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THE STRUCTURE OF HUSSERL'S *PROLEGOMENA*

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Husserl's refutation of psychologism one hundred years ago in his opus magnum Logische Untersuchungen *is a painfully detailed enterprise. After justifying the existence of logic as a separate practical discipline, Husserl first shows that normative and a fortiori practical disciplines are founded on theoretical ones. He then formulates the psychologistic theses, extracts empirical consequences from them and shows how psychologism distorts the content of logical laws. The nucleus of the refutation consists in six arguments showing that specific relativism and, in particular, anthropologism is a form of skepticism, and, finally, establishing that psychologism is a specific relativism, an anthropologism. A more direct and brief refutation follows, in which Husserl brings to the fore the prejudices on which psychologism is based.*

1. INTRODUCTION

Husserl and Frege are rightly credited for the devastating critique of psychologism some one hundred years ago. As is well known, in the second half of the nineteenth century the psychological "foundation" of logic was the most important trend among philosophers writing about logic. Frege's most important critique of psychologism in logic appears in the introduction to the first volume of his *Grundgesetze der Arithmetik* published in 1893. It was a decisive and direct attack on psychologism by an author who made no concessions to his oppo-

nents. But the critique lacked structure, it was more brutal than sophisticated and did not take into account the wide spectrum of proponents of such a view, but limited its consideration to the writings of Benno Erdmann. Moreover, Frege's refutation of psychologism appeared in a technical book which received very little attention by philosophers.

On the contrary, Husserl's refutation of psychologism is a detailed and impressive enterprise which extended for more than two hundred pages and consisted of nine of the eleven chapters of the first volume of a much larger project, Husserl's masterpiece, *Logische Untersuchungen*[1], one of the really great works in the history of philosophy. The last chapter, with which we are not going to deal in this paper, can be traced to Husserl's investigations on logic and mathematics up to 1894[2] and already contains Husserl's mature and definitive views on logic, mathematics and their relationship. The first ten chapters of the *Prolegomena* – as the first volume is usually known- were written around 1895.

Husserl's enterprise in the *Prolegomena* was by no means an easy one. As he says in the Introduction (§1), psychologism was the prevailing trend in logic at the end of the nineteenth century. Thus, although psychologism consisted in a trespassing of the boundaries which separate different general of discipline – as he already put it in the Introduction (§2) –, to be really effective the refutation had to be sophisticated and based on a detailed analysis. And so was Husserl's refutation: a very well structured and painfully detailed refutation, which constitutes an example of what serious philosophical argumentation should be.

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[1] *Logische Untersuchungen*, 1900-1901, *Husserliana* XVIII (1975), XIX (1984). Reference to this work will be to the § and – to avoid an excess of footnotes – will be included in the main text. All quotations in this paper have been translated by the present author.

[2] See on this issue his *Introduction to the Logical Investigations*, pp. 35-36 and Schumann (1977), pp. 42-44 and p. 46.

2. THE JUSTIFICATION OF A NORMATIVE LOGIC

In Chapter I of the *Prolegomena* Husserl establishes the necessity of logic as a normative and even practical discipline. At first sight, this justification might seem totally superfluous, since logic exists as a philosophical discipline since Aristotle and – conceived as a normative discipline – was part of the traditional philosophical curriculum for centuries. Nonetheless, the justification of logic as a normative discipline as first step of Husserl's refutation of psychologism serves the purpose of blocking the easy way out of rejecting logic altogether and, thus, closes a possible gap in the argumentation. Husserl begins his analysis (§6) with the following three assertions: (1) The unity of a foundational context is essential to every science. (2) Since only a limited – in any case, finite – number of statements can be considered immediately, most of the infinite multiplicity of statements in any given science have to be founded on a finite number of them. (3) But the fact that there are foundations of most of our knowledge not only makes possible the existence of the sciences, but makes necessary a logic conceived as a doctrine of science. This is so, argues Husserl (§7), because the foundations have a sort of rigid structure. As forms of inference from statements to statements, they are really forms – Husserl says "class concepts" – under which fall an infinite multiplicity of connections between statements having the formal structure stipulated in the forms of inference. Hence, no matter which science is under consideration, when we begin with a given knowledge and look for its foundation in other knowledge, "the foundational path has a certain form common to infinitely many other [actual or possible] foundations and is subject to a general law which allows us to justify once and for all those special cases of foundation". There is no foundational connection of knowledge in knowledge, states Husserl (§7), which is not a special case of a predetermined form of foundation that concerns either an external sort of connection between statements – we could add:

as in propositional logic – or this sort of external connection and the inner structure of the particular statements – we could add: as, e.g., in predicate logic. But all these sorts of inference applied in the different sciences are, thus, clearly independent of any of those sciences and, as Husserl states (§7), can be considered for themselves, without any essential relation to any determined region of knowledge. Now, "if ... the forms of inference make possible the existence of the sciences", Husserl adds (§8), "the independence of the form of the foundations from any particular knowledge makes possible a logic conceived as a doctrine of science". As Husserl correctly puts it (§8), without such an independence from particular knowledge there could not be a general logic but only a multiplicity of "particular logics", each corresponding to a determined science. Hence, logic as a doctrine of science is the discipline concerned with the forms of foundations of knowledge which occur in all sciences, and has as one of its tasks not only the clear separation between valid foundation and invalid foundation of knowledge, but also the separation between (formally) valid and (formally) invalid theories and sciences. Thus, as Husserl states (§11), logic as a doctrine of science is a normative discipline. The justification of logic as a normative science has been completed.

3. ON THE THEORETICAL FOUNDATION OF NORMATIVE DISCIPLINES

At the beginning of Chapter II (§13) Husserl explains in similar terms as Frege did some years earlier in the introduction to *Grundgesetze der Arithmetik* (Frege (1962), p. xv) that both mathematical disciplines as well as abstract natural sciences, although theoretical disciplines, have practical disciplines or techniques founded on them. Thus, the fact that there is a sort of practical logical discipline in no way excludes the possibility of a theoretical logical discipline as its foundation. Now, to say that a normative discipline has its foundation in one or more

theoretical disciplines means, as Husserl points out (§14), that the practical rules of the discipline possess a theoretical content clearly distinct from any normative consideration, and such that it admits a scientific investigation by those theoretical disciplines.

The totality of the norms of a normative discipline is determined by a fundamental evaluation. There is, thus, states Husserl (§14), a fundamental norm expressed in the normative sentence which states, for any object in the domain of objects under consideration, "the general requisite that they have to satisfy as much as possible the constitutive traits of the positive predicate". This fundamental norm, adds Husserl (§14), is in some sense "the correlate of the definition of 'good' and 'bad' under discussion", a sort of "definition of the concept of 'good' under consideration". (E.g., 'To be a good soldier you have to be brave...' or 'To be a good student you have to be …') Each and every normative discipline is completely characterized by its fundamental norm, which represents the only principle of the normative discipline. As Husserl aptly observes (§14), in this aspect, normative disciplines are essentially different from theoretical ones, since in theoretical disciplines there is no relation of the whole discipline to such a fundamental evaluation.

Up to now we have spoken of normative and practical disciplines as if those concepts were synonymous. Husserl, however, explains (§15) that a practical discipline is the special case of a normative discipline in which the fundamental norm consists in reaching a general practical goal. Thus, any practical discipline completely contains a normative discipline, which is not practical, as a sort of nucleus, since the task of any practical discipline presupposes the task of fixing the norms independently of any practical consideration. Conversely, any normative discipline in which the fundamental evaluation is transformed in a corresponding fixing of objectives can be extended to a practical discipline.

As Husserl states (§16), each and every normative discipline, and, thus, every practical one, presupposes one or more theoretical disciplines as foundation, since the former must have a theoretical content before any sort of normatization is introduced, and this theoretical content has its place in some existing or possible theoretical discipline. The fundamental norm not only determines the unity of the discipline but introduces the normatization in all normative sentences of the discipline. These normative sentences, however, possess, besides the common content of its measurement with respect to the fundamental norm, a theoretical content which is different in different sentences. (E.g., 'An *X* should be a *Y* ' possesses the following theoretical content: 'Only an *X* which is a *Y* has the property *Z* ', where '*Z* ' represents the predicate 'good' under consideration.) But the theoretical relations present in the sentences of the normative disciplines have their place in determined theoretical sciences. Hence, any normative discipline and, thus, any practical one presupposes the knowledge of some non-normative truths, which either belong to determined theoretical sciences or are obtained from them by means of their application to cases determined by the normative interest. In particular, logic as a normative – or even practical discipline- has its foundation in one or more theoretical disciplines.

Husserl concludes §16 (and Chapter II) with an important distinction between essential and non-essential foundations. Essential theoretical foundations of a discipline are foundations without which the discipline is not possible. Non-essential foundations of a discipline are foundations that are helpful for the discipline but not decisive for it. They are secondary foundations, since the existence of the discipline does not depend on them. This distinction will be of the utmost importance for the remaining part of the refutation.

4. THE ARGUMENTS OF PSYCHOLOGISM AND ITS TRADITIONAL OPPONENTS

In Chapter III Husserl considers the arguments of psychologism and the counterarguments of traditional antipsychologism. According to psychologism, the essential foundations of practical logic lie in psychology. Hence, there is no need for a theoretical science of logic. Logic is an application of psychology in the same way in which the art of measuring fields is an application of Euclidean geometry. The argumentation of psychologism, states Husserl (§18), is the following:

> No matter how one defines logic as a practical discipline ... we always find designated psychological activities or products [of these activities – e.g., thoughts, judgments, inferences, proofs] as the objects of the logical regulations. And thus since in general the practical treatment of a stuff presupposes the knowledge of its properties, it will also occur here, where one is concerned with a psychological stuff. The scientific investigation of the rules according to which it should be treated will evidently be traced to the scientific investigation of these properties: the theoretical foundations for the construction of a logical practical discipline are given, thus, by psychology, specifically, by psychology of knowledge.

Hence, no matter how we delimit the frontiers of logic, we cannot exclude the psychological, since psychology is already present in the constitutive concepts of logical laws – e.g. in truth and falsehood, assertion, negation and judgment.

Traditional antipsychologism argued for the separation of logic from psychology on the basis of the presumed normative character of logic in contrast to psychology. However, since normative disciplines are based on theoretical ones, it was not difficult for psychologism to counterattack by saying that although logic is a normative discipline, all its theoretical foundations lie in psychology. Traditional antipsychologism answered with an apparently decisive argument, namely, that psychology, like every other discipline, presupposes the validity of logical rules. Husserl considers (§19) that this argument is not as strong as it

looks. Traditional antipsychologism confuses under the presupposition of logical rules two clearly distinct things, namely: (i) that these rules are to be obeyed by the science, and (ii) that these rules are premises for the foundation of the sentences of the discipline. Only when we infer from the premises do we get involved in a vicious circle. A researcher in a specific discipline – e.g., in psychology – can very well construct proofs without in any way basing them on logic. Thus, concludes Husserl (§19) the logical laws cannot be its premises, although proofs in psychology, as in any other science, should proceed according to logical rules. This distinction made by Husserl is clear for us nowadays, but seems not to have been so one hundred years ago.

On the other hand, although Husserl acknowledges that psychologism had the upper hand in its feud with traditional antipsychologism – due specially to the latter's insistence on the normative character of logic and the fact that normative disciplines presuppose theoretical ones – he makes it clear (§20) that psychologism did not show that psychology contains the essential foundations of logic seen as a normative or even practical discipline. There is, thus, space for a pure logic, independent of all psychology, as a distinct theoretical discipline with its proper truth realm.

5. THE EMPIRICAL CONSEQUENCES OF PSYCHOLOGISM

Chapter IV considers the empirical consequences of psychologism. At the very beginning (§21), Husserl reminds us that psychology is a science about facts and, thus, an empirical science. Moreover, psychology does not even have exact laws. What it calls 'laws' are mere vague generalizations about more or less approximate regularities. Hence, the first empirical consequence of psychologism is that if logic had its foundations in psychology, logical laws – which are supposed to be exact laws of an exact science – would be at least as vague as its vague theoretical foundations. However, argues Husserl (§21), logic not

only seems to be an exact science but seems to be intimately related to mathematics, and Lotze and others have gone so far as to assert that the latter is just a development of the former. Hence, if psychologism were true and logic is intimately related to mathematics, mathematical laws would also be vague. But they are not.

The second empirical consequence of psychologism is the following. Even if logical laws were laws in the sense of the natural sciences, i.e., even if they were natural laws of thought, logical laws would state only probabilities, since the only way to justify a natural law is through induction on the basis of singular empirical facts, and what is really justified is its probability, not its validity. However, the laws of logic seem to be valid *a priori* and absolutely, and, thus, it is not their probability which is founded but its truth. On the other hand, laws in the natural sciences are neither valid *a priori* nor are considered absolutely valid. As a matter of fact, there is always an infinite number of possible laws with the same empirical consequences, and scientists choose one of them, e.g., Newton's gravitational law, because of its simplicity. Moreover, in the factual sciences it does not have any sense to look for the only true law, since our laws seem to be approximations to the really valid but unattainable laws. In logic, however, our knowledge is not of probabilities or approximations, but of truths. Hence, Husserl concludes (§21) that if the consequence of the psychologistic foundation of logic is absurd, the thesis of psychologism is also absurd. Such a thesis, adds Husserl (§21), seems only plausible when we limit ourselves to general considerations. As soon as we examine it in detail we see that psychology can only produce empirical generalizations, being completely incapable of producing exact logical laws which are apodictically (i.e., necessarily) valid.[3]

[3] This last remark of Husserl seems to be true not only of psychologism, but of other reductionisms of the last two centuries. The initial plausibility of the reductionist thesis is severely shaken as soon as one considers it in detail.

As Husserl states (§22), psychologism confuses logical laws, which are possible contents of judgments, with the judgments themselves conceived as acts of judgment, which are clearly spatio-temporal events with their causes and effects. But if you do not differentiate between the content of the judgment and the act of judging or knowing the law, between what is ideal and what is real, then it is clear that you would take the law as being a determining factor in the flow of thoughts. However, adds Husserl (§22), causal laws that regulate our thought so that, e.g., it flows according to some ideal norms are not the same thing as the norms themselves. Even if someone is so constituted that he cannot contradict himself or make an inference which is not a logical one, that does not mean that the logical laws are natural laws that could explain such a perfect constitution. E.g., that a perfect logical being – a machine, robot or superhuman entity – could never commit a fallacy would have to be explained by the physical laws applied in designing it, if it is a machine or robot, by the psychological and physiological laws that govern its constitution, if it is a superhuman natural entity, but not by the laws of logic which the machine, robot or superhuman natural entity is bound to obey. If psychologists have thought differently, concludes Husserl (§22), is because they have ignored the essential and insurmountable differences between ideal law and real law, between normative and causal regulation, between logical and real necessity, between logical foundation and real foundation.

The third empirical consequence of psychologism is the following (§23): If logical laws were to have their epistemological basis in psychological factualities, if they were just normative twists of psychological facts, then they would have a psychological content in two senses: (i) they would have to be laws for the psychological, and (ii) they would have to presuppose or contain the existence of something psychological. However, remarks Husserl (§23), no logical law implies a matter of fact nor the existence of any judgment or any other sort of act of knowledge. To put it in more recent terminology, they are conservative

with respect to any consistent empirical theory. Moreover, logical laws are not laws for any sort of psychological fact. A consequent psychologism would be obliged, according to Husserl (§23), to reinterpret logical laws in a way totally foreign to its true sense, so that they would speak about psychological factualities and the existence of such factualities. But no logical law is of this sort. They are neither psychological nor empirical, and no rule of inference – Husserl says "form of inference" – would allow us to derive a fact from a pure logical law. On the contrary, empirical laws, like those present in psychology, are improper laws which only say that under such and such circumstances, one can expect, on the basis of experience and with more or less high probability, that such and such events occur. At this point in his refutation of psychologism, Husserl makes a small digression to contrast logical laws with laws in the exact natural sciences. We will follow in Husserl's footsteps in the next section, since, apart from the contrast, Husserl's views on laws in the exact natural sciences deserve a detailed consideration.

Continuing with Husserl's main trend of thoughts, in (§23) he discusses the two senses in which, according to the third empirical consequence of psychologism, the logical laws should have an empirical content, and emphazises their strict connection. Thus, he states (§23): "As any law which originates in isolated facts through experience and induction is a law for facts, so also conversely, any law for facts is a law based on experience and induction....". Husserl concludes Chapter IV with some additional arguments of a more general nature. First of all, he states (§24) that although it is clear that our knowledge of logical laws – like any knowledge – is a psychological act and as such presupposes some concrete experience, such psychological assumptions and bases for our knowledge of a law should not be confused with the logical assumptions, the foundations and premisses of a law. Since any law for facts originates in experience and can only be founded on induction, if there are laws whose validity is not ultimately founded on ex-

perience and induction, such laws cannot be concerned immediately with facts. Moreover, Husserl argues (§24), some logical laws are concerned with truths in general, and are, thus, clearly not laws for facts, for something determined in time, since truths are atemporal. Thus, as Husserl states (§24), the fundamental difference between real and ideal objects, and the corresponding one between ideal and real laws is decisive for the conflict between pure logic and the psychologistic interpretation of logic.

6. HUSSERL'S CONCEPTION OF PHYSICAL THEORIES IN THE *PROLEGOMENA*

The empirical content of such rough inductive generalizations mentioned above is evident. But even the exact (higher level) laws of the empirical sciences, especially the physical sciences, have a factual content and as such, states Husserl (§23), are not merely laws about facts but also imply the existence of facts (i.e., they are not conservative with respect to the diagram – in a model-theoretic sense – of all true factual statements). In their usual presentation, such exact higher level laws of the physical sciences have the appearance of pure laws devoid of any existential import. However, in contrast to logical and mathematical laws, such laws of the exact natural sciences are really idealizing fictions, but idealizing fictions *cum fundamento in re*, i.e., they are in some sense based on the facts, since they are compatible with the existing facts but not compatible with all possible facts. Such laws serve the purpose of making possible the highest ideal of scientific theoretical research about facts, the ideal of an explanatory theory according to laws, of a nomological unity within the limits of our human knowledge capabilities.

The process of obtaining these laws can be described as follows. We begin with singularities and empirical generalizations, and from them we first obtain the probabilities within which all our knowledge

of reality is contained. But such probabilities are reduced to exact proper laws, and in this way we build the formally adequate systems of explanatory theories. These systems, however, can only be valid as ideal possibilities *cum fundamento in re*, and as such do not exclude infinitely many other possible systems of laws also *cum fundamento in re*. Thus, the empirical facts in no way determine the laws of highest level uniquely. There is an infinite spectrum of possible physical laws compatible with the data and with the empirical generalizations obtained from them. All such possible physical laws are empirically equivalent with respect to the data. All of them are ideal possibilities *cum fundamento in re*. This infinite set of ideal possibilities could probably be somewhat reduced by extending the data, but never eliminated. The spectrum of infinitely many possible laws empirically equivalent to any given physical law of high level is constitutive of such physical laws. The preference for one of these infinitely many empirically equivalent laws would be based, e.g., on criteria of simplicity. By the way, the infinitely many possible physical laws empirically equivalent to a given physical law should not be confused with different formulations of the same law. With respect to different formulations, or as is sometimes said, different formalisms of the same physical law, Husserl has a very different rendering, which appears in his *Vorlesungen über Bedeutungslehre* ((1987), pp. 101-102) of 1907. Using his important distinction between states of affairs and situations of affairs, introduced for the first time in the Sixth Logical Investigation (*LU* II, U. VI, §48), Husserl says that two different formalisms of the same law have the same situation of affairs in common, i.e., the same referential basis. Hence, their relation is stronger than that of being empirically equivalent.[4]

[4] For Husserl, statements refer to states of affairs, and two or more states of affairs have the same situation of affairs as referential basis. On this issue, see, e.g., our paper 'On Husserl's Distinction Between State of Affairs (*Sachverhalt*) and Situation of Affairs (*Sachlage*)' in C. Ortiz Hill and G. E. Rosado Haddock (2000), and other papers of the author included there, as

The exact physical laws of higher level differ essentially from logical and mathematical laws. Whereas a proper nomology is a mere ideal in the realm of facts, it is present in the realm of purely conceptual knowledge, to which logical and mathematical laws belong. Logical laws are not founded on induction in any sense nor have any existential import. Logical laws are founded with absolute exactness on evidence, not so either the empirical generalizations nor the laws of higher level of the factual sciences. Moreover, logical laws do not represent one in an infinite variety of theoretical possibilities in an objectively determined sphere, but exclude any other possibility.

Before continuing with Husserl's main trend of thoughts, it should be emphasized here that by contrasting logical laws with exact physical laws, Husserl expounded a very interesting conception of physical theories. First of all, it was clear for Husserl that through the induction process applied to obtain the laws of lower level of the exact sciences only the probability of the law, not the law itself, can be founded. Furthermore, he clearly distinguished between empirical generalizations and the high level exact laws of physics, which are hypotheses *cum fundamento in re* and which serve the highest goal of physical theories, namely, its explanatory function of the lower level laws. Moreover, many decades before Quine's work, Husserl propounded a view of the subdetermination of exact physical laws and, thus, of physical theories. Thus, Husserl's views on physical theories in 1900 were – as was the case with his views on logic and mathematics – far more advanced and sophisticated than those of most of his contemporaries.

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well as Jairo José da Silva's paper (1998) 'Husserl's Conception of Logic', *Manuscrito*, XXII(2), 367-397.

7. THE PSYCHOLOGICAL INTERPRETATION OF LOGICAL LAWS

At the beginning of Chapter V (§25) Husserl observes that the extreme empiricism of John Stuart Mill gladly admits as its theses the strongest consequences of psychologism. According to such a doctrine, logical laws are neither *a priori* nor absolutely exact and of a pure conceptual sort, but rather vague generalizations concerned with some factualities of our psychological life. For Mill the principle according to which two contradictory statements cannot both be true and, thus, exclude themselves is just a generalization of facts like light and obscurity, or noise and silence. As Husserl argues (§25), there is in Mill no explanation of how the logical laws are presumably obtained on the basis of such empirical facts. Mill confuses, states Husserl (§25), the ideal impossibility of two contradictory statements being both true with the real incompatibility of the corresponding belief acts. There is, however, asserts Husserl (§25), no psychological impossibility that forbids human beings from having contradictory beliefs. And if the empiricists answer Husserl that such an impossibility applies only to normal human beings, they would have transformed what is an evident, exact and absolutely valid logical law in a vague, inexact and complicated statement, which is only plausibly valid under determined circumstances. Even in its normative use, adds Husserl (§26), the principle of non-contradiction does not have the vague and inexact content attributed to it by the empiricists.

In the Appendix to §§25-26, Husserl launches a direct attack against the extreme empiricist theory of knowledge. As a theory of knowledge, argues Husserl, extreme empiricism is as absurd as extreme skepticism, since it abolishes the possibility of a rational justification of mediate knowledge, and in this way abolishes its own possibility as a scientifically founded theory. To demand a justification in principle for all mediate knowledge makes sense only – and avoids an infinite regress – if we accept some evident principles, on which any foundation

is to be ultimately based. Extreme empiricism renounces the possibility of a rational justification of mediate knowledge when it tries to base logical laws on singular empirical judgments, ignoring by the way the difficulties in the latter. Empiricism does not see, adds Husserl (Appendix to §§25-26), that if there is no justification based on general immediately evident principles, the whole psychologistic theory and the whole doctrine of empiricism, which presupposes mediate knowledge, would be deprived of any rational justification and, thus, could not be distinguished from an arbitrary hypothesis or prejudice. It is interesting, adds Husserl (Appendix to §§25-26), that empiricism gives more credit to a theory so clearly plagued with absurdities than to the trivialities of logic and arithmetic. But moderate empiricism of the Humean sort is not free of difficulties. As is well known, according to Hume's doctrine, mediate factual judgments do not admit any rational justification, but just a psychological explanation. However, since the psychological premises of such a theory are also mediate factual judgments, on the basis of Hume's theory, they are also deprived of any rational justification. Husserl concludes (§27) his critique of empiricism with the following remark. "The correctness of empiricism presupposes the irrationality of its premisses, whereas the correctness of its premisses presupposes the irrationality of the [empiricist] theory". Of course, in the case of Hume's moderate empiricism the above would only apply to knowledge of matters of fact, whereas in the case of Mill's extreme empiricism it would apply to all knowledge.

Returning to psychologism in general, Husserl states (§27) that it is based on equivocations. Thus, the proper logical laws and their equivalents are confused with psychological assertions. When, e.g., it is stated that no judgment can be true to the facts if in it a state of affairs is both asserted and denied, what is meant is a proposition equivalent to the logical law of non-contradiction. Nothing is being said about the real possibility of coexistence, in one or more consciousnesses of contradictory judgments. No psychological compulsion is being expressed,

but only the evidence that two contradictory statements cannot both be true or, equivalently, that the corresponding states of affairs cannot coexist and, thus, that if a judgment is to be true to the facts, it has to obey the logical law of non-contradiction. There is, however, no psychological law which obliges us to obey the logical law. Psychologism confuses the objective incompatibility expressed in the logical principle with the subjective psychological presumed impossibility of unifying in a conscience acts of judgment with contradictory contents.

Husserl concludes Chapter V with a critique of some traditional anti-psychologists, like F. A. Lange, for making an unwarranted concession to psychologism. According to Lange, and also to Sigwart, the principle of non-contradiction is a double-faced principle. On the one hand, it is a natural law which determines our factual judging and, on the other hand, it is a normative law which is the foundation of all logical laws. But the presumed natural law of non-contradiction, observes Husserl (§28), is just a rough empirical generalization, plagued with an ineliminable sphere of indetermination. Such vague empirical generalities have nothing to do with the logical principle of non-contradiction, and it is an absurdity to try to derive one from the other or to bring them together as the two faces of a presumed principle. Moreover, adds Husserl (§28), if Lange and Sigwart were on the right track, there would have to be a general formula expressing the double-faced principle, which would include both the presumed factual law and the logical law about ideal objects. Such a general formula seems, however, not feasible.

8. SYLLOGISTIC IN THE LIGHT OF PSYCHOLOGISM

At the beginning of the brief Chapter VI Husserl states (§30) that the identification of logical laws with psychological ones eliminates the difference between thinking correctly and thinking incorrectly, since judgments not true to the facts would be as psychologically

founded as those true to the facts. Hence, the psychological foundation would make the distinctive character of logical laws disappear. The psychologistic reinterpretation of logical laws, repeats Husserl (§30), simply confuses evidence with a blind conviction, exact generality with empirical generality, and logical incompatibility of states of affairs with psychological incompatibility of belief acts.

In §31 Husserl considers an interpretation of logical laws made by Heynmans, which intends to establish an analogy between logic and chemistry. According to this novel variant of psychologism, the conclusion of a valid inference would be generated from the premises in a similar fashion to that in which chemical compounds are generated from their elements. However, Husserl observes (§31), such an analogy with chemical formulas would apply as well to sophisms and fallacies as to valid inferences. A person who defends a sophism, as well as one who defends a valid inference, feels the inexorable necessity or compulsion that the conclusion which she draws cannot be otherwise. But the analogy with chemistry is inadequate on other grounds, as Husserl adds (§31), since chemical formulas are valuable inductions, the exact conditions being well known under which the syntheses expressed in those formulas occur, whereas in psychology one cannot even fix exactly the circumstances in which we can validly infer.

9. PSYCHOLOGISM AS SKEPTICAL RELATIVISM

Chapter VII is clearly the nucleus of Husserl's refutation of psychologism and the culmination of the efforts of the preceding chapters. Hence, we need to discuss this chapter at length. Of course, someone could remind us that Frege's argumentation against psychologism in *Grundgesetze der Arithmetik* ((1962), Introduction) was directed at showing that psychologism is a sort of relativism. But that is just the easy part of the refutation. And although Frege's refutation is probably suf-

ficient to convince many of the difficulties of that doctrine, there is nothing comparable in Frege's work to much of what follows.

Husserl begins Chapter VII by stating (§32) that the strongest reproach against any theory, and especially against a logical theory, is that it violates the conditions of possibility of theories in general. By conditions of possibility one can understand either (i) from a subjective standpoint, what Husserl calls the 'noetic conditions', i.e., the *a priori* conditions on which is based the possibility both of mediate and immediate knowledge, and with them the possibility of any rational foundation of any theory, since they are the ideal conditions which lie in the form of subjectivity and its relation to knowledge; or (ii) from an objective standpoint, the logical conditions, i.e., the conditions of possibility of any theory, as a unity of truths or propositions linked by relations of foundation and consequence.[5] Hence, these last conditions are all the laws based only on the concepts which essentially constitute the concept of theoretical unity, or, more briefly, the laws based only on the concept of theory. A theory abolishes itself in this logico-objective aspect when its content violates the laws without which the word 'theory' would be devoid of any rational sense. The most grotesque violation of the logical conditions, adds Husserl (§32), occurs when it belongs to the meaning of the thesis the negation of the laws on which depends the rational possibility of any thesis and of the foundation of any thesis. Moreover, Husserl states (§32) that a theory is skeptical if its theses implicitly or explicitly assert that the logical or noetical conditions of

[5] Although in what follows Husserl is concerned almost exclusively with the logical conditions, the fact that he also speaks about 'noetic conditions' seems to run counter to the popular view in analytic circles that there is a sort of rupture between the *Prolegomena* and the second volume of *LU*, and *a fortiori* between the *Prolegomena* and the rest of Husserl's work. By the way, the recent publication of *Husserliana* XXIV, XXVI and XXX clearly disproves such a popular interpretation.

possibility of any theory are false. Both radical and moderate empiricism are for Husserl examples of skeptical theories.

Relativism in general, defines Husserl (§34), is a doctrine which argues that any truth (and, thus, any knowledge) is relative to the subject who judges. If this subject is the individual human subject, we have an individual relativism, whereas if the subject is a species, i.e., the constitution of the members of a species, we have a specific relativism, and if this species is the human species, we speak of anthropologism. About individual relativism, states Husserl (§35), there is not much to say besides that "[it] is refuted as soon as it is stated, although only for those who acknowledge the objectivity of the logical. [However], one cannot convince a subjectivist or a confessed skeptic in general, since he lacks the disposition to see that propositions like the principle of non-contradiction are based just on the sense of the word 'truth' and, thus, for such propositions it is absurd to speak about a subjective truth ...." Thus, Husserl considers (§35), that "the content of the assertions of individual relativists denies what belongs to the sense of any assertion and ... is inseparable from it".

At the beginning of the extremely important §36, in which Husserl presents his arguments against specific relativism, Husserl states that this doctrine is also a sort of skepticism. Husserl's argumentation against specific relativism consists of six arguments. The first two arguments are related to those offered by Frege in his refutation of psychologism some years earlier. The remaining four arguments are less familiar, and the last three of them are certainly the most ingenious.

First Argument: The doctrine of relativizing truth to the species that judges is absurd, since then the same proposition can be true for a human subject but false for a non-human subject. However, the same judgeable content cannot both be true and false, since if we use the words in their usual sense, such a thesis contradicts its proper sense. It is simply absurd to maintain that the same judgeable content is true or

false depending whether the judging subject is a human being or not. Clearly, the law of non-contradiction cannot be expressing truth for a species.

Second Argument: When specific relativism states that there could be other species that do not obey the logical principles, either (i) what is meant is that in the judgments of such a species could appear propositions and truths not in accord with the logical principles, or (ii) that in such a species judging is not psychologically governed by such principles. In this last case there is nothing strange, since human beings are such a species. In the first case there are two possibilities: (i) either such a species understands the words 'true' and 'false' in our sense, in which case one cannot speak rationally of the invalidity of the logical principles, since they belong to the sense of the words as we understand them; or (ii) they use the words 'true' and 'false' in another sense, in which case the dispute is just a matter of words.

Third Argument: The constitution of a species is a fact and on the basis of facts only facts can be founded. To base truth on the constitution of a species is to give truth the status of a fact. However, facts are individual and temporal, and are subject to relations of cause and effect, whereas truths lack any temporal determination and it is absurd to think of them in terms of causes and effects. One should clearly separate the content of a judgment, which is an ideal unity – as truth also is – from the individual real act of judging, which is a fact and as such is related to other facts as cause or effect.

The Fourth (or Modal) Argument: If all truth were based on the constitution of human nature in general – the argument would be similar in the case of any other species – then if such a species did not exist, there would be no truth. The consequence of the last conditional is logically impossible – Husserl says "absurd" – since the statement 'There does not exist any truth' is equivalent to the statement 'There exists the truth that there does not exist any truth'. The logical impossibility of the consequent implies the logical impossibility of the ante-

cedent. Hence, it follows that it is logically impossible that the human species does not exist. However, the statement 'The human species does not exist' is simply the negation of a factually (or contingently) true statement' and is, thus, factually (i.e., contingently) false, but not logically impossible. Hence the conditional is false – Husserl uses once more the word 'absurd' but here it should be rendered simply as 'false', since it has a logically possible antecedent and a logically false consequent. It follows that the assertion of specific relativism that all truth is based exclusively on the constitution of the human nature is also false, since the contingency of 'The human species exists' implies the contingency of 'The human species exists and founds the truths', whereas the existence of truths is not contingent but necessary, due to the logical impossibility of its denial as shown above.

We have expounded Husserl's argument using Husserl's word 'absurd' in two senses, namely, as 'logically impossible' in some cases and in others simply as 'false'. For the refutation of the original thesis, it is enough that the conditional derived from it be false under some interpretation. Since truths exist necessarily, but human beings exist only contingently, it would also be (at best) contingently true that there exist human beings whose constitution founds truths. Put in current more colourful terminology, there are possible worlds in which human beings do not exist and, thus, human beings who can found truths do not exist. But truths exist in all possible worlds, since the statement 'There does not exist any truth' is logically impossible. (By the way, in any possible world in which human beings do not exist the statement 'There do not exist human beings' would be true.) Hence, it is false that each and every truth is founded on the constitution of human beings. Thus, the thesis of specific relativism that every truth is founded on the constitution of the human species has been refuted.[6]

[6] It should be mentioned that there is a sense in which the truth of statements of a very special sort, e.g., 'There exist human beings', presupposes the

The Fifth Argument: According to specific relativism, it could happen that on the basis of the constitution of a species it would be true for such a species that it does not exist. In such a case the truth of a proposition which says that a determined species does not exist would be founded on the constitution of that same species, what is clearly absurd. Moreover, even if we substitute 'existence' for 'non-existence' in the above argument, the absurdity remains. In that case, instead of considering a hypothetical species possible from the relativistic standpoint, we just consider the human species. Thus, the truth of the proposition that says that the human species exists would be founded on the special constitution of the human species, specifically, in its capability of acknowledging its own existence as a species.

The Sixth Argument: Relativity of truth implies the relativity of the existence of the world, since the world is just the objectual total unity corresponding to the ideal system of all factual truth and is inseparable from it. When you relativize truth to the existence of a subject, individual or specific, you also relativize its object. Thus, if specific relativists were right, there would be no objective world, but only a world relative to the human species or to some other sort of species. Moreover, since the I and its conscious contents belong to the world, even propositions like 'I am' or 'I am thinking this or that' would be false if I were constituted in such a way that on the basis of my constitution I were obliged to deny them. But if no factual species in the world were so constituted that it had to acknowledge the existence of a world of which the species is a part, relativists would have to conclude that there is no world. Finally, a change in the constitution of some species – e.g., that finally at least one of the species acknowledges the

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existence of human beings. However, in this case what is presupposed is the state of affairs referred to by the statement, not any human beings that think or assert the statement, i.e., not any human subject, but the objectuality meant in the proposition expressed by the statement.

existence of the world – would produce a change in the constitution of the world – now the world exists for at least one of the millions of species in the world – even though science generally accepts that there was a point in time at which the different species began to emerge in the already existing world. Thus, as a consequence of the specific relativist thesis, the world would not have existed before there emerged a species for which it was true that the world exists. In that case that privileged species would have in some sense created the world, instead of being a byproduct of the world. Finally, it should be clear that specific relativists cannot deny this ontological consequence of their thesis extracted by Husserl, since if the world existed independently of the constitution of any species, the statement, 'The world exists' would be true independently of the constitution of any species.

In the brief §37 Husserl adds that an assertion abolishes itself and is logically contradictory if its particular content contradicts the demands of the corresponding meaning categories. Hence, any theory that founds logical principles on facts is logically contradictory, since this conflicts with the general sense of the concepts 'logical principle' and 'fact', or more exactly with the concepts 'truth based on the mere sense of the concepts' and 'truth based on individual existence'.[7] In §38 the refutation of psychologism is essentially completed. Psychologism is in all its forms a specific relativism and, thus subject to the six arguments presented above, no matter if it is based on a transcendental psychology and intends to save the objectivity of knowledge through a presumed formal idealism, or if it is based on empirical psychology and accepts relativism as an inevitable fatality. Thus, any doctrine that con-

[7] Although we cannot dwell on this issue here, it is interesting to compare the underlying notion of 'truth based on the mere sense of the concepts', which seems so near to the notion of analyticity popular in analytic philosophy, and which can be traced back to Kant and even Leibniz, with Husserl's definition of the notion of 'analyticity' in *LU* II**,** *U.* III, §12, which can be traced back to Bolzano.

ceives logical laws as empirico-psychological laws, as well as any doctrine that bases them on some mythical original forms of understanding, here Kant and his followers are clearly meant, or on the general consciousness as generic human reason, or on the *intellectus ipse*, all of which as a human capability would precede factual knowledge, is a form of specific relativism. Hence, Husserl concludes (§38), all objections presented against specific relativism apply to all such variants of psychologism, wherever the words 'understanding', 'reason', 'consciousness', etc. are interpreted as having an essential relation with the human species.

10. SOME CONCRETE CRITIQUES

In §§39 and 40 Husserl discusses and refutes the doctrines of two prominent defenders of psychologism, namely, Sigwart and B. Erdmann. The latter had already been chosen as special target by Frege in his refutation of psychologism in *Grundgesetze der Arithmetik*. We will expound briefly some interesting aspects of Husserl's refutation of Sigwart's and Erdmann's views. Thus, e.g., in his discussion of the moderate psychologism of Sigwart, Husserl anticipates some of the themes of the second volume of *Logische Untersuchungen*[8]. In §39 Husserl states that general objects, like truths and propositions, are essentially different from singular objects, and the corresponding acts in which they are apprehended are also different. Moreover, even if there were no intelligent beings or, at least, no intelligent beings capable of understanding some determined truths, these and all truths would maintain their status as ideal beings in the atemporal realm of ideas. Truths are absolutely valid independently of their being known by any intelligent being. If truths had any essential relation with the human species, they would originate and disappear with the human species. Returning to

[8] See especially *Logische Untersuchungen* II, U. II.

the fifth argument, Husserl adds (§39) that if human beings were incapable of asserting their existence as true, they would at the same time exist (from the standpoint of another species or being) and not exist (from the standpoint of the existing human beings).

In the same §39 Husserl distinguishes between foundation of a truth, which is a purely logical notion, and foundation of a judgment – which is a notion belonging to the realm of the logico-normative. When a truth, as a unity of validity, has its foundation, that means that there is a theoretical proof of that truth which can be traced back to its objective theoretical foundations and ultimately to axioms. For this logical concept of foundation, Husserl adds (§39), the Leibnizian principle of sufficient reason is not valid, since each proper axiom is devoid of foundation. Moreover, any factual judgment is devoid of foundation, since only its probability, not the judgment itself, can be founded. Finally, Husserl also distinguishes (§39) between subjective necessity, which is a sort of compulsion of belief accompanying our acts of judgment, and the objective necessity of a law, and underscores that it is on this last objective and ideal sense of necessity that the apodictic contents of judgments of pure logic are based, and which governs and constitutes every theoretical unity.

Contrary to Sigwart, who was a moderate psychologist, the psychologism of Erdmann was more radical. In §40 Husserl discusses Erdmann's views. Against Erdmann, Husserl maintains that the real act of negating the logical laws is perfectly compatible with the objective validity of those laws. Logical laws are concerned with ideal relations between judgment contents, not with real relations either between acts of judgment or between acts of judgment and conditions of a law. Logical laws are not laws of our human thought, which could change with a change in human nature, as Erdmann believed, but simply express some truths based exclusively on the sense of concepts like those of 'truth', 'falsity' and 'proposition'. But a proposition which states only what already lies in the concepts does not express anything real, and

when logical laws express something about concepts they are not talking about acts of judgment or any sort of psychological activity. They are concerned with the meaning in species of statements, and such meanings are identically the same no matter if somebody asserts them or not. Thus, one should clearly distinguish between the logical impossibility of the negation of a logical law and the presumed psychological incapability of negating the law, since what is logically impossible is not the act of negating – what, Husserl observes (§40), already philosophers like Epicurus and Hegel have already done-, but the negative proposition which is its content. It is the contradictory possibility, says Husserl (§40), which is logically impossible, not the act of judgment. Moreover, if it were impossible to assert (or even to think) the negations of the logical principles, the negations of their necessary consequences would also be impossible to assert (or even to think). However, we very often fail to see the truth of complicated logical and arithmetical judgments, and even sometimes judge them to be false. Moreover, even if it were impossible for any human being to assert contradictory judgment contents, that would be on the basis of its psychological constitution, and such psychological impossibility would have nothing to do with the logical impossibility of the negation of logical laws. It is not logically impossible that there exist species which contradict logical laws. Erdmann's and others' misconception is based on a misreading and psychological reinterpretation of logical laws. Moreover, if no one existed who could acknowledge the truth or falsity of propositions, these would remain as they are, since truth and falsity concern only the content of judgments. Of course, Husserl concludes that Erdmann, as well as Sigwart, is a specific relativist, and – going back to the sixth argument – adds (§40) that if you relativize the logical principles, you also relativize all other truths.

11. PSYCHOLOGISTIC PREJUDICES

Husserl's refutation of psychologism has already been completed in §38. That refutation was based on the absurd consequences which could be extracted from the psychologistic theses. In Chapter VIII, however, Husserl is concerned with a second and more direct refutation of psychologism, which will consist in unmasking the prejudices and misconceptions on which psychologism is based.

First Prejudice (§41):

> Prescriptions for the regulation of the psychological are obviously psychologically founded. Hence, it is also clear that the normative laws of knowledge have to be based on a psychology of knowledge.

However, argues Husserl (§41), logical laws are not normative propositions, they are not prescriptions for judgment. They can serve for the normatization of cognitive activities, but that does not mean that they are norms. Logical laws are theoretical laws, but as happens with the laws of any theoretical discipline, e.g., mathematics, they can serve for the foundation of norms. Not only psychologism but also traditional antipsychologism failed to realize the theoretical and pure nature of logic, and its similarity with formal mathematics – Husserl says 'equivalence' but what is meant is that they are of the same nature to the point that it is not easy to trace a dividing line between the two – and, thus, failed to appreciate the difference between the proper content of logical laws and their practical application. The frequent talk about normatization and about laws of thought, adds Husserl (§41), made people believe that logical laws had a psychological nature and that only their normative function separated them from other psychological laws. However, the normative and even practical application of logical laws is of secondary importance, since as laws they are concerned only with the ideal – not the real – and have their foundation in evident axioms.

In §42 Husserl is concerned with the justification of pure logic. Thus, he begins by stating that from the standpoint of its theory content each science is constructed of truths, which lie in propositions, that these, on the one hand, contain subjects and predicates which refer respectively to objects and properties, and, on the other hand, are connected with other propositions as foundation or consequence. Truths that are based only on the essential constituents of any science cannot be abolished without abolishing what gives objectivity and sense to any science, since only with respect to such truths can be measured what pretends to be science or to belong to a science. Moreover, Husserl argues (§42) that if one acknowledges that such truths based on the sense of the concepts constitutive of the notion of science as an objective unity cannot belong to the domain of a particular science, that such ideal truths cannot have their origin in a factual science and, thus, not in psychology, then the existence of a pure logic as a theoretical science is beyond dispute. Such a discipline is concerned with the concepts constitutive of the notion of theoretical unity and with the theoretical relations on which such concepts are based. This pure logic, adds Husserl (§42), which has the peculiarity that it applies to itself, since "the ... theoretical connections of which it consists as a systematic unity of truths obey the laws that belong to its theoretical content...", is the primary and most essential foundation of practical logic. Ideally, what is expressed in a proposition is a truth, and in science no truth is isolated, but connected with other truths through theoretical relations of foundation and consequence. This objective content of science is totally independent of the subjectivity of the scientists and of the peculiarities of the human species, and it is this objective theoretical content of science that concerns logic, thus, the form of the theoretical connections between truths in general. Hence, the laws of pure logic, which are of a completely ideal nature, have to be obeyed by any science.

With respect to the norms present in practical logic, Husserl draws (§42) an important distinction. There are norms that are just normative transformations of the ideal laws of pure logic. Such normative laws govern *a priori* each foundation, each apodictic relation in our judgmental activity, and are of a pure ideal nature. On the other hand, there are auxiliary functions which can be helpful in our judgmental activity but are of an empirical nature, and are based on the psychological and even on the physiological constitution of the human species. The former are essential foundations of practical logic, the latter non-essential ones.

In §43 Husserl clearly states that the opposite of a natural law, conceived as an empirically founded rule about facts, is not a normative law, conceived as a prescription, but an ideal law, as a nomology based only on concepts, thus, not empirical. Husserl remarks (§43) that traditional antipsychologism has totally missed this point. With regard to the argument of traditional antipsychologism against psychologism mentioned above, Husserl says (§43) that it is always an inconvenience but only sometimes a circle. In the case of primitive principles, like the principle of non-contradiction or *modus ponens*, there is clearly a circle, since when one tries to derive them from their presumed psychological foundation one would be presupposing them in individual steps of the derivation as principles of derivation, although not necessarily as premises. Husserl speaks in this case of a reflexive circle instead of a demonstrative (or vicious) circle, in which the premises and the derived propositions are mixed up. The fact of the matter, adds Husserl (§43), is that only logic is free of such objections, since its premises are homogeneous with its inference rules. Logic evades the circle because it does not prove in a given deduction the statements presupposed by this deduction as principles, nor does it prove the statements presupposed by any deduction, but puts them at the beginning of all deductions as axioms. The goal of logic, states Husserl (§43), has to be, on the one hand, to trace back analytically the statements to the axioms

indispensible as starting points, which are irreducible to each other without falling in a direct or reflexive circle, i.e., they are independent from each other, and, on the other hand, form and order the deductions of logical theorems so that not only the premises but also the inference rules – which Husserl called 'principles of deduction' – belong either to the axioms or to the previously proved theorems, i.e., are either primitive statements or rules of inference, or are theorems or derived rules. It should be clear that Husserl's concept of logical deduction – or proof – is essentially the one to be still found in logical textbooks, in which logic is presented as an axiomatic system.

Second Prejudice (§44):

> [Logic talks] about representations and judgments, about inferences and deductions, about truth and probability, about necessity and possibility, about foundation and consequence, and other with them strictly connected and related concepts.... [But representations and judgments are psychological phenomena.] Inferences are foundations of judgments in judgments, and to found is a psychological activity... [whereas] truth and probability, necessity and possiblity... can only be exhibited in judgments.... [Thus,] the distinction between pure logical and methodological propositions is useless [since all of them refer to psychological phenomena].

Husserl focuses his refutation of this prejudice on the similarity between logic and mathematics. Thus, he says (§45) that due to the strict relation between logic and mathematics already stated by Lotze and Riehl, if what the second prejudice says were correct, one could also argue that numbers originate in psychological activities of counting, that relations originate in acts of relating, connections in acts of connecting, that to add, subtract, multiply and divide are psychological processes and, thus, the products of such activities, e.g., sums and products, also obey psychological laws.

On this issue, Husserl observes (§46) that although it is true that mathematical operations can be traced to some psychological acts in which arithmetical concepts are produced in us, it would be a clear

transgression of spheres to maintain that mathematical laws are psychological. Whereas psychology is the empirical science of all psychological facts, arithmetic is not concerned with individual facts nor with temporal determination, but with ideal species, like the numbers 1, 2, 3, etc. Such ideal singularities, i.e., species of the lowest level, are the object of study of arithmetico-singular propositions as well as of the arithmetico-general ones of algebra. (Here Husserl has in mind traditional (or school) algebra, not the abstract algebraic structures, like groups, monoids, rings or fields studied nowadays in university courses.) Such propositions do not speak about anything real or psychological, but either about the laws based solely on the notion of the genus cardinal number, as does general arithmetic – i.e., traditional algebra – or about the lowest singularities falling in the extension of such laws, which are the determinate numbers, i.e., the ideal species talked about by arithmetico-singular propositions.[9]

Moreover, says Husserl (§46), what happens with arithmetic also happens with logic. Although logical concepts have in us a sort of 'psychological origin', that does not mean that such concepts are based on psychology. Pure logic, as a theoretical discipline is totally foreign to psychology, and logical laws lose their proper sense when they are reinterpreted psychologically. The concepts on which logical laws are built do not have any empirical extension constituted by factual singularities, but are true general concepts to whose extension belong ideal singularities which are legitimate species. The psychological confusion, adds Husserl (§46), is the result of the equivocity of some terms occuring in logical contexts.

[9] With respect to the refutation of psychologism in mathematics, Frege had also preceded Husserl, and in this case it is Frege's refutation which is clearly the most detailed. On this issue, see Frege's small jewel *Die Grundlagen der Arithmetik* (1986).

In §47 Husserl is concerned with such equivocities. Thus, e.g., in the psychological parts of practical logic one used to speak of judgments as special sorts of acts of consciousness, acts of taking something as true, whereas in the purely logical parts one used to speak of judgment as synonym of proposition, understood as an ideal unity of meaning. It is in this last sense of the word 'judgment' that the logical principles are judgments and are concerned with judgments, thus, not as laws concerned with acts of judgment but as laws concerned with judgment contents, with ideal meanings or, briefly, with propositions. Hence, Husserl concludes (§47), both pure logic and arithmetic are sciences about the ideal singularities of some pure genera, and as such are clearly distinct from psychology, which is a science about the individual singularities of some empirical classes.

There is, states Husserl (§48), an insurmountable essential difference between ideal sciences – like logic and mathematics – and the real sciences. The first are *a priori* and concern the ideal nomological generalities based with evident certainty on legitimate general concepts. Real sciences, on the other hand, are empirical, establish real nomological generalities with evident probability and are concerned with a factual domain. The extension of general concepts is one of specific differences of the lowest level of a pure genus, whereas the extension of the concepts in the real sciences is one of temporally determined individual singularities. In the ideal sciences the ultimate objects are ideal species, whereas in the real sciences they are empirical facts.

In the case of any science, Husserl distinguishes (§48) between (i) the nexus in which the science is subjectively carried out, i.e., the nexus of representations, judgments, etc. in which the scientific research is done; (ii) the nexus of the objects studied and theoretically known by the science, which constitute as such the region or domain of the science, thus, a nexus which is both objective (*sachlich*) and objectual (*gegenständlich*); and (iii) the logical nexus, i.e., the – objective but not objectual – nexus of theoretical notions which constitutes the unity

of truths in a scientific theory, in a proof or inference, as well as the unity of the concepts in a true proposition, and of simple truths in the nexus of truths. These three different nexuses are present also in logic and arithmetic as in any other discipline, although the object of research are ideal species and not real facts as in physics. The case of logic is, nonetheless, somewhat peculiar, since the ideal nexus which constitutes its theoretical unity falls as a special case under the logical laws. Thus, logical laws belong both to the theoretical connection and to the region of logical science.

Third Prejudice (§49):

> All truth lies in judgment. But we acknowledge a judgment as true only in the case of its evidence. This word designates... a peculiar psychological trait well known to everyone through its inner experience, a unique sentiment which guarantees the truth of the judgment to which it adheres. Now, if logic is the practical discipline whose goal is to make us know truths, then these logical laws are clearly propositions belonging to psychology.

Against this prejudice, Husserl observes (§50) that the proposition '*S* is true' does not have the same sense as 'It is possible that someone judges with evidence that *S* ' – even though they are in some sense equivalent – since the first proposition does not speak of judgments of anyone. The second one is obtained from the first through an evident transformation which preserves equivalences. The result of such a transformation is not the object of study of psychology, since such possibilities of evidence are ideal, whereas psychology is an empirical science and, as such, is concerned only with facts, namely, with psychological facts. Moreover, what is psychologically impossible can very well be ideally possible (e.g., a thousand-sided polygon). Truths, says Husserl (§50), are ideal unities for a possibly infinite number of true propositions of the same form and matter, and each actual judgment belonging to such an ideal multiplicity satisfies either by its form or by its matter the ideal conditions of possibility of its evidence. Pure

logical laws, adds Husserl (§50), are truths based solely on the concept of truth and related concepts, and when they are applied to possible acts of judgment they express, on the basis only of the form of the judgment, the ideal conditions of possibility or impossibility of evidence.

Anticipating an important issue of the second volume of *Logische Untersuchungen*, Husserl traces (§51) the dispute over evidence to the fundamental epistemological difference between the ideal and the real, between truths, laws and ideal sciences and real sciences, between real generalities and individual singularities, on the one hand, and ideal generalities and specific singularities, on the other. Empiricism ignores not only the relation between ideal and real in thought, but also the relation between truth and evidence. Empiricists think that evidence is a sentiment which either causally or with natural nomology adheres to some judgments. But evidence is no a psychological trait which adheres to every true judgments and to no others. For Husserl, truth is an idea and evidence is a sort of correlate of truth. The recognition of the adequacy of what is expressed in the proposition with the state of affairs given is evidence, and the idea of such an evidence is truth. Thus, the ideality of truth guarantees the objectivity of evidence. It is not simply a causal fact that the thought expressed in a statement coincides here and now with the state of affairs – where 'coincides' does not mean that they are identical. The relation concerns the ideal propositional meaning and the state of affairs, and both validity and objectuality or invalidity and unobjectuality do not concern the temporal psychological act but the proposition *in specie*, the identical proposition to which correspond an unlimited multiplicity of acts of judgment. Moreover, we also have the evidence that the evidence of nobody can be in conflict with ours, if both are really evidences, since to have evidence means that what is recognized as true is simply true and cannot be false. Thus, e.g., we have evidence not only of the principle of non-contradiction but also of the impossibility of someone having evidence of its negation.

12. ON THE SO-CALLED ECONOMY OF THOUGHT

Both the indirect refutation of psychologism by extracting clearly false consequences and the direct refutation of psychologism have been completed, as has been also the justification of pure logic as a theoretical discipline. Chapters IX and X can be, thus, considered as appendixes, but of a different nature. Chapter IX is concerned with a sort of biological 'foundation' of logic propounded by Mach, Avenarius and Cornelius, whereas Chapter X offers a sketchy overview of possible coincidences between Husserl's views and those of his predecessors. We will complete our presentation with a brief exposition of some important aspects of these chapters, especially of the first one. Chapter XI, which can be traced back to the early 1890s, and which is without doubt the culmination of Husserl's efforts in the *Prolegomena*, offers his definitive views on logic, mathematics and their relationship. We cannot expound its contents here, what would require a paper of its own. In any case, we have discussed it elsewhere.[10]

As Husserl states in §52, Mach, Avenarius and Cornelius argued for a sort of biological 'foundation' of logic and the theory of knowledge on the basis of a so-called principle of thought economy. Such a presumed principle, explains Husserl (§53), is not an exact law capable of being the base of a rational explanation – as occurs with mathematical or physico-mathematical principles – but is just one of those teleological standpoints used in biological science and bound to the general ideas of evolution.

There is a sense, acknowledges Husserl (§54), in which a sort of thought economy has played an important role. The thought economy

[10] See, e.g., our dissertation *Edmund Husserls Philosophie der Logik und Mathematik im Lichte der gegenwärtigen Logik und Grundlagenforschung* (1973), or our recent papers 'To be a Fregean or to be a Husserlian: that is the Question for Platonists' in C. Ortiz Hill and G. E. Rosado Haddock (2000), and 'Husserl's Relevance for the Philosophy and Foundations of Mathematics' (1997).

induced by the introduction of special symbols in our thought produced formal generalizations of the original thoughts and even of sciences, and, thus, helped originate new deductive disciplines of a wider formal spectrum, e.g., algebra from arithmetic, or even the pure doctrine of multiplicities, which is, in Husserl's view (see Chapter XI) to embrace formally the whole spectrum of possible deductive systems, and for which formal arithmetic is simply a special case. Thus, the thought economy is an important but not essential foundation of practical logic. However, adds Husserl (§55), the doctrine of the thought economy is of no help as a rational explanation of the pure theory of knowledge and, especially, of the ideal laws of pure logic. Moreover, such an attempt to found pure logic and pure theory of knowledge on the doctrine of thought economy is ultimately a version of a psychological foundation. Hence, all the arguments expounded above against psychologism are valid also against this doctrine. E.g., it is perfectly clear that such a view is a sort of anthropologism and, thus, the arguments against specific relativism also weight against it.

On §56 Husserl discusses in detail the confusions of the doctrine of thought economy. First of all, Husserl states (§56) as the highest theoretical objective and as an ideally justified goal any explanation that – beginning with a conceptually determined region – orders blind facts under laws of the highest possible generality, and in this way connects to the highest possible rationality. When we order the facts under laws, there must be a minimal collection of laws of the highest possible generality, which are deductively independent from each other and from which all other laws are obtained by pure deduction. These fundamental laws are in some sense the widest possible and the most fruitful, since its knowledge produces the most absolute intelligibility in the region under consideration, allowing us to explain all that is capable of explanation. This principle of the highest rationality, states Husserl (§56), is the highest objective of rational science. But the principle is ideal and normative, and, thus, neither biological nor a principle of

thought economy. To identify the tendency to the highest possible rationality with a biological tendency of adaptation, or derive the former from the latter, or consider it a sort of psychological fundamental force is totally mistaken and is comparable only to the psychologistic reinterpretation of logical laws as natural laws. It is an error to say that our psychological life is factually governed by this principle. Our factual thought does not function according to ideals, as if the ideals were natural laws. Moreover, adds Husserl (§56), the ideal validity of the norm is presupposed by any meaningful discussion of thought economy and, thus, cannot be the result of an explanation based on the doctrine of thought economy. Hence, the propounders of the doctrine of thought economy confuse the consequence with the foundation. We have first to know which ideal is science's objective, what is a connection between laws, what are fundamental laws and what are derived laws, before we can evaluate the function of thought economy in knowledge. Husserl concludes his argumentation by stating (§56) that the errors of the doctrine of thought economy lie – as in the case of psychologism in general – in the fact that what cognitively interests its propounders is empirical science. Hence, they consider science as a biological phenomena, and do not even see the epistemological problem of science as an ideal unity of objective truth.

It is appropriate to finish this lengthy essay with two remarks made by Husserl at the beginning of Chapter X. First of all, Husserl concludes (§57) that the analyses of the preceding chapters have shown the untenability of all sorts of empirical or psychologistic foundation of logic, and that practical (or methodological) logic has its most important foundation in pure logic, not in psychology. However, he adds (§57), his objective is not a return to traditional Aristotelian-scholastic logic, but a radical transformation in logic. As mentioned above, Husserl's views on logic, mathematics and their relationship were presented for the first time in the last chapter of the *Prolegomena*, although they seem to have been developed in the early 1890s. As Husserl wrote

more than once, such views drew their inspiration, on the philosophical side, especially from Leibniz, and to a lesser degree from Bolzano and Lotze, and on the mathematical side, especially from Riemann and Cantor, and in a lesser degree probably from Klein and Lie.

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