

## Possibilism and Reflections on Total Systems

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### Possibilism

#### 1. Definition of “logically independent,” consistency, freedom from contradiction

In what follows, two sentences  $S_1$  and  $S_2$  are called logically independent if and only if each of the conjunctions  $S_1 \& S_2$ ,  $S_1 \& \sim S_2$ ,  $\sim S_1 \& \sim S_2$  are logically consistent. (Here the  $\sim$  sign represents negation and can be read as “not”.) The truth of each of the conjunctions is said to be logically possible. Freedom from contradictions is taken to be the same as consistency. Consistency is left undefined.  $S_1 \& \sim S_1$  and  $S_2 \& \sim S_2$  are examples of logically inconsistent conjunctions.

A set of sentences  $S_1, S_2 \dots S_n (n \geq 2)$  is called *logically independent* if and only if each conjunction of members of the set

$$(1) \{S_1 \& S_2 \& \dots \& S_n, S_1 \& S_2 \dots \& \sim S_n \dots, \sim S_1 \& \sim S_2 \& \dots \& \sim S_n\}$$

is logically consistent. The set consists of the  $2n$  conjunctions of the sentences or their negations. Using  $S_1$  to refer to  $S_1$  or its negation, we symbolize the set as follows

$$(2) \{S_1 \& S_2 \& \dots S_n\}$$

An example: Of “Live and let live” we form the set live and let live, live and do not let live, do not live but let live. In order to avoid imperatives we take, for the sake of the illustration, “live and let live” to be an abbreviation for “it is ethically valid to live and it is ethically valid to let live” and we take the other sentences to be similar abbreviations. If somebody objects that even so, the sentences cannot be true or false, let us add the prefix “It cannot be true or false that . . .” to each of the four sentences.

## 2. Relevant evidence, consistency in texts offering evidence, one-dimensional texts, “true,” “likely”

If in a text  $G_1, G_2 \dots, G_m$  are logically independent sentences offered as reasons or evidence or ground for the truth of  $F_1$ , and  $H_1, H_2, \dots, H_k$  are logically independent sentences with the same kind of relation to  $F_2$ , one or more inconsistencies within the set

$$(3) \{G_1 \& H_1, G_1 \& H_2 \dots G_m \& H_k\}$$

will be taken as sufficient basis for considering the text as a whole to be inconsistent.<sup>1</sup>

The joint assertion  $F_1 \& F_2$  in the text at hand implies, besides the connectability of  $E_1$  with  $E_2$ , two further sets of assertions

$$(4) \{G_1 E F_1, \& \dots, \& G_m E F_1\}$$

$$(5) \{H_1 E F_2 \&, \dots, H_k E F_2\}$$

where  $G_1 E F_1$  and  $H_1 E F_2$  are abbreviations for “ $G_1$  is connectible with  $F_1$ ” and “ $H_1$  is connectible with  $F_2$ ,” “connectability” is taken in a weak sense so that very different kinds of explicit or implicit assertions of relevance, evidence, reason, or ground are covered as specifications of connectability.

The notion of connectability in its basic features we take from R. von Mises. Presumably, the more precise and complex the stipulations in a theory, the more complicated will be the question of connectability of the sentences of the theory with sentences of daily life or other theories.

If the set (3) contains at least one instance of inconsistency, the joint assertion

$$(6) F_1 \& F_2 \& (4) \& (5)$$

involves an inconsistency.

Considering a text to be logically equivalent to a conjunction of its sentences, and (6) being part of the text, the text as a whole is to be considered inconsistent.

The most simple case of a text analyzed in what follows is one consisting of a single series of logically independent elementary sentences none of which explicitly or implicitly are intended to give reason, evidence, or ground for any other, or in any other manner capable of “interference” with the others *so as to raise questions of consistency*.<sup>2</sup> Examples: “Snow is white. Caesar died. Life gets short.”

In this example we stipulate that the language is English except that (1) of all classes of synonyms one member is selected. The rest are eliminated as nonsense. Secondly, every word or string of words within a sentence has a meaning which when conceptualized, shows a specific set of conceptual implications endangering consistency. The following text may also be considered to be an example of a “one-dimensional” text: “God is good. Men are imperfect. The will is free”.

From the logical independence of a set of sentences  $S_1, S_2 \dots S_n$  follows the consistency of every conjunction of the set (2). It follows therefore that any text corresponding to (2) is consistent if the set of sentences is logically independent. Applied to the last example, this means that the following set of texts are consistent:

God is good. Men are imperfect. The will is free.

God is good. Men are imperfect. The will is not free.

...

God is not good. Men are imperfect. The will is not free.

If  $S$  is a sentence, we shall say that  $S$  is true if and only if  $S$ , or, less ambiguously, “ $S$ ” is true if and only if  $S$ . The following formulation may also be used: “ $S$ ” is true if and only if it is the case that  $S$ . We need also the expression “it is likely that  $S$  is true” and “it is more likely that  $S_i$  is true than  $S_j$  is true.” We shall use these expressions within the broad range of ordinary usages. Among these uses there is one that suits us well, but it seems incapable of being made precise beyond certain modest levels of preciseness.<sup>3</sup>

After these preliminaries we should be in a better position to attack our main problem.

### **3. Philosophical systems, total views**

My discussion will centre on the question of truth or likelihood of very special, very complicated, most often many-dimensional sets of sentences, namely texts expressing “philosophical” systems. It is not essential, but convenient and historically justified to use the vague term “philosophical.” In a first approximation to a rough definition of such a system, we shall use the following definiens expression: A philosophical system is

“A set of sentences expressing an ontology, logic, semantics, methodology, epistemology, ethics, and theory of value.”

The terms “total systems,” “complete synthesis,” and “complete philosophy” might be used, but there are problems of self-reference that immediately crop up if “total” and “complete” are used in absolute ways. We shall, when using “total” or “complete,” take them to be abbreviations for “near total” and “nearly complete,” postponing any discussion of just what would have to be added, if anything, in order to reach totality or completeness. And, of course, the question must be taken up, which degrees of nearness are near enough to make our consideration of systems interesting as a separate study from the study of ordinary limited doctrines within the various branches of science.

As examples of sets of sentences expressing a total view, the following are taken to be paradigmatic:

1. The works of Spinoza, excluding his *Short Treatise*
2. The works of Thomas Hobbes, *De Corpore*, *De homine*, *Elements of Law*, *Leviathan*

Spinoza did not publish any separate texts of logic, but there is sufficient material in his works to indicate what his main opinions were in matters of logic. The nature of Spinoza’s works may be said to “express” a total view, if the term “express” is used that does not require detailed articulation as in encyclopedias.

Aristotle, Thomas, Descartes, Kant, Hume, Hegel, and some others may also be said to express total views, but it would not always be easy to agree which part of their productions should be chosen as expressing a definite view. (Philosophers change their opinions, but I think we should be glad that they do.) *L’être et le néant* of Sartre and *Sein und Zeit* of Heidegger look, at first glance, as if worked out in different ways from Spinoza’s *Ethica*, but closer scrutiny reveals, I think, sufficient similarities in structure to use the same pyramidal model for representing them.

Consider that some propositions give ground, reasons, or evidence for others. The relations between the two sets are of great variety and cannot be brought under one or two precise headings without a simplification that may be fatal to any deeper understanding of the system. Here we limit ourselves to a few observations: the relations result in chains of propositions, A giving grounds for G, B for C, and so on, but scarcely A for B and B for A, or A for A. At least we shall limit ourselves to cases in which the grounds, reasons, and evidence form non-reflexive, non-symmetric, but transitive relations. And as a

common word for these relations, we shall use “grounds” (Begründung) and sometimes “reasons” as in “chains for reasons” (Begründungsketten) instead of “chains of grounds.” “Grounds” is a better word for the intended deepening of foundations, but it does have certain heaviness.

When, in a system, F is given as ground or evidence for G, we do not symbolize this by an inference in propositional logic, since if F/G is valid in this logic, G carries less or, at the most, an equal amount of information as F. Thus,  $F \supset G$  (F implies G, or if F then G) is not true if the system is well ordered in its main feature. A theorem G would count as unnecessary to state just because  $F \supset G$  (F implies G).

Interest in great systems of the past diminished when the opinion spread that “deduce,” “demonstrate,” “give good reason for,” and “if . . . so” could be symbolized by the material implication or the valid inference of propositional logic. Systems must not be looked upon as bad results of efforts to create vast sets of tautologies. The amount of *new* information carried by a theorem is always greater than zero, even if the theorem *follows* without qualification from certain premises. If a term like “follow” (sequi) in Descartes, Spinoza, or other systems is taken to be a term of formal logic, the system collapses and can at the most be used for the exercises in detecting logical flaws.

In Sartre’s *L’être et le néant* the phenomenological foundations are laid down in its introduction. There is a superabundance of terms and few definitions. In order to reveal the pyramidal structure, a reconstruction is badly needed. The initial links in the long chains of reasons will then start with sentences such as “aucune apparition n’est privilégiée comme apparition qui manifest l’existant A,” “l’existant A est la série des apparitions qui manifest A,” “une apparition suppose quelqu’un à qui elle est une apparition,” etc.<sup>4</sup>

A look at Spinoza’s *Ethics* is more rewarding. It starts manifestly with eight definitions and seven axioms. These mark out the initial links in the long chains of reasoning through the first book. But this is only a superficial account of what is happening: The “definitions” are not single propositions. Under the headings “Definitiones,” we find a complicated subtext:

II. That thing is said to be finite in its kind that can be limited by another thing of the same kind. E.g., a body is said to be finite because we can conceive another larger than it. Thus, a thought is limited by another thought . . .

Here already we have a vastly complicated propositional structure, very difficult to reformulate adequately in chains of reasoning from a set of initial propositions. To definition six (of God) there is an “explanation” added and the same is the case with definition eight (of eternity). One of the axioms is not explicitly referred to anywhere in the *Ethics*. (Axiom 2). If we go further, and look at the subtexts marked “demonstration” they give not only grounds, reasons, or evidence of various kinds, but also offer new insights, sidelines, additional information, and so on.

Nevertheless, there is marked tendency away from a mere position of logically independent positions, which might be shuffled without the slightest injury to the doctrines expressed.

As initial links, not only explicit axioms, postulates, and definition must find their place, but so also must a vast number of sentences of small interest to the major objectives of the great enterprise. Thus, examples involve claims “x is an example of y” which mostly are not substantiated by any reasons, evidence, or grounds. The first exemplification in the *Ethics* is already quoted. It results in the adoption of several initial propositions; for example, “if x is a body, and y is a man, y can conceive a body z that is larger than x.” But even if the initial sentence in a reformulation of the *Ethics* (adding some epistemology and methodology from “On the Correcting of the Understanding”) would run into the thousands, the number of later links would be much greater if spelled out in detail.

#### **4. The non-different, non-zero validity of consistent total systems**

In what follows, I shall, for the sake of simplicity, assume that a system starts with a relatively small number of propositions that are conceived to be basic and indispensable.<sup>5</sup>

If the set of initial formulations of a system is taken to describe the outline of “a possible world” or a “state description” (as these terms have been used in relation to sets of logically independent propositions of propositional logic), the kind of non-zero validity of the different systems can be partially clarified by saying that they have non-different, non-zero, *a priori* probability, in the sense of Carnap’s inductive logic. The natural thing would be to assign a probability of 1 to each initial proposition of each system. The propositions that are said by the systematizers to be based upon the initial ones, would be, or might be, assigned probabilities. It is difficult, however, to imagine an “inductive logic” sufficient to represent the great differences in relations of

propositions. Philosophical systems from the time of Plato exemplify rather deep differences, but it seems that the sources of differences are far from exhausted.

A consistent total system *might* have positive validity one can show oneself by attempting to codify one's own beliefs. For every belief  $B_1$  entertained, one would trust that  $B_1$  or non- $B_1$ , and presumably  $B$  is true or probable. If certain conjunctions, say  $B_5$  & non- $B_7$  and  $B_8$  & non- $B_5$  are inconsistent, this subtracts from the possible systems comprising one's beliefs. However, we may tentatively assume that the conjunction of all main beliefs would be consistent.

The term "main" is inserted because a stated system need not—and psychologically cannot—comprise all beliefs if they are required to be articulated. Which beliefs are needed and which are not in order to form a total system depends to a large degree upon the kind of system envisaged. Taking systems in Western Philosophy since 1500 as models, we might ask for a system that answers basic questions in logic, semantics, methodology, ontology, epistemology, theory of values, and ethics. What is taken as basic would be a question of what sub-kind of system is envisaged.

#### Lack of *tertium comparationis*

One and the same painting can be evaluated from different systems, A and B, of aesthetics if (1) the representatives of the systems have a common "geography" so that the paintings, as things, can be identified, (2) if there is a common basis of understanding concerning what it involves to evaluate. If there is a basic difference here, it does not amount to anything that the painting was valued differently from points of view A and B. If there is a common basis and, say, an aesthetic judgment is taken to have 10 dimensions in the sense that the painting can score positively or negatively in 10 ways, *difference* in evaluation may stem from differences in priority lists of the 10 scores.<sup>6</sup> Thus, according to A, drawing or form always plays an important role, "badly drawn" pictures getting a large minus, whereas to B, there is only for a small sub-kind of paintings any stress on drawing, and even then it counts low. We may imagine these differences given reasons "deeper" in the systems.

Complications arise from aestheticians who insist on a concept "work of art" used before evaluation is started. Is this picture a work of art or is it not? Cases of incomparability and incommensurability arise as soon as two aestheticians stipulate two different concepts. "Highly

valuable” and “of modest value” are incommensurable evaluations, if the first refers to price and the second to value as a work of art, but the same holds good if this value is *defined* as basically different.

Now let us proceed from narrow systems, such as those of aesthetics, to wider ones. The wider the system, the poorer is the common frame of reference. If the semantics of two systems are different and incompatible, they may even get incomparable, because semanticist A uses a set of rules  $R_A$  to interpret the texts of semanticist B, and semanticist B uses the set of rules  $R_B$ .  $R_A$  and  $R_B$  are incompatible. They are eternally speaking past each other.

How can I know this? What metascience do I have at my disposal?

These questions touch upon some grave problems of self-reference and total systems, if totality is taken in strict senses. In order not to be bogged down prematurely in those questions, it is convenient to talk of a series of expanding systems, the differences between two adjacent members of the series being fixed. We can then study how communication gradually breaks down. Let semantics  $A_0$  differ only slightly from  $B_0$ , let  $A_1$  and  $B_1$  be a pair of semantics constructed as  $A_0$  and  $B_0$ , but with slight modifications which makes the difference between  $A_1$  and  $B_1$  greater than between  $A_0$  and  $B_0$ . If this process is repeated, I predict there will be a stepwise destruction of communicability between A-semanticists and B-semanticists because they interpret each other's text more and more falsely, or have to give up finding the meaning of more and more sentences.

After a certain number of steps, communicability will be practically zero.

In practice, the semanticists may get along very well, because they may use gestures. And here the relevance of broadening the systems is clear. If the systems A and B are gradually generalized *in the direction of* complete totality, two end-situations are of particular interest to us. In one, understandability is kept at a maximum in spite of increasing disagreements. Here the end product is a pair of systems with certain comparability of language, but with mutually inconsistent assertion (and evaluations) at a maximum degree. It may be conceived of as a kind of “father-son” relation, where the son reacts systematically *against* the father in all conceivable ways, but thereby is imprisoned within the realm of points of view *conceivable* by the father. The range of differences, if father and son have their systems, is limited by considerations of comparability and understanding. Each difference

must be conceived as a difference on both scales, otherwise there is no reaction “against”—no antagonism.

Another end-product is a pair of systems with minimal understandability compatible with maximum agreement. That is, considering the differences along the series  $(A_0B_0)$ ,  $(A_1B_1)$  . . .  $(A_nB_n)$  . . . we experience an increasing difficulty in understanding the articulations of B on the basis of A and vice versa. But insofar as we succeed, we see an amazing degree of agreement in assertions and evaluations. The difficulties are language difficulties in a broad sense.

*Possibilism* as a term introduced here has to do, not primarily with understandability, but with the *differences* in assertions and evaluations taken to be understandable *somehow*.

The non-zero validity of two mutually incompatible near-total systems in an expanding series of pairs  $A_0B_0$ ,  $A_1B_1$ ,  $A_2B_2$  . . . stems from two factors: (1) the systems include sentences we anyhow take to be true or probable or valid, and (2) any attack from the basis of one system on the other may involve a *principium negantem* mistake: it will be based on the assumption that “the other” accepts a principle he does not accept—and cannot be argued to accept except by further mistakes of the *principium negantem* class.

Thus, we are forced to retrace our steps, which I take to be equivalent to an admittance of non-zero validity of both systems. This admission will, however, not be done by A or B, but by a hypothetical C, who is able to follow what happened when A and B tried to argue against each other.

This hypothetical systems botanist must somehow be able to understand the series of A- and B-systems. One may argue that he must have a kind of metasytem *comprising* A and B. Under certain conditions this is not possible without contradiction.

## **5. Possibilism, and possibilism for N.N**

An argumentation ending with the conclusion “false,” or less specifically, “invalid,” is always itself invalid, if what is judged false or invalid, is a consistent set of initial formulations of a *total system*. This point of view might be modified a little and termed possibilism, stressing the possibility of a system in face of argumentations to the contrary.

Let  $F_1, F_2, \dots, F_n$  be a consistent set of initial formulations of a total system. Every member of the class of sets  $\{F_1 \& \dots \& F_n\}$  is then a possible initial formulation of a system. And there is at least one consistent set.

This I shall call possibilism. It is mainly a defensive position directed against efforts to narrow down the range of possible “worlds” in which we might be—for all we know. Personally, I would suggest that there is, potentially, not only one set of initial formulations of a total system, but an indefinite *multiplicity*. I think what are called the main philosophical traditions have materials for constructing consistent sets, and I think the possible varieties of such traditions has not been exhausted, and perhaps never will be.

Looking upon possibilism from a personal angle, it is clear that even if a set of initial formulations is mutually consistent according to a certain person, say N. N., they need not offer the possibility of a system according to him. Some of the formulations may be self-evidently false. Moreover, he will not subscribe to possibilism if one of the formulations according to him is self-evidently true. There will, in that case, be a subclass of sets of the total class  $\{E_1 \& \dots \& F_n\}$  to which he cannot subscribe to as possibilities. In general, I shall characterize a possibilism as broader than another if the independent sets of consistent initial formulations taken as possible, according to the former, includes those of the latter.

The most inclusive possibilism states that, whatever the set of consistent initial formulations  $F_1 \dots F_n$  of a total system, and there are such sets, every member of the class of sets  $\{F \& \dots \& F_n\}$  is a possible initial formulation of a system.

This rules out the existence of self-evident initial formulations.

### **Appendix 1. History, applied semantics and Gödel’s Theorem**

If  $S_1$  is “Columbus discovered America,” and  $S_2$  is “Leif Ericson discovered America,” the consistency or freedom from contradiction of the conjunction  $S_1 \& S_2$  clearly raises various problems of interest to what follows. They belong in part to applied formal logic, in part to applied semantics. “Columbus discovered America” and “Leif Ericson discovered America” both belong to a common language, or to two languages part of the vocabularies of which can be translated into each other. Actually, we shall simply accept that the sentences are meant to be ordinary English sentences. This language has no provisions such

that the two sentences are inconsistent. Complications arise with the historians, especially those of Italian or Scandinavian stock. They agree that Columbus and Leif Ericson were not contemporaries and view the possibility of joint simultaneous discovery as *impossible*. We should say, “highly” unlikely, perhaps “exceedingly” unlikely. Why not impossible?

Because we hear, and in what follows we tentatively assume, that every question is potentially a scientific question, and that scientific methodology is relevant. Now, historians have elaborated a beautiful methodology for interpretation of texts. It is clear from those parts of the methodology that historians have in common, that certain sources of error are never completely eliminated. It is therefore methodologically unwise in a discussion at the professional, methodological level to pronounce it impossible that Columbus and Leif Ericson simultaneously discovered America. Actually, it would be a good exercise in a postgraduate seminar to let someone list the minimum set of auxiliary hypotheses necessary to make the co-discovery more likely than the separate or non-discovery.

Our main conclusion here is that semantic or ordinary language considerations cannot furnish valid arguments for an unqualified answer of “impossible” to the question. I say “unqualified,” because one can rightly argue that the word “impossible” very often, and especially in loose talk, is used for what is rather unlikely and a little stupid to believe in.

So much for the question of applied semantics. As for the questions of applied logic, I shall only argue that it is justifiable methodologically to apply symbols of formal logical calculi to sentences of ordinary languages for the purposes of conciseness in formulating general hypotheses. This application shall be strictly tentative. Perhaps it will turn out to be a source of confusion, perhaps not.

Here is another point concerning applied semantics. At the end of 1, I offered two examples of a class  $S_1 \& S_2 \& \dots S_n$  Here is a third question: “Did Columbus and Leif Ericson both discover America?”

Let  $S_1$  be “There is a contradiction in Gödel’s proof of Gödel’s theorem” and  $S_2$  “Anything follows from Gödel’s proof of Gödel’s theorem.” The four conjunctions formed from  $S_1$  and  $S_2$  are not independent for all interpretations of “contradiction” and “anything follows from,” because according to some, a contradiction in a proof entails logically that *anything* follows from the proof, that is, from the

inconsistent set of propositions of the so-called proof. Whether it does entail this or not is, in part, a (formal) logical and in part a semantic question. Different explicit formal logical systems may be said to make “contradiction” and “follow from” more precise, but in different directions. There is no last step, it seems, in the process of making something more precise, and there is no supreme tribunal that can decide which directions of making precise (which direction of *precization*<sup>7</sup>) are the legitimate, correct, or most fruitful ones.

For the purpose of this paper, we can only conclude, first, that at the professional level, concepts, criteria, and methodology of consistency, when carefully elaborated, branch out to form a tree in growth, rather than a dead stem. Or, to be less quasi-poetic: If a pair of sentences for some interpretations of “inconsistent” in some directions are inconsistent, this does not exclude the possibility that they are consistent according to other interpretations in the same or other directions.

Second: An assertion that for at least one professionally unobjectionable interpretation a conjunction  $S_1 \ \& \ S_2$  are consistent is weaker, and sometimes very considerably weaker than the assertion that for all unobjectionable interpretations  $S_1 \ \& \ S_2$  are consistent.

As we shall see, these conclusions are important for possibilism, because of the limited efforts normally bestowed on a search for semantic premises making intuitively suspicious, queer, or paradoxical sets of sentences logically unobjectionable. We have, when provoked, a natural tendency to mobilize formal logic in support of common sense.

## **Appendix 2. Validity, falsifiability, and total systems**

We have tentatively supposed, somewhat rashly, that if a total system is consistent, it is to be classed as valid, and that consistency is a sufficient criterion of validity. This view goes against certain views within philosophy of science. If a body of assertions have meaning, they are falsifiable, it is sometimes said. If, now, a total system is formulated explicitly and with care, it might obtain a kind of scientific status. There would be a concept of truth and testability, and the event might occur that the system was falsified. One might even grant that some queer new kinds of systems did not have notions of truth and testability and falsifiability very similar to those known to us today, and therefore to not assert that all total systems would be falsifiable. But there would remain an important class, systems modeled after what we might call a scientific theory. If assertions of a highly integrated scientific theory

taken as a whole suffers falsification, or at least disconfirmation if a set of methodologically unobjectionable observations goes against it, that is, against derived singular sentences (predictions). Why should not this be possible, whatever the scope of a theory?

First, one must bear in mind that a sufficiently wide theory contains other things than mere assertions. It contains rules and postulates as well. These are not tested directly by observations. But as long as we presuppose the theory to be highly integrated, as many are today in physics, astronomy, and many other disciplines, rules and postulates within the theory are given up together, with the assertions, in case of falsification. And falsification does not mean separate falsification or disconfirmation by observation, one at a time. The falsificatory wave originating from one set of observations hits all parts of the theory, if it hits one. (If not, there is no integrated theory of which to speak.)

Why should not a system of “unified science,” to take up a catch-word of Otto Neurath, be falsifiable or disconfirmable even if consistent?

One main objection to the falsifiability has little to it, but deserves mentioning because of its importance in other connections. Scientific research done at a definite time and at a definite place belongs to a tradition, a general way of doing science, only partly articulated. Seen from without, this way of doing things is based on certain assumptions and presuppositions that are *never questioned*. They are normally not articulated, and if articulated, appear self-evident. How can these assumptions and presuppositions be falsified by members in the tradition? Obviously they cannot be, and will not be tested. And if all consistent rivals of a theory elaborated by the members of the tradition at least one point goes against the traditional assumptions and presuppositions, they cannot be adopted. Whatever the glaring shortcomings of the traditional theory, it will never be considered to be of a practical kind, disturbing influences from phenomena not covered by the theory, etc. The end of the affair will, history teaches us, be a kind of revolution whereby a new tradition is started. The old theory is not falsified or disconfirmed, but a new set of principles (basic assumptions and presuppositions) is adopted, and—as a matter of course, not involving observation—the old theory seen to be inconsistent with the new way of thinking, and *ipso facto* declared *false*. Adherents of the old slowly die out and so the time of controversy ends.

The generalization to scientific total systems would be that falsification is out of the question, because of the even more important part played by assumptions and presuppositions.

The argument does not, however, take into account the stipulation made from the very beginning: that a system, in order to fall into the category discussed here, must fulfill a requirement of explicitness. If a *historian post festum* is capable of finding out which are the assumptions and presuppositions of a researcher within a definite tradition or a definite time and place, we shall—safely, I think—assume that a genius at that time in that place might have “looked through” the tradition and somehow articulated the assumptions and presuppositions. The dictum that this would have been or is impossible *can* be argued from a sociology of knowledge of, for example, the Karl Mannheim class. I grant this class of sociologies the status of possible arguable sociologies today, but doubt their consistency. Anyhow, I shall proceed from the postulate that articulations always have been possible in principle, when a scientific theory had its roots in a strong tradition, and that therefore falsification or disconfirmation has not been impossible in principle. On the other hand, it remains to be considered what falsification means here. It is certainly very far from clear-cut falsification by observation. Some sort of consideration of simplicity and other non-observational factors enter. If they enter in a decisive way, it is necessary to ask: has the theory been shown to be *invalid*?

## Notes

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<sup>1</sup> For the sake of simplicity we presume texts consist of a series of sentences all capable of being true or false.

<sup>2</sup> It is scarcely to be expected that anybody could *define* a concept of non-interference fulfilling the task.

<sup>3</sup> What I have in mind is the sense  $P_1$  described by Siri Blom in her paper “Concerning a controversy on the meaning of ‘probability’,” *Theoria*, vol. 21.

<sup>4</sup> A preliminary sketch of the cognitive structure of the introduction to *L’être et le néant* I have published in *Norsk Filosofisk Tidsskrift*, 2, 1967. (“Bidrag til analyse av den kognitive struktur i ‘fenomenteorien’ i “L’être et le néant”).

<sup>5</sup> Examples are not basic, and one can be a substitution for another, the two forming logically independent sentences. On the other hand, particular (singular) sentences may well be basic and indispensable.

<sup>6</sup> Actually, P. W. Zapffe has proposed a 10-dimensional score for *dramas*. From his general account, it can be clearly seen how the methodology of comparisons might be fixed in detail.

<sup>7</sup> The conceptual framework made use of here is introduced in my *Communication and Argument*, Allen & Unwin, London, 1967. This is now available as *SWAN* Volume 7.