless, pictures can come over as very realistic. Studying the effects of pictures may inform us about the rules we apply to perceive the outside world. On the other hand, our theories of perception may inform our theories about art as well. Physical sciences formulate laws, and these laws are formulated in mathematical language, for instance: $e = mc^2$. There is no reason to assume that mathematical descriptions will not hold for higher level processing as in the psychophysical and in the experiential realms. However, these realms differ from one another and therefore their mathematical descriptions must differ as well. Cognition, by the way, as I firmly believe, can be described with the help of mathematical logic.

Albertazzi makes the following case: „[W]e possess neither a psycho-physics suitable for description of numerous phenomena of form (from the figure/ground configuration to phenomena of intermodal perception) nor a logic or mathematics totally adequate for their representation“ (2002, 6).

And a few pages further she writes:

„However, the ‘points,’ ‘lines’ and ‘surfaces’ of the perceptive world are not immediately points, lines and surfaces in the Euclidian or mathematical sense. They still possess thickness, irregularity, colour, texture, and so on“ (2002, 13).

In other words, we do not know the psycho-physics that underlies perception and we do not know what kind of mathematics or mathematical logic describes perception. However, we do know that Euclidian mathematics does not describe perception. Hence the mathematics of the world-as-perceived cannot be Euclidian. The same seems to be true for perceptual continua. Koenderink notes: „There exist distinct mathematical notions of ‘continua.’ None appears to apply to the notion of ‘perceptual continuum’ though“ (2002, 103).

The mathematical description of continua as perceived must be different from today’s mathematical descriptions of continua. Moreover, the mathematical description of perceptual continua has not been found. This needs some unfolding. For instance, a plate is perceptually a continuum although it may contain motives like some small flowers. We may hang two plates of Delft porcelain one on top of the other in our living room as decoration. Each of these two plates is a perceptual continuum, but together (one on top with the one below) they are not. Nonetheless, the higher and the lower one are both placed on the same mathematical continuum. Hence, the mathematical description of higher and lower must be different from the perceptual description of the two plates. The notion of continuum is, of course, directly related to the notions of space and time. The mathematical account of events happening in physical space and time, then, must be different from the one of events happening in phenomenological space and time.

I wrote above that the two books do not contain many references of work done at the beginning of the 20th century. Much research on consciousness was done at the end of the 19th and beginning of the 20th century. However, most psychologists in the 20th century abandoned the research of consciousness. We may credit Gestalt Theory that it kept the flame of consciousness research burning. Now, consciousness research has become again an acceptable activity for professional researchers and psychologists. These two books give a good example of today’s research on consciousness with the help of the latest techniques. They also demonstrate that this area of research does not have only a history but, more importantly, a promising future indeed.

Geert-Jan Boudewijnse, Montreal

Geert-Jan Boudewijnse, semi-retired, earned his doctorate degree on a historical thesis on the relationship between Franz Brentano and the later Gestalt schools. He taught psychological courses including the course History of Psychology at the two English speaking universities in Montreal, Concordia and McGill. Some of his most important papers were published in *Gestalt Theory*.

Address: 3, rue Beacon, H9J 2E9 Kirkland, Canada. E-Mail: geertjan.boudewijnse@gmail.com