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On the Relation Between Psychological and Physical Concepts *

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I

Recent philosophy has not been lacking in attempts to free the Cartesian problem of the relation between mind and body from its metaphysical obscurities, by refusing to pose it in terms of mental and physical substances; beginning, instead, with the harmless question as to how, in general, we have come by our physical and psychological concepts. That this is actually the correct way to approach the solution of the problem, I have no doubt. Indeed, I am convinced that the problem will already be solved the moment we become completely clear as to the rules in accordance with which we employ the words "mental" and "physical." For we shall then grasp the proper meaning of all physical and psychological propositions, and in doing so will know in what relation the propositions of physics stand to those of psychology.

When Descartes sought to define his "corporeal substance" by specifying the attribute "*extensio*" as its characteristic mark, he took the first step in a direction which must be followed to the end before one can hope to form a clear idea of the properties which belong to all "physical" concepts, and to these alone. "*Extensio*" refers, of course, to *spatial extension*; and it is indeed possible confidently to assert that an analysis of the concept of spatial extension yields without further ado a definition of the concept "physical."

The problem, however, is by no means so simple that it suffices to say "whatever is spatially extended is physical," for there are words which make sense when combined with the predicate "spatially extended," and which nevertheless refer to "mental" states; such words, for example, as "visual image," "tactual sensation," "pain," etc. Consequently, the difference we are seeking can be found along the above lines only if the word "extended" has different meanings in its psychological and physical usages.

Is this the case? Do I have the same thing in mind, or something different, when I say of a pain that it spreads over a certain area, as compared to when I ascribe a certain spatial extensity to a physical object, for ex-

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ample my hand? Is the visual image of the moon "extended" in the same sense as the moon itself? Do my visual impressions on looking at a book have extension in the same sense as the tactual impressions I obtain by holding it in my hand?

The answering of these questions is the first step in the process of clarifying our concepts, nay the second,—for the first and more difficult step is to ask these questions at all. This step was not taken by Descartes nor by those who follow him,—the possibility not even occurring to them that the word "*extensio*" is used in more than one sense. It would therefore not be correct to describe their use of this word by saying that they took it to have the *same* meaning in significantly different cases. They didn't even see that there were different cases. Berkeley alone was a famous exception. He posed the third of our three questions. The first two couldn't be raised in his system, since a by no means inconsiderable part of his philosophy consisted exactly in a proof that these questions do not exist. For him there is no other kind of extension than that which can be attributed to the representations of sight and touch; indeed, in Berkeley's philosophy it is already a mistake to speak of these as "representations," since there is nothing which is copied by them and is their original. Kant, who philosophized so much later than Berkeley, believed he had nothing to learn from him, and didn't succeed in raising our questions. He invariably speaks, as did Descartes before him, of extension, of Space, and omits any investigation as to whether it may not be necessary to distinguish between several space-concepts; first, between the physical and the psychological, and under the latter, between visual-space, tactual-space, etc. This neglect had unfortunate consequences for Kant's philosophy of geometry, and, through this, for his system as a whole. Physical space, the space of nature, is for him also psychological space, since nature is for him "mere appearance," that is, mere "idea," and this is a psychological term.

It is possible to regard Kant's distinction between "outer" and "inner" sense as an attempt to draw a boundary between the physical and the mental. His doctrine that Space, the form of intuition for outer sense, is lacking in the case of inner sense is indeed reminiscent of Descartes, as well as a forerunner of recent attempts to characterize the mental as simply the non-spatial. It is said that even where the mental has to do with the spatial (in ideas and perception), it is itself non-spatial. The idea of a red triangle is itself neither red nor triangular, nor is the perception of an extended object itself extended.

This assertion owes its appearance of plausibility to the fact that the words "perception" and "idea" are ambiguous. By them one can refer either to the content, that which is given (*une donnée actuelle*), or to the event, the act of perception, which is characterized as a "mental process" and concerning which there is indeed no question of "extension." (We

leave unraised the question as to the justifiability of this distinction between content and act, and limit ourselves to pointing out that surely it first occurred to us to speak of an act of perception—and, later, of imaging—only after we had gained the knowledge that the occurrence of “contents” is somehow dependent on processes in the sense organs, and, furthermore that these processes are physical.) One can certainly not say of the contents of perception—at least in the cases of sight and touch—that they are “non-spatial”; rather they are beyond doubt extended. Indeed it is from them that we first derive this concept.

Nevertheless, we do not mean the same by “extension” in psychological and physical contexts. In order to make the difference clear it is best to examine exactly those cases where it is most difficult to distinguish psychological from physical space. We asked above if, for example, a pain is extended in the same sense as is a physical object, say, my hand. But what about the case where the pains are in my hand itself, where my whole hand aches? Do we not have here a mental datum the spatial extension of which is identical with that of the physical object which is “my hand”?

The answer is, “absolutely not!” Pain has its own space just as visual sensations have theirs and as do sensations of touch. The fact that several sensations of pain can occur *simultaneously* is sufficient to require us to speak of a “pain-space.” Every arrangement of simultaneous items is a side-by-side (as opposed to a sequence) and it is customary to call such facts “spatial.” It is experience which first brings about the coördination of the several spaces of visual and tactual sensations, feelings of pain, etc.

This can be made to stand out most clearly by conceiving of a man who lives in complete darkness and complete absence of motion. He would be acquainted with neither visual nor tactual sensations, but he could very well have “pain throughout his hand” (even though he would not use these words). Should he be freed from his cell, he would slowly form the customary spatial notions and on the basis of the observation of certain coexistences and sequences of events would gradually learn to interpret these pains as pains of the “hand,” that is to say, of the five-fingered visual and tactual object which is connected with his body by another bodily structure, the “arm.” For he would observe that his pains depend in a definite way on what befalls a physical object which he calls “my hand,” which is visible in the visual field and touchable in the tactual field. Thus, a wounding or movement of this object would increase the pain, while other processes (medical treatment) would diminish them. In this way, the pain-space would be coördinated with the sight-space. Since experience alone teaches us that the several kinds of extension always appear together, the conclusion is to be drawn that there are several “spaces” rather than only one. If the world were otherwise than it actually is, if, for example, the person concerned always felt a pain when a certain object, for example the candlestick on the table, was violently disturbed, and, should the

candlestick move, perceived a sensation akin to the kinaesthetic sensation which normally accompanies the movement of his hand, such experience could lead him to coördinate the space of the "handache" with that of the candlestick (and if, for example, the candlestick had five branches, its extension would correspond to that of the five fingers). He could thus meaningfully say, "I have a pain in the candlestick." (Similar and as yet unpublished considerations have been advanced by Ludwig Wittgenstein in another connection.) Thus, it is possible to conceive of experiences which would result in the localization of the *same* handaches in quite different physical spaces. It follows that mental pain-space and physical space are entirely different things.

The difference is obvious in extreme cases. Let us compare, referring back to our second example, the extension of the moon with that of the visual image of the moon. The diameter of the moon, a physical magnitude, can be given in miles; the diameter of the visual image, on the other hand, is not even a "size." (Needless to say, the visual image must not be confused with the retinal image, which has physical magnitude, and, consequently, a diameter which can be specified in units of measure.) The extensity of the visual image is frequently assigned an angular measure. The latter is, indeed, a physical magnitude, but it does not make one of the visual image itself. Rather, such a method of assigning a measure can be justified only by means of a definitional coördination, which, however, is not practical for many purposes. Thus, if one compares the visual image of the moon at the zenith, with that of the moon at the horizon, the angle is the same in both cases; nevertheless, as is well known, we call the extent of the mental visual image of the moon greater in the second case than in the first. Whatever is meant by the "extension" or "size" of a mental image, it is in any case something quite different from the extension or size of a physical object.

II

In what, then, does the difference consist which is to lead us to a definition of the "physical"?

Here we shall use the method which seems to me the sole method of true philosophy: We shall turn our attention to the way in which propositions about physical objects are *verified*. That which is common to all the methods by which such propositions are verified, must then be that which is characteristic of the physical. All propositions are tested with respect to their truth or falsity by the performance of certain operations, and to give an account of the meaning of the propositions consists in specifying these operations. Of what sort, then, are these operations in the case of propositions in which physical terms appear? In other words, in what does the process of determining physical properties consist?

Physical properties are *measurable* properties. They are defined by the

methods of measurement. (Bridgman's book, *The Logic of Modern Physics*, carries this thought through for physics as a whole.) It will suffice if we limit our discussion of these methods to the *scientific* methods of physics. There are, of course, pre-scientific ways of noting the presence of physical properties which continue to play a dominating rôle in everyday life, but there is no difference in principle between the procedures of everyday life and those of research. Since, however, the methods of science stand out more clearly, we shall limit ourselves to these. In everyday life, also, physical concepts arise only where measurements of one kind or another have taken place (even if by the thoroughly crude methods of pacing, touch, visual estimation, etc.), that is, *quantitative* determinations have been achieved. Every measurement springs from a counting, and can in the last analysis always be traced to a numbering of "coincidences," where by a coincidence is to be understood the spatial coming together of two previously separated singularities of the visual or tactual fields (marks, pointers, etc.). This characteristic of measurement whereby spatial extension is, as it were, mastered by division into discrete parts has often been pointed out. It is this way of determining the spatial which is the *physical*.

Why exactly do we make use of this procedure?

The only correct answer is, because of its objectivity, that is, because of its inter-sensual and inter-subjective validity. What this means can be easily clarified by an example. If I move the tips of my index fingers toward one another, there occurs in the visual field an event which is called "meeting of the finger tips," and another event in the tactual field which I call "contact of the finger tips." These two events, each of which is a discrete and distinguishable element in its field, always occur simultaneously. This is a fundamental empirical relation between them. Every time that a coincidence occurs in the field of touch, one also occurs in the visual field (at least under favorable circumstances of an exactly specifiable sort, for example, illumination, position of the eyes, etc.). This relationship is independent of the particular sense in question; it is inter-sensual. We also learn from experience that it is inter-subjective. That is to say, all other people who are present affirm (again under given, readily specifiable circumstances) that the same number of homologous coincidences occur in their visual and tactual fields. Thus, not only the different several senses, but also the different subjects agree in their testimony concerning the occurrence of coincidences. The order of these coincidences is nothing other than physical space-order (properly, space-time-order); it is an *objective* order (for by this word we bring together the two ideas of inter-sensual and inter-subjective).

In general, objectivity obtains only for these physical propositions which are tested by means of coincidences, and not for propositions which are concerned with qualities of color or sound, feelings such as sadness

or joy, with memories and the like, in short, "psychological" propositions.

The meaning of all physical propositions thus consists in the fact that they formulate either coincidences or laws relating to coincidences; and these are spatio-temporal determinations. One may be tempted to say that this makes sense only if the coinciding items are specified, and that the propositions are incomplete without this addition. But closer examination shows that such specifications (which indeed must be made) refer us back to propositions concerning other coincidences. (Here we find the justification for the theses, elaborated particularly by A. S. Eddington, that physics as a whole is to be understood as geometry. "Geometry" in this connection clearly refers to an empirical science, rather than a purely formal mathematical discipline.) Even explication by means of ostensive gestures, which alone, in the last analysis, relates our concepts to the world, and makes them signs of objects in nature, is readily seen to consist in the bringing about of coincidences (for example, of a pointing finger with the object singled out). The fact that the spatial description of atomic processes does not occur in modern quantum theory does not alter the fact that all physical laws are verified by the occurrence of coincidences; for this holds also of the laws in which magnitudes relating to atoms appear. These magnitudes also have meaning only by their relation to physical space determinations.

According to what we have said above, the essential feature of physical concepts is that they are arrived at by selecting out of the infinite variety of events a special class, namely these "coincidences," and describing their inter-relationships with the help of numbers. Physical magnitudes are identical with the number-combinations which are thus arrived at. The question which we are seeking to answer (in principle) can therefore be put as follows: What is the relation of these coincidences to all other events, for example to the occurrence of a pain, to the change of a color, to a feeling of pleasure, to the emergence of a memory, and so forth?

III

It is usually claimed that the physicist simply and deliberately avoids reference to whatever is not a matter of space-time determinations. He ignores, it is said, the "qualitative" and limits himself to describing the quantitative relationships to be found in the world. This usually develops into the charge that physics is "one-sided"; that it plays a narrowly circumscribed rôle in our knowledge of reality; that it gives us only a fragment which must be supplemented, an empty space-time hull which must be filled with content. This content, it is urged, is the psychological. Psychology would therefore confront physics as an autonomous discipline. Indeed, we often hear the opinion that not even physics and psychology together exhaust the modes of describing the world, and that

there remains a place where metaphysics is privileged to lay down the law.

To the assertion of the one-sidedness and limitations of the methods of physics, there stands in sharp opposition the claim that an absolutely complete description of the world is possible by the use of physical methods; that every event in the world can be described in the language of physics, and therefore specifically, that every psychological proposition can be translated into an expression in which physical concepts alone occur. This claim—which is referred to (in somewhat inelegant terminology) as the thesis of “physicalism”—is correct, if the physical language is not only objective, which we have already seen, but is in addition the *only* objective language; or, more accurately, if translatability into the physical language is a necessary condition of objectivity. This seems indeed to be the case. All experience up to now points to the conclusion that only physical concepts and concepts which are reducible to physical concepts fulfill the requirement of objectivity, which is, of course, essential to a language, for without it the language could not serve as a means by which different subjects could arrive at an understanding.

I therefore hold the thesis of physicalism to be correct (compare my *Allgemeine Erkenntnislehre*, 2nd ed., p. 271), but—and this can hardly be overemphasized—it is correct only on the basis of specific *experiences*. The thesis is therefore a factual one, an empirical proposition, as is, say, the proposition that England is an island, or the assertion that conservation of energy obtains in nature. The thesis is therefore not a philosophical discovery. The philosopher as such is not interested in facts of experience as such, for each fact is only one of indefinitely many possible facts. Rather he is interested in the *possibility* of facts. Since, in my opinion, his task is that of determining the meaning of propositions, and since a proposition has meaning only when it formulates a *possible* state of affairs (whether or not the state of affairs actually exists is irrelevant), it is one and the same thing to say that the philosopher is concerned with the meaning of propositions, and to say that he deals with the possibility of facts.

That the world is exactly as it is, that matters stand exactly as experience shows they do, is—in a readily intelligible sense—a contingent fact; and it is in exactly the same sense a contingent fact that the physical language is an inter-subjective universal language. (Even one of the most ardent exponents of “physicalism,” Carnap, explains it as a stroke of good luck. Cf. *Erkenntnis* 2, p. 445.) As far as we are concerned, it follows directly from this that the word “physicalism” in no way designates a “philosophical movement.” This is an admonition to us to evaluate and make use of the facts which the term brings to mind no differently than any other empirical matter of fact; to treat them, namely, as a paradigm, as one possibility among others. It is exactly by picturing other possible states of affairs from which the one that is actually realized stands out as against a

background, that we shall first come to understand the latter correctly, and to grasp the rôle actually played by physical concepts, as well as their relation to psychological concepts.

IV

What, then, are the data of experience on which the objectivity and universality of the physical language rests? They consist in the fact that between the "coincidences" and all other events, there can be found systematic relationships such that to every difference in any of the other events, there corresponds a determinate difference in the coincidences so that, in principle, the world contains no variation nor constancy which does not go hand in hand with a variation or constancy in the domain of coincidences. If this is the case, then clearly the entire world of experience is uniquely determined by these coincidences; when these are known, so is it. It is from this that stems the universal character of the physical language. Two examples may suffice to illustrate. For the first we choose the relationship that exists between the psychological and the physical concepts of color. Physically, a color is defined by a frequency, a number of vibrations per second. This number, as is well known, is arrived at by the familiar procedure of counting the interference fringes of the light or measuring a spectrum, and from the resulting figures along with other measurements read off the apparatus, calculating the "frequency." That is to say, one observes the coincidence of a spectral line or of an interference fringe with certain marks on the measuring apparatus. Now experience shows that these coincidences always occur at the same places, and in accordance with the same general laws, whenever the light has visually the same color. For monochromatic light of an absolutely specific shade of red, I always get exactly the same frequency. Consequently, if I know that a source of light is emitting rays of this frequency, then I know what color I will see when it meets my eye. Thus, to designate the color, it is sufficient to give the frequency. Indeed, this physical designation is actually far more accurate than the corresponding color word (for example, "Bordeaux-red") used by the psychologist.

But is the correspondence of the frequency with the color as seen truly unambiguous? Do I always see the same color when I look at a source emitting the same frequency? Obviously not, for if my eye is tired, or has previously been affected by light of another color, or if my nervous system is under the influence of *santonin*, then I have different color impressions although objectively the radiation is the same. Doesn't experience refute the "thesis of physicalism"? No, for experience teaches that in all these cases in which, in spite of the identity of the frequency, I see a different color, *other* physical changes are detectable, namely those which concern the state of my organism, in particular my nervous system. The investigation of my nervous system, which is naturally a physical in-

investigation, making use of the method of coincidences, shows (as far as our experience goes) that every difference in color quality goes hand in hand with a difference in the optical segment of the nervous system.

But without concerning ourselves as to whether a physiological investigation of the nervous system will be carried to completion, or is even a technical possibility, we find other physically describable processes which can be used in place of neural events to achieve an unambiguous correspondence between sense-quality and coincidence system, namely the physical behavior of the individual—in particular the reactions (speech, writing, etc.) by which he reports on his sensations when he is asked about their qualities. It will be supposed that the reason these reactions are as satisfactory for the purpose as the above-mentioned neural processes is because they in their turn can be unambiguously correlated with these processes (by virtue of the causal connection between them). But this is irrelevant to our purpose. What concerns us is solely the fact that it is possible unambiguously to coordinate quality of sensation with coincidence systems.

Every change of color quality thus corresponds to a change in the system of coincidences; but this is a matter not of those coincidences alone which are involved in the measuring of the frequency of the light, but also of other coincidences, observable on the body of the perceiver, the belonging of which to the sum-total of coincidences is a matter of empirical fact. With the taking into account of all relevant coincidences, the coordination of physical concepts with the qualities becomes completely unambiguous, as "physicalism" asserts.

One cannot reproach the physicist with the intentional overlooking of all qualities, for it is just not true that he overlooks them. On the contrary, every difference is for him an occasion and a hint to search for a difference of coincidences. If, for example, I were to say that I see blue under circumstances in which one is expected to have a sensation of yellow (say, at the place of the sodium line of the spectrum), the physicist would not rest until he had "explained" this unexpected fact, that is, until he had discovered physical peculiarities in my body, in other words, abnormal measurements shown by certain coincidences, which appear in this case and in no other. The world of qualities is thus of highest importance for him. He in no way forgets it, but on the contrary only regards his quantitative system as a satisfactory description of nature if the manifold of the world of qualities is represented in it by a corresponding multiplicity of numbers.

For our second example, let us take the question as to how the mental datum which is a feeling of grief is expressed and communicated. A feeling of this kind is neither localized, nor do we ascribe it a spatial extent, and its structure is essentially different from that of a sense quality. To be sure, grief is for the most part evoked by external events, that is to say,

by events which occur outside the body of the griever, and which can be described in physical terms (for example, someone's death, or the news of a death). But the difference between this case and the preceding consists in the fact that no one believes that there exists a one-to-one correspondence between the quality of the feeling of grief and these external events. Rather, the dependence of the feeling on the state of the subject is so obvious that everybody looks to the body of the griever himself for the coincidences which are here principally in question. Once again we do not need to consider the events in the nervous system—which are for the most part unknown—for it is sufficient to pay attention to his expression, his utterances, his whole deportment. In these processes—which are describable in terms of coincidences—we have the facts by which feelings are expressible in the physical language.

Let it not be thought that the physicist must leave something out of his description, that there is something which he cannot formulate, which it remains, say, for the poet to express. For even the poet can only perceive someone's grief in terms of bodily behavior, and only in terms of bodily behavior can he make it intuitive for the listener. Indeed, the better a psychologist he is, the more he is a master of poetic language, the less he will make use of psychological terms to describe the grief. Instead he will attempt to achieve his purpose in an apparently indirect way by describing how the griever walks, his expression, how he holds his head, the weary movements of his hand, or by repeating his broken words,—occurrences, in short, which can also be described by the physicist, although he would make use of other symbols.

V

How exactly do we build our "psychological" concepts? Whereas the physical language gives formulation to events in their extensive spatial-temporal relationships, the psychologist brings them together from quite a different point of view, namely, in accordance with their "intensive similarity." Thus, each of a large number of different but resembling properties which occur in experience, is called by the common name "green", another manifold is called "yellow", and so on. Both of these manifolds exhibit such a resemblance to one another as well as to certain other qualities, that they are grouped under the common term "color". In addition, there are other elements which differ from these, but resemble each other and therefore receive a common name, as for example, "sound", "pleasure-feeling", "anger", "odor", "pain", "uncasiness", etc. Furthermore, there are families of events which are called "change of color," "intensification of sound," "decrease in brightness," "dying away of a feeling," "visual motion," "tactual motion," and so on. With these there naturally belong the classes of events, "visual coincidence" and "tactual coincidence."

We must therefore include the latter in the list of "psychological" con-

cepts. If this strikes one as paradoxical or seems to contradict our earlier statements, then he is far removed from an understanding of the relation between physical and psychological concepts. It would be clearly a mistake to say: "The coincidences are of a much more complicated nature." If, for example, I dream that I am playing billiards, I see the balls come together in such a way that at certain points on their surfaces there occur coincidences which cannot, however (in this case), be used to construct a physical or objective space. For they are only dream-events. One cannot fit them into the same structure with the corresponding events of an actual game. They obey different laws. The "physical space" that one might construct with their aid, would be an unreal physical space, whereas the visual coincidences of a dream as mental events have naturally the same reality as the fact of waking life. But they do not have the inter-subjectivity which distinguishes the coincidences observed in real life. Indeed, the difference from an actual billiard game consists exactly in the fact that the coincidences of the dream are not suited to the construction of an inter-subjective space, whereas the coincidences of normal life fit in a direct and easy way into the system of physical space and natural law. Thus, it is not the coincidences as such, which constitute the "physical world", rather it is their incorporation into a certain system (the system of objective space) which makes possible the formation of physical concepts. The adjectives "physical" and "mental" formulate only two different representational modes by which the data of experience are ordered; they are different ways of describing reality. That in which one counts ordered coincidences in inter-subjective space, is the physical; whereas that which operates by the grouping of intensive properties is a psychological description.

The so-called "psycho-physical problem" arises from the mixed employment of both modes of representation in one and the same sentence. Words are put side by side which, when correctly used, really belong to different languages. This gives rise to no difficulties in everyday life, because there language isn't pushed to the critical point. This occurs first in philosophical reflection on the propositions of science. Here the physicist must needs assure us that, for example, the sentence, "The leaf is green" merely means that a certain spatial object reflects rays of a certain frequency only: while the psychologist must needs insist that the sentence says something about the quality of a perceptual content. The different "mind-body theories" are only outgrowths of subsequent puzzled attempts to make these interpretations accord with one another. Such theories speak for the most part of a duality of percept and object, inner-world, outer-world, etc., where it is actually only a matter of two linguistic groupings of the events of the world. The circumstance that the physical language as a matter of experience seems to suffice for a complete description of the world, has, as history teaches, not made easy the understand

ing of the true situation, but has favored the growth of a materialistic metaphysics, which is as much a hindrance to the clarification of the problem as any other metaphysics.

VI

In our world, the physical language has the character of objectivity and universality, which the psychological language seems to lack. It is possible to conceive that matters were turned around—that the formation of psychological concepts was inter-sensual and inter-subjective, while no universal agreement could be achieved in the case of assertions concerning coincidences. Such a world would bear no resemblance to the actual world, but one could nevertheless picture it to oneself—as consisting, for example, of a finite number of discrete qualities (classifiable in various resemblance-classes) the simultaneous or successive occurrence of which was shown by experience to be governed by certain laws, but which were never clearly distinguished from one another by clear-cut boundaries. Naturally, in this world, the means of communication, the linguistic symbols, would be constructed of entirely different material than our words, and the individuals who speak with one another would not possess spatial bodies of the sort to which we are accustomed, but all this is not impossible.

The reason for the fact that exactly the physical language, the language of spatial coincidences, is for us an inter-subjective means of communication, lies naturally in the fact that it is by spatial relationships that individuals are both distinguished from and yet bound up with one another. Putting it somewhat differently: The external world is a spatial world. Indeed, the word "external" serves to designate a spatial relation; and it is easy to see that the opposition between "I" and "external world" is as a matter of fact only the difference between "one's own" body and other physical objects. But the clarification of such complicated concepts as "I" or even "consciousness" lies beyond the scope of this paper. We content ourselves here with the examination of the employment of certain simple psychological and physical terms. It is a preliminary task which prevents the emergence of those difficulties which hide behind the words "psycho-physical problem."

VII

We have emphasized that the circumstances on which rests the universality of the physical language, that is to say, the "thesis of physicalism," are of an empirical rather than a logical character. They are, however, of such a pervasive sort, and we are so thoroughly accustomed to them, that it is by no means easy to form an idea as to how the world would look if only these decisive relationships did not obtain, though

everything else remained the same. It would be a world enormously different from the actual world.

In it there would be no uniform one-to-one correspondence between coincidences and qualities. Perhaps we can imagine this most easily if we consider *feelings*. I can, for example, imagine that my feeling of grief corresponded in no way to any bodily condition. If, for example, I laughed, skipped around, sang and told witty stories, no one would be able to conclude from this that I was gay, rather this behavior would be as compatible with a sorrowful as with a cheerful mood. Above all, and this is a significant point, it would have to be impossible for me to communicate my state of feeling under interrogation. I must not be able, even if I desired, to give information concerning my feelings. (It is extremely difficult to express oneself accurately on such considerations; in our case, the correct formulation would be: in the changed world it would be a law of nature relating to my will, that there was no such thing as a wish to give expression to a feeling.) For if I could say something concerning my feelings, then there would be spatially describable processes, namely, speech movements and speech sounds—by reference to which the feeling qualities could be unambiguously described, and that would contradict our hypothesis. There must be no uniform relation between any kind of external events and the occurrence of my feelings, for otherwise someone could describe my feeling-state as “that which one has on the death of a friend or relative.” Only if my feelings occurred entirely without connection with my sense-perceptions, would it be impossible to designate that which in the actual world we call “grief” by a word belonging to inter-subjective language which anyone can understand. It would be impossible to give a definition for such a word.

In the described case there would be a world of feeling which could not be talked about in the physical language. To be sure, all that I could communicate would be expressible in this language. It would be the sole inter-subjective language (in contrast with the possibility suggested in the preceding section), but it would no longer be universal, for in addition to it there would be a private language in which I could reflect about the world of feeling.

Similar considerations arise in connection with the “sense qualities.” It is, for example, possible that although all visual coincidences continue as before, they should be accompanied by entirely different perceptual contents from those to which we are accustomed, and, indeed, in a fully irregular way. For example, in the case of the observation of optical spectra, the lines might preserve their exact position, but appear in varying colors, so that the location of the D-line of sodium appeared first as yellow, then as red, then green, etc., without my being able to discover any rule by which the appearance of a specific color was bound up with determinate external conditions capable of being specified by means of

coincidences. In this case, while I could always order the colors in classes and assign them symbols, these symbols would not belong to an objective language; they would have only a private use.

With the aid of these symbols I could formulate such regularities as might very well be present and discoverable in the domain of the qualities. Here are a few examples of such possibilities:

1. At every moment, the entire visual field has only one color—with different intensity at different places—but undergoes a temporal variation such that the various colors appear in their spectral order: red, yellow, green, blue, etc.

2. We see the world as red when we are in a cheerful mood; as blue, on the other hand, when we are in an unpleasant mood. These feelings—in accordance with our assumption—must be in no way bound up with bodily events.

3. I have the ability to bring about "arbitrary" changes of quality; I can act in this domain. This, however, can only be allowed on the assumption that the motive for such activity always lies in the qualities themselves, and never in the coincidences. These would not, if I may so express myself, influence my will in so far as it was concerned with qualities; nor, on the other hand, could my will be influenced (if we are to be consistent with our assumptions) by the qualities in so far as it was concerned with coincidences (actions in the external world).

4. If I feel warm, the color qualities change in one direction of the spectrum, if I feel cold, in the other—here as well, needless to say, warmth and coldness must be independent of coincidences.—etc., etc.

In circumstances such as those described, and in a thousand others more or less phantastic, there would be no possibility of assigning words for the color-qualities in an inter-subjective language. We would as a matter of course think of language *qua* means of communication as something which belongs only to the domain of coincidences. We wouldn't even conceive of an alternative possibility, for it wouldn't even occur to us that there could be a connection between coincidences and changes of quality,—just as now many a physicalist may think that there couldn't fail to be such a connection.

The notion of worlds which differ from actuality in the ways we have indicated perhaps makes by no means inconsiderable demands on our imagination; the laws of such a world—and with them the conditions of our own existence—would strike us as extremely strange and would have an entirely different form. But is imagination a privilege of the poet alone? May we not assume it in the philosopher?

VIII

What could be said about such a non-physicalistic world as we have pictured in several examples? First of all perhaps this, that we should hardly speak of it as *one* world but rather as two different domains, one physical, public, and common, and one private, psychological and suited only to monologue. The latter would be to such an extent mine alone, that I couldn't even arrive at the thought of communicating facts concerning it to others. The two worlds would run on side by side. Yet they

would not be lacking in all connection. There would be certain relations between the spatial characteristics of the two, for the coincidences would in any case mark the boundaries of the qualities.

By means of a comparison of the constructed example with the actual world we first learn to understand and evaluate the structure of the latter. It is, as far as experience tells us, so constructed that it is fully describable by means of the spatio-temporal conceptual apparatus of Physics; this implies the existence in the world of a certain determinate mode of interconnection. The instant we think away this property of the world, reality falls apart into several domains; it ceases to be a *universe*.

We have therefore to do with an empirical fact of far-reaching significance. But only with an empirical fact. We can be saved from attaching too much weight to this fact by noting that we can conceive of different degrees of the separation of the domain of qualities from that of the coincidences, so that a gradual transition from the actual world to our so completely different imaginary world is conceivable. For example, qualities in general might be strictly bound up with coincidences, with the exception, for example, of a limited domain of colors, let us say, shades of green, for which all our earlier assumptions would be true. In this case, the private domain excluded from physics would be of extremely limited scope. We can, however, think of it as broadened to any desired degree, first to include all visual, then all acoustic qualities, etc., so that the validity of the physicalistic assertion would be ever more restricted.

Moreover, we can think of the worlds of sight, sound, smell, etc., as related to one another in certain uniform ways or not, as we choose. In the latter case we are led to conceive of as many mutually independent domains as there are kinds of quality. Needless to say there is here no question of metaphysical pluralism any more than it would be a metaphysical dualism to contrast the world of qualities uniformly interrelated in accordance with empirical laws with the world of coincidences. Rather we would have to do with an empirical, contingent division of the world, just as it is an empirical contingent fact that we have exactly the number of sense-organs we do, neither more nor less.

If, as a matter of fact, the physical language is characterized by complete universality, the setting down of this circumstance is in no way the assertion of a metaphysical "monism." But one could hardly go wrong with the assumption that it is exactly this empirical fact which impressed the great system builders of the monistic tradition, particularly Spinoza and Leibniz, even though it was impossible at their time to find the correct way of expressing it. Here, however, we are getting off the main track of our remarks. Our aim has been so to loosen up thought by the consideration of various logical possibilities, as to dispel the traditional associations which have so often hindered the understanding of the relation between physical and psychological propositions.