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Notes on Husserl and Phenomenology

1. Biographical Note
   Student of Karl Weierstrass and wrote a thesis on Calculus of Variations. Listener of Franz Brentano's lectures in Psychology. Another listener was Sigmund Freud.

2. Scientific revolution of the 17^{th} and 18^{th} centuries: laws of motion were expressed in a new set of concepts invented from scratch. Concepts of Galilean Physics not to be found in everyday language

   Husserl claims that phenomenology is a forerunner of the next scientific revolution

3. Husserl believed in absolute truth. Mathematics for him was the supreme achievement of civilization. However, one of the key words of phenomenology is "equiprimordality." He believed that side by side with a training in mathematical rigor, one should receive an equiprimordially rigorous education in the life of the emotions.

4. Throughout his life, Husserl was obsessed with the coming threats to Western Civilization. To him, the threat was the crisis brewing in the sciences (cf. Crisis in European Science). He was deeply concerned by the growing distance between the exact sciences such as physics and chemistry on the one hand, and the descriptive (data intensive) sciences such as psychology, sociology and, most importantly, biology on the other. Towards the middle of his career, he began to question the inevitable mathematization of the sciences. His alarm at the rise of the positivists --- logical positivism as the basis for all rigorous thinking.

5. Husserl's thinking in the middle years was a meditation on Galileo's sentence, "The great book of nature is written in the language of mathematics." This led Husserl to describe the mathematical enterprise from a radical viewpoint.

6. Theorems vs. Facts
   The statement that "the normal distribution is the only stable distribution of finite variance" is not just a theorem, nor a mere consequence of the axioms of probability. It is a statement of fact.

   Phenomenon <-> Mathematics <-> Interpretation of Phenomena

   The results of mathematics are "facts" about the world we live in, facts which by their applicability and effectiveness are on a par with any scientific law.

   > Ex: Shannon Theory of Information: mathematical theory: wide applicability and effectiveness
   >
   > Theorems <-> Laws

7. Facts of mathematics are not facts of the ordinary kind. They are qualitatively different from the facts of, say, biology. It is the philosopher's task to "rigorously" characterize such a difference.

Phenomenologists' Description of the Unique Features of Mathematics

1. Mathematical facts are endowed with *absolute truth*.

   Once a mathematical theorem is proved, its truth is forever established. The absolute truths of mathematics may be shared among persons living in different civilizations and at different periods in history.

2. The *entities* of mathematics, such as a sphere, a topological space or a normal distribution are not ordinary objects. The difference between a mathematical entity, say *a cube*, and an object, say *a chair*, is based on the observation that a cube remains identical when communicated from one person to another. This communication can take place without any visual aids.

3. The attribution of "existence" is irrelevant to mathematical entities. Whether a seven-dimensional sphere exists or not is irrelevant.

   (*Note*: Synthesis of seven-dimensional sphere: existence?)

4. The constitutive property of mathematical entities is not existence, but identity. Identity need not pre-suppose existence. The permanence of the identity of a mathematical entity through space and history and across civilizations is not shared by objects of the world.

5. Just as it does not make sense to ask whether mathematical entities exist, similarly, it does not make sense to ask "where" mathematical entities are to be found. The seven-dimensional space does not exists "in" anybody's mind -- it is "nowhere." The abstract concept of a computer program exists nowhere, although instances can be found in specific computers.

6. The process of mathematical discovery (invention) is complex and requires a lengthy description. This discovery, initially, appears imaginary, contrary to common sense, but later appears to be natural if not trivial.

7. Mathematics is a rigorous theoretical science. It can be carried out rigorously without need for experimental verification.

   The Galilean (Newtonian) revolution established a new link between certain facts of the world and the rigorous entities of mathematics. The laws of physics came into being thanks to the language of mathematics, and the success of physics as an exact science can be attributed to the possibility, opened up by the Galilean revolution, of dealing with

phenomena of the world by a rigorous theory. Every physical theory, once it is understood, and carefully written, becomes a mathematical theory. (See Feynman: The Character of Physical Law, Chapter 2).

Do these properties uniquely characterize mathematics along theoretical disciplines? It is true that mathematics is the only existing discipline that meets these requirements. Can other theoretical sciences, sharing these properties, but distinct from mathematics, exist? Husserl believed that, just as the rigor of physics was made explicit by the language of mathematics, similarly, rigorous theories will be born which attach rigor to the descriptive sciences, including biology. These theories will be ushered through Galilean Revolutions.

What is a Galilean Revolution? What properties must all Galilean Revolutions possess?

(a) Denial of Common Sense (see Freud)
Initially, the experimental data of a descriptive science are expressed in the language of common sense. However, these data call for a reinterpretation in terms of a new language, which is not common language, and this language must be brought into being by an original leap of the imagination (see also: Kunha Structure and lectures in London). The rigorous notion of "free fall" was formulated by abandoning the common sense idea of falling. One needs a "leap into the imaginary."

(b) From Imaginary Concepts to Theoretical Laws
These imaginary concepts with their necessary use of a new language will be used to reinterpret the data and explain the data in the form of theoretical laws. How will the rigor of such laws be tested? By subjecting it to the tests which characterize mathematics? What will the new theoretical sciences associated with the descriptive sciences look like? In what sense are they rigorous?

Phenomenological Description

Phenomenological descriptions are a way of focussing on phenomena using a method which bears a resemblance to the techniques of psychoanalysis. Phenomenological descriptions are a psychoanalysis of ideas. Husserl described intersubjectivity, perception and rigor to illustrate phenomenological descriptions. His description of times consciousness runs into seven hundred pages and lays the groundwork for a rigorous theory of time.

Perception (see: Idea of Phenomenology: Husserl)

A phenomenological description of perception begins by observing that perception depends on a background of past experience and is oriented towards some future goal. The structure of the double dependence must be described rigorously. A theoretical characterization of multiple dependencies inherent in every act of perception must receive a theoretical characterization.

Husserl's phenomenological description of perception delivers "the conditions of possibility" (Kant) of perception or the "grammar of perception" (Wittgenstein). It attempts to single out the theoretical properties of *all* acts of perception and those properties of perception that are *independent* of any neurophysiological or neuro-anatomical aspects of perception. It has similarities to the truth and validity of a mathematical theorem irrespective of any experimental verification.

The recognition of the necessity of a theoretical description that will remain valid, irrespective of experimental conditions, is a fundamental tenet of phenomenology.

According to phenomenology, the question whether perception can be accounted for entirely in terms of brain functions or that there is an essential difference between brain function and perception is irrelevant. The phenomenological description of perception must take into account both those possibilities and must remain valid wherever perception is located. The two-way dependence of perception on past history and future goals must be account for by any theory irrespective of its grounding in neurophysiology.

Externalist vs. Internalist Perspectives

1. Externalist perspective in Systems and Control, Computer Science and Information Science

   Theory of behaviors and observation induced states (equivalence classes).

   Representation: independence with respect to hardware and software implementation.

   Universal Turing machine.

   Context-freeness (work on formal grammars).

   Values and rationality of designer imposed on the modeling and analysis of the system.

   Utility of the external view in Engineering Systems.

   The success of information and communication theory in the design of communication systems.

   Engineering systems: is it unavoidable that one has to take the externalist view?

   Engineering systems designed *ab initio* vs. engineering systems in evolution.

   The internal culture of design.

Detour on Heidegger

Sciences not clear about the sense in which they allow *man* to be "being." They act as if it were possible to get *man* as a "whole" into focus as one can other objects in the world. They follow a spontaneous tendency of "Dasein to understand its own being … in terms of that entity which computes itself proximally and in a way which is essential constant -- in terms of the "world." Self-mystification of Dasein. Dasein implies Möglich-sein. Man's relationship with his own being: Existence as called by Heidegger.

Existence has a transitive meaning … "Dasein is ontically, distinctive in that it is ontological." "Ontic" designates everything that exists.

Dasein means not only we *exist*, but we *perceive* we exists. At each point we are open for a future. We must lead our lives. We are what we become. How can one speak about Dasein? Heidegger focuses on time. Temporality is the experience of the *present*, the *future* and eventually the fatal in the past.

There are two aspects of temporality: its concluding and its initializing aspects (concept of duration of time!) -- these are major challenges to Dasein.

Heidegger's linkage of two questions: the emphatic one as to meaning of being and the semantic question about the meaning of the term "being."

In a state of anxiety (a mood), Dasein asks about the meaning of Being, the meaning of its being. Philosophy of anxiety. It is in anxiety that Dasein experiences the uncanniness of the world and its own freedom. Duality: world anxiety and anxiety of freedom.

Relationship to Freud: Civilization and Discontents.

Expression of Dasein: phenomenological view, adopt an attitude that will allow the phenomenon to "show" itself.

One must start from *In-Sein*, because phenomenologically one neither first experiences oneself, and then the world, nor the other way about, but in experience the two are *simultaneously present* inextricably. This is the world reference of Dasein.

The analysis of In-sein is difficult because one has to be careful in not separating Subject-Object.

Heidegerrian terminology:

- In-der-Welt-sein
- Mit-sein-mit-anderen
- Sich-vorweg-sein
- Innerweltlich beglaitenden Seienden

(For us: global has to be always carried with the local. External and internal manifestations of the same reality.)

Complexity of Dasein is the complexity of everyday experience.

Analysis of Dasein is called by Heidegger, Existential analysis and its fundamental determinants Existentials (in the sense of categories)

Action and dealing within the fundamental structure of Dasein. His linking of action with cognition is pragmatic. Cognition is a function of action. It is to be explored through the practical activity of life.