Factorial Structure of Consciousness

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Physiology isa science in its own right, employing endogenous methods. In relation to the science of consciousness it is auxiliary to the latter, deriving its heuristics from the definitions and questions scientific consciousnessology develops. Physiology cannot discover consciousness, it cannot reconstruct it, it cannot describe it, it cannot define it. Rather, it describes how the brain emulates it by revealing causal functional relations between modules of the brain. Challenged by consciousnessology it scans the brain for functional properties of cerebral modules apt to provide causal explanations for known structural properties of consciousness (like, e.g., space and time).

In this sense, consciousness can be said to reside in the cerebellum. Alternative suggestions that have been made have taken physiology as a science guiding consciousnessology, rather than following it, by pointing out modules of the brain that put out qualia, intentions, and, in general, recognizable cognitive material. As all this can in fact be present in conscious experience - as well as in subconscious one, though - this hunt for ";centers"; or critical ";gates"; of consciousness can go on endlessly, with each physiological approach enforcing a slightly different definition of consciousness onto consciousnessology

Consciousness is an highly abstract operator. It is not an emergent property of functionally related modules, each of which would do something specific, with the whole producing an output impredictable from the constituents. It is energy. In scrutinizing the brain for a drive that makes the brain conscious, therefore, one has to look for modules the output of which is abstract, and is as unakin to anything qualitatively describable as is materially feasible. This leads to the cerebellum as the drive that makes the brain conscious, because all the cerebellum puts out are time differences, which, in turn, being the most abstract qualities physiologically possible, delineate the border between modular output as such and sheer stochastic events.

This author uses - and understands - ";consciousness"; and ";human consciousness"; as synonyms. Why, then, aren't infrahuman species conscious, although they do possess cerebella? Because, brains are built like McIntosh computers: drive, or kernel, and operating system are one big lump, with the components designed for each other. Replacing a dog's cortex by a human one just wouldn't make the dog conscious. The dog's drive, its cerebellum, would lack the power to accelerate that big a cortex to the conscious level. - This brute paradigm leads us up to the point: Physiologically, the output of any brain module depends on which higher level module that output is for. The output of the cerebellum, taken as such, is meaningless, but only appears so due to its abstractness. Evaluated as output that is input to a target module, i.e. the cortex, and only then, it takes up recognizable forms. These forms can be described mathematically. The cerebellum - cortex - interface is the locus of these formal, abstract equations that turn the output of other brain regions into qualia, intentions, and cognitions. This interface constitutes the
ontological level of consciousness.

This interface is apriori to space and time, the Kantian aprioris of reason. To find out its structure, we perform the following experiment: We read the "Encyclopaedia Britannica" like we would read a novel, i.e. from the first entry in page one, volume one, to the last entry in page 1088, volume 29. We may omit or include the "index" and "guide" volumes as we like, it doesn't matter. In reading, we take down at the margins annotations, consisting of integers. Each integer represents the total amount of features enumerated in an entry, or in a paragraph belonging to an entry, or in whatever subunit of any entry. Each enumeration of features is counted only once, ofcourse, and the appropriate integer is written down at the margin. - For example: The text below a certain headline

may read somewhat like: "The climate regions of this country comprise the damp, coastal lowlands, the moderately climated foothills, the barren Alpine region and the arid inland Altiplano." At the margin of this enumaration we would jot down the integer "4". If we read, e.g., "The work of this artist is usually categorized into his youth period, maturity, and works of old age," then we write "3" at the margin. If nothing countable is mentioned, then we don't write down anything. In this manner we proceed through all of the encyclopaedia. Havinhis manner we proceed through all of the encyclopaedia. Having put back the last volume onto the shelf, we prepare a frequency table with x- and y- axes. The y-axis represents the frequency, the x-axis carries the integers from zero to infinity in their natural order. For practicality, we might cut the x-axis at 100, or at 1000 *ad libitum*, instead of letting it run to infinity.

Now we turn again to our Encyclopaedia Britannica, and, proceeding from the first page to the very last as we did before, we count the integers at the margins by entering a mark for each of them into our frequency table. Thus, each time we find integer "23" at the margin, we enter a mark into our frequency table in the direction of the y-axis above the location of the natural number "23" on the x-axis, and so forth for all integers from 1 to infinity, or whatever upper limit we decided on for practicality. - Finally, having leafed through 30,000 or so pages we should have taken down 300,000 or so y-values, distributed over all integers occurring.

<IMG SRC="Fac 2.gif" ALIGN="right">The question is: What will this distribution be like? The most probable one to expect would be one that shows a frequency that is equal for all natural numbers, i.e. a straight line parallel to the x-axis at distance y = constant from that x-axis. Some artificial deviation from parallelity is to be expected at the cut-off that we chose for the x-values. - An alternative hypothesis might take into consideration that the number of features enumarable about any topic in a written text the contents of which are expected to be remembered may be limited. This hypothesis then would predict a rather narrow, bell-shaped Gaussian distribution over some median. - Other hypotheses are possible, and would lead to different distributions.

What we do find, instead, is the distribution given in the figure. The winning integer is "3", with "2" and "4" ranking behind and "1" and "5" finishing last. Numbers between "6" and infinity are distributed like random noise at level zero, with a marked exception for number "7."

Given the fact that the encyclopaedia covers humanities and sciences alike, describes statics as well as dynamics, sequences as well as structures or systems, we can only conclude that the distribution found mirrors a fundamental structural property. The ontological basis of this structure must be the interface between the time-producing unit, or cerebellum, and the time-annihilating unit, or cortex.

The concept of "structure" implies a hypothesis about factors, orthogonal or oblique, that are causal to that structure. How sound is this hypothesis, given the fact that the marginal integers that make up the data base are scaled by rank? - The topics covered in the encyclopaedia comprise an epistemic totality. If qualia are of no influence upon the number of discernable features, then they are only secondary to underlying quantitative properties. If these represent themselves in a constant, non-arbitrary way, then they depend ontologically on a structure. If this structure rules all of Popper's Three Worlds then it must serve as the *prima causa differentiae* for them and thus possess factorial property. Possessing a factorial property implies ontological status. Thus, time gains ontological status, defined by factorial and causal properties.