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Psychology and Epistemology.ⁱ

by Carl Stumpf.

[467]ⁱⁱ

1. The Issue

When Zeller,ⁱⁱⁱ in the lecture “On the meaning and mission of epistemology”,^{iv} called for a renewed fostering of this science, he designated as its mission the study of the preconditions under which the human mind is able to acquire knowledge of truth, especially the study of the *origin* and the *truth* of our ideas [Vorstellungen]. He called it Kant's immortal achievement, that he put this question back in motion and answered it more thoroughly than his predecessors. He stressed the necessity for logic to hark back to such studies. He did not say explicitly that they are also tightly connected to psychology; but what he presents about the origin of our ideas in this lecture, and especially in the latter appendices (1877), does not leave room for doubt about his affirmative view on this matter.

In the neo-Kantian school, which has developed since then, other views on the above came to the fore. Indeed, on this side one mostly combines logic and epistemology. The more severely one does so, the more psychology is separated, even brought into diametric opposition with it. This view is so widespread that even those who cannot be counted in this school defend the widest possible division of labour, and a principled independence of epistemology. This is connected to a change in view of Kant's distinctive achievement as designating this sharp separation and opposition. There was already psychology of thought-activities in Locke's time, and earlier. [468] Also the difficulties concerning knowledge of causal laws raised by David Hume have been dealt with as fully as possible from this standpoint by Kant's contemporary Nicolas Tetens.^v But the emancipation of

epistemology from psychology, which is the *critique* of knowledge, is only due to Kant. Well, most agree that Kant himself only made the distinction in the second edition of the *Critique of Reason*, and even there not consistently enough. One distinguishes, if I may say so, an ideal and a historical Kant.^{1vi} Some believe that the tendency to pure critique of knowledge, to “critical idealism”, can also already be found in Leibniz, in Descartes, in Plato, thus the distinctive nature of Kant's achievement is to some extent put into question from this standpoint. I will not go into these differences here.

In the following we will use the expression “criticism” [“Kriticismus”] for the conception of epistemology which aims to free itself from all psychological foundations; the expression “psychologism” (which perhaps was first used by J. E. Erdmann^{vii}) for the reduction of all philosophical and especially all epistemological investigations to psychology. And now we let the “criticists” and the “psychologists” fire their bullets at each other, where, due to the subject matter, we aim for the most pointed form of the argument, without paying attention to the question whether the argument appears precisely in that form in the literature.

To the most obvious argument of the psychologists, that gaining knowledge is itself a psychological process and accordingly the investigation of its conditions a psychological investigation, the criticist responds that psychological research into the known facts of our inner lives can lead to knowledge

1 Compare, among other things, Windelband, *Vierteljahrsschrift fuer wissenschaftl. Philosophie* I 224 f. [Windelband 1877], where Windelband precisely with respect to Kant's relation to psychology arrives at the result that the true criticism[Kriticismus] is not expressed in its full form in any of Kant's writings, but only signifies one of the transitory standpoints through which he passed between 1770 and 1780. Windelband stresses emphatically the “dependence of critical philosophy on the psychological theory of its author, which cannot be covered by all statements to the contrary.”

[Kenntnis] of thought- and emotion-processes and at most to empirical rules such as those of the association of ideas, [469] but never to knowledge [Erkenntnis]^{viii} of general and necessary truths, least those which should be objectively valid, such as geometrical principles or causal laws. The latter especially, conversely, underlies all psychological research. Psychology is a special empirical science; epistemology teaches us the conditions for the possibility of every experience in general.

Thus pushed into the defensive, the psychologist still has it easy, so long as the distinct positions of Kantian philosophy are avoided. He answers that one can attain knowledge without epistemology, just as one can eat and go for a walk without physiology. One can see that the square of the hypotenuse is equal to the sum of the squares of the two adjacent sides without having an idea of the difference between analytic and synthetic judgment. One could discover laws of the pendulum, without recognizing [erkennen] the law of causation as a synthetic a priori principle. And therefore, one could and can also explore psychological connections without a theory of knowledge. This might seem so obvious as to not be worth mentioning, if not for the fact that many utterances from the critical side let one infer the opposite view. “Should there – one asks – be knowledge without critique of it? That would be knowledge without law, without a norm for its truth, and therefore without truth.” By no means! Knowledge cannot be merely true, it can be fully evident to the knower right down to its ultimate grounds, without him having developed his own theory of this evidence.

This much is nonetheless right: that one often counts on presuppositions that have been found to be useful only in practice, and that research, after it has moved forwards a good deal, feels the need to investigate the possible inner legitimacy or necessity of those presuppositions and to bring itself under general concepts and rules. Just as the processes and dealings of daily life are always subject to theory and later executed “with consciousness,” just as natural seeing and hearing has led to optics and acoustics and furthermore to the [470] construction of the finest instruments and to the

set up of sharp criteria for the objective reliability of perceptions [Wahrnehmungen], so epistemology is the daughter of natural knowing [Erkennens] and the mother of artificial (artful) knowing. Locke and Hume were within their rights to set as the goal of such an investigation, not knowledge in general, but rather the more precise determination of the ways and means, the limits, and the degrees of probability of our knowledge.

One could dare to assert that psychology is in less need of such a subsequent test [Prüfung] of its presuppositions than the natural sciences: insofar as precisely *the* presupposition, which pushes us most towards epistemology, namely the assumption of a consciousness-independent external world, seems irrelevant for psychology. But we don't want to put any weight on this here, because it is not immediately clear whether psychology really makes do without this assumption, if it sees its task not merely in the description of, but also in the genetic exploration of, mental states.

Psychology, as any other science, pushes in its development towards epistemological reflections, and it needs these very reflections to come to completion, but not to begin. How so? Is epistemology also in its beginnings or in general independent of all psychology? Does it not require necessarily a psychological groundwork and contribution, at least concerning the question of the origin of our concepts?

In order to refute this, the criticist keeps stronger and sharper weapons at the ready, that he takes from the arsenal of the *Critique of Pure Reason*: the doctrine of the roots of all scientific experience in the a priori forms of intuition and of thinking, of the transcendental synthetic and the transcendental schematism.

We cannot, the *Critique* tells us, talk of an “object” [Gegenstand], much less of “Nature”, as the all-encompassing lawfully-connected unity of objects [Gegenstände], or of natural laws as the rules of

this connection, without applying the categories of unity, [471] totality, substance, causality, necessity and so on, to appearances. Each category is a form of synthesis or, as it has also been said, a function of unity. Hence it is the understanding which through the exercise of its functions of unity *creates* the objects [Gegenstände], nature and its lawfulness. Nature is not first there, and only reflected in the understanding, rather it arises as nature first in and through the understanding. Appearances as such have no rule, no order, no law in them.

No psychological presupposition, fact, or observation is necessary for the articulation of this state of affairs, says the criticist. We start from the concept of scientific experience and enquire into the conditions of its possibility, the presuppositions or elements which are contained in this concept. We find therein the concept of substance and so on. One does not speak in the psychological sense of the “conditions of possible experience”. One does not mean anything other than the elements which are found through an analysis of the concept of experience. Hence epistemology is possible without psychology. Indeed, it cannot draw on psychology without contaminating itself. The deduction of the validity of the categories must not be made to depend upon the validity of a single psychological fact or law.^{2ix,x}

Although the most observant criticists – dogmatic criticists! – present this state of affairs as one that has been established once and for all, and impose upon dissidents harsh censure from the outset, many older and newer investigations into Kant’s doctrine allow one to hope for a gradual rapprochement of the lesser extremes of both sides. Firstly, it concerns the question in what way and to what extent it can be said that the understanding creates objects and their lawfulness (II); then, it concerns the positions which serve as the main support for this doctrine, the separation of matter and form (III) and the doctrine of synthetic necessity (IV). [472]

2 Compare for example Alois Riehl, *Philosophical Criticism* I, 8: “The critical philosophy of Kant knows no psychology”. 18, 166, 247 u. s. t. [Riehl 1876].

Over the course of a century a great many things have been said about all these questions, and amongst these some have been spot on. But only a small part is relevant for our purposes. The majority concerns mere questions of interpretation, prompted by Kant's dark and tortuous style of presentation, and have already compelled many exegetes to resigned acknowledgement of manifold contradictions.^{3xi} In order to avoid such discussions as far as possible – one cannot avoid them completely – I stick to the interpretation which is most charitable and preferred by the modern criticists. We are not only driven to this by Kant's reminder, "that when we compare the thoughts that an author expresses about a subject ... it is not at all unusual to find that we understand him even better than he understood himself, since he may not have determined his concept sufficiently and hence sometimes spoke ... contrary to his own intention",^{xii} and the rationale for applying this charitably [Billigkeitsmotiv], namely, that one would have to concede this "milder interpretation that is more adequate to the nature of things" of Kant himself (A. Stadler), but also on tactical grounds: for only in this case do we have a factual objective for our factual dispute and hope for an agreement.

³ In the treatise mentioned above, [see footnote 1] Windelband reaches the conclusion that in one of the most important sections of the *Critique of Pure Reason* one is thrown back and forth between three different conceptions (p. 256f.). Vaihinger [1881] finds in the *Critique* three to five different tiers of concepts, "tied together in a single argumentative knot that is difficult to disentangle". The still unfinished commentary of this Kant scholar with his painstaking compilation and discussion of all interpretations offers a wholly discouraging picture. Despite all reverence, the author repeatedly resorts to the strongest expressions about the confusion in Kant's presentation, and often enough mentions the dogmatic criticists who declare every objection against Kant's doctrine to be a misunderstanding as evidence for different and opposed interpretations. Occasionally, he allows one of the ringleaders to spread "a cloud of misunderstandings and dark, select turns of phrase" (I 471).

II. The Creation of Nature through the Understanding.

Since concepts as such only exist in consciousness, it is an indubitable truth that the unification of appearances into the concept of an object, the relation of appearances or objects [473] to one another under the aspect of causality, the comprehension of all objects and causal connections in the concept of nature, are all synthetic acts of thinking that are functions of consciousness. There is also nothing to be objected against saying that, if one takes specifically thinking-together, *ζυλλαβεῖν εἰς ἓν*, to be a characteristic function of the power of thought, albeit also the other function highlighted by Plato, the separating (*τέμνειν*) of a unified given in intuition does not seem less essential. But the core question remains: what may, can, must we unify, and what not? Neither the general concept of a “function of unity”, nor the particular “forms of synthesis” (categories) provide guidance for this. Here now begins, as is well-known, the “transcendental deduction” and the “schematism” of the pure concepts of the understanding. The first shall substantiate the right to apply the categories to appearances at all, the second shall specify the possibility or the route whereby this has to happen. According to our regressive plan we first consider the second point.

1. (On the schematism.) According to Kant, the application of categories to appearances is made possible and regulated through schemata, that is, through space and time, in which appearances order themselves. The most well-known example, on which we will initially focus, is the application of causality mediated through temporal succession. If one event regularly follows another event the category comes into play, as if it is triggered. We talk then not of a merely subjective (determined through the accidental direction of imagination [Einbildungskraft]) but rather an objective connection; that does not mean anything other than: of a causally necessary connection that stands under the rule of causality.

In response to the obvious objection already voiced by Schopenhauer, that day and night regularly follow one another without us bringing them into causal connection, defenders of Kant have remarked that according to Kant this does not concern individual appearances, but rather changes of substances. The application of the concept of substance itself is already explained by Kant beforehand. We want therefore to refrain from dwelling on this objection in a preferably immanent critique, even if the difficulty may perhaps only be pushed back. [474]

Kant himself has already replied to a different objection, namely, that cause and effect, strictly speaking, are always simultaneous, because in the same moment in which the conditions of the event are fully present the event must occur.^{4xiii} “Here one must note that it is the **order** of time and not its **lapse** that is taken account of; the relation remains even if no time has elapsed. The time between the causality of the cause and its immediate effect can be **vanishing** (they can therefore be simultaneous), but the temporal relation of the one to the other still remains determinable. If I consider a ball that lies on a stuffed pillow and makes a dent in it as a cause, it is simultaneous with its effect. Yet I still distinguish the two by means of the temporal relation of dynamical connection. For if I lay the ball on the pillow the dent follows its previously smooth shape; but if (for whatever reason) the pillow has a dent, a leaden ball does not follow it.”^{xiv 5}

⁴ Descartes already declared the following to be an evident sentence: “Lumen natural non dictat ad rationem efficientis require, ut tempore prior sit suo effectu: nam contra, non proprie habet rationem causae, nisi quamdiu producit effectum, nec proinde illo est priori” (Respons. ad primas objections, Meditat. 1695 p.56 [p.49])

⁵ We must here indeed more precisely write in Kant’s sense: “if the pillow has a dent and I lay the ball upon it, a smooth shape does not follow.” The pressure of the ball in connection with the previous figure we call the cause, the new figure is the effect; and the temporal succession of these circumstances or states is – that is what is important to Kant – irreversible.

What does Kant mean when he says that we distinguish cause and effect through the “temporal relations of dynamical connection”? A dynamical connection is not a temporal relation. It is just what we are supposed to extract from the temporal relation of regular succession in the first place.

A passage that follows shortly afterwards may elucidate this point. There Kant emphasized that each transition into a new state required time, and so also each cause acts over an extended time and during this time produces the new state through smaller increments. One can further [475] add that whatever we designate as cause in the strict sense, namely the complete collection of the conditions of a state, comes together only gradually over time. With respect to both considerations one may say that the cause precedes the effect: the aggregation of conditions precedes the effect and, in particular, the complete production of the effect.

If on the grounds of this interpretation we want now to set aside this objection, this leads us straight onto a third objection, which I in fact without further ado take to be unanswerable. Also this objection is not at all new, but must always be re-emphasised.

If one completely sharply distinguishes with Kant the concept of causation and the concept of the passage of time in such a way that neither of these concepts includes the other in any way, then one cannot come to know from these concepts why only the earlier could be the cause of the later and not vice versa. One can then also conceive without logical difficulty that the later would be the cause of the earlier, or that there is not any fixed temporal relation between cause and effect.

That time has a priority in common with the categories, and intuitiveness in common with the sensible appearances, gives it a middle, but not a mediating, position; it does not provide a ground for *subsuming* appearances under the categories. Radically, but not incorrectly, Ueberhorst objects to such a motivation: “Can one, for instance, with the help of the representation of a glass, which

shares with a leaf the property of being coloured green; and shares with air the property of being transparent, subsume the leaf under the concept of air?”⁶ – And finally, in the best case, only the applicability of the categories in general would follow from this, not this particular relation of causality to the time series in contrast to the reverse relation.

Granting Kant’s premises, the only ground on which one could rely in deducing this determinate relation would be that gradual aggregation of conditions up until the cause is complete, [476] and the gradual growth of the effect from the first moment of effectiveness. But these are, so far as I see, empirical facts. It seems impossible to derive them from the concept of cause and effect.

It is also not derivable from the premises of the critique of reason why the same effect can be produced by different causes, whereas the same cause only ever has one effect. If the latter proposition is really given a priori with the concept of causality and the time series, why not also the former? – The following statement from a notable recent presenter is only indicative of this: “As a matter of fact we all claim that water could not come to the boil at all without an antecedent generation of heat, therefore that *each* time the fire *must* occur before the cooking of the water can.” As a matter of fact we do *not* all claim this. Water can boil without fire and without heat, through a reduction of air pressure. Of course it doesn’t help, if one wants to interpret this such that through reduction of pressure just as through heating one and the same determinate state of water molecules will be brought about, which then regularly has boiling as a consequence, so that this effect is produced each time through the same cause. For each state of the molecule can again be generated through two causes.

This applies in a similar way to the concept of substance, as it does to the concept of cause. The justification of applicability seems more plausible here because from the outset Kant defines

⁶ Kant’s Doctrine of the Relation of Categories to Experience (1878) p. 20.

substance as that which is persistent and unchangeable, which includes the concept of time. “To time ... which is itself unchangeable and lasting, there corresponds in appearance that which is unchangeable in existence, i.e., substance, and in it alone can the succession and simultaneity of time be determined.”^{xv}

Either the mark of persistence is literally understood, so that there then lies in the concept of substance a mark of time, which completely contradicts the essence of the categories, or it is understood in some merely improper sense, so that it is then futile to demonstrate subsumability through the mere analogy.

[477] This evidently applies to all categories. It is therefore no way and no possibility to apply categories to appearances in an obvious way. The application could only depend upon arbitrary rules or on an incomprehensible psychological *coercion*, and we would be in the wake of complete scepticism. For a blind compulsion, to connect appearances with concepts, without any affinity, a direct or indirect factual relation, without a shadow of understanding of the reason why, would always again raise the question of the justification of the process. If the critique of knowledge [Erkenntniskritik] really comes down to mere recording of such psychological machinery, then it would therefore become a psychologism of the worst kind. Kant has spoken out energetically enough against mere coercion from mental organisation, wherein indeed some see (as Albert Lange^{xvi}) the essence of Kant’s doctrine, against such a “preformation system of pure reason”. “I would not be able to say that the effect is combined with the cause in the object (i.e., necessarily), but only that I am so constituted that I cannot think of this representation otherwise than as so connected; which is precisely what the sceptic wishes most, for then all of our insight ... is nothing but sheer illusion, and there would be no shortage of people who would not concede this subjective necessity (which must be felt) on their own; at least one would not be able to quarrel with anyone about that which merely depends on the way in which his subject is organized.”^{xvii} (Kehrbach’s

edition. p.683.) And yet one is pushed inevitably into such a preformation system and thereby into scepticism for want of an obvious proof. Merely to say: “the application of the categories in the way described is a condition of experience; without which we would have to forgo all empirical experience” – will convince no sceptic. He will just draw the conclusion: “Therefore we must forgo”. If the criticist relies on the assumption that there is indeed an empirical science, then the sceptic needs only to take himself to be a witness of the fact that experience in the sense of absolutely valid laws of nature can at least be put into doubt. And surely such [478] a doubt cannot be shown to be unreasonable through the detailed depiction of a certain interlocking mechanism of form and scheme, but rather only through seeking out the intermediate *logical* links, which lead to them from immediate insight. Not so-called “*demonstration*” in the sense of the criticists, but only *proof* in the ordinary sense of logic, can help here.

Here we already reach the problem that Kant wanted to solve with the “transcendental deduction”. It should not consider the handling of the application of the categories individually, but rather the right of their application at all. Although this seems initially futile if the justification of their individual application is not demonstrable, and unnecessary if it is, I should not omit designating the point, which might be the “critical” turning point in the dual sense of the word.

2. (On the transcendental deduction.) Each of the activities that Kant lists under the name of the Synthesis of Apprehension in Intuition, the Reproduction in Imagination, the Recognition in the Concept or Transcendental Apperception (which we want to accept here, for now, as results of the critical method, without insisting on the psychological nature of these statements and the necessity of their psychological examination) – admittedly lead overall in the best case only to the insight that it lies in the nature and tendency of our knowing to bring the world of appearances into connection, but not the insight that the world of appearances must comply with it.

If we ask the physicist of the present age why he identifies light and electricity, then he will appeal to particular features of appearances. Initially he believes himself justified in relating the light- and electricity-appearances, as the senses present them to us, with respect to interference among other things, to objective wave motions, moreover to identify these motions. The philosopher may still have many reservations relating to the concept of an external world in general, but in no case should he overlook that *particular* syntheses are the result only of the consideration of the special constitution of appearances and their manifold spatiotemporal combinations. [479] But if in all particular cases particular syntheses have to be justified by reasons which have been extracted from the appearances themselves, then we do not require a priori justification and in general there is also no possibility of such. One should not say: the concept of natural law or the possibility of such in general is grounded exclusively in the understanding, but rather the particular, actual laws of nature in the application of the understanding to appearances. Whatever grounds all particular laws of nature, also grounds the concept of the law of nature in general, which is only an abstraction from the particular laws of nature.

Therefore, the determining, logical, evident grounds of all synthesis must be sought in what is given to us in the matter of appearance. The concepts of the object, of nature, of natural laws, are, if we want to adopt a scholastic formula which has often been used in the debate about universals, *entia rationis cum fundamento in re*; - initially we understand by *res* appearances, furthermore indeed objective things, without which appearances could not be understood.

In the “transcendental deduction”, amongst the many technical expressions and concepts, there is none more remarkable than that of “*affinity*” or “*associability*” of appearances (1st edition of the *Critique of Pure Reason*), whereby the mere contingent connection of representations differs from that which we state as a law of nature. The appearances, says Kant explicitly, must be “*associable in themselves*”.^{xviii} Admittedly – I would like to say: regrettably – he immediately adds: “But we can

never encounter this objective ground of all association of appearances anywhere except in the principle of the unity of apperception with regard to all cognitions that are to belong to me.”^{xix} He completely resists allowing that which is *given* sensibly to us to become authoritative. Precisely in this vain effort lies, it seems to me, the ultimate ground of darkness, which one has always found in this section of the famous work.

A precisely analogous turn, with only the difference that instead of appearances the otherworldly object is recognised as the determining and [480] unifying factor, is included in the section of the synthesis of recognition, where Kant designates the object of cognising as “that which is opposed to our cognitions being determined at pleasure or arbitrarily rather than [in order that it is]^{7xx,xxi} being determined *a priori*”^{xxii}; but immediately adding, that unity which is conditioned by X could only be the *formal* unity of consciousness in synthesis.

The modern critics follow Kant in such near tautologies. One of them, speaking of the “unity of apperception”, expresses himself thus: “We can cognise a priori of things only that which we put into them. From where do we ourselves take that which we must put into things, in order to cognise something a priori of them? If the answer is as follows: out of consciousness, then we think consciousness as the embodiment of the means and methods which make up this inputting.”^{8xxiii} Are we not simply led in a circle here? We take that which we must put into things from the embodiment of the methods which make up the inputting.

⁷ Volkelt correctly amends the ungrammatically composed sentence in this way (*Immanuel Kant's Epistemology Analysed from its Grounding Principles* p. 114-5) [Volkelt 1879]. In this Volkelt is also undoubtedly correct, that under the object X here is not to be understood with Cohen as the category of substance, but rather the thing in itself.

⁸ Cohen, [1885] *Kant's Theory of Experience*, 2nd edition, p. 142.

In contrast, I believe one finds the decisive insight in the work of another, otherwise very convinced, follower of criticism. He distinguishes in consciousness “state of awareness” and content. “In a state of awareness as such is no such unity, which could ground the unity of the law, and thereby the unity of the object. ... A state of awareness is only determined to a certain extent through the determination of content. Therefore it is content alone, and indeed in relation to its connection to each respective consciousness, that gives the mental or fact of conscious its actual positive sense ... Hence the fundamental determining factor is just the objective (content-related) unities.”^{9xxiv}

[481] It is in fact only half, or not even half of the truth, what criticism indefatigably repeats, that we bring order and lawfulness into appearances, that the understanding is the source of nature and her laws. We cannot admit this claim on the basis of which one rejects the participation of psychology in the work of epistemology in its one-sidedness. Whether, if it were correct, such a conclusion would be justifiably drawn (for some may want perhaps to draw the opposite conclusion)¹⁰ – we may set aside.

But, to be sure, we will now directly show, with respect to the foundations of criticism, how the disregard of psychological investigations has pushed criticism to these points, which we have just recognized from an epistemological standpoint to be one-sided and impracticable in their one-sidedness. It concerns mostly the ubiquitous distinction between matter and form in our

⁹ Natorp, *Introduction to Psychology according to the Critical Method*. (1888) p.112 f.

¹⁰ As Windelband has it (Viertelj. Sch. F. wiss. Phil. I 247): [Windelband 1877] “The categories are valid a priori for all experience, because they make it. If this ... argument is the decisive one, then the Kantian doctrine here hangs on the hinges of a psychological insight; for that experience results through the categories, can only be recognized through psychological analysis. Indeed, one cannot fail to notice the psychological character of this deduction.”

presentations.

III. Matter and Form

Kant believes that he needs to make this distinction not merely by opposing categories and appearances, but already within sensory perception, insofar as he calls space and time mere forms of intuition, in contrast to sensory qualities (colours, tones, etc.).

No matter how much one may insist that Kant has not discovered or grounded the distinction through psychological considerations, that he calls his discussions of space and time “metaphysical expositions”, that the decisive motive for these lies in the possibility of synthetic a priori judgment and especially of mathematical cognitions – all the same: the [482] results must pass the test of psychology. *It cannot be something epistemologically true and psychologically false.*

In my view, the test has already been carried out. The distinction is psychologically completely indefensible; indeed, it has harmed the progress of investigations to a high degree, and this also in all other areas to which it has been extended: for so-called formal logic, ethics, aesthetics, are all connected, in their unfruitful one-sidedness, to this epistemological distinction.

Since everything we think at all, and whereof we speak, while we think of it and speak of it, is *eo ipso* the content of our consciousness, and since criticism does not want to provide an account of unconsciousness, since also geometry, whose possibility is to be explained, is concerned with space as a conscious presentation, therefore without any doubt space, time, causality, and so on, must be in the widest sense *contents* of consciousness.^{11xxv}

¹¹ Kant does not always express himself in the same way on this point. Often he talks of forms as mere conditions of intuition or as possibilities which as such in themselves cannot be presented.

From time immemorial, absolute and relative contents (presentations of relations) were distinguished, and still Tetens has given a detailed treatment of this. But this distinction does not completely coincide with the Kantian one. Rather, Kant calls “matter” the sensory qualities, for example, hardness, colour, and “form”, in contrast, “that which allows the manifold of appearance to be intuited as ordered in certain relations”.^{xxvi} [483] Therefore several colours can appear in different spatial and temporal order. One immediately sees how this concept of form as the ordering principle of appearances can also be applied to the categories. It contains relations, such as causality, and it likewise contains space and time, which one cannot count as mere relations.

“That which brings about that the sensations (the manifold of appearance) is ordered and placed in relations cannot itself be sensation”^{xxvii} The division and the opposition of matter and form is first introduced in the *Critique of Pure Reason* with this proposition,. Therefore, it is further concluded, the matter of all appearances is indeed given to us only a posteriori, but the form for them must lie ready as a whole in the mind a priori, and can therefore be considered to be separate from all sensation. Furthermore, Kant also stresses that one could abstract away from the presentation of a

(Compare Cohen, opus. cit. 152: “This possibility in appearance ... this potential relation is called form”). Now Kant thinks that these possibilities could be made into contents of consciousness and be intuited. Then they are precisely no longer forms, in the above sense of the word. Nonetheless, they are not merely called intuitions, but also forms of intuition: indeed, the considerations through which Kant wants to show that space and time are such forms, obviously concern space and time as contents of consciousness. One could ask what this that is completely removed from consciousness is to have in common with that which we call space and time, and how it is possible to give a description of it. In any case, Kant talks in those passages with which we will be concerned in the following of space, extension, figure, and so on, as *presented* forms, and even asserts that they can be presented in isolation.

body everything that belongs to sensation, hardness, colour, and nevertheless could retain extension and figure as remaining. He does not mean by this some mere distinction in the manner of abstraction: for such a distinction also occurs when we distinguish the quality from the intensity, which both belong to content, to sensation.

Here psychology has several opportunities to have its say and, to be frank, to object. Contemporary nativists and empiricists, although they diverge so much in the theory of spatial presentation, are nonetheless completely agreed that it is impossible to present space, extension and figure without any sensory quality. I know of only a single author who in this point openly sides with Kant, and who ascribes to himself the ability to present a completely colourless square on an arbitrary background (also [484] not black, grey, or white).¹² How this can happen, when the outline is not

¹² O. Liebmann, [1876] *On the Analysis of Reality*, 2nd edition, p.234.

Cohen accuses me (see cited above p.105) of turning the Kantian assertion on its head in my book *On the Psychological Origin of the Idea of Space* [1873], where I made the objection above. Kant would talk of “objects” which one can remove in thought from space; I in contrast talk of colours. Indeed, in *another* place Kant talks of *objects*, but in the place against which I direct my objection, and which I also quote, but which Cohen in the quotation of my objection only marks by points, Kant talks of *colours*: “So if I separate from the representation of a body that which the understanding thinks about it, such as substance, force, divisibility, etc., as well as that which belongs to sensation, such as impenetrability, hardness, *colour*, etc., something from this empirical intuition is still left for me, namely *extension and form*. These belong to the pure intuition, which occurs *a priori*, even without an actual object of the senses or sensation, as a mere form of sensibility in the mind.” [A20-21/B35, CE:173]. One cannot assert more clearly that we are able to represent extension without colour.

One can only dispute whether I was justified to use the last quotation to explain another quotation where Kant says: “One can never represent that there is no space, although one can

even picked out through a difference in brightness from a light or dark background, is difficult to say. And mustn't one then also be able to present movement without involvement of any qualities of sensation? However, for Kant himself, these presuppose "something empirical", therefore sensation (Kehrbach's edition p.66). Movement is change of location, a figure is a whole of different locations. Just as changes of location in the visual image (also in that of imagination) are not conceivable apart from a change in some quality that changes its location, so also differences of location are nothing other than changes in a quality that is instantiated in different locations.

Not only Berkeley and Hume,¹³ but also a contemporary of Kant's, Platner,^{xxviii} has, as little as he can compare himself in philosophical depth and sharpness with Kant, more correctly seen this point. In the few years before the *Critique of Pure Reason* appeared, he taught in the first volume of his "Philosophical Aphorisms" that the idea of extension as visual presentation is inseparable from the idea of colour.

The fact that colour qualities order themselves in space, that the very same qualities can appear to us in different spatial arrangement, does not ground the separation of space from the whole content of sensation. The qualities also appear to us in variable [485] intensity, more qualities at the same time in different intensities could appear, in a variable order of intensity, and yet intensity in and with the qualities is given in the whole content of sensation as a moment of content, just as the

very well think that there are no objects to be encountered in it." [A24/B38-9, CE: 175] I still take this interpretation of the second quote through the first quote to be correct. For in the first quote Kant talks directly of the object without a real object of the senses or sensation and it is anyway obvious that in the second quotation by "object" Kant can only mean the empirical object, that is, a complex of sensations. In any case, this is a separate question, and the sense of Kant's assertion which I have attacked is completely clear, and it is also clear that it is false.

¹³ Cf. who in my aforementioned writing was quoted on p.24.

quality itself is given. Generally, ordering principles of different kinds can be extracted from the content of sensations. Not only space and time, but also the system of tone- and colour-qualities, of intensities, brightnesses, degrees of saturation, and what one otherwise distinguishes in sensations, all compose, in modern terms, manifolds of one or more dimensions, which even allow the application of mathematical methods to a certain degree, without thereby concerning a mere transmission of spatial analogies. The locations whose system constitutes space are only a special class of manifolds.

Furthermore, one can indirectly show that the separation cannot be carried out. If location and time, spatial and temporal extension, and spatial and temporal order were not given in the total content of our sensible perception, in an analogous way to how intensity is given and interlinked with the qualitative moment, we would we never ever have any clue at all to put them into it.

We do not perceive different sense qualities in invariable extension and at invariable locations, but with continually changing spatial determinations. Kant had, as Herbart^{xxix} has already reminded us, left the question of the ground of *determinate* localisations untouched. Lotze^{xxx} sought to fill in this gap by assuming, in agreement with Kant, that the compulsion to spatial intuition in general “lies ready” a priori, but the determinate changing localisations of the in and for themselves non-spatial and unordered qualities is conditioned by the so-called local signs. He understood “local signs” to be qualities of sensation of another kind. Thus, muscle sensations of the eye should help us to the localisation of the initially non-spatial colour sensations. But the theory has already shown this to be impracticable, because the fineness and accuracy of these muscle sensations do not nearly achieve those optical localisations, and precisely the impressions which allow the sharpest spatial discrimination, [486] namely those of the fovea, are simultaneously perceived and localised alongside each other without any movement.^{14xxxi} Indeed, it stands to reason that local signs in

¹⁴ Compare my *Origin of the Presentation of Space* [1873] p.97ff and Th. Lipps [1885]

Lotze's sense would be completely unhelpful even if one adopted another kind of quality instead of muscle sensation (which one has repeatedly tried and again abandoned) or even restricted oneself to the mere abstract postulate of such an auxiliary sensation. We have indeed in all of these cases at the same time two sums of qualities in sensation, that of colours and that of the auxiliary sensations, and we lack clues for how the former are to be correlated with the latter, and which elements of both belong to each other. Therefore, one would have to again postulate a sign system and so it never ends.^{15xxxii}

Psychological Studies, p.19.

¹⁵ When Lotze compares local signs with labels that would allow one to rebuild a library, it would conform to the presuppositions of the theory that the labels lie loosely in the book boxes (for what connection obtains between heterogeneous sensory qualities?): hence the analogy serves only to highlight the weak point of the theory.

I had remarked (*Origin of the Presentation of Space*, [1873] p.91) with respect to the sensation of movement that in the case where we perceive with the resting eye a surface filled with colours and where, according to Lotze, the "earlier imprinted associated" sensation of movement as a local sign should occur, the reproductive moment which could make the association effective was lacking. In this form the objection has meanwhile been raised by F. Brentano (in lectures) and by Reinhold Geyer (Geijer) in the *Philosoph. Monatsheften XXI* (1885, p.543, ff.). But the latter takes it not to be impossible to rehabilitate the theory by adding auxiliary assumptions. The apperception of a colour could be connected centrally with a strengthening of the optical excitation, and thereby, also an already present movement drive, be strengthened a little bit. But how would these physiological mechanisms help? We would only have a sum of stronger colour-sensations and a sum of stronger (hypothetical) movement-sensations, and it would be psychologically equally unexplained how these stronger, as before the weaker, belong to each other. In order to solve the problem, Höffding has latterly (their [1888] XXIV p.426), simply denied the possibility of localizing simultaneous impressions, and

In continuing use of the expression 'local signs', some understand it to mean determinations of the content of the respective sensation itself (of the visual- or taste-sensation), even if it is unconscious, [487] grounded in specific powers of the (visual- or taste-) nerve fibres.^{16xxxiii} But with this the original concept is completely given up and the Kantian principle, the distinction between matter and form of sensation, is abandoned.

One would have to make analogous investigations about time. Temporal signs would be required for us to be taught which sense content is placed earlier, which later, and so forth. Of course, one cannot easily reply, each qualitative impression is assigned to just that moment in which it is perceived. For the qualities in themselves should indeed be atemporal throughout, and only become temporal through assignment and classification [Zu- und Ein-ordnung].

However, there are cases where we do not *perceive* spatial magnitudes or position, just as temporal duration or position, in the sensory content to which we ascribe these determinations, but rather only *suppose* them on the basis of certain clues; like when we determine in virtue of the bluish colour of the mountains their distance, or in virtue of the strong convergence of the eyes the fixation of the proximity of the object, or in virtue of the indistinctness of a memory that the relevant event is long past. This evidence would then be able to be called in the most proper, if also in no way the

traced back the apparent simultaneous localization to successive arrangement which, due to training, very rapidly occurs. But even setting aside that temporal connectedness would raise problems for the Kantian view. It is an undeniable experimental fact that even if we exclude all movement, as in the case of momentary illumination through electrical sparks, we perceive the spatial arrangement of visual impressions. It seems therefore as if Höffding does not grasp the core of the above difficulty at all. In his psychology (1887, 252-3) he completely ignores it.

¹⁶ As Auerbach and v. Kries in Dubois-Reymond's Archiv. F. Physiol. 1877 p.342, 349.

most fundamental, sense local- (temporal-) signs. But it is clear that their application already presupposes original space and time perceptions. It is impossible to *form* the presentation of space and the spatial arrangement or the temporal succession of visual impressions out of such criteria.

Even for the gradation and arrangement of *intensities*, whereupon the sensation of a sense changes from weakest to strongest and a particular sensation takes up a particular place in this order of intensity, also several sensations of the same sense of unequal strength can be given at the same time. Even for this one has required analogues of local signs. And surely this is consistent, although the author of such a hypothesis may also fail to be conscious of its origin in the Kantian doctrine of forms. But the problem that one wants to resolve immediately arises again: the signs must, [488] in order for there to be a basis for the formation of a series and arrangement, always already form a series, and the position of each one in the series must be recognisable for consciousness. Therefore, in each formation of a series and arrangement of sensation there lies a problem that is only to be solved through the assumption of a system of signs, and so on ad infinitum. Therefore, its order must be directly given along with sensation as an immanent feature.

Finally, something analogous holds for the “forms of thinking”, *concepts of relation*, which Kant contrasts with the matter of sensation. Space and time are not themselves mere relations, but only the basis of certain relations, namely, spatial and temporal relations; just as intensity and quality form bases for intensity- and quality-relations. But the following also holds for the so-called pure concepts of relation, such as unity and plurality: plurality is not something in addition to sensed tones or colours, but rather must already be given somehow in them. Of course, occasionally one can infer from signs to a plurality that is contained in the sensation, yet not immediately recognized; but such plural signs do not also create the plurality, and somewhere it must be directly recognisable.¹⁷

¹⁷ If I say that plurality is given in the sense impression itself, this cannot be asserted in the exact

The same applies to similarity, equality, which Kant has not included in his table of categories (we will leave open whether they can be subsumed under the category of unity). That a middle tone is more similar to a deeper tone than to a higher, must be a matter of their own nature, the principle of order must be immanent in them. Similar attempts to those made with space have been made here: one has appealed to muscle-sensations, in order to deduce the order of tones from them. And again one has to concede that in many cases such [489] co-sensations serve as auxiliary criteria. But the order is also directly recognisable, and if it were not every indirect cognition would be impossible.¹⁸

Things are no different with respect to causality and other categories. What Kant calls the schema is indeed nothing but one such system of signs; it is causal-signs, substance-signs, just as a more recent exegete has precisely used this expression for it.¹⁹ Lotze, indeed, hardly thought that he would transfer the problem of the schematism of the pure concepts of the understanding to pure intuitions with his theory of local signs. In truth, a schematism is here an equally mandatory demand of the theory of forms, as it is there.

Similarly, with causality, we need to concede that we do not *perceive* causality in all those

same sense as with other relations, for example, the relation of similarity. We cannot apprehend the plurality as such without reflection on the collecting act, while one does not require analogous reflection in order to perceive similarity. On this see Husserl's *Philosophy of Arithmetic* 1891, especially p.70. But we can neglect this difference here. The given absolute content itself needs to show us whether it includes a plurality, and no "signs" can replace this immediate perception.

¹⁸ Compare on this, as on intensity and plural signs, the considerations in my *Tonpsychologie* [1890], listed under "Signs" in the register of the second volume.

¹⁹ R Falckenburg, *History of recent philosophy*, [1886] p.277.

appearances where we *suppose there to be* causality. In such cases, again, secondary criteria – whose exploration and formulation is one of the main tasks of epistemology – have to mediate. But again, immediate perception needs to take place here somewhere, for otherwise we would lack the prototype for such a transfer; and a relation can be perceived nowhere else than in and with contents which stand in the relation. If the concept of cause is innate (in any sense whatsoever), contents have to be innate along with it, as whose relation we grasp and think the content. Equally, if it is acquired (in any sense whatsoever), the corresponding absolute contents have to be acquired in the same sense. In both cases the apprehension of the relation is a kind of perception, or, if one wants to talk of “perceiving” only with respect to absolute contents, a kind of “noticing” which is analogous to perceiving.

Let’s look back. The separation of form from matter in the Kantian sense robs us of all possibility to predicate the former of the latter, to denote particular impressions in individual cases as located here and there, as a plurality, as effects, and so on. The separation is just as impracticable as the ontological separation of the same name [490] of Aristotle and the Scholastics, with which it is not historically unrelated (see appendix 1).^{xxxiv} Each is just as damaging as the other, by leading to many unsuccessful theories which have been built upon the pseudo-problems they created.^{20xxxv}

²⁰ I obviously do not want to say that if one wants to keep these *words*, it would be impossible to give the expressions ‘matter’ and ‘form’ a meaning which is compatible with psychology and not completely incompatible with their use in language, equally that there is no difference between space and time on one side, and sensory qualities on the other. But the attempts which have been made to keep this double opposition in a sense which is at least close to the Kantian doctrine seem unsuccessful to me.

For instance, I cannot accept Helmholtz’s rescue attempt for space (*The Facts of Perception*, [1878] p.14), because the presupposition of feelings of innervation [innervationsempfindungen], of perception of the impulse to move, in the form of a centrally-excited sensation whereupon his

Now, if psychology – as I sought essentially to substantiate here by reference to my own and other investigations elsewhere – is able to show that this theory of signs and thereby the separation of form and matter in our presentations – an alleged result of the “critical method” – is untenable, one requires no further words on the indispensability of psychological investigations for the epistemologist.

As a positive task in the service of epistemology, psychology has, just as before, to continually clarify the origin of presentations of space and time and especially the origin of presentations of relation. Concerning the latter, the task is to seek those contents of perception, be they the so-called outer [491] or inner, in which such a relation can be apprehended and, through the finest analyses of the given, to enable the abstraction of the relation from the remaining perceptual content. It is not thereby excluded that a concept of relation such as causality is composed of several sub-concepts of

reinterpretation of the Kantian doctrine is based, seems to me to have been definitively shown to be unfounded by a number of recent investigations.

In his *System of Philosophy* [1889] p.109 ff., Wundt makes a similar attempt by appealing to the fact that spatial and temporal properties of our presentations cannot change without change of qualities, but that conversely, if the form of space and time is held constant, the qualities can arbitrarily vary, but not the other way around. (He says the same in the article “What Kant can’t be for us”, *Philosophische Studien* 7, p.1 [1892], which appeared after my presentation of this essay in the Academy.) But, in actual fact, the local and temporal moment is as equally independently variable as the qualitative one (the opposite view depends only on the purely hypothetical feelings of innervation or other “local signs”), and, in actual fact, one cannot freely vary the spatial and temporal arrangement while keeping the qualities of the impressions constant and vice versa; we can present the same six colours in all kinds of spatial relations, the same six tones in all kinds of temporal relations (including partial and total simultaneity).

different origin. Only through decomposition of “impressions”, do we arrive at the final elements of concepts to which we restrict ourselves in ordinary thought, elements which are then combined in different ways, depending on need, in scientific thought. Whole sciences can newly arise by means of decomposition of a complex that has hitherto been taken to be inseparable. The history of mathematics provides examples of this. The final goal of psychological work – although it is not always only performed by psychologists – would be the genetic classification of the simplest concepts of relation. It will deviate considerably from the table of categories, which has been arrived at via the “critical” route. One has to take special account of the many relations that obtain between parts of a whole, because we talk of parts in very different senses. But we are quite far away from this goal.

Tetens has pursued this task with more energy than any other psychologist of the previous century, indeed, more than most earlier and later. We want to compile the essentials of his theories in appendix 2(a)^{xxxvi} – since the historical appreciation of this researcher is intimately connected with our topic (see Introduction), but on the other hand, we may not interrupt the flow of our discussion by merely historical excurses.

Now, the criticist, aiming to preserve the relevance of Kant’s considerations independently of all psychology, used to emphasize that therein nothing should be asserted about the origin of the presentation of space, time, causation etc. Kant’s a priori has no relation to this question. Kant is so little an adherent of the inborn or otherwise original nature of space, that rather the gradual acquisition of this presentation in conformity with the principles of present day empiricists is in complete accord with his presuppositions. One appeals to the famous passage in Kant’s response to [492] Eberhard: “The critique admits absolutely no implanted or innate representations. One and all, whether they belong to intuition or to concepts of the understanding, it considers them as acquired.”^{xxxvii} The a priori has only an epistemological (transcendental) meaning; it is supposed

to make comprehensible the possibility of a scientific geometry, in general an objective, i.e., general and necessarily valid combination of presentations (science). It does not matter to Kant how space, time, causality are *developed* in us, but rather what they *provide* or mean for scientific use. Only this a priori stirs the interest of the criticist. Hence he doesn't care at all whether or not they are innate.²¹

At this point, I must firstly repeat that although the position may have only very little psychological interest for the author, it can nonetheless not escape psychological examination. One will always have to ask how the conception of the presentation of space which alone seems serviceable to criticism is compatible with psychological research.

Now, one cannot take Kant to hold that he allows space to be present in consciousness prior to sensory perception, although this should be possible, given what we have heard from him about the separability of quality from extension. But he says explicitly that all our cognition begins with experience (here as much as perception).

On the other hand, it seems also not to be in conformity with his opinion, if one counts him as an empiricist in the contemporary sense, or even takes his opinion to be compatible with the empiricist view.²² The acquisition of all presentations, of which he talks in the quoted passage, is, as can be inferred from context, not an acquisition of the kind which the empiricist assumes with respect to the presentation of space, but rather an "original acquisition": the forms, for which previously only the possibility was given (inborn), become real in consciousness, prompted by sensory impressions. But that space is gradually [493] composed or created from different sensory impressions in consciousness, that originally only qualities without any spatial extension and arrangement are

²¹ Compare Cohen, *loc. cit.* p.225, *passim*.

²² Cohen [1885] p.203. Riehl, [1876] *Criticism*, p.7, 373 footnote.

given in consciousness, directly contradicts the Kantian presuppositions according to which space and time are the forms of all sensory impressions.

Kant explicitly declares the attempt of an “empirical deduction, which shows how a concept is acquired through experience and reflection on it”, to be *utterly in vain* with respect to space and time as well as for the categories (Kehrb. p. 104).^{xxxviii} One can only find the occasional cause of its production, “where the impressions of the senses provide the first occasion for opening the entire power of cognition to them”.^{xxxix} But the contemporary empiricist-psychological theory of space does not want to find the occasional cause, but rather the elements of the presentation of space in the sensory impressions.

Certainly, Kant has made – and wanted to make – some assertion about the psychological origin of forms of intuition and thought with the “a priori”: not merely an assertion about their meaning for cognition. He wants to say, and says often enough, that they, as a priori concepts, are not analysable and not given through the senses as contents of sensations.²³ This negation of analysability is also a psychological assertion; and it is so little obvious that most proponents of psychology and physiology take it to be erroneous with respect to space, while the others (nativists) take the other part of the theory to be erroneous, namely, that the presentation of space is not given through the senses. In all cases we have here a new confirmation of how necessary more precise psychological discoveries are for epistemology. It is simply not possible to avoid the ground of psychology, even though one’s interest may be exclusively aimed at the heights of the critique of knowledge. The neglect of psychology is not, as it is often presented, an incidental and irrelevant peculiarity, but a fundamental defect of Kantian philosophising.

²³ Similarly, Cohen talks in this sense explicitly of ‘elements of consciousness which are unavailable for psychological analysis, which means that they are to be acknowledged a priori’.
p. 74.

[494]

IV. The concept of natural necessity

One step further back in the analysis of the foundations of criticism leads us to the real, final root of it, the concept and the demand of a strict and factual [sachlichen] (objective) necessity, in contrast to the principle of habit to which Hume subjected all our experience, even the scientific. Habits of ideas and thought, Kant rightly teaches, are not factual necessity. Only if the objects of experience themselves have their source in the understanding, he adds, can one save such a factual necessity and with it scientific empirical knowledge from scepticism. The understanding must create the lawfulness of things through its own immanent lawfulness. Connected with this is already the concept of the synthetic a priori judgment, with which Kant's account (not the historical development of his thoughts) begins, followed by the distinction between form and matter and everything else.

It is not merely the concept of causality which is important in this connection, but the more general one of natural necessity, since there are also laws other than causal ones (laws of so-called co-existence), which one can hardly reduce to causal laws.

The psychological question concerns the origin of the concept of natural necessity. It is likely that one will have to assume that it is an abstraction from the domain of judgment, just as the concepts of truth, probability, and similar predicates are. If we want to demonstrate the concept of necessity to someone *ad oculos* [visually], as one would say, we ask him to envision the law of identity, or the proposition that the whole is more than its part, or similar judgments. We call these judgments in such cases necessary, not as mental processes, but only with respect to that which is asserted in them, for example, the being greater of the whole and so on. We don't say (also it is not denied) that

such *processes* of judgment have to occur necessarily under the obtaining psychological conditions, but rather that such *matter*, irrespective of by whom, when and under which conditions it may be judged, cannot with respect to *its own inner nature* be judged differently. Necessity is therefore [495] primarily a property of certain judgment contents, namely, the so-called necessary truths, and the abstract concept of necessity arises through reflection on these judgment contents. It is not abstracted from the external world, nor from the mental states as such, nor finally is it an “a priori form” that is added to the matter, but rather it is immanent to certain contents, and is to be separated from them in no other way than through conceptual abstraction.²⁴

²⁴ We can leave the question open whether only analytic or also synthetic propositions are the source of the concept; also, whether necessity is a positive or a negative concept (impossibility of the opposite), in which latter case it would also have a positive part from which the above would be said; finally, whether one should count abstractions of the described kind as “psychological” or as “inner” perception in the usual sense or rather whether one would not in fact have to differentiate the perception of the states of things as such from the perception of content, and indeed as judged, willed, etc. Through the distinction and acknowledgement of this direction of perception we avoid many a misunderstanding with respect to psychologism, as well as on the part of it. We also gain a better historical understanding. If one considers the example of “innate ideas” in Descartes and Leibniz, by which nothing other was meant than that they are given through inner perception, then one finds these classes confused (Desc. Med. III: res, veritas, cogitatio. Leibniz Erdm. P. 228: être, substance, un, même, cause, perception, raisonnement). Kant was not wrong when he found the ideas of being, identity, and so on, not to be derivable from psychological perception in the same sense as that of understanding, reason, and will. But he was wrong to stamp them as a priori forms.

Some will object: the necessary truths are not the basis for the concept of necessity, but the other way round: this concept has already to be present in order to make necessary judgments.

This would be a misunderstanding. Of course, if the epistemologist distinguishes judgments into necessary and non-necessary ones, and develops a theory of both, he must already have the concept of necessity and that of judgment. But in order to *make* a necessary judgment, one does not need this. One knows that an apple is an apple without having before or at that time the concept of necessity as such. It indeed only arises through reflection on such judgments as are already present in consciousness.^{25xl}

We form the concept of natural necessity from the concept of necessity of thought in the sense just mentioned. And here begins the specific task of epistemology. It shows what can be [496] made from this concept and what motivates and justifies us in this artificial construction.

In the sentence: “A body must fall in empty space”, the “must” is surely not to be understood merely in the sense: “We are accustomed to seeing bodies falling in empty space”. It also does not mean a mere matter of fact, as stated in the sentence: “Mont Blanc is 4810 metres high”. If we take this fact as a consequence of forces which work according to natural laws, it is not deducible from these general laws alone but only in combination with earlier and again merely factual “collocations”. And hence one cannot eliminate this difference.^{26xli}

²⁵ This goes analogously for the concept of existence. Compare Brentano, [1874] *Psychologie* I, 279. Marty [1884], *Viertelj. Sch. F. wissensch. Philos.* VIII. 171f. Hillebrand [1891], *The new theory of categorial inferences*, p.27f.

²⁶ I can just as little agree with Sigwart [1873] (*Logik* I² 236) and Volkelt [1886] (*Experience and Thought* p. 142), who explain each cognition as necessary without distinction, as with those that explain everything to be merely factual. That we have a determinate judgment of fact is indeed

If we have no original concept of necessity other than the logical one, it will also play a role here in some way or other. And since we don't perceive such a necessity in the appearances themselves – in this Hume was certainly as right as he was wrong in the positive part of his theory – it must lie in something besides the appearances, in “real things”. In speaking of natural laws, we presuppose that the behaviour of the things for which they hold is logically necessary [denknotwendig] for an understanding that is able to grasp their innermost essence, in the same way as $2 \times 2 = 4$. Physical necessity is a logical necessity that we *assume* without *perceiving* it. This is not to say something new, but something that has been agreed upon in German philosophy since Leibniz, its great progenitor, if not in this version, at least in its tendency. The differences mainly relate to the question whether this merely assumed necessity [497] can ever turn into a perceived necessity, as Leibniz has taught, and, in the most extreme way, later German Idealism. Of course, there is a tremendous chasm between idealism and realism. But we should not overlook the commonalities which connect them and contrast them with positivism, which aims to reinterpret the lawful as the merely factual.

We make the assumption of something besides appearances, just as many other particular assumptions, in order to subordinate the course of appearances to the Deduction. It is confirmed step by step through success, and it needs no other confirmation. Almost all remaining presuppositions are at bottom only parts of this one and each confirmation only a part of the

equally psychologically necessary as in another case our asserting a law. But the necessity of asserting is not under consideration here, as Sigwart distinguishes it from objective truth (p. 251), rather we are concerned with the necessity of the asserted content (state of affairs). In the asserted truth, there is a difference between what is asserted merely to be fact and what is asserted to be a law, and a fact will never turn into a law, nor a law into a fact.

immeasurable confirmation, which this receives through the continuing development of our knowledge of nature and our life which is based upon it. Also the general regularity of the course of nature, according to which the same must always happen under the same circumstances, is included in this great presupposition (because not things in general, but rather only lawfully-connected things, are assumed) and does not need any other – e.g. a priori – support.

This regularity is not contained in the appearances themselves. If we turn our head to the side and then turn it back to the starting position, we have the same muscle feeling again, the same content of consciousness in all other respects, and yet the visual appearance can now be a different one. All the innumerable exceptions of this kind only disappear through the auxiliary assumption [Hilfsvorstellung] of an external world, in the above sense.

It is not true that natural science deals only with appearances. There is not a single law of nature that can be expressed as a law of mere appearances, if we take this word in the strict (subjective) sense. There is no causality among appearances.²⁷

Indeed, Kant himself has – as he once himself affirmed – never thought of restricting our knowledge to mere appearances in the [498] proper sense.^{28xlii} Not only does he constantly define sensation as an effect of external objects, but he also allows empirical bodies in space to exist even if they don't appear at present; indeed the being of such a spatial external world is absolutely certain for him, because the concept of inner perception already includes this truth within it;²⁹ in this point

²⁷ As per Lipps in his review of Riehl's "Criticism", Goetting. Ge. Anzeigen 1888, no.24, p.911f.

²⁸ See Zeller's [1875] *History of German Philosophy*, 2nd edition, p.351f., B. Erdmann, [1878] *Kant's Prolegomena*, p.45-66, [1878] *Kant's Criticism*, p.45.

²⁹ The "Refutation of Idealism" in the second edition of the *Critique of Pure Reason* amounts to a kind of ontological proof of the external world; Kant also spoke in this sense often enough in the

therefore he goes beyond what can be justified if scientific and not naïve consciousness is under consideration.

Kant spoke, as many still do today who restrict our knowledge [Wissen] to appearances, of appearances in a dual sense without clearly distinguishing this. He called also that which remains of the rose if I don't look at it, indeed don't even think of it, appearance. More precisely, there remain only the conditions in virtue of which if I look again the same visual sensation arises again. Only in this sense could Kant speak of laws of appearances and of the causal connection between them.³⁰

But since space and time, in which these objective appearances are also supposed to take place, can only be, according to Kant, forms of intuition of a consciousness, and since in general appearances which don't appear to anyone would be a wondrous concept, more recent exegetes [499] move them into a super-individual consciousness, a generic human reason. In this, according to Kant, they say, the rose continues to be spatially and temporally intuited, even when it is not seen by any eye. They

first edition. See on this Vaihinger's essay "On Kant's Refutation of Idealism" in the "Strasbourg Treatise on Philosophy", 1884; also the presentation of R. Falckenberg in his *History of Recent Philosophy*, [1886] p.268f. Of course, one can find here, as almost everywhere, also opposed statements, for instance, Kehrb. p.312, 1st Edition.

³⁰ Latterly (1888), in the posthumously published "Transition from the Metaphysical Foundations of Natural Science to Physics", Kant repeatedly distinguished direct and indirect appearances, and also appearances of first and second rank, the latter again as appearances of the former. He wants by this only to oppose the single sensible data of appearance and those appearance complexes which are generated by the application of the categories (empirical objects), or also the sensible appearances of inner sense "because the subject is for itself an object of empirical cognition". See no. 150 (where if one puts a full stop after "direct" and puts the following "appearances" into brackets, the passage should become intelligible). 160, 194, 201, 203, 209^h.

say it is it [the rose] that contains the final ground of the possibility of a lawful connection of individual appearances.³¹

It is indeed the question whether Kant would wholly agree with this exegesis, reminiscent of Fichte, of what he in fact repeatedly calls “consciousness in general”. But at least this much can be gathered from the above, that there is no lack of traces in Kant of the concept of objective necessity as we try to formulate it, as well as the included concepts of objective things and a possible consciousness for which the connection, which is imperceptible in but deducible from appearances, would be a true logical necessity. We would not call such an auxiliary concept a generic reason or a super-individual consciousness, but as long as we are only concerned with the marks that are contained in the concept of a law of nature, we are satisfied with the less-demanding formulation above.

We can also underwrite that the understanding puts necessity into things [hineintragen], insofar as we *hypothetically* put the concept derived through inner perception into the things which are themselves hypothetical, in order to take it as confirmed out of them again (if I may put it this way).

But the point, in which one must agree with Kant completely and without reservation, is his retaining of the concept of necessity in the strictest sense of the word. Hume’s elimination of this provoked him to enter a fight, and was the starting point of his critical undertakings. If we consider that, even in our times, a thinker such as J. St. Mill, highly-esteemed in every respect, believed that he could ground the law of contradiction on a gradual collection of observations, we cannot give Kant high enough credit [500] for marshalling all his intellectual power to the attempt to save the thought, maintained throughout German philosophy, of a true necessity, not merely in the laws of

³¹ Windelband, *History of Recent Philosophy*, [1878] vol.2, p.75f. Falckenberg, op. cit. 269.

Vaihinger says (op. cit.) only that one is pushed to this thought.

thought, but also in the laws of nature. In this lies his true historical merit in the theoretical realm. Its correlate in the practical realm is the retaining of the strict “You shall!” in opposition to the heteronomous pseudo-morality that we see to be prevalent today in a different form.

In contrast, in light of the considerations of this section we can take the tendency to reject psychological investigations as the starting point and basis of epistemology again only to be a misfortune; and the complete failure of “idealist” philosophy, which followed him in this point, is historical confirmation of this.

V. Division and unification of investigations

“It is not an expansion but a contamination [*Verunreinigung*] of the sciences when their boundaries are allowed to run over into one another.”^{xliii} This famous saying of Kant’s is the basis of the emphatic resistance, as a methodological rule, of the criticists against the inclusion of psychological investigations.

Scientific methodology demands us to isolate the *questions* as far as possible. *Divide et impera!* One unties the bundle of sticks in order to break it. But it is otherwise with the division of the *sciences*. If Kant meant, or could have meant – let us leave questions of interpretation aside here – that the bounty of knowledge, which one science gains, is to remain unfruitful for the others, or even just that there are no boundary questions for whose investigation several sciences would have to collaborate, then in a time where psychologists and physiologists, logicians and mathematicians, pedagogues and physicians, economists and politicians, linguistic scientists and natural scientists, and so many other so far separately marching corps, come together to a united attack, one would have to decisively object to him. A science is indeed only a complex of questions, and we will not divide up the questions individually, [501] in order then to join them together en masse; each

science retains its own kernel of tasks, which does not coalesce with others, but by contrast divides further and creates new special sciences. But what holds for the formulation of the questions, does not similarly hold for their treatment and execution. In order to treat a question fruitfully, one must draw on everything that can be exploited without violation of the general logical prescriptions, especially circularity.

In my opinion, one cannot seriously dispute this point of view; one can only misunderstand it.

If we are to contrast the distinctive tasks of psychology and epistemology, we have only to extend some of the considerations already made.

The investigation of the origin of *concepts*, of absolute as well as of relative content, is an old task of psychology. If it is correct that a concept is not thinkable on its own, but rather can only be grasped by abstracting it from within a concrete presentation, as if embedded within it, or with a perhaps more marked picture, as if stereoscopically prominent, then this task coincides with the determination of each concrete presentation and the most precise characterisation of the moments or modes of variation of this presentation, which enable the abstraction of the corresponding concept. We already mentioned that much remains to be done here.

The discovery of the most general immediately evident *truths*, in contrast, is the concern of epistemology. A concept is not a judgment, not a cognition. If a concept were in some way or other innate, nothing would follow about the judgments in which it can be used. Let us assume that all concepts contained in a judgment are psychologically a priori, even in the sense that they are present to consciousness before all perception: then it could still happen that only perceptions, experiences [Erfahrungen], prompted and entitled us to certain combinations of these concepts and to the acknowledgement of them in judgments. And, the other way around, a concept can be

extracted from perception, as e.g. that of red, of [501] colour in general, of square and figure, while the judgment: “Red is red” or “Red is not a figure” is undoubtedly a priori. For we do not need a particular perception, or even an accumulation of perceptions, in order to assure ourselves of the truth of such a sentence; we only need them in order to acquire the concept, from which then the sentence flows without any addition.

The same goes for space and time. The question pertaining to the nature of geometrical axioms (whether they are analytic, synthetic a priori or merely empirical sentences) is quite different to the question of the psychological origin of the presentation of space (whether it is already originally given in the content of visual sensation, or is a product of individual mental development). But these two questions have been conflated here and elsewhere for a long time, and this to the detriment of psychology as well as epistemology. One has separated the sciences and conflated the questions, instead of proceeding the other way around.

The discovery of the most general immediate evident cognitions, and their characteristics, are, like that of the origin of concepts, problems which will not be satisfactorily solved for a long time. Kant has included in the list of so-called synthetic principles much of the following: what may well count as an empirical proposition, although cemented with the most general guarantees of security (such as the law of causality and reciprocity), other propositions which first of all need interpretation (such as the principle of substantiality, which depends upon the conception of substance), others whose truth can seriously be doubted (as, for example, Hering^{xliv} doubted the proposition that all sensations have a degree with respect to colours and would have rightly protested against someone who wanted to discount the question with an a priori “it must be so”). Kant’s general Axiom of Intuition: “All intuitions are extensive magnitudes” has, so far as I can see, not in the least contributed to the solution of the big questions about the nature of geometrical principles. But even if we disregard the particular propositions, the concept of synthetic principles in general is found to

be in need of revision by all independent, more recent epistemologists, insofar as they retain it.

[503]

Let us assume that the task above has been completed; that the most general immediately evident cognitions are completely enumerated, exactly formulated and classified, and separated from the merely purported principles. Then, as it seems to me, nothing would be left for epistemology to do with respect to the foundations of cognition. I cannot make epistemological sense of the question of the “*conditions of possibility*” of such immediate truths. Every further inquiry could only extend to the *psychological* conditions under which judgments of this kind occur in consciousness. The relevant presentations need to be there, the capacity to abstract general concepts must be present, attention has to have the required intention and intensity, and so on. But even so careful a description of all the elements of the psychological mechanism will not make evidence more evident, the immediate cognition more immediate, and nor will it give us an insight into how and why just these [elements] and no others are possible as the foundation of our thinking. Either one provides premises as the logical grounds of the content of the judgment – in which case these cognitions would not really be immediate – or one provides psychological conditions of the process of judgment, in which case one has left the field of epistemology and has, in the most proper sense, crossed over to a *ἄλλο γένος* [another genus] of investigations. There is no third.

While the nature of things bars epistemology from digging deeper, it opens up a rich seam of problems on the same and a higher level. It raises the question how the elements of our presentations unearthed by psychological analysis can be used for the thinking construction of the world, and especially for the “external world”. Epistemology has to clarify the most general means and ways of cognising as well as the most general starting points.

The external world is, scientifically speaking, an hypothesis, made in order to calculate the

succession of appearances. In order to form this hypothesis, we have no presentations and concepts other than those which we can extract from the appearances themselves, including in addition the appearances of inner perception. [504] One part of these is useful; another is not. If it should turn out that those do not suffice, then the world would be to that extent incalculable and be beyond any subsumption under laws. Among the absolute contents that are provided for us in appearances, one has found the so-called sensory qualities unserviceable for such a construction, but the presentations of space and time, e.g. the local and temporal moment of appearances, serviceable to a high degree. They owe their privilege to the fact that one can calculate with them to a much higher extent (as already mentioned, the qualities are also not completely inaccessible for calculation) and that the calculated consequences, which can be drawn from the assumption of objective spatiotemporal processes, apply again in new appearances. From the outset they do not have more claim to objective validity than sensory qualities.³²

On closer inspection, space and time, in *the* guise in which they are given to us, are also *not* usable; they only became usable through many transformations or abstractions. Space and time, as we present them, have a centre: we cannot present a time other than going backwards or forwards from the present to which everything is related. Something analogous holds for the presentation of places. The physical concept of space and time does not include such a centre. Furthermore, presented space has either only two dimensions, or the third is only rudimentary, embryonic. We are not able to present the thickness of a body in the same way as its breadth and length; we cannot see through

³² The opposite opinion can be traced back historically to Descartes. In virtue of the mathematics and the mathematical physics based on them, he labeled space and time as “completely clear and distinct”, completely objective, in contrast to qualities, which he labeled as “obscure” and therefore merely subjective presentations. The reasons adduced for this obscurity (that we, for instance, cannot always locate pain precisely) were indeed weak enough; in itself a colour or sound or pain sensation is certainly not more confused than the presentation of a triangle.

and through a body, we cannot present this through and through in imagination (only Hering takes the latter to be possible). The space of the geometer and physicist has [505] in general in every point and in every direction the same properties; the space of sensation does not. Up and down, right and left, are to a certain extent qualitative differences for sensation. A square that first stands upright and is then turned 45 degrees such that it comes to rest on one of its corners is completely differently sensed and only recognised again through the mediation of inferences.^{33xlv} It is indeed false that space (and equally time) as we present it is everywhere congruent with itself, that one can think of each part as transposed into a different section.³⁴ We cannot think of a *subjective* place transplanted, just as we cannot think of a deep tone transposed into a high octave.

Hence there are a number of peculiarities of the space of sensation, which must be disregarded in the hypothesis of objective space, although they cannot be purged from the intuitive presentation.

For, from the outset, nothing speaks against the assumption of a fourth dimension of space. The sole question is whether we need it. Indeed, it is easy to see that one can take to be objectively valid only the abstract relations which are expressed in the formulae of analytic geometry and completely

³³ Mach, *The Analysis of Sensations*, [1886] p.44f. Mach's remarks on the difference between optical and geometrical similarity, on the impression of symmetry, and so on, are interesting and informative to a high degree, even though I don't want unconditionally to accept them. He also points out that the influence of the space of sensation occasionally can be felt in geometry against its intentions, as one distinguishes concave and convex curvature, where the geometer should only know the deviation from the mean of the ordinates.

Kant already emphasized the non-interchangeability of left and right. The subjectivity of the space of sensation follows from this indeed; but it does not follow that space has to be separated from the matter of sensation as an a priori form.

³⁴ As Wundt, *System of Philosophy*, [1889] p.119, and many others, assert.

disregard the absolute content, the intuitive, in our presentation of space. The space of the physicist is, as follows from the above, already only to be thought of through essential abstractions of the space of sensation. From this standpoint there is no objection at all to using four or more variables in these formulae instead of three. By this I don't want to say that we would have even [506] the shadow of a substantive ground for the fourth dimension and not rather the strongest proofs for three. But it is epistemologically useful to envision this possibility as such, because it shows most distinctly to what extent we are able to transform our presentations as regards making them more abstract, *if* the need arises.

What goes for absolute contents, goes also for relative ones, the concepts of relation. If we must agree that the objective validity of absolute contents can only be empirically grounded, then there is no reason to deduce the objective validity of the relative ones from an entirely different source. We neither have nor need a justification other than success. All application is first a trial, and the vast, inestimable trust which we give to the concept of causality and others with respect to their objective validity is sufficiently justified by their indispensability in each new step on the way to knowledge. When considering the concept of necessity, we have seen that transformations, as regards abstractions of higher order from the immediately given presentations, are required. And likewise for the concept of causality. I suspect that some Kantianising natural scientists take this to be the core of the Kantian project: to precisely and completely designate the most general and simple concepts of relation and the propositions relating to them, without which an explanation of nature would be factually impossible; this by no means makes a claim for their validity independently of every application, independently of trial, of their usability and feasibility.^{35xlv}

³⁵ Helmholtz says with respect to the law of causation, which he calls an a priori given transcendental law: "Here there is only one thing to advise: Trust and act!" (*The Facts of Perception*, [1878] p.41f.) The reverse order would seem to me in this case more apt: "Act and trust!" Or in one word, "Try!"

Psychology has a thoroughly different task [507] with respect to our belief in the external world and our presentations of its properties. It does not have to *justify* scientific assumptions in this respect, but it has to explain the general immediate belief in the external world, *regardless of whether it is true or false*; and namely the belief in the external world as it appears, coloured, sounding and whooshing, smelling and tasting, only minus the corrections which the ordinary consciousness, educated through numerous sensory illusions, makes. If the origins of scientific cognition play a role here, as in the previous connection, psychology takes them merely to be forces amongst others.

One has to note that *the* external world that is under consideration here does not coincide merely in particular properties but in its complete concept with the external world that is of concern for the metaphysician and the philosophising natural scientist. For ordinary consciousness, the boundary between I and the external world is simply the boundary between one's own and foreign bodies. In contrast, since Descartes, the metaphysician has understood by I that which is given with immediate scientific certainty (evidence), and this epistemological I is consciousness and the phenomena contained within it, while from this standpoint the so-called own body belongs to the external world just like the so-called foreign body. Psychology has only to show (and it measures up to this task) what the "reality" of the sensed means for ordinary consciousness and a boundary that is not originally there comes to be drawn in reality between "one's own" and "foreign".^{36xlvii}

In his polemical paper in the "Strasbourgian Philosophical Treatise" (1884), F. Laas came to the same view when he tried to give the so-called "critical method" and the concept of "conditions of a possible experience" a defensible sense.

³⁶ In his recently published "Contributions to the solution of the question of the origin of our belief in the reality of the external world and its justification" (Sitzungsberichte der Berliner Akademie, Phil-hist. Cl. 1890) Dilthey emphasizes against the "intellectualizing" interpretation of this belief the outstanding significance of volitional processes and the "experience of volition". He also

[508]

Therefore, in this way properly discerned complexes of tasks are distinguished for both sciences. But it is now even more important to return to the idea that a fruitful completion of these tasks is unthinkable without mutual, multiple support. The epistemologist cannot ignore the question of the origin of concepts, he must delve into the depths and difficulties of this problem as an expert; and the psychologist in turn has to be an epistemologist, not merely because cognitions are a special class of judgment phenomena that should be described as any psychological phenomenon should be described, but mainly because he, like anyone for whom science is more than a trade, has to have clarity about the foundations of his knowledge. But in this connection proper boundary issues arise, as one can see for instance with respect to the concept of inner perception, which one can ascribe to both of these sciences with equally good reason, irrespective of the difference in their tasks otherwise. There is little point in debating to whom such an area of research belongs more; the main point is that both should take it on.

aims by this to go beyond the assumption that the reality of the external world has only the value of a hypothesis. He finds the difference between the philosophical justification and the psychological formation of the belief in the fact that the former represents analytically that which is given in the living experience, and then, by means of the components which are found in this experience, increases its horizon. I want to see the difference not merely in the method but mainly in the object itself. The external world in the epistemological, indeed scientific, sense, seems to me to be nothing more than an hypothesis, which therefore can and may only be supported through intellectual, that is, scientific operations. In contrast, in order to explain the psychological external world – if I may use that expression – one has to use the full apparatus of mental powers and amongst them, certainly to a paramount extent, the volitional acts, insofar as the distinction between one's own and foreign bodies is in large part based upon them. In this connection the pathological states that Dilthey extensively utilizes will be informative.

May then psychologism as well as criticism disappear from the agenda, and the abstract and unfruitful policy of standpoints, which particularly pertains to criticism, be replaced with collaboration that fits the nature of the individual problem.³⁷

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³⁷ We are grateful to the anonymous referees for comments and suggestions.

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ⁱ Stumpf 1892

ⁱⁱ Page numbers of Stumpf's German text are given in square brackets.

ⁱⁱⁱ Eduard Zeller (1814-1908): influential historian of (Greek) philosophy and a central figure in the Neo-Kantian movement.

^{iv} Zeller 1862

^v Johan Nikolaus Tetens (1736-1807): German-Danish philosopher who was one of the most important empiricist philosophers in Germany. Stumpf discusses Tetens's empiricist views of necessity and relations in an appendix to this essay. See note xxxiv.

^{vi} Wilhelm Windelband (1848-1915): German neo-Kantian philosopher.

^{vii} Johan Eduard Erdmann (1805-92): German historian of philosophy who coined the term 'psychologism' in his *Grundriss der Geschichte der Philosophie II*, Berlin: Hertz 1870.

^{viii} The German word 'Erkenntnis' and its cognates, e.g. 'erkennen', are notoriously difficult to translate into English. In this passage we have translated 'Kenntnis' and 'Erkenntnis' both as 'knowledge', but in the following paragraph we have translated 'erkennen' as 'recognise'. We have based our translations on the most appropriate English word, given the surrounding context, in recognition of the fact that there isn't really a clear and consistent translation available. The convention in the Kant literature to translate 'Erkenntnis' and cognates as 'cognition', 'cognising' etc. is one way to achieve consistency, but results in 'cognition' becoming a rather technical term, with which we are reluctant to saddle Stumpf.

^{ix} Alois Riehl (1844-124): Austrian neo-Kantian philosopher. His main work, *The Principles of the Critical Philosophy: Introduction to the Theory of Science and Metaphysics* (1876), influenced Logical Positivists such as Schlick.

^x Where Stumpf has given book and article titles in German, we have translated for the reader here. Full references, including both German and English titles, can be found in the bibliography.

^{xi} Hans Vaihinger (1852-1933): German philosopher influenced by Kant and Nietzsche. His *Philosophy of 'As If'* develops a theory of make-believe and applies it to philosophical problems.

^{xiii} A314/B370, CE: 396. We have added ellipses where Stumpf omits part of Kant's sentence. Translations of Kant's *Critique of Pure Reason* are taken from Kant, I. *Critique of Pure Reason*, translated and edited by P. Guyer and A. W. Wood, Cambridge University Press (1998), and references from that translation are given as CE (Cambridge Edition):xx, alongside A/B numbers. We have left Stumpf's own references to his Kehrbach edition untouched.

^{xiii} "The light of nature does not stipulate that the nature of an efficient cause requires that it be temporally prior to its effect. On the contrary, a thing does not bear the trademark of a cause except during the time it is producing an effect, and thus it is not prior to the effect." Descartes 2006, p.62.

^{xiv} A203/B248-9, CE: 312.

^{xv} This is a slight misquotation of Kant. We have therefore altered Guyer and Wood's translation slightly to reflect this. Stumpf writes: "und blos an ihr kann die Folge und das Zugleichsein der Zeit nach bestimmt werden", which we translate as: "and in it alone can the succession and simultaneity of time be determined". In the *Critique of Pure Reason*, Kant writes: "und bloß an ihr kann die Folge und das Zugleichsein der Erscheinungen der Zeit nach bestimmt werden" (A144/B183), which Guyer and Wood translate as "and in it alone can the succession and simultaneity of appearances be determined in regard to time." CE: 275.

^{xvi} Friedrich Albert Lange (1828-1875): Neo-Kantian social reformer and philosopher. His *Geschichte des Materialismus und Kritik seiner Bedeutung für die Gegenwart* (first edition 1866, second revised edition 1873 (first volume) and 1875 (second volume) is a highly influential work.

^{xvii} B168, CE: 265.

^{xviii} A122, CE:240.

^{xix} A122, CE: 240. Stumpf slightly alters Kant's text. We have altered the translation accordingly.

^{xx} Stumpf's square brackets.

^{xxi} Johannes Volkelt (1848-1930): German neo-Kantian philosopher.

^{xxii} A104, CE: 231.

^{xxiii} Hermann Cohen (1842-1918): German philosopher who founded the Marburg school of neo-Kantianism.

^{xxiv} Paul Natorp (1854-1924): German neo-Kantian philosopher and member of the Marburg school. In his work on psychology he formulated and used an early version of the thesis that consciousness is diaphanous.

^{xxv} Otto Liebman (1840-1912): German neo-Kantian philosopher. His best known work is the book *Kant and the Epigones* (1865).

^{xxvi} A20/B34, CE: 155-6.

^{xxvii} We couldn't find this exact quotation in our editions of Kant's *Critique*, although it appears to come from around A20/B34.

^{xxviii} Ernst Platner (1744-1818): German anthropologist and philosopher. His *Philosophische Aphorismen nebst einigen Anleitungen zur philosophischen Geschichte* (Vol I, 1776/Vol. II: 1782) are mined by many philosophers.

^{xxix} Johann Friedrich Herbart (1776-1841): German philosopher and psychologist. His *Psychologie als Wissenschaft, neu gegründet auf Erfahrung, Metaphysik, und Mathematik* (1824/5) is the reference point for German philosophers of mind and science in the 19th century.

^{xxx} Hermann Lotze (1817-1881): leading post-Hegelian philosopher. Lotze supervised Stumpf's PhD and habilitation. Stumpf's *The Psychological Origin of the Presentation of Space* (1872) responds critically to Lotze's theory of how the presentation of space is formed from mental representations that have no spatial content.

^{xxx}ⁱ Theodor Lipps (1851-1914): German psychologist and philosopher mainly known for his work on empathy and self-consciousness. He influenced the Munich school of phenomenology.

^{xxx}ⁱⁱ Harald Høffding [Höffding] (1843-1931): Danish philosopher and theologian.

^{xxx}ⁱⁱⁱ Johannes von Kries (1853-1928): German psychologist. His *On the Material Basis of the Phenomena of Consciousness* (Tübingen/Leipzig: Mohr) is an early attempt to refute reductive materialism.

^{xxx}^{iv} We have not included translations of Stumpf's appendices here. Both appendices are brief historical commentaries and the main essay can be read independently of them.

^{xxx}^v Hermann von Helmholtz (1821-94): German physician and physicist; one of the leading lights of the 'back to Kant' movement. Wilhelm Wundt (1832-1920): German philosopher and psychologist. His *Grundzüge der physiologischen Psychologie* (1874) is one of the founding documents of empirical psychology.

^{xxx}^{vi} See note xxxiv

^{xxx}^{vii} Academy edition, 8: 221. Kant, I. *Theoretical Philosophy after 1781*, edited by H. Allison and P. Heath, translated by G. Hatfield, M. Friedman, H. Allison and P. Heath, Cambridge University Press (2004), p. 312.

^{xxx}^{viii} A85/B117, CE:220.

^{xxx}^{ix} A86/B118, CE:220-221.

^{xl} Anton Marty (1847-1914): Swiss 'Brentanian' philosopher who developed a Brentano-inspired theory of linguistic meaning. Franz Hillebrand (1863-1926): Austrian philosopher and founder of the Psychological Institute in Innsbruck. He published in 1891 *New Theories of Categorical Inference* in which he developed Brentano's reform of syllogistic logic.

^{xli} Christoph von Sigwart (1830-1904): German philosopher and logician. His *Logik* (1873) is an important contribution to the development of logic in the 19th century.

^{xlii} Benno Erdmann (1851-1921): German neo-Kantian philosopher who was criticized by Husserl and Frege for his logical psychologism.

^{xliii} Bviii, CE:106. Guyer and Wood translate “Vermehrung” as “improvement”; we have altered this to “expansion”. “Vermehrung” has the connotation of growth or increase – literally, *more of something* – rather than the more normative connotation of improvement. Stumpf misquotes Kant, using “Verunreinigung” in place of “Verunstaltung”. Guyer and Wood translate the latter as “deformation”. We have accordingly altered their translation, putting “contamination” for “Verunreinigung”, in order to more accurately capture Stumpf’s own (admittedly mistaken) presentation.

^{xliv} Ewald Hering (1834-1918): German physiologist and first rector of Charles University in Prague. One of the pioneers of the theory of memory and perception.

^{xlv} Ernst Mach (1838-1916): Physicist and philosopher. His *The Analysis of Sensations* (1886) is one of the main works of early Positivism. He influenced the Vienna Circle, William James and Einstein.

^{xlvi} Ernst Laas (1837-1885): early German positivist.

^{xlvii} Wilhelm Dilthey (1833-1911): German philosopher best known for arguing for a fundamental difference between human and natural sciences (Geistes- versus Naturwissenschaft).