

Visualizing Inner-Sense Theories: An Application of Scientonomic Diagramming

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The pervasive use of diagrams in scientific fields, such as biology, stands in stark contrast to their paucity in philosophy (Sheredos et al. 2013; Perini 2005, 201; Barseghyan, Patton, and Shaw, (in preparation)). Although typically neglected by philosophers, diagrams can be a powerful and intuitive means of communicating and analyzing the logical relationships between premises and conclusions in an argument. Scientonomic diagramming is a method of representing and analyzing belief systems derived from Unified Modeling Language (UML) which was initially developed as an aid to the formulation of computer algorithms (Seidl et al. 2014). While the notation system itself is borrowed, in part, from this source, what is novel is its use in a field where diagrammatic representation of arguments has seldom been used: the history and philosophy of science. In this presentation, we seek to demonstrate the usefulness of this method by applying it to a specific case: Medieval-Aristotelian theories of inner mental sensory faculties (Kemp and Fletcher, 1993; Henikoff and Patton, (in preparation)).

For instance, using our diagrammatic notation, we can represent the following passage of prose text from Kemp and Fletcher (1993) in Figures 1 and 2:

Aristotle did not believe that these latter processes [of common sense, imagination, and memory] took place in the cerebral ventricles or even in the brain, but rather in the heart or the sense organs themselves...However, medieval theorists tended to follow the lead of Claudius Galen...in locating these processes in the head... It was often remarked that animals displayed behavior that suggested they were capable of what appeared to theorists to be at least some cognitive processing... Augustine (426/182) observed that the fish in the fountain of his town must have memories, because they had learned to swim close to passersby in the hope of being fed. Because it was generally believed in the Middle Ages that animals did not have immortal souls, their cognition had thus to take place in some mortal, physical organ. Second, the model was invoked to explain why human cognitive functioning occasionally broke down following head injury or fever (Kemp & Fletcher, 1993, pp. 560-561).

Here we use a theory-relation diagram to indicate lines of reasoning explained in Kemp and Fletcher's text (1993). The lines of reasoning explain Galenists' arguments for localizing cognitive faculties in mortal physical organs in the brain. This is shown in Figure 1.

This argument can be combined with the following mosaic-comparison diagram, illustrating how beliefs about the localization of the common sense, held by medieval Galenists, differed from those of Aristotle. This comparison is shown in Figure 2. Complementing these passages with their diagrammatic reconstructions makes evident

certain details and inconsistencies that might otherwise fade into the backdrop of the prose. For instance, Kemp and Fletcher's (1993, p. 560) presentation of the medieval Galenists position seems logically consistent and complete, until one is made aware, by theory-relation diagrams of all the implicit premises (indicated by the dotted boxes in Figures 1 and 2) required to render the argument deductively valid; premises that may require further research to substantiate. Moreover, one might easily understand that Aristotle's localization of the common sense *differed* from that of Galenists, without realizing the justification underlying this claim was *absent* in the text. Thus, the mosaic comparison diagram clearly delineates each champion's beliefs regarding the localization of the common sense and their contradicting conclusions.

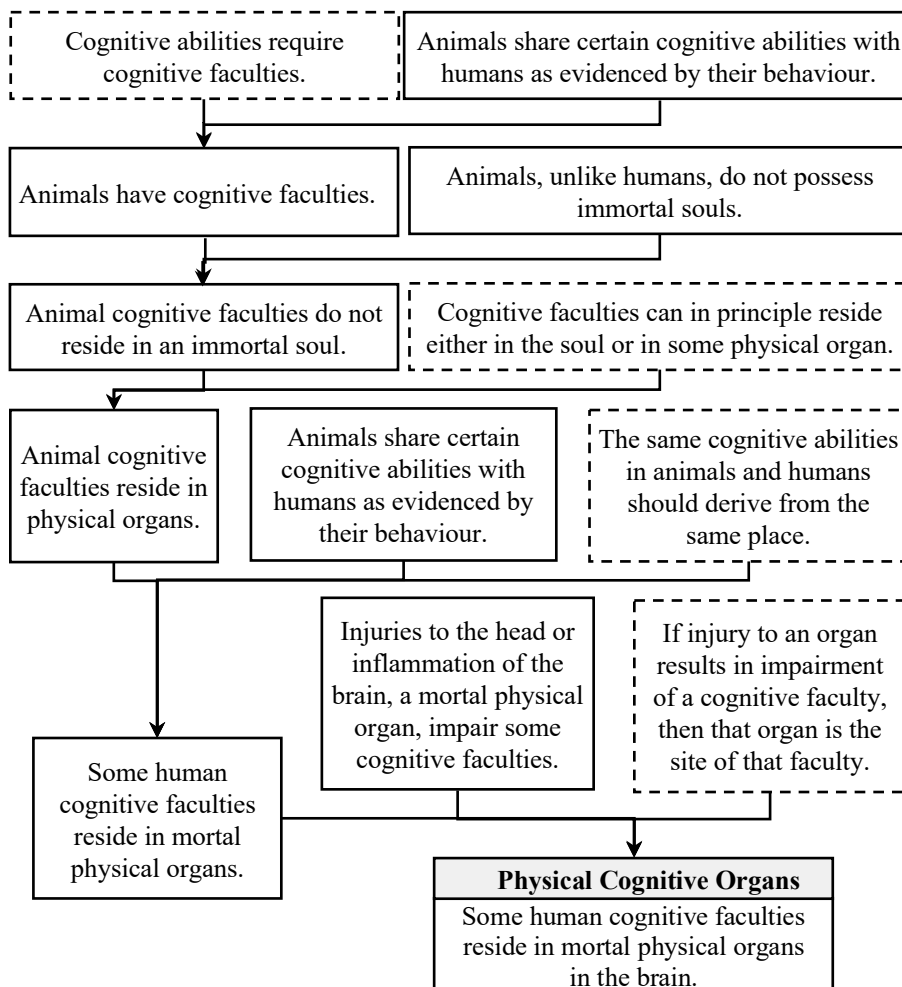


Figure 1: Reasons for the Acceptance of Inner-Sense Theory
 These diagrams, among others, make evident the need for additional historical investigation. Most notably, the implicit premises require primary source

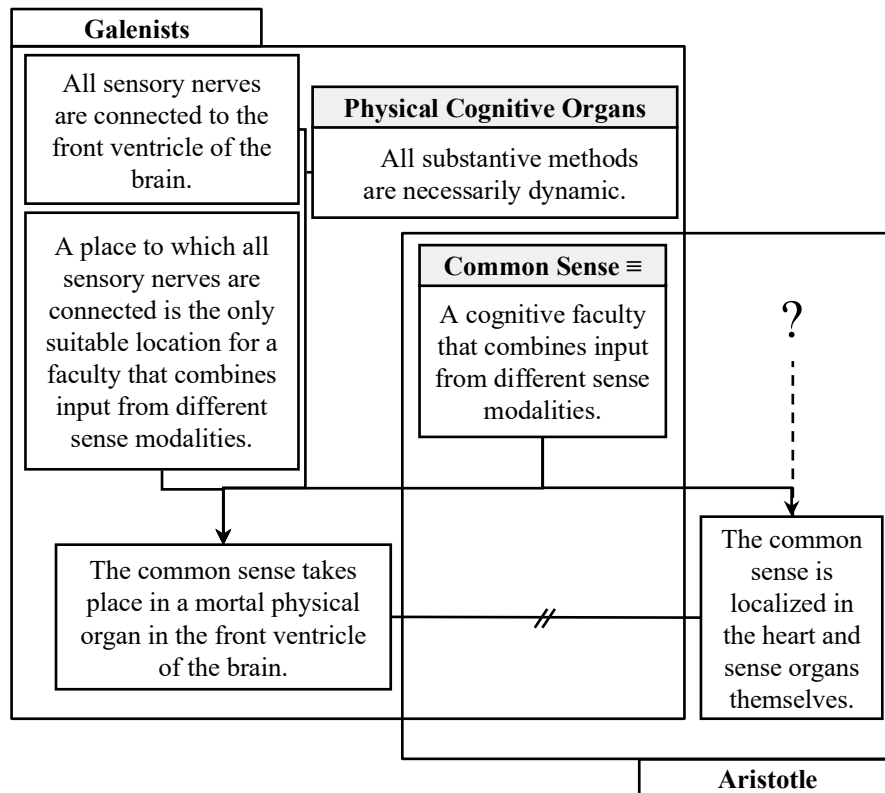


Figure 2: Localization of the Common Sense

corroboration and/or supplementation and the taxonomies require more conclusive definition and characterization. The implicit premises in the figures might serve as a starting point for further research. The completed text and diagrammatic representations can then work in tandem to provide more comprehensive and accessible reconstructions of this theory.

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