§11 Logic or theory of science as normative discipline and as technology

From our discussions up to this point logic – in the sense of the theory of science here in question – emerges as a normative discipline. Sciences are creations of the spirit which are directed to a certain end, and which are for that reason to be judged in accordance with that end. The same holds of theories, validations and in short of everything that we call a ‘method’. Whether a science is truly a science, or a method a method, depends on whether it accords with the aims that it strives for. Logic seeks to search into what pertains to genuine, valid science as such, what constitutes the Idea of Science, so as to be able to use the latter to measure the empirically given sciences as to their agreement with their Idea, the degree to which they approach it, and where they offend against it. In this logic shows itself to be a normative science, and separates itself off from the comparative mode of treatment which tries to conceive of the sciences, according to their typical communities and peculiarities, as concrete cultural products of their era, and to explain them through the relationships which obtain in their time. For it is of the essence of a normative science that it establishes general propositions in which, with an eye to a normative standard, an Idea or highest goal, certain features are mentioned whose possession guarantees conformity to that standard, or sets forth an indispensable condition of the latter. A normative science also establishes cognate propositions in which the case of non-conformity is considered or the absence of such states of affairs is pronounced. Not as if one had to state general marks in order to say what an object should be to conform to its basic norm: a normative discipline never sets forth universal criteria, any more than a therapy states universal symptoms. Special criteria are what the theory of science particularly gives us, and what it alone can give us. If it maintains that, having regard to the supreme aim of the sciences and the human mind’s actual constitution, and whatever else may be invoked, such and such methods $M_1, M_2 \ldots$ arise, it states general propositions of the form: ‘Every group of mental activities of the sorts $AB \ldots$ which realize the combinatory form $M_1$ (or $M_2 \ldots$) yield a case of correct method’, or, what amounts to the same ‘Every (soi-disant) methodical procedure of the form $M_1$ (or $M_2 \ldots$) is a correct one.’ If one could really formulate all intrinsically possible valid
propositions of this and like sort, our normative science would certainly possess a measuring rod for every pretended method, but then also only in the form of special criteria.

Where the basic norm is an end or can become an end, the normative discipline by a ready extension of its task gives rise to a technology. This occurs in this case too. If the theory of science sets itself the further task of investigating such conditions as are subject to our power, on which the realization of valid methods depends, and if it draws up rules for our procedure in the methodical tracking down of truth, in the valid demarcation and construction of the sciences, in the discovery and use, in particular, of the many methods that advance such sciences, and in the avoidance of errors in all of these concerns, then it has become a *technology of science*. This last plainly includes the whole normative theory of science, and it is therefore wholly appropriate, in view of the unquestionable value of such a technology, that the concept of logic should be correspondingly widened, and should be defined in its sense.
§16 Theoretical disciplines as the foundation of normative disciplines

It is now easy to see that each normative, and, *a fortiori*, each practical discipline, presupposes one or more theoretical disciplines as its foundations, in the sense, namely, that it must have a theoretical content free from all normativity, which as such has its natural location in certain theoretical sciences, whether these are already marked off or yet to be constituted.

The basic norm (or basic value, or ultimate end) determines, we saw, the unity of the discipline: it also is what imports the thought of normativity into all its normative propositions. But alongside of this general thought of measurement in terms of a basic norm, these propositions have their own theoretical content, which differs from one case to another. Each expresses the thought of a measuring relation between norm and what it is a norm for, but this relation is itself objectively characterized – if we abstract from valuational interest – as a relation between condition and conditioned, which relation is set down as existent or non-existent in the relevant normative propositions. Every normative proposition of, e.g., the form ‘An \( A \) should be \( B \)’ implies the theoretical proposition ‘Only an \( A \) which is \( B \) has the properties \( C \)’, in which ‘\( C \)’ serves to indicate the constitutive content of the standard-setting predicate ‘good’ (e.g. pleasure, knowledge, whatever, in short, is marked down as good by the valuation fundamental to our given sphere). The new proposition is purely theoretical: it contains no trace of the thought of normativity. If, conversely, a proposition of the latter form is true, and thereupon a novel valuation of a \( C \) as such emerges, and makes a normative relation to the proposition seem requisite, the theoretical proposition assumes the normative form ‘Only an \( A \) which is \( B \) is a good \( A \)’, i.e. ‘An \( A \) should be \( B \)’. Normative propositions can therefore make an appearance even in theoretical contexts: our theoretical interest in such contexts attaches value to the being of a state of affairs of a sort – to the equilateral form, e.g., of a triangle about to be determined – and then assesses other states of affairs, e.g. one of equiangularity, in relation to this: If the triangle is to be equilateral, it must be equiangular. Such a modification is, however, merely passing and secondary in theoretical sciences, since our last intention is here directed to the theoretical coherence of the things themselves. Enduring results are not therefore stated in normative form, but in the forms of this objective coherence, in the form, that is, of a general proposition.
It is now clear that the theoretical relations which our discussion has shown to lie hidden in the propositions of normative sciences, must have their logical place in certain theoretical sciences. If the normative science is to deserve its name, if it is to do scientific work on the relations of the facts to be normatively considered to their basic norms, it must study the content of the theoretical nucleus of these relations, and this means entering the spheres of the relevant theoretical sciences. In other words: Every normative discipline demands that we know certain non-normative truths: these it takes from certain theoretical sciences, or gets by applying propositions so taken to the constellation of cases determined by its normative interest. This naturally holds, likewise, in the more special case of a technology, and plainly to a greater extent. The theoretical knowledge is there added which will provide a basis for a fruitful realization of ends and means.

One point should be noted in the interest of what follows. Naturally these theoretical sciences may share in very different degrees in the scientific foundation and elaboration of the normative discipline in question. Their significance for it can also be greater or less. It may become plain that, to satisfy the interests of a normative discipline, the knowledge of certain sorts of theoretical connection has a prime urgency, and that the development and bringing closer of the theoretical field of knowledge to which they belong therefore plays a decisive part in making such a normative discipline possible. In building up such a discipline, it may be that certain sorts of theoretical knowledge play a useful and perhaps very weighty role, but none the less are of secondary significance, since their removal would only narrow, but not wholly destroy, the field of the discipline. One may think, e.g., of the relation between merely normative and practical ethics (see above, §15). All the propositions which have to do with making practical realization possible, do not effect the sphere of the pure norms of ethical valuation. If these norms, or the theoretical knowledge underlying them, were to fall away, ethics would vanish altogether. If the former propositions were to drop out, there would be no possibility of ethical practice (or no possibility of a technology of ethical conduct).

It is in relation to such distinctions that talk of the essential foundations of a normative science must be understood. We mean thereby the theoretical sciences that are absolutely essential to its construction, perhaps also the relevant groups of theoretical propositions which are of decisive importance in making the normative discipline possible.
Chapter 3

Psychologism, its arguments and its attitude to the usual counter-arguments

§17 The disputed question as to whether the essential theoretical foundations of normative logic lie in psychology

If we now apply the general results arrived at in the last chapter to logic as a normative discipline, a first, very weighty question arises: Which theoretical sciences provide the essential foundations of the theory of science? And to this we forthwith add the further question: Is it correct that the theoretical truths we find dealt with in the framework of traditional and modern logic, and above all those belonging to its essential foundations, have their theoretical place in the sciences that have been already marked off and independently developed?

Here we encounter the disputed question as to the relation between psychology and logic, since one dominant tendency of our time has a ready answer to the questions raised: The essential theoretical foundations of logic lie in psychology, in whose field those propositions belong – as far as their theoretical content is concerned – which give logic its characteristic pattern. Logic is related to psychology just as any branch of chemical technology is related to chemistry, as land-surveying is to geometry etc. This tendency sees no need to mark off a new theoretical discipline, and, in particular, not one that would deserve the name of logic in a narrower and more pointed sense. Often people talk as if psychology provided the sole, sufficient, theoretical foundation for logical technology. So we read in Mill’s polemic against Hamilton: ‘Logic is not a science separate from and coordinate with psychology. To the extent that it is a science at all, it is a part or branch of psychology, distinguished from it on the one hand as the part is from the whole, and on the other hand as the art is from the science. It owes all its theoretical foundations to psychology, and includes as much of that science as is necessary to establish the rules of the art’ (An Examination of Sir William Hamilton’s Philosophy, p. 461). According to Lipps it even seems that logic is to be ranked as a mere constituent of psychology for he says: ‘The fact that logic is a specific discipline of psychology distinguishes them satisfactorily from one another’ (Lipps, Grundzüge der Logik (1893), §3).
§18 The line of proof of the psychologistic thinkers

If we ask for the justification of such views, a most plausible line of argument is offered, which seems to cut off all further dispute ab initio. However one may define logic as a technology – as a technology of thinking, judging, inferring, knowing, proving, of the courses followed by the understanding in the pursuit of truth, in the evaluation of grounds of proof etc. – we find invariably that mental activities or products are the objects of practical regulation. And just as, in general, the artificial working over of a material presupposes the knowledge of its properties, so this will be the case here too, where we are specially concerned with psychological material. The scientific investigation of the rules according to which this stuff should be worked over, naturally leads back to the scientific investigation of these properties. Psychology therefore provides the theoretical basis for constructing a logical technology, and, more particularly, the psychology of cognition.

Any glance at the contents of logical literature will confirm this. What is being talked of throughout? Concepts, judgements, syllogisms, deductions, inductions, definitions, classifications etc. – all psychology, except that they are selected and arranged from normative and practical points of view. Draw the bounds of pure logic as tightly as one likes, it will not be possible to keep out what is psychological. This is implicit in the concepts constitutive for logical laws: truth and falsehood, affirmation and negation, universality and particularity, ground and consequent etc.

§19 The usual arguments of the opposition and the psychologistic rejoinder

Remarkably enough, the opposition believes that it can base a sharp separation of the two disciplines on precisely the normative character of logic. Psychology, it is said, deals with thinking as it is, logic with thinking as it should be. The former has to do with the natural laws, the latter with the normative laws of thinking. It reads in this sense in Jäsche's version of Kant's Lectures on Logic: 'Some logicians presuppose psychological principles for logic, but to introduce such principles into logic, is as absurd as to derive morality from Life. If we take principles from psychology, i.e. from observations of our understanding, we shall only see how thought proceeds, and what happens under manifold subjective hindrances and conditions. Those would only lead to a knowledge of merely contingent laws. Logic does not however ask after contingent, but after necessary laws – not how we think but how we ought to think. The rules of logic must therefore be taken, not from the contingent, but from the necessary use of reason, which one finds in oneself apart from all psychology. In logic we do not wish to know what the understanding is like and how it thinks, nor how it has hitherto proceeded in its thinking, but how it ought to proceed in its thinking.
It should teach us the correct use of the understanding, the use in which it is consistent with itself' (Introduction, I. Concept of Logic. Kant's Werke, ed. Hartenstein, 1867, viii, p. 14). Herbart takes up a similar position when he objects to the logic of his time and 'the would be psychological stories about understanding and reason with which it starts', by saying that this is as badly in error as a moral theory which tried to begin with the natural history of human tendencies, urges and weaknesses, and by pointing to the normative character of logic as of ethics (Herbart, Psychologie als Wissenschaft, ii, §119, original ed. ii, p. 173).

Such arguments do not dismay the psychologistic logicians. They answer: A necessary use of the understanding is none the less a use of the understanding, and belongs, with the understanding itself, to psychology. Thinking as it should be, is merely a special case of thinking as it is. Psychology must certainly investigate the natural laws of thinking, the laws which hold for all judgements whatever, whether correct or false. It would, however, be absurd to interpret this proposition as if such laws only were psychological as applied with the most embracing generality to all judgements whatever, whereas special laws of judgement, like the laws of correct judgement, were shut out from its purview. (Cf., e.g. Mill, An Examination, p. 459 f.) Or does one hold a different opinion? Can one deny that the normative laws of thinking have the character of such special laws? This also will not do. Normative laws of thought, it is said, only try to say how one must proceed provided one wants to think correctly. 'We think correctly, in the material sense, when we think of things as they are. But for us to say, certainly and indubitably, that things are like this or like that, means that the nature of our mind prevents us from thinking of them otherwise. For one need not repeat what has been so often uttered, that one can obviously not think of a thing as it is, without regard to the way in which one must think of it, nor can one make of it so isolated an object of knowledge. The man, therefore, who compares his thought of things with the things themselves can in fact only measure his contingent thinking, influenced by custom, tradition, inclination and aversion, against a thinking that is free from such influences, and that heeds no voice but that of its own inherent lawfulness.'

'The rules, therefore, on which one must proceed in order to think rightly are merely rules on which one must proceed in order to think as the nature of thought, its specific lawfulness, demands. They are, in short, identical with the natural laws of thinking itself. Logic is a physics of thinking or it is nothing at all.' (Lipps, 'Die Aufgabe der Erkenntnistheorie', Philos. Monatshefte, xvi (1880), p. 530 f.)

It may perhaps be said from the antipsychologistic side: Of course the various kinds of presentations, judgements, syllogisms etc., also have a place in psychology as mental phenomena and dispositions, but psychology has a different task in regard to them than logic. Both investigate the laws of these activities, but 'law' means something quite different in the two cases.
The task of psychology is to investigate the laws governing the real connections of mental events with one another, as well as with related mental dispositions and corresponding events in the bodily organism. 'Law' here means a comprehensive formula covering coexistent and successive connections that are without exception and necessary. Such connections are causal. The task of logic is quite different. It does not enquire into the causal origins or consequences of intellectual activities, but into their truth-content: it enquires what such activities should be like, or how they should proceed, in order that the resultant judgements should be true. Correct judgements and false ones, evident ones and blind ones, come and go according to natural laws, they have causal antecedents and consequences like all mental phenomena. Such natural connections do not, however, interest the logician; he looks rather for ideal connections that he does not always find realized, in fact only exceptionally finds realized in the actual course of thoughts. He aims not at a physics, but an ethics of thinking. Sigwart therefore rightly stresses the point that, in the psychological treatment of thought, 'the opposition of true and false has as little part to play as the opposition of good or bad in human conduct is a psychological matter'.

We cannot be content – such will be the psychologistic rejoinder – with such half-truths. The task of logic is of course quite different from that of psychology: who would deny it? It is a technology of knowledge, but how could such a technology ignore questions of causal connection, how could it look for ideal connections without studying natural ones? 'As if every “ought” did not rest on an “is”, every ethics did not also have to show itself a physics.' (Lipps, ‘Die Aufgabe der Erkenntnistheorie’, op. cit. p. 529.) ‘A question as to what should be done always reduces to a question as to what must be done if a definite goal is to be reached, and this question in its turn is equivalent to a question as to how this goal is in fact reached’ (Lipps, Grundzüge der Logik, §1). That psychology, as distinct from logic, does not deal with the opposition of true and false ‘does not mean that psychology treats these different mental conditions on a like footing, but that it renders both intelligible in a like manner’ (Lipps, op. cit. §3, p. 2). Theoretically regarded, Logic therefore is related to psychology as a part to a whole. Its main aim is, in particular, to set up propositions of the form: Our intellectual activities must, either generally, or in specifically characterized circumstances, have such and such a form, such and such an arrangement, such and such combinations and no others, if the resultant judgements are to have the character of evidence, are to achieve knowledge in the pointed sense of the word. Here we have an obvious causal relation. The psychological character of evidence is a causal consequence of certain antecedents. What sort of antecedents? This is just what we have to explore.

The following often repeated argument is no more successful in shaking the psychologistic ranks: Logic, it is said, can as little rest on psychology as on any other science; since each science is only a science in virtue of its
harmony with logical rules, it presupposes the validity of these rules. It would therefore be circular to try to give logic a first foundation in psychology.\textsuperscript{5}

The opposition will reply: That this argument cannot be right, is shown by the fact that it would prove the impossibility of all logic. Since logic itself must proceed logically, it would itself commit the same circle, would itself have to establish the validity of rules that it presupposes.

Let us, however, consider more closely what such a circle could consist in. Could it mean that psychology presupposes the validity of logical laws? Here one must notice the equivocation in the notion of ‘presupposing’. That a science presupposes the validity of certain rules may mean that they serve as premisses in its proofs: it may also mean that they are rules in accordance with which the science must proceed in order to be a science at all. Both are confounded in our argument for which reasoning according to logical rules, and reasoning from logical rules, count as identical. There would only be a circle if the reasoning were from such rules. But, as many an artist creates beautiful works without the slightest knowledge of aesthetics, so an investigation may construct proofs without ever having recourse to logic. Logical laws cannot therefore have been premisses in such proofs. And what is true of single proofs is likewise true of whole sciences.

\section*{§20 A gap in the psychologistic line of proof}

In these and similar arguments the anti-psychologistic party seem undoubtedly to have got the worst of it. Many think the battle quite at an end, they regard the rejoinders of the psychologistic party as completely victorious. One thing only might arouse our philosophical wonder, that there was and is such a battle at all, that the same arguments have repeatedly been adduced while their refutations have not been acknowledged as cogent. If everything really were so plain and clear as the psychologistic trend assures us, the matter would not be readily understandable, since there are unprejudiced, serious and penetrating thinkers on the opposite side as well. Is this not again a case where the truth lies in the middle? Has each of the parties not recognized a valid portion of the truth, and only shown incapacity for its sharp conceptual circumscription, and not even seen that they only had part of the whole? Is there not perhaps an unresolved residuum in the arguments of the anti-psychologists – despite much uncleanness and error in detail which has made refutation easy; are they not informed by a true power, which always re-emerges in unbiased discussion? I for my part would answer ‘Yes’. It seems to me that the greater weight of truth lies on the anti-psychologistic side, but that its key-thoughts have not been properly worked out, and are blemished by many mistakes.

Let us go back to the question we raised above regarding the essential foundations of normative logic. Have the arguments of psychologistic thinkers really settled this? Here a weak point at once appears. The argument only
proves one thing, that psychology helps in the foundation of logic, not that it has the only or the main part in this, not that it provides logic's essential foundation in the sense above defined (§16). The possibility remains open that another science contributes to its foundation, perhaps in a much more important fashion. Here may be the place for the 'pure logic' which on the other party's view, has an existence independent of all psychology, and is a naturally bounded, internally closed-off science. We readily grant that what Kantians and Herbartians have produced under this rubric does not quite accord with the character that our suggested supposition would give it. For they always talk of normative laws of thinking and particularly of concept-formation, judgement-framing etc. Proof enough, one might say, that their subject-matter is neither theoretical nor wholly unpsychological. But this objection would lose weight if closer investigation confirmed the surmise suggested to us above in §13, that these schools were unlucky in defining and building up the intended discipline, yet none the less approached it closely, in so far as they discerned an abundance of interconnected theoretical truths in traditional logic, which did not fit into psychology, nor into any other separate science, and so permitted one to divine the existence of a peculiar realm of truth. And if these were the truths to which all logical regulation in the last resort related, truths mainly to be thought of when 'logical truths' were in question, one could readily come to see in them what was essential to the whole of logic, and to give the name of 'pure logic' to their theoretical unity. That this hits off the true state of things I hope actually to prove.
So far our attack has been mainly upon the consequences of psychologism. We now turn against its arguments: we shall try to show that what it regards as obvious truths are in fact delusive prejudices.

§41 First prejudice

A first prejudice runs: Prescriptions which regulate what is mental must obviously have a mental basis. It is accordingly self-evident that the normative principles of knowledge must be grounded in the psychology of knowledge. One's delusion vanishes as soon as one abandons general argumentation and turns to the 'things themselves'.

We must first put an end to a distorted notion which both parties share, by pointing out that logical laws, taken in and for themselves, are not normative propositions at all in the sense of prescriptions, i.e. propositions which tell us, as part of their content, how one should judge. One must always distinguish between laws that serve as norms for our knowledge-activities, and laws which include normativity in their thought-content, and assert its universal obligatoriness.

Let us take as an example the well-known syllogistic principle we expressed in the words: A mark of a mark is also a mark of the thing itself. This statement would be commendably brief if its expression were not also an obvious falsehood. To express it concretely, we shall have to adjust ourselves to a few more words. ‘It is true of every pair of characters $A$, $B$, that if every object which has the character $A$ also has the character $B$, and if any definite object $S$ has the character $A$, then it also has the character $B’. That this proposition contains the faintest thought of normativity must be strongly denied. We can employ our proposition for normative purposes, but it is not therefore a norm. Anyone who judges that every $A$ is also $B$, and that a certain $S$ is $A$, ought also to judge that this $S$ is $B$. Everyone sees, however, that this proposition is not the original proposition of logic, but one that has been derived from it by bringing in the thought of normativity.
The same obviously holds of all syllogistic laws, as of all laws of pure logic as such. But not of such laws alone. A capacity for normative use is shared by the truths of other theoretical disciplines, and above all by those of pure mathematics, which are usually kept separate from logic. The well-known principle

\[(a + b) (a - b) = a^2 - b^2\]

tells us, e.g. that the product of the sum and the difference of any two numbers equals the difference of their squares. Here there is no reference to our judging and the manner in which it should be conducted; what we have before us is a theoretical law, not a practical rule. If, however, we consider the corresponding practical proposition: ‘To arrive at the product of the sum and difference of two numbers, one should find the difference of their squares’, we have conversely uttered a practical rule and not a theoretical law. Here, too, the transformation of law into rule involves a bringing in of the notion of normativity; the rule is the obvious, apodeictic consequence of the law, but it none the less differs from it in thought-content.

We can even go further. It is clear that any theoretical truth belonging to any field of theory, can be used in a like manner as the foundation for a universal norm of correct judgement. The laws of logic are not at all peculiar in this respect. In their proper nature, they are not normative but theoretical truths, and as such we can employ them, as we can the truths of all other disciplines, as norms for our judgement.

We cannot, however, treat the general persuasion that the laws of logic are norms of thinking as quite baseless, nor the obviousness with which it impresses us as a mere delusion. These laws must have some intrinsic prerogative in the regulation of our thought. But does this mean that the idea of regulation, or of an ‘ought’, must therefore form part of the content of such laws? Can it not follow from that content with self-evident necessity? In other words: May not the laws of logic and pure mathematics have a distinctive meaning-content which gives them a natural right to regulate our thought?

This simple treatment shows us how both sides have made their mistakes. The anti-psychologists went wrong by making the regulation of knowledge the ‘essence’, as it were, of the laws of logic. The purely theoretical character of formal logic, and its identity of character with formal mathematics, were thereby insufficiently recognized. It was correctly seen that the set of laws treated in traditional syllogistic theory were remote from psychology. Their natural right to regulate knowledge was recognized, for which reason they must be made the kernel of all practical logic. The difference between the proper content of these laws, and their function, their practical application, was, however, ignored. Men failed to see that so-called basic laws of logic were not in themselves norms, though they could be used normatively. Concern with this normative use had led men to speak of such
laws as laws of thought, and so it appeared that these laws, too, had a psychologistic content, and that their only difference from what are ordinarily called psychological laws lay in this normative function, not possessed by other psychological laws.

The psychologistic thinkers, on the other hand, went wrong in putting forward a presumed axiom whose invalidity we may expose in a few words: It is entirely obvious that each general truth, whether psychological or not, serves to found a rule for correct judgement, but this not only assures us of the meaningful possibility, but even of the actual existence of rules of judgement which do not have their basis in psychology.

Not all rules which set standards for correct judgement are on that account logical rules. It is, however, evident that, of the genuinely logical rules which form the nucleus of a technology of scientific thinking, only one set permits and demands a psychological establishment: the technical precepts specifically adapted to human nature concerning the acquisition and criticism of scientific knowledge. The remaining, much more important group consists of normative transformations of laws, which belong solely to the objective or ideal content of the science. Psychological logicians, even such as are of the stature of a Mill or a Sigwart, treat science from its subjective side (as a methodology of the specifically human acquisition of knowledge), rather than from its objective side (as the Idea of the theoretical unity of truth), and therefore lay one-sided stress on the methodological tasks of logic. In doing so they ignore the fundamental difference between the norms of pure logic and the technical rules of a specifically human art of thought. These are totally different in character in their content, origin and function. The laws of logic, seen in their original intent, concern only what is ideal, while these methodological propositions concern only what is real. If the former spring from immediately evident axioms, the latter spring from empirical facts, belonging mainly to psychology. If the formulation of the former promotes our purely theoretical interests, and gives only subsidiary practical help, the latter, on the other hand, have an immediate practical aim, and they only give indirect help to our theoretical interests, in so far as they aim at the methodical progress of scientific knowledge.

§42 Elucidations

Every theoretical statement, we saw above, permits of a normative transformation. But the rules for correct judgement which thus arise, are not, in general, such as logic, considered as a technology, requires: few of them are, as it were, predestined to normativity. If such a logical technology is to be of real help in our scientific endeavours, it must not presuppose that full knowledge of the complete sciences which we hope to achieve by its means. We shall not be helped by the mechanical restatement of all given theoretical knowledge as norms: what we need are general norms, extending beyond all
particular sciences to the critical evaluation of theoretical knowledge and its methods in general, as well as practical rules for its promotion.

This is exactly what logic as a technology aims at, and if it aims at this as a scientific discipline, it must itself presuppose certain items of theoretical knowledge. It is clear from the start that it must attach exceptional worth to all knowledge resting only on the notions of Truth, Proposition, Subject, Predicate, Object, Property, Ground and Consequent, Relation and Relatum etc. For all science in its objective, theoretical aspects, i.e. in respect of what it tells us, consists of truths, truth pertains to propositions, all propositions have subjects and predicates, and refer by way of these to things or properties, propositions are connected as grounds and consequents etc. Those truths, it is now clear, which have their roots in such essential constituents of all science considered as an objective theoretical unity, truths which, accordingly, cannot be thought away without thinking away all that gives science as such its objective purchase and sense, such truths obviously provide the fundamental standards by which we can decide whether anything claiming to be a science, or to belong to one, whether as premiss, conclusion, syllogism, induction, proof or theory, really lives up to its intentions, or does not rather stand in an a priori conflict with the ideal conditions of the possibility of theory and science as such. Men should admit that truths which have their roots in the concepts which constitute the objectively conceived Idea of Science, cannot also belong to the field of any particular science. They should see that such truths, being ideal, cannot have their home-ground in the sciences of matter of fact, and therefore not in psychology. If these facts were realized, our case would be won, and it would be impossible to dispute the existence of a peculiar science of pure logic, absolutely independent of all other scientific disciplines, which delimits the concepts constitutive of the Idea of System or of theoretical unity, and which goes on to investigate the theoretical connections whose roots lie solely in these concepts. This science would have the unique peculiarity of itself, qua form, underlying the content of its laws; the elements and theoretical connections of which it, as a systematic unity of truths, consists, are governed by the very laws which form part of its theoretical content.

That the science which deals with all sciences in respect of their form, should eo ipso deal with itself, may sound paradoxical, but involves no inner conflict. The simplest example will make this clear. The law of contradiction governs all truth, and since it is itself a truth, governs itself. To realize what such self-government means one need only apply the law of contradiction to itself: the resultant proposition is an obvious truism, having none of the marks of the remarkable or the questionable. This is invariably the case where pure logic is used to regulate itself.

This pure logic is therefore the first and most essential foundation of methodological logic. The latter, however, has other quite different foundations contributed by psychology. Every science, as we stated above, permits
of a double treatment: it is, on the one hand, an aggregate of human devices for acquiring, systematically delimiting and expounding this or that territory of truth. These devices are called methods, e.g. calculation by abacus or slide-rule, by written signs on a slate, by this or that computer, by logarithmic, sine- or tangent-tables, astronomical methods involving cross-wires or telescopes, physiological methods involving microscopy, staining etc. All these methods, and also all forms of exposition, are adapted to the human constitution as it at present normally is, and are in fact in part expressive of contingent, national features. Even physiological organization has a not unimportant part to play. Would our most refined optical instruments be of much use to a being whose sense of sight was attached to an end-organ differing considerably from our own?

But all science permits of quite another treatment; it can be considered in regard to what it teaches, in regard to its theoretical content. What each statement states is – in the ideal case – a truth. No truth is, however, isolated in science: it occurs in combination with other truths in theoretical connections bound by relations of ground and consequent. This objective content of science, to the extent that it really lives up to its intent, is quite independent of the scientist's subjectivity, of the peculiarities of human nature in general. It is objective truth.

Pure logic aims at this ideal side of science, in respect of its form. It does not aim at the peculiar material of the various special sciences, or the peculiarity of their truths and forms of combination: it aims at what relates to truths and theoretical combinations of truths as such. For this reason every science must, on its objective, theoretical side, conform to the laws of logic, which are of an entirely ideal character.

In this way these ideal laws acquire a methodological significance, which they also have since mediate justification is provided by proofs whose norms are merely normative transformations of the ideal laws whose sole grounds lie in logical categories. The characteristic peculiarities of proofs mentioned in the first chapter of this work (§7) all have their origin and complete explanation in the fact that inner evidence in demonstration – whether in the syllogism, in connected, apodeictic proof, or in the unity of the most comprehensive, rational theory, or also in the unity of an argument in probabilities – is simply our consciousness of an ideal law. Purely logical reflection, whose first historic awakening occurred in the genius of Aristotle, abstracts the underlying law itself, and then brings the multiplicity of laws discoverable in this manner, and at first seen in isolation, under primitive basic laws, and so creates a scientific system which, in a purely deductive order, permits the derivation of all possible laws of pure logic, all possible forms of syllogisms, proofs etc. The forms of logic transform themselves into norms or rules telling us how we should conduct proofs, and – in relation to possible illegal formations – into rules telling us how we should not conduct them.
Norms accordingly fall into two classes. One class of norms regulates all proof and all apodeictic connection *a priori*; it is purely ideal, and only relates to our human knowledge by way of a self-evident application. The other class is empirical, and relates essentially to the specifically human side of the science. It consists of what might be called mere auxiliary devices or substitutes for proofs (above §9). It has its roots in our general human constitution, in the main, in our mental constitution, since this is more important for logical technology, but also in part in our physical constitution.
§44 Second prejudice

To confirm his first prejudice that rules for cognition must rest on the psychology of cognition, the psychologistic party appeals to the actual content of logic (cf. the arguments of §15 above, p. 52, par. 2). What is logic about? Everywhere it concerns itself with presentations and judgements, with syllogisms and proofs, with truth and probability, with necessity and possibility, with ground and consequent, and with other closely related or connected concepts. But what can be thought of under such headings but mental phenomena and formations? This is obvious in the case of presentations and judgements. Syllogisms, however, are proofs of judgements by means of judgements, and proof is plainly a mental activity. Talk of truth, probability, necessity, possibility etc., likewise concerns judgements: what they refer to can only be manifested or experienced in judgements. Is it not, therefore, strange that one should wish to exclude from psychology propositions and theories which relate to psychological phenomena? In this regard the distinction between purely logical and methodological propositions is pointless, the objection affects both equally. Every attempt, therefore, to extrude even a part of logic from psychology, on ground of its pretended ‘purity’, must count as radically mistaken.

§45 Refutation. Pure mathematics would likewise be made a branch of psychology

Obvious as all this may seem, it must be mistaken. This is shown by the absurd consequences which, as we know, psychologism cannot escape. There is, however, another reason for misgiving: the natural affinity between purely logical and mathematical doctrine, which has often led to an assertion of their theoretical unity.

We have already mentioned by the way that even Lotze taught that mathematics must be regarded as ‘an independently developed branch of general logic’. ‘Only a practically motivated division of teaching’ can, he thinks, blind us to the fact that mathematics ‘has its whole home-ground in the general field of logic’ (Logik, ed. 2, §18, p. 34 and §112, p. 138). To which Riehl adds that ‘one could well say that logic coincides with the general part of purely formal mathematics (taken in the sense of H. Hankel)’ (A. Riehl, Der philosophische Kritizismus und seine Bedeutung für die positive Wissenschaft, vol. II, Part 1, p. 226). However this may be, an argument that is correct for logic must be approved in the case of arithmetic as well. Arithmetic sets up laws for numbers, for their relations and combinations: numbers, however, are the products of colligation and counting, which are mental activities. Relations arise from relating activities, combinations from acts of combination. Adding and multiplying, subtracting and dividing – these are merely mental processes. That they require sensuous supports makes
no difference, since this is true of any and every act of thinking. Sums, products, differences and quotients, and whatever may be determined in arithmetical propositions, are merely mental processes, and must as such obey mental laws. It may be highly desirable that modern psychology with its earnest pursuit of exactness should be widened to include mathematical theories, but it would hardly be much elevated by the inclusion of mathematics itself as one of its parts. For the heterogeneity of the two sciences cannot be denied. The mathematician, on the other hand, would merely smile if psychological studies were pressed upon him as supposedly providing a better and deeper grounding for his theoretical pronouncements. He would rightly say that mathematics and psychology belong to such different worlds, that the very thought of interchange among them was absurd: here, if anywhere, talk of a μετάβασις εἰς ἄλλο γένος is applicable. 

§46 The research domain of pure logic is, like that of mathematics, an ideal domain

These objections may have taken our argument far afield, but, when we attend to their content, they help us to state the basic errors of our opponents' position. The comparison of pure logic with pure mathematics, its mature sister discipline, which no longer needs fight for its right to independent existence, provides us with a reliable Leitmotiv. We shall first glance at mathematics.

No one regards the theories of pure mathematics, e.g. the pure theory of numbers, as 'parts or branches of psychology', though we should have no numbers without counting, no sums without addition, no products without multiplication etc. The patterns of all arithmetical operations refer back to certain mental acts of arithmetical operation, and only in reflection upon these can we 'show' what a total, sum, product etc., is. In spite of the 'psychological origin' of arithmetical concepts, everyone sees it to be a fallacious μετάβασις to demand that mathematical laws should be psychological. How is this to be explained? Only one answer is possible. Counting and arithmetical operation as facts, as mental acts proceeding in time, are of course the concern of psychology, since it is the empirical science of mental facts in general. Arithmetic is in a totally different position. Its domain of research is known, it is completely and exhaustively determined by the familiar series of ideal species 1, 2, 3 . . . In this sphere there can be no talk of individual facts, of what is temporally definite. Numbers, Sums and Products and so forth are not such casual acts of counting, adding and multiplying etc., as proceed here and there. They also differ obviously from presentations in which they are given. The number Five is not my own or anyone else's counting of five, it is also not my presentation or anyone else's presentation of five. It is in the latter regard a possible object of acts of presentation, whereas, in the former, it is the ideal species of a form whose concrete instances are found in what becomes objective in certain acts of
counting, in the collective whole that these constitute. In no case can it be regarded without absurdity as a part or side of a mental experience, and so not as something real. If we make clear to ourselves what the number Five truly is, if we conceive of it adequately, we shall first achieve an articulate, collective presentation of this or that set of five objects. In this act a collection is intuitively given in a certain formal articulation, and so as an instance of the number-species in question. Looking at this intuited individual, we perform an 'abstraction', i.e. we not only isolate the non-independent moment of collective form in what is before us, but we apprehend the Idea in it: the number Five as the species of the form swims into our conscious sphere of reference. What we are now meaning is not this individual instance, not the intuited object as a whole, not the form immanent in it, but still inseparable from it: what we mean is rather the ideal form-species, which is absolutely one in the sense of arithmetic, in whatever mental act it may be individuated for us in an intuitively constituted collective, a species which is accordingly untouched by the contingency, temporality and transience of our mental acts. Acts of counting arise and pass away and cannot be meaningfully mentioned in the same breath as numbers.

Arithmetical propositions are concerned with such ideal unities ('lowest species' in a heightened sense quite different from that of empirical classes), and this holds both of numerical propositions (arithmetical singulars) and of algebraic propositions (arithmetical generalizations). They tell us nothing about what is real, neither about the real things counted, nor about the real acts in which they are counted, in which such and such indirect numerical characteristics are constituted for us. Concrete numbers and numerical propositions belong in the scientific fields to which the relevant concrete units belong: propositions about arithmetical thought-processes belong in psychology. In strict propriety, arithmetical propositions say nothing about 'what is contained in our mere number-presentations': as little as they speak of other presentations, do they speak of ours. They are rather concerned with absolute numbers and number-combinations in their abstract purity and ideality. The propositions of universal arithmetic – the nomology of arithmetic we may call it – are laws rooted in the ideal essence of the genus Number. The ultimate singulars which come within the range of these laws, are ideal singulars: they are the determinate numbers, i.e. the lowest specific differences of the genus number. It is to these singulars that arithmetically singular propositions relate, propositions which belong to the arithmetic of definite numbers. These arise through the application of universal arithmetical laws to numerically specific numbers, they express what is purely part of the ideal essence of these numbers. None of these propositions reduces to one that has empirical generality, not even to the widest case of such generality, one that applies without exception to the entire real world.

What we have here said in regard to pure arithmetic carries over at all points to pure logic. In the latter case too, we accept as obvious the fact that
logical concepts have a psychological origin, but we deny the psychologistic conclusion to which this seems to lead. In consideration of the domain that must be granted to logic in the sense of a technology of scientific knowledge, we naturally do not doubt that logic is to a large extent concerned with our mental states. Naturally the methodology of scientific research and proof must take full cognizance of the nature of the mental states in which research and proof take their course. Logical terms such as ‘presentation’, ‘concept’, ‘judgement’, ‘syllogism’, ‘proof’, ‘theory’, ‘necessity’, ‘truth’ etc., may therefore, and must therefore, come up as general names for psychical experiences and dispositions. We deny, however, that this ever occurs in the purely logical parts of logical technology. We deny that the theoretical discipline of pure logic, in the independent separateness proper to it, has any concern with mental facts, or with laws that might be styled ‘psychological’. We saw that the laws of pure logic, e.g. the primitive ‘laws of thought’, or the syllogistic formulae, totally lose their basic sense, if one tries to interpret them as psychological. It is therefore clear from the start that the concepts which constitute these and similar laws have no empirical range. They cannot, in other words, have the character of those mere universal notions whose range is that of individual singulars, but they must be notions truly generic, whose range is exclusively one of ideal singulars, genuine species. It is clear, for the rest, that the terms in question, and all such as function in purely logical contexts, must be equivocal; they must, on the one hand, stand for class-concepts of mental states such as belong in psychology, but, on the other hand, for generic concepts covering ideal singulars, which belong in a sphere of pure law.
The psychologistic prejudices

The earth is a cube, the theorem of Pythagoras etc., and each only in the singular. The same is obviously true if one says 'The judgement follows from the judgement', and so in all similar cases. We can thereby pin down the true sense of logical laws, and make it such as we have said it to be in our previous analyses. The principle of contradiction, we are told, is a judgement about judgements. But, in so far as 'judgements' are taken to mean mental experiences, acts of affirmation, believing etc., this conception can have no validity. To utter the principle is to judge, but neither the principle, nor what it judges about, are judgements. If someone says: 'Of two contradictory judgements, one is true and one false', he means (if he does not misunderstand himself, as subsequent interpretation may well lead him to do) no law for acts of judgement, but a law for the contents of judging, in other words for the ideal meanings which we call 'propositions'. He would have done better to say: 'Of two contradictory propositions, one is true and the other false'. It is also clear that we require nothing, in order to understand the law of contradiction, beyond conceiving the sense of opposed propositional meanings. We need not think of judgements as real acts; they are in no sense our relevant objects. One need only look in order to see that only judgements in an ideal sense fall within the range of this logical law: 'the' judgement $2 \times 2 = 5$ is one judgement, 'the' judgements There are dragons another, 'the' proposition about the sum of the angles etc., another, but not one of the actual or imaginary acts of judgement falls within it, that in their endless multiplicity, correspond to each of these ideal unities. The case of all purely logical propositions, e.g. the laws of syllogism, is exactly parallel.

The distinction between the psychological mode of treatment, whose terms function as class-terms for mental states, and the objective or ideal mode of treatment where the same terms stand for ideal genera and species, is not a subsidiary, or a merely subjective distinction. It determines the difference between essentially distinct sciences. Pure logic and arithmetic, as sciences dealing with the ideal singulars belonging to certain genera (or singulars belonging to certain empirical classes.

§48 The decisive differences

We shall conclude by stressing the decisive differences on whose recognition or non-recognition one's total response to the psychologistic line of argument depends. These are as follows:

1. There is an essential, quite unbridgeable difference between sciences of the ideal and sciences of the real. The former are \textit{a priori}, the latter empirical.
The former set forth ideal general laws, grounded with intuitive certainty in certain general concepts: the latter establish real general laws, relating to a sphere of fact, with probabilities into which we have insight. The extension of general concepts is, in the former case, one of lowest specific differences, in the latter case one of individual, temporally determinate singulars. Ultimate objects are, in the former case, ideal species, in the latter case, empirical facts. The essential differences between natural laws and ideal laws, between universal propositions of fact (perhaps disguised as general propositions: 'All ravens are black', 'The raven is black') and genuine generalizations (such as the universal propositions of pure mathematics), between the notion of an empirical class and that of an ideal genus etc. A correct assessment of these differences presupposes the complete abandonment of the empiricistic theory of abstraction, whose present dominance renders all logical matters unintelligible. We shall have to speak in detail of this matter later on (cf. Investigation 11).

2. In all knowledge, and particularly in all scientific knowledge, there are three fundamentally distinct patterns of connection:

(a) A pattern of connection of cognitive experiences, in which science is subjectively realized, a psychological pattern of connection among the presentations, judgements, insights, surmises, questions etc., in which research is carried out, in which a theory already discovered receives its insightful thinking out.

(b) A pattern of connection among the matters investigated and theoretically known in the science, which constitute its sphere a territory. The pattern of connection of investigation and knowing is plainly quite different from that of what is investigated and known.

(c) The logical pattern of connection, i.e. the specific pattern of connection of the theoretical Ideas in which the unity of the truths of a scientific discipline, and those, in particular, of a scientific theory or proof or inference, are constituted (the unity of concepts in a true proposition, of simple truths in truth-combinations etc.).

In the case, e.g., of physics we distinguish between the pattern of connection of the mental states of the physical thinker from that of the physical nature that he knows, and both from the ideal pattern of connection of the truths in physical theory, e.g. in the unity of analytical mechanics, of theoretical optics etc. Even the form of an argument in probability, which governs the connection between facts and hypotheses, is part of this logical line. The logical pattern of connection is the ideal form for the sake of which we speak in specie of the same truth, the same syllogism or proof, the same theory and rational discipline, by whomsoever these 'same things' may be thought. This unity of form is one of legal validity, of the validity of laws under which all these 'same things' stand, the validity, i.e. of the laws of pure logic, which accordingly overshadow all science, and do so, not in respect of the psychological or objective content of science, but in respect of
its ideal meaning-load. The peculiar patterns of combination of the concepts, propositions and truths which form the ideal unity of a particular science, can of course only be called 'logical', in so far as they are instances falling under logic. They do not belong among the actual parts of logic.

The three patterns of combination just distinguished naturally concern logic and arithmetic like all other sciences. Only in their case, the matters investigated are not, as in physics, real matters of fact, but ideal species. The specific nature of logic involves the previously noted peculiarity that the ideal patterns of combination which make up its theoretical unity are themselves subordinate instances of the laws that it sets up. Logical laws are at once parts and rules of such patterns of combination: they belong to the theoretical structure, but at the same time to the field, of logical science.

§49 Third prejudice. Logic as the theory of evidence

We shall state a third prejudice - one particularly to the fore in the arguments of chapter 11, §19 - in the following words: All truth pertains to judgement. Judgement, however, is only recognized as true when it is inwardly evident. The term 'inner evidence' stands, it is said, for a peculiar mental character, well-known to everyone through his inner experience, a peculiar feeling which guarantees the truth of the judgement to which it attaches. If logic is the technology which will assist us to know the truth, logical laws are obviously psychological propositions. They are, in fact, propositions which cast light on the psychological conditions on which the presence or absence of this 'feeling of inner evidence' depends. Practical prescriptions are naturally connected with such propositions, and help us to achieve judgements having this distinctive character. Such psychologically based rules of thought must surely be meant where we speak of logical laws or norms.

Mill hits on this conception when he attempts to draw a line between logic and psychology, and says: 'The properties of thought which concern logic are some of its contingent properties, those namely on the presence of which depends good thinking as distinguished from bad' (An Examination of Sir William Hamilton's Philosophy, p. 462). In his further statements, he repeatedly calls logic the (psychologically conceived) 'theory' or 'philosophy of evidence' (op. cit. pp. 473, 475–6, 478) he was of course not immediately concerned with the propositions of pure logic. In Germany this point of view occasionally crops up in Sigwart. 'Logic', he says, 'can only proceed by becoming conscious of the way this subjective feeling of necessity [the 'inner feeling' of the evident of our previous paragraph] makes its appearance, and then expressing these conditions in a general manner' (Logik, 1, ed. 2, p. 16). Many statements of Wundt's tend in a similar direction. We read, e.g., in his Logik that 'the properties of self-evidence and universal validity involved in
certain thought-connections, permit us to derive the logical from the psychological laws of thought'. The normative character of the former 'has its sole foundation in the fact that certain psychological thought-connections actually do have self-evidence and universal validity, without which it would not be possible for us to approach thought with the demand that it should satisfy the conditions of the self-evident and universally valid'. 'The conditions that must themselves be fulfilled if we are to have self-evidence and universal validity are called the logical laws of thought.' But Wundt emphasizes that 'psychological thinking is always the more comprehensive form of thinking'.

In the logical literature at the end of last century the interpretation of logic as a practically applied psychology of the inwardly evident certainly became more penetrating and more widely entertained. The Logik of Höfler and Meinong here deserves special mention, since it may be regarded as the first properly carried out attempt to make a thorough, consistent use of the notion of the psychology of inward evidence over the whole field of logic. Höfler says that the main task of logic is the investigation of 'those laws, primarily psychological, which express the dependence of emergent inward evidence on the particular properties of our presentations and judgements' (Logik, Vienna 1890, p. 16). 'Among all actually given thought-phenomena, or even such as we can conceive possible, logic must pick out the types or forms of thinking to which inner evidence attaches directly, or which are necessary conditions for the emergence of inner evidence' (op. cit. p. 17). The seriousness of such psychologism is shown by the rest of the treatment. Thus the method of logic, in its concern with the theoretical groundwork of correct thinking, is said to be the same method that psychology applies to all mental phenomena: it must describe such phenomena, in this case those of correct thinking, and reduce them as far as may be to simple laws, i.e. explain more complex laws by way of simple ones (op. cit. p. 18). Further on, one reads that the logical doctrine of the syllogism is given the task of 'formulating the laws, which tell us what features in our premisses determine whether a certain judgement can be deduced from them with inward evidence'. Etc. etc.

§50 Transformation of logical propositions into equivalent propositions about the ideal conditions for the evidence of judgement. The resultant propositions are not psychological

We turn to criticism. We are far from regarding as unobjectionable the nowadays commonplace, but far from clear assumption with which the argument starts, that all truth lies in our judgements. We do not of course doubt that to know truth and to utter it justifiably, presupposes the prior seeing of it. Nor do we doubt that logic as a technology must look into the
psychological conditions in which inner evidence illuminates our judgements. We may even go a further step in the direction of the conception we are refuting. While we seek to preserve the distinction between purely logical and methodological propositions, we expressly concede that the former have a relation to the psychological datum of inner evidence, that they in a sense state its psychological conditions.

Such a relation must, however, be regarded as purely ideal and indirect. The pure laws of logic say absolutely nothing about inner evidence or its conditions. We can show, we hold, that they only achieve this relation through a process of application or transformation, the same sort of process, in fact, through which every purely conceptual law permits application to a generally conceived realm of empirical cases. The propositions about inner evidence which arise in this manner keep their \textit{a priori} character, and the conditions of inner evidence that they assert bear no trace of the psychological or the real. They are purely conceptual propositions, transformable, as in every like case, into statements about \textit{ideal} incompatibilities or possibilities.

A little reflection will make matters clear. Every law of pure logic permits of an (inwardly evident) transformation, possible \textit{a priori}, which allows one to read off certain propositions about inward evidence, certain conditions of inward evidence, from it. The combined principles of contradiction and excluded middle are certainly equivalents to the proposition: One and only one of two mutually contradictory judgements \textit{can} manifest inner evidence.\footnote{The like holds of every proposition of pure logic. Understandably so, since there evidently is a general equivalence between the proposition \textit{A is true} and \textit{It is possible for anyone to judge A to be true in an inwardly evident manner}. The propositions, therefore, whose sense lies in stating what necessarily is involved in the notion of truth, that the truth of propositions of certain forms determines the truth of propositions of corresponding other forms, can certainly be transformed into equivalent propositions which connect the possible emergence of inner evidence with the forms of our judgements.}

Our insight into such connections will, however, provide us with the means to refute the attempt to swallow up pure logic in a psychology of inner evidence. In itself, plainly, the proposition \textit{A is true} does not state the same thing as the equivalent proposition \textit{It is possible for anyone and everyone to judge that A is the case}. The former says nothing about anyone's judgement, not even about judgements of anyone in general. The position here resembles that of propositions of pure mathematics. The statement that \(a + b = b + a\) states that the numerical value of the sum of two numbers is independent of their position in such a sum, but it says nothing about anyone's acts of counting or addition. The latter first enters the picture in an inwardly
evident, equivalent transformation. It is an *a priori* truth that no number can be given *in concreto* unless we count, and no sum unless we add.

But even when we abandon the original forms of the propositions of pure logic, and turn them into corresponding equivalents regarding inward evidence, nothing results which psychology could claim as its own. Psychology is an empirical science, the science of mental facts, and psychological possibility is accordingly a case of real possibility. Such possibilities of inner evidence are, however, real ones, and what is psychologically impossible may very well be ideally possible. The solution of the generalized ‘3-body problem’, or *n*-body problem’ may transcend all human cognitive capacity, but the problem *has* a solution, and the inner evidence which relates to it is therefore possible. There are decimal numbers with trillions of places, and there are truths relating to them. No one, however, can actually imagine such numbers, nor do the additions, multiplications etc., relating to them. Inward evidence is here a psychological impossible, yet, *ideally* speaking, it undoubtedly represents a possible state of mind.

The turning of the notion of truth into the notion of the possibility of evident judgement has its analogue in the relation of the concepts *Individual Being* and *Possibility of Perception*. The equivalence of these concepts, if by ‘perception’ we mean adequate perception, is undeniable. A perception is accordingly *possible*, in which the whole world, with the endless abundance of its bodies, is perceived at *one* glance. But this ideal possibility is of course no real possibility, we could not attribute it to any empirical subject, particularly since such a vision would be an endless continuum of vision: unitarily conceived, it would be a Kantian Idea.

Though we stress the ideality of the possibilities of evident judgement which can be derived from logical principles, and which we see to reveal their *a priori* validity in cases of apodeictic self-evidence, we do not deny their *psychological utility*. If we take the law that, out of two contradictory propositions, one is true and one is false, and deduce from it the truth that, one only out of every pair of possible contradictory judgements can have the character of inward evidence, we may note this to be a self-evidently correct deduction, if self-evidence be defined as the experience in which the correctness of his judgement is brought home to a judging subject, the new proposition utters a truth about the compatibilities or incompatibilities of certain *mental experiences*. In this manner, however, every proposition of pure mathematics tells us something about possible and impossible happenings in the mental realm. No empirical enumeration or calculation, no mental act of algebrical transformation or geometrical construction, is possible which conflicts with the ideal laws of mathematics. These laws accordingly have a psychological use. We can read off from each of them *a priori* possibilities and impossibilities relating to certain sorts of mental acts, acts of counting, of additive and multiplicative combination etc. These laws are not thereby made into psychological laws. Psychology, the natural science
concerned with what we mentally live through, has to look into the natural conditions of our experience. In its field are specifically to be found the empirically real relationships of our mathematical and logical activities, whose ideal relations and laws make up an independent realm. This latter realm is set up in purely universal propositions, made up out of ‘concepts’ which are not class-concepts of mental acts, but ideal concepts of essence, each with its concrete foundation in such mental acts or in their objective correlates. The number Three, the Truth named after Pythagoras etc., are, as our discussion showed, neither empirical singulars nor classes of singulars: they are ideal objects ideationally apprehended in the correlates of our acts of counting, of inwardly evident judging etc.

In relation to inner evidence, psychology has therefore merely the task of tracking down the natural conditions of the experiences which fall under this rubric, of investigating the real contexts in which, as experience shows, inward evidence arises and perishes. Such natural conditions are concentration of interest, a certain mental freshness, practice etc. Their investigation does not lead to knowledge which is exact in its content, to inwardly evident, truly lawlike generalizations, but only to vague, empirical generalizations. The inward evidence of our judgements does not merely depend on such psychological conditions, conditions that one might also call external and empirical, since they are rooted not purely in the specific form and matter of our judgement, but in its empirical context in mental life: it depends also on ideal conditions. Each truth stands as an ideal unit over against an endless, unbounded possibility of correct statements which have its form and its matter in common. Each actual judgement, which belongs to this ideal manifold, will fulfil, either in its mere form or in its matter, the ideal conditions for its own possible inward evidence. The laws of pure logic are truths rooted in the concept of truth, and in concepts essentially related to this concept. They state, in relation to possible acts of judgement, and on the basis of their mere form, the ideal conditions of the possibility or impossibility of their inner evidence. Of these two sorts of conditions of the inwardly evident, the former relates to the special constitution of the sorts of psychical being which the psychology of the period recognizes, psychological induction being limited by experience. The other conditions, however, have the character of ideal laws, and hold generally for every possible consciousness.

§51 The decisive points in this dispute

A final clearing-up of our present dispute depends likewise on a correct discernment of the most fundamental of epistemological distinctions, the distinction between the real and the ideal, or the correct discernment of all the distinctions into which this distinction can be analysed. We are here concerned with the repeatedly stressed distinctions between real and ideal
truths, laws, sciences, between real and ideal (individual and specific) generalities and also singularities etc. Everyone, no doubt, has some acquaintance with these distinctions: even so extreme an empiricist as Hume draws a fundamental distinction between 'relations of ideas' and 'matters of fact', a distinction which the great idealist Leibniz drew before him, using the rubrics *vérités de raison* and *vérités de fait*. To draw an epistemologically important distinction does not, however, mean that one has as yet grasped its epistemological essence. One must clearly grasp what the ideal is, both intrinsically and in its relation to the real, how this ideal stands to the real, how it can be immanent in it and so come to knowledge. The basic question is whether ideal objects of thought are – to use the prevailing jargon – mere pointers to ‘thought-economies’, verbal abbreviations whose true content merely reduces to individual, singular experiences, mere presentations and judgements concerning individual facts, or whether the idealist is right in holding that such an empiricistic doctrine, nebulous in its generality, can indeed be uttered, but in no wise thought out, that all attempts to reduce ideal unities to real singulars are involved in hopeless absurdities, that its splintering of concepts into a range of singulars, without a concept to unify such a range in our thought, cannot be thought etc.

The understanding of our distinction between the real and the ideal 'theory of inner evidence' presupposes, on the other hand, correct concepts of *inner evidence* and *truth*. In the psychologistic literature of the last decades we have seen inner evidence spoken of as a casual feeling which attends on certain judgements, and is absent from others, which at best has a universally human linkage with certain judgements and not with others, a linkage in every normal human being in normal circumstances of judgement. There are certain normal circumstances in which every normal person feels self-evidence in connection with the proposition $2 + 1 = 1 + 2$, just as he feels pain when he gets burnt. One might then well ask what gives such a special feeling authority, how it manages to guarantee the truth of our judgement, 'impress the stamp of truth' on it, 'proclaim its truth', or whatever other metaphor one cares to use. One might also ask what such vague talk of normal endowment and normal circumstances precisely covers, and might point to the fact that even this recourse to normality will not make inwardly evident judgements coincide with true ones. It is in the last resort undeniable that even the normal man in normal circumstances must pass, in an unnumbered majority of cases, possible correct judgements which lack inner evidence. One would surely not wish to conceive the 'normality' in question in such a way that no actual human being, and no possible human being living in our finite natural conditions, could be called 'normal'.

Empiricism altogether misunderstands the relation between the ideal and the real: it likewise misunderstands the relation between truth and inner evidence. Inner evidence is no accessory feeling, either casually attached, or attached by natural necessity, to certain judgements. It is not the sort of
mental character that simply lets itself be attached to any and every judgement of a certain class, i.e. the so-called ‘true’ judgements, so that the phenomenological content of such a judgement, considered in and for itself, would be the same whether or not it had this character. The situation is not at all like the way in which we like to conceive of the connection between sensations and the feelings which relate to them: two persons, we think, have the same sensations, but are differently affected in their feelings. Inner evidence is rather nothing but the ‘experience’ of truth. Truth is of course only experienced in the sense in which something ideal can be an experience in a real act. Otherwise put: Truth is an Idea, whose particular case is an actual experience in the inwardly evident judgement. The inwardly evident judgement is, however, an experience of primal givenness: the non-self-evident judgement stands to it much as the arbitrary positing of an object in imagination stands to its adequate perception. A thing adequately perceived is not a thing merely meant in some manner or other: it is a thing primarily given in our act, and as what we mean it, i.e. as itself given and grasped without residue. In like fashion what is self-evidently judged is not merely judged (meant in a judging, assertive, affirmative manner) but is given in the judgement-experience as itself present – present in the sense in which a state of affairs, meant in this or that manner, according to its kind, whether singular or general, empirical or ideal etc., can be ‘present’. The analogy which connects all experiences of primal givenness, then leads to analogous ways of speaking, and inner evidence is called a seeing, a grasping of the self-given (true) state of affairs, or, as we say with tempting equivocation, of the truth. And, as in the realm of perception, the unseen does not at all coincide with the nonexistent, so lack of inward evidence does not amount to untruth. The experience of the agreement between meaning and what is itself present, meant, between the actual sense of an assertion and the self-given state of affairs, is inward evidence: the Idea of this agreement is truth, whose ideality is also its objectivity. It is not a chance fact that a propositional thought, occurring here and now, agrees with a given state of affairs: the agreement rather holds between a self-identical propositional meaning, and a self-identical state of affairs. ‘Validity’ or ‘objectivity’, and their opposites, do not pertain to an assertion as a particular temporal experience, but to the assertion in specie, to the pure, self-identical assertion 2 × 2 = 4 etc.

This conception alone accords with the fact that it makes no difference whether we perform a judgement (a judgement with the content, the meaning J) insightfully, or whether we have insight into the truth, the being of J. We accordingly also have insight into the fact that no one’s insight can be at variance with our own (to the extent that either of us really has insight). This has its source in the essential relation between the experience of truth and truth. Our conception alone escapes the doubt which the conception of inner evidence as a casually connected feeling never can escape, and which plainly amounts to a complete scepticism: the doubt whether, when we have
insight that $J$ is the case, another might not have the insight that $J'$, incompatible with $J$, is the case, that insights in general might not clash with insights, without a hope of settlement. We understand, accordingly, why the 'feeling' of inner evidence has no other essential precondition but the truth of the judged content in question. It is obvious that where there is nothing, nothing can be seen, but it is no less obvious that where there is no truth, there can be no seeing something to be true, i.e. no inward evidence (cf. Investigation VI, chapter 5).