Lecturer's Précis - Wundt (1902)

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Wundt's "Schematic Representation"

Wilhelm Wundt (1832-1920) [Wikipedia biography] trained originally as a physician, but gradually specialised in physiological psychology. He wrote a major textbook - "***Grundzüge der Physiologischen Psychologie***" (In English as "Principles of Physiological Psychology") - on this subject in 1873/1874, and founded the first European experimental psychology laboratory at the University of Leipzig in 1875 [EXTANT homepage].

Read the full textbook (1910 English edition) here (open at p318 for diagram)

Our present interest in this book is with the processing hierarchy diagram featured on p318, which provides what Wundt called a "schematic representation" of the functional layout of the nervous system. We have reproduced this with added coloured highlights in the panel below. Note the remarkable visual and conceptual similarity to the A-shaped cognitive hierarchy diagrams so beloved of cognitive scientists in the second half of the 20th century ...

******* AN IMPORTANT INTERRUPTION *******

A-shaped cognitive hierarchies go all the way back to **Rene Descartes** in the 17th century, and are very much the received format for visualising the flow of information up and down the vertebrate nervous system. Here, copied in from our ***smithsrisca*** homepage, is a quick historical timeline ...

Historical Cognitive Models Series (In Timeline Sequence)

Descartes (1662) - The Philosopher's View	**click here**
Bell-Magendie (1811) - The Anatomist's View	**click here**
Lordat (1834) - The Army Surgeon's View	**click here**
Wernicke (1874) - The Aphasiologist's View	**click here**
Kussmaul (1878) - Early "Cog Neuro" View	**click here**
Charcot's (1883) "Bell" - Early "Cog Neuro" View	**click here**
Lichtheim's (1885) "House"	**click here (STILL BEDSIDE NEUROLOGY'S FAVOURITE)**
Grashey (1885)	**click here**
James (1890)	**click here**
Freud (1891)	**click here (DESERVES TO BE BETTER KNOWN)**
Wundt (1902)	

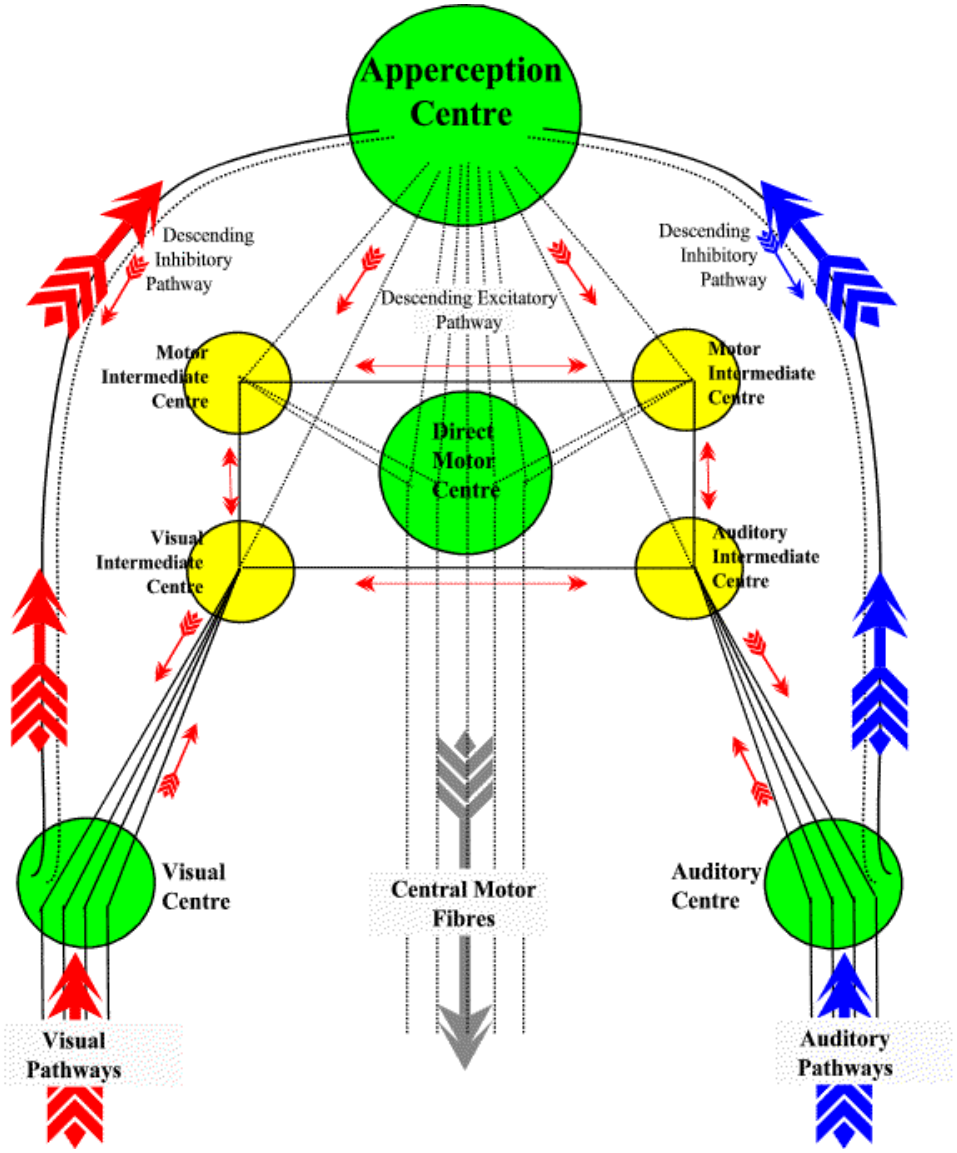
Craik (1945) - The Pioneer Ergonomist's View	**click here (OUR FAVOURITE)**
Wepman et al (1960) - The Clinician's View	**click here**
Frank (1963) - The Information Scientist's View	**click here (DESERVES TO BE BETTER KNOWN)**
Reader (1969) - Early Roboticist's View	**click here**
Dennett (1978) - The Philosopher's View	**click here**
Rasmussen (1983) - The Forensic Ergonomist's View	**click here**
Allport (1985) - The Distributed Semantics View	**click here**
Norman (1990) - Another Ergonomist's View	**click here**
Arkin (1990) - State-of-the-Art Roboticist's View	**click here** [scroll to Figure 7]
Smith (1993) - The System Analyst's View	**click here (ONE WE MADE EARLIER)**
Frith, Rees, and Friston's (1998) - "Forward Model" [LECTURE POWERPOINT]	**click here**
Smith (2007-2011) - Early Project *Konrad* View [incorporating all the above]	**contact the author**
Smith (2020-2024) - Current Project *Konrad* View	**contact the author**

Note how the <Wundt (1902)> version led the field for a good half century.

Wundt (1902): In his chapter "The Physiological Function of the Central Parts", Wundt reviewed **Lichtheim's (1885)** diagram, and criticised it for oversimplifying the problem of functional localisation. In an attempt to demonstrate how complex the cognitive system actually was, Wundt produced the diagram shown below. In it, he shows visual information ascending to the left (heavy red arrows), auditory information ascending to the right (heavy blue arrows), and a common motor pathway descending centrally (heavy grey arrow). Higher conscious processing takes place in an "Apperception Centre" (green, top centre). Wundt defines apperception as "a psychological process in which, on the objective side [certain contents become] *clear* in consciousness and, on the subjective, certain *feelings* arise ....." (Wundt, 1910, p316; italics original), and saw it as "the one elementary process indispensable to any sort of 'manifestation of intelligence', and, indeed, to the higher mental functions at large" (*ibid.*, p318). He also used the term "centre" with the explicit reservation that this should not be taken as implying a neat physical localisation. The Motor Centre (green, central) is responsible for initiating and maintaining physical behaviour, but is assisted in this by four associated "Intermediate" centres (yellow). Additional centrifugal information passes out to the Visual Centre and Auditory Centre via the Descending Inhibitory Pathways (top left/top right) [descending pathways in the sensory system are a cybernetic nicety frequently overlooked by lesser modelers, and Wundt is to be congratulated for having included them - Ed.]. Note that the diagram is actually a double A, that is to say, a left-and-central A for visual input, and a mirror-imaged right-and-central A for auditory input. Wundt's preoccupation with language processing at this point leads him to omit the haptic and chemical senses to avoid complicating the already complicated.

If this diagram fails to load automatically, or if you need a scalable copy, it may be accessed separately at

https://www.smithsrisca.co.uk/PICwundt1902.bmp



Redrawn from a black and white original in Wundt (1902G/1910E, p318; Figure 105 [there is a link direct to the original artwork above]). This colour graphic Copyright © 2002/2024, Derek J. Smith.

References:

Wundt, W. (1910). *Principles of Physiological Psychology (Volume 1, 2nd Edition)*. London: Swan Sonnenschein. [This is the Titchener translation of Wundt's work, first published in English in 1904, from a 1902 German 5th edition. This explains why we refer to this extract from Wundt (1910) as his "1902 diagram". The German first edition was dated 1874, but we have not yet been able to establish where in the five German editions the figure in question first appeared: that said, there are sufficient similarities between this diagram and that of **Kussmaul (1878)** to suggest it must have been quite early.]