CONTRIBUTIONS

TO THE

ANALYSIS OF THE SENSATIONS

BY

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TRANSLATED

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WITH THIRTY-SEVEN CUTS

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INTRODUCTORY REMARKS.

ANTIMETAPHYSICAL

I

THE splendid success achieved by physical science in modern times, a success which is not restricted to its own sphere but embraces that of other sciences which employ its help, has brought it about that physical ways of thinking and physical modes of procedure enjoy on all hands unwonted prominence, and that the greatest expectations are associated with their employment In keeping with this drift of modern inquiry, the physiology of the senses, gradually leaving the paths which were opened by men like Goethe, Schopenhauer, and others, but with particular success by Johannes Muller, has also assumed an almost exclusively physical character This tendency must appear to us as not exactly the proper one, when we reflect that physics despite its considerable development nevertheless constitutes but a portion of a *larger* collective body of knowledge, and that it is unable, with its limited intellectual implements, created for limited and special purposes, to exhaust all the subject-matter

of science. Without renouncing the support of physics, it is possible for the physiology of the senses, not only to pursue its own course of development, but also to afford to physical science itself powerful assistance, a point which the following simple considerations will serve to illustrate

2.

Colors, sounds, temperatures, pressures, spaces, times, and so forth, are connected with one another in manifold ways, and with them are associated moods of mind, feelings, and volitions Out of this fabric, that which is relatively more fixed and permanent stands prominently forth, engraves itself in the memory, and expresses itself in language Relatively greater permanency exhibit, first, certain *complexes* of colors, sounds, pressures, and so forth, connected in time and space, which therefore receive special names, and are designated *bodies* Absolutely permanent such complexes are not

My table is now brightly, now dimly lighted Its temperature varies It may receive an ink stain One of its legs may be broken It may be repaired, polished, and replaced part for part But for me, amid all its changes, it remains the table at which I daily write

My friend may put on a different coat His countenance may assume a serious or a cheerful expression His complexion, under the effects of light or emotion, may change His shape may be altered by motion,

or be definitely changed. Yet the number of the permanent features presented, compared with the number of the gradual alterations, is always so great, that the latter may be overlooked It is the same friend with whom I take my daily walk.

My coat may receive a stain, a tear My very manner of expression shows that we are concerned here with a sum-total of permanency, to which the new element is added and from which that which is lacking is subsequently taken away.

Our greater intimacy with this sum-total of permanency, and its preponderance as contrasted with the changeable, impel us to the partly instinctive, partly voluntary and conscious economy of mental representation and designation, as expressed in ordinary thought and speech That which is perceptually represented in a single image receives *a single* designation, *a single* name

As relatively permanent, is exhibited, further, that complex of memories, moods, and feelings, joined to a particular body (the human body), which is denominated the "I" or "Ego" I may be engaged upon this or that subject, I may be quiet or animated, excited or ill-humored Yet, pathological cases apart, enough durable features remain to identify the ego Of course, the ego also is only of relative permanency [1]

[1] The apparent permanency of the ego consists chiefly in the fact of its *continuity* and in the slowness of its changes The many thoughts and plans of yesterday that are continued to-day, and of which our environment in waking hours incessantly reminds us (wherefore in dreams the ego can be very in-

After a first survey has been obtained, by the formation of the substance-concepts "body" and "ego" (matter and soul), the will is impelled to a more exact examination of the *changes* that take place in these relatively permanent existences The changeable features of bodies and of the ego, in fact, are exactly what moves the will to this examination Here the component parts of the complex are first exhibited as its

distinct, doubled or entirely wanting) and the little habits that are unconsciously and involuntarily kept up for long periods of time, constitute the groundwork of the ego There can hardly be greater differences in the egos of different people, than occur in the course of years in *one* person When I recall to-day my early youth, I should take the boy that I then was, with the exception of a few individual features for a different person did not the chain of memories that make up my personality lie actually before me Many an article that I myself penned twenty years ago impresses me now as something quite foreign to myself The very gradual character of the changes of the body also contributes to the stability of the ego, but in a much less degree than people imagine Such things are much less analysed and noticed than the intellectual and the moral ego Personally, people know themselves very poorly

Once, when a young man I espied in the street the profile of a face that was very displeasing and repulsive to me I was not a little taken aback when a moment afterwards I found that it was my own, which in passing by a place where mirrors were sold I had perceived reflected from two mirrors that were inclined at the proper angle to each other

Not long ago, after a trying railway journey by night and much fatigued, I got into an omnibus just as another gentleman appeared at the other end "What degenerate pedagogue is that, that has just entered thought I It was myself opposite me hung a large mirror The physiognomy of my class, accordingly was better known to me than my own

The ego is as little absolutely permanent as are bodies That which we so much dread in death, the annihilation of our permanency, actually occurs in life in abundant measure That which is most valued by us, remains preserved in countless copies, or in cases of exceptional excellence is even preserved of itself In the best human being however, there are individual traits, the loss of which neither he himself nor others need regret Indeed, at times, death, viewed as a liberation from individuality, may even become a pleasant thought [When I wrote these lines Ribot's admirable little book, *The Diseases of Personality*, second edition Paris, 1888, Chicago, 1895, was unknown to me Ribot ascribes the principal rôle in preserving the continuity of the ego to the general sensibility Generally, I am in perfect accord with his views —Mach, 1895]

properties A fruit is sweet, but it can also be bitter Also, other fruits may be sweet The red color we are seeking is found in many bodies The neighborhood of some bodies is pleasant, that of others, unpleasant Thus, gradually, different complexes are found to be made up of common elements The visible, the audible, the tangible, are separated from bodies The visible is analysed into colors and into form In the manifoldness of the colors, again, though here fewer in number, other component parts are discerned—such as the primary colors, and so forth The complexes are disintegrated into *elements*

3

The useful habit of designating such relatively permanent compounds by *single* names, and of apprehending them by *single* thoughts, without going to the trouble each time of an analysis of their component parts, is apt to come into strange conflict with the tendency to isolate the component parts The vague image which we have of a given permanent complex, being an image which does not perceptibly change when one or another of the component parts is taken away, gradually establishes itself as something which exists *by itself* Inasmuch as it is possible to take away *singly* every constituent part without destroying the capacity of the image to *stand for* the totality and of being recognised again, it is imagined that it is pos-

sible to subtract *all* the parts and to have something still remaining Thus arises the monstrous notion of a *thing in itself*, unknowable and different from its "phenomenal" existence

Thing, body, matter, are nothing apart from their complexes of colors, sounds, and so forth—nothing apart from their so-called attributes That Protean, supposititious problem, which springs up so much in philosophy, of a *single* thing with *many* attributes, arises wholly from a mistaking of the fact, that summary comprehension and precise analysis, although both are provisionally justifiable and for many purposes profitable, cannot and must not be carried on *simultaneously* A body is one and unchangeable only so long as it is unnecessary to consider its details Thus both the earth and a billiard ball are spheres, if the purpose in hand permits our neglecting deviations from the spherical form, and great precision is not necessary But when we are obliged to carry on investigations in orography or microscopy, both bodies cease to be spheres

4

Man possesses, in its highest form, the power of consciously and arbitrarily determining his point of view He can at one time disregard the most salient features of an object, and immediately thereafter give attention to its smallest details, now consider a stationary current, without a thought of its contents, and

then measure the width of a Fraunhofer line in the spectrum, he can rise at will to the most general abstractions or bury himself in the minutest particulars The animal possesses this capacity in a far less degree It does not assume a point of view, but is usually forced to it The babe who does not know its father with his hat on, the dog that is perplexed at the new coat of its master, have both succumbed in this conflict of points of view Who has not been worsted in similar plights? Even the man of philosophy at times succumbs, as the grotesque problem, above referred to, shows

In this last case, the circumstances appear to furnish a real ground of justification Colors, sounds, and the odors of bodies are evanescent But the tangible part, as a sort of constant, durable nucleus, not readily susceptible of annihilation, remains behind, appearing as the vehicle of the more fugitive properties annexed to it Habit, thus, keeps our thought firmly attached to this central nucleus, even where the knowledge exists that seeing, hearing, smelling, and *touching* are intimately akin in character A further consideration is, that owing to the singularly extensive development of mechanical physics a kind of *higher reality* is ascribed to space and time than to colors, sounds, and odors, agreeably to which, the temporal and spatial *links* of colors, sounds, and odors appear to be *more real* than the colors, sounds, and odors themselves. The physiology of the senses, however,

demonstrates, that spaces and times may just as appropriately be called sensations as colors and sounds

5

The ego, and the relation of bodies to the ego, give rise to similar pseudo-problems, the character of which may be briefly indicated as follows

Let those complexes of colors, sounds, and so forth, commonly called bodies, be designated, for the sake of simplicity, by $A\,B\,C$, the complex, known as our own body, which constitutes a part of the former, may be called $K\,L\,M$, the complex composed of volitions, memory-images, and the rest, we shall represent by $\alpha\,\beta\,\gamma$ Usually, now, the complex $\alpha\,\beta\,\gamma$ $K\,L\,M$, as making up the ego, is opposed to the complex $A\,B\,C$, as making up the world of substance, sometimes, also, $\alpha\,\beta\,\gamma$ is viewed as ego, and $K\,L\,M$ $A\,B\,C$ as world of substance Now, at first blush, $A\,B\,C$ appears independent of the ego, and opposed to it as a separate existence But this independence is only relative, and gives way upon closer inspection Much, it is true, may change in the complex $\alpha\,\beta\,\gamma$ without a perceptible change being induced in $A\,B\,C$, and *vice versa* But many changes in $\alpha\,\beta\,\gamma$ do pass, by way of changes in $K\,L\,M$, to $A\,B\,C$, and *vice versa* (As, for example, when powerful ideas burst forth into acts, or our environment induces noticeable changes in our body) At the same time the group $K\,L\,M$ appears to be more

intimately connected with $\alpha\,\beta\,\gamma$ and with $A\,B\,C$, than the latter do with one another, relations which find their expression in common thought and speech.

Precisely viewed, however, it appears that the group $A\,B\,C$ is *always* codetermined by $K\,L\,M$. A cube of wood when seen close at hand, looks large, when seen at a distance, small, it looks different with the right eye from what it does with the left, sometimes it appears double, with closed eyes it is invisible. The properties of the same body, therefore, appear modified by our own body, they appear conditioned by it. But where, now, is that *same* body, which to the appearance is so *different*? All that can be said is, that with different $K\,L\,M$ different $A\,B\,C$ are associated [1]

We see an object having a point S. If we touch S, that is, bring it into connexion with our body, we receive a prick. We can see S, without feeling the prick. But as soon as we feel the prick we find S. The visible point, therefore, is a *permanent fact* or *nu-*

[1] A long time ago (in the *Vierteljahrsschrift fur Psychiatrie*, Leipsic and Neuwied, 1868, art. "Ueber die Abhängigkeit der Netzhautstellen von einander,") I enunciated this thought as follows: The expression "sense-illusion" proves that we are not yet fully conscious, or at least have not yet deemed it necessary to incorporate the fact into our ordinary language *that the senses represent things neither wrongly nor correctly*. All that can be truly said of the sense organs is, that, *under different circumstances they produce different sensations and perceptions*. As these "circumstances," now, are extremely manifold in character, being partly external (inherent in the objects), partly internal (inherent in the sensory organs) and partly interior (having their seat in the central organs), it would naturally seem especially when attention is paid only to external circumstances as if the organs acted differently under the same conditions. And it is customary to call the unusual effects, deceptions or illusions.

cleus, to which the prick is annexed, according to circumstances, as something accidental From the frequency of such occurrences we ultimately accustom ourselves to regard *all* properties of bodies as "effects" proceeding from permanent nuclei and conveyed to the ego through the medium of the body, which effects we call *sensations* By this operation, however, our imagined nuclei are deprived of their entire sensory contents, and converted into mere mental symbols The assertion, then, is correct that the world consists only of our sensations In which case we have knowledge *only* of sensations, and the assumption of the nuclei referred to, or of a reciprocal action between them, from which sensations proceed, turns out to be quite idle and superfluous Such a view can only suit with a half-hearted realism or a half-hearted philosophical criticism

6

Ordinarily the complex $\alpha\beta\gamma$ KLM is contrasted as ego with the complex ABC Those elements only of ABC that more strongly alter $\alpha\beta\gamma$, as a prick, a pain, are wont to be comprised in the ego Afterwards, however, through observations of the kind just referred to, it appears that the right to annex ABC to the ego nowhere ceases In conformity with this view the ego can be so extended as ultimately to embrace the entire world [1] The ego is not sharply

[1] When I say that the table, the tree, and so forth, are my sensations, the statement, as contrasted with the mode of representation of the ordinary man,

marked off, its limits are very indefinite and arbitrarily displaceable Only by failing to observe this fact, and by unconsciously narrowing those limits, while at the same time we enlarge them, arise, in the conflict of points of view, the metaphysical difficulties met with in this connexion.

As soon as we have perceived that the supposed unities "body" and "ego" are only makeshifts, designed for provisional survey and for certain practical ends (so that we may take hold of bodies, protect *ourselves* against pain, and so forth), we find ourselves obliged, in many profound scientific investigations, to abandon them as insufficient and inappropriate The antithesis of ego and world, sensation (phenomenon) and thing, then vanishes, and we have simply to deal with the *connexion* of the *elements* $\alpha\ \beta\ \gamma$ $A\ B\ C$ $K\ L\ M$, of which this antithesis was only a partially appropriate and imperfect expression This connexion is nothing more nor less than the combination of the above-mentioned elements with other similar elements (time and space) Science has simply to *accept* this connexion, and to set itself aright (get its bearings) in the intellectual environment which is thereby furnished, without attempting to explain its existence

involves a real extension of my ego On the emotional side also such extensions occur, as in the case of the virtuoso, who possesses as perfect a mastery of his instrument as he does of his own body, or in the case of the skilful orator, on whom the eyes of the audience are all converged, and who is controlling the thoughts of all, or in that of the able politician who is deftly guiding his party and so on In conditions of depression, on the other hand such as nervous people often endure, the ego contracts and shrinks A wall seems to separate it from the world

On a superficial examination the complex $\alpha\beta\gamma$ .. appears to be made up of much more evanescent elements than $A\,B\,C$ and $K\,L\,M$. in which last the elements seem to be connected with greater *stability* and *in a more permanent manner* (being joined to solid nuclei as it were) Although on closer inspection the elements of all complexes prove to be *homogeneous*, yet in spite of the knowledge of this fact, the early notion of an antithesis of body and spirit easily regains the ascendancy in the mind The philosophical spiritualist is often sensible of the difficulty of imparting the needed solidity to his mind-created world of bodies, the materialist is at a loss when required to endow the world of matter with sensation The *monistic* point of view, which artificial reflexion has evolved, is easily clouded by our older and more powerful instinctive notions

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The difficulty referred to is particularly felt in the following case In the complex $A\,B\,C$, which we have called the world of matter, we find as parts, not only our own body $K\,L\,M$, but also the bodies of other persons (or animals) $K'L'M'$, $K''L''M'$, to which, by analogy, we imagine other $\alpha'\beta'\gamma'$. , $\alpha''\beta''\gamma''$, annexed, similar to $\alpha\,\beta\,\gamma$ So long as we deal with $K'L'M'$, we find ourselves in a thoroughly familiar province at every point sensorially accessible to us When, however, we inquire after the sensations or feelings appurtenant to the body

K'L'M' . ., we no longer find the elements we seek in the province of sense. *we add them in thought* Not only is the domain which we now enter far less familiar to us, but the transition into it is also relatively unsafe We have the feeling as if we were plunging into an abyss [1] Persons who adopt this method only, will never thoroughly rid themselves of this sense of insecurity, which is a frequent source of illusive problems

But we are not restricted to this course Let us consider, first, the reciprocal relations of the elements of the complex *A B C* , without regarding *K L M* (our body) All physical investigations are of this sort A white bullet falls upon a bell, a sound is heard The bullet turns yellow before a sodium lamp, red before a lithium lamp Here the elements (*ABC*) appear to be connected only *with one another* and to be independent of our body (*K L M*) But if we take santonine, the bullet again turns yellow If we press one eye to the side, we see two bullets If we close our eyes entirely, we see none at all If we sever the

[1] When I first came to Vienna from the country, as a boy of four or five years, and was taken by my father upon the walls of the city s fortifications, I was very much surprised to see people below in the moat, and could not understand how from my point of view, they could have got there, for the thought of another way of descent never occurred to me I remarked the same astonishment, once afterwards in life, in the case of a three year old boy of my own, while walking on the walls of Prague I recall this feeling every time I occupy myself with the reflexion of the text, and I frankly confess that this accidental experience of mine helped to confirm my opinion upon this point, which I have now long held The habit of pursuing the same methods in material and psychical questions tends greatly to confuse our field of survey A child, on the piercing of the wall of a house in which it has long dwelt, may experience a veritable enlargement of its world view, and in the same manner a slight scientific hint may often afford great enlightenment

auditory nerve, no sound is heard The elements $A\,B\,C$, therefore, are not only connected among one another, but also with $K\,L\,M$ To this extent, and to this extent *only*, do we call $A\,B\,C$ *sensations*, and regard $A\,B\,C$ as belonging to the ego In this way, accordingly, we do not find the gap between bodies and sensations above described, between what is without and what is within, between the material world and the spiritual world [1] All elements $A\,B\,C$, $K\,L\,M$ constitute a *single* coherent mass only, in which, when any one element is disturbed, *all* is put in motion, except that a disturbance in $K\,L\,M$ has a more extensive and profound action than in $A\,B\,C$ A magnet in our neighborhood disturbs the particles of iron near it, a falling boulder shakes the earth, but the severing of a nerve sets in motion the *whole* system of elements [2]

8

That traditional gulf between physical and psychological research, accordingly, exists only for the habitual stereotyped method of observation A color is a physical object so long as we consider its dependence upon its luminous source, upon other colors, upon heat, upon space, and so forth Regarding, however, its dependence upon the retina (the elements $K\,L\,M$),

[1] Compare my *Grundlinien der Lehre von den Bewegungsempfindungen* Leipsic Engelmann, 1875, p 54

[2] Quite involuntarily does this relation of things suggest the picture of a viscous mass, at certain places (as in the ego) more firmly coherent than in others I have often made use of this simile in lectures

it becomes a psychological object, a sensation Not the subject, but the direction of our investigation, is different in the two domains

Both in reasoning from the observation of the bodies of other men or animals, to the sensations which they possess, as well as in investigating the influence of our own body upon our own sensations, we must complete observed facts by analogy This is accomplished with much greater readiness and certainty, when it relates, say, only to nervous processes, which cannot be fully observed in our own bodies—that is, when it is carried out in the more familiar physical domain—than when it is made in connexion with psychical processes Otherwise there is no essential difference

9

The considerations advanced will gain in strength and vividness by a concrete example Thus, I lie upon my sofa If I close my right eye, the picture represented in the accompanying cut is presented to my left eye In a frame formed by the ridge of my eyebrow, by my nose, and by my moustache, appears a part of my body, so far as visible, with its environment [1] *My* body differs from other human bodies—beyond the fact that every intense motor idea is immediately expressed by a movement of it, and that its

[1] A discussion of the binocular field of vision, with its peculiar stereoscopic features, is omitted here, for although familiar to all, it is not as easy to describe, and cannot be represented by a single plane drawing

being touched determines more striking changes than contact with other bodies—by the circumstance, that it is only partly seen, and, especially, is seen without

Fig 1

a head If I observe an element *A* within my field of vision, and investigate its connexion with another element *B* within the same field, I step out of the domain of physics into that of physiology or psychology, pro-

vided B, to use the apposite expression of a friend[1] of mine made upon seeing this drawing, passes through my skin Reflexions like that for the field of vision may be made with regard to the province of touch and the perceptual domains of the other senses

10

Reference has already been made to the different character of the groups of elements designated by $A\,B\,C$ and $\alpha\,\beta\,\gamma$ As a matter of fact, when we *see* a green tree before us, or *remember* a green tree, that is, represent a green tree to ourselves, we are perfectly aware of the difference of the two cases The represented tree has a much less determinate, a much more changeable form, its green is much paler and more evanescent, and, what is of especial note, it is plainly situate in a *different* domain A movement that we *propose* to execute is never more than a represented movement, and appears in a different sphere from that of the executed movement, which always takes place when the image is vivid enough The statement that the elements A and α appear in different spheres, means, if we go to the bottom of it, simply this, that these elements are united with different other elements Thus far, therefore, the fundamental constituents of $A\,B\,C$, $\alpha\,\beta\,\gamma$ would seem to be *the same* (colors, sounds, spaces, times, motor sensations

[1] J Popper of Vienna.

.), and only the character of their connexion different

Ordinarily pleasure and pain are regarded as different from sensations Yet not only tactile sensations, but all other kinds of sensations, may pass gradually into pleasure and pain Pleasure and pain also may be justly termed sensations Only they are not so well analysed and so familiar as the common sensations In fact, sensations of pleasure and pain, however faint they may be, really make up the contents of all so-called emotions Thus, perceptions, ideas, volition, and emotion, in short the whole inner and outer world, are composed of a small number of homogeneous elements connected in relations of varying evanescence or permanence Usually, these elements are called sensations But as vestiges of a one-sided theory inhere in that term, we prefer to speak simply of *elements*, as we have already done The aim of all research is to ascertain the mode of connexion of these elements [1]

II

That in this complex of elements, which fundamentally is *one*, the boundaries of bodies and of the ego do not admit of being established in a manner definite and sufficient for all cases, has already been remarked The comprehending of the elements that

[1] Compare the note at the conclusion of my treatise, *Die Geschichte und die Wurzel des Satzes der Erhaltung der Arbeit*, Prague, Calve, 1872,

are most intimately connected with pleasure and pain, under one ideal mental-economical unity, the ego, is a work of the highest significance for the intellect in the functions which it performs for the pain-avoiding, pleasure-seeking will The delimitation of the ego, therefore, is instinctively effected, is rendered familiar, and possibly becomes fixed through heredity. Owing to their high practical value, not only for the individual, but for the entire species, the composites "ego" and "body" assert instinctively their claims, and operate with all the power of natural elements In special cases, however, in which practical ends are not concerned, but where knowledge is an object in itself, the delimitation in question may prove to be insufficient, obstructive, and untenable [1]

The primary fact is not the *I*, the ego, but the elements (sensations) The elements *constitute* the *I* *I* have the sensation green, signifies that the element green occurs in a given complex of other elements (sensations, memories) When *I* cease to have the sensation green, when *I* die, then the elements no longer

[1]Similarly, *esprit de corps*, class bias, national pride, and even the narrowest minded local patriotism may have a high value, *for certain purposes* But such attitudes will not be shared by the broad-minded inquirer, at least not in moments of research All such egoistic views are adequate only for practical purposes Of course, even the inquirer may succumb to habit Trifling pedantries and nonsensical discussions, the cunning appropriation of others' thoughts, with perfidious silence as to the sources, the metaphorical dysphagia suffered when recognition must be given, and the crooked illumination of others' performances when this is done, abundantly show that the scientist and scholar have also the battle of existence to fight, that the ways of science still lead to the mouth, and that the *pure* quest of knowledge in our present social conditions is still an ideal.

occur in their ordinary, familiar way of association. That is all Only an ideal mental-economical unity, not a real unity, has ceased to exist [1]

If a knowledge of the connexion of the elements (sensations) does not suffice us, and we ask, *Who* possesses this connexion of sensations, *Who* experiences the sensations? then we have succumbed to the habit of subsuming every element (every sensation) under some *unanalysed* complex, and we are falling back imperceptibly upon an older, lower, and more limited point of view.[2]

[1] The ego is not a definite, unalterable, sharply-bounded unity None of these attributes are important, for all vary even within the sphere of individual life, in fact their alteration is even sought after by the individual *Continuity* alone is important This view accords admirably with the position which Weismann has recently reached by biological investigations ("Zur Frage der Unsterblichkeit der Einzelligen," *Biolog Centralbl*, Vol IV, Nos 21, 22, compare especially pages 654 and 655, where the scission of the individual into two *equal* halves is spoken of) But this continuity is only a means of predisposing and of conserving what is contained in the ego This content and not the ego is the principal thing This content, however, is not confined to the individual With the exception of some insignificant and valueless personal memories, it remains preserved in *others* even after the death of the individual The *ego* is unsavable It is partly the knowledge of this fact, partly the fear of it, that has given rise to the many extravagances of pessimism and optimism, and to numerous religious and philosophical absurdities In the long run we shall not be able to close our eyes to this simple truth, which is the immediate outcome of psychological analysis We shall then no longer place so high a value upon the ego, which even during the individual life greatly changes, and which, in sleep or during absorption in some idea, just in our very happiest moments, may be partially or wholly absent We shall then be willing to renounce *individual* immortality, and not place more value upon the subsidiary elements than upon the principal ones In this way we shall arrive at a freer and more enlightened view of life, which will preclude the disregard of other egos and the over-estimation of our own [It will be seen from the above remarks that I consider that form of immortality alone as possessing reality and worth, which, with others Dr Paul Carus upholds, and which may be found in his discussions in *The Monist*, *The Open Court Fundamental Problems*, etc —Mach, 1895]

[2] The habit of treating the unanalysed ego-complex as an indiscerptible unity frequently assumes in science remarkable forms. First, the nervous

The so-called unity of consciousness is not an argument in point Since the apparent antithesis of *real* world and *perceived* world is due entirely to our mode of view, and no actual gulf exists between them, a rich and variously interconnected content of consciousness is in no respect more difficult to understand than a rich and diversified interconnexion of the world

If we regard the ego as a *real* unity, we become involved in the following dilemma either we must set over against the ego a world of unknowable entities (which would be quite idle and purposeless), or we must regard the whole world, the egos of other people included, as comprised in our own ego (a proposition to which it is difficult to yield serious assent)

But if we take the ego simply as a *practical* unity, put together for purposes of provisional survey, or

system is separated from the body as the seat of the sensations In the nervous system again, the brain is selected as the organ best fitted for this end, and finally, to save the supposed psychical unity, a *point* is sought in the brain as the seat of the soul But such crude conceptions are hardly fit even to foreshadow the roughest outlines of what future research will do for the connexion of the physical and the psychical The fact that the different organs of sensation and memory are physically *connected* with, and can be readily *excited* by, one another, is probably the foundation of the "psychical unity "

I once heard the question seriously discussed, "How the percept of a large tree could find room in the little head of a man?" Now, although this "problem" is no problem, yet it renders us vividly sensible of the absurdity that can be committed by thinking sensations spatially into the brain When I speak of the sensations of *another* person, those sensations are, of course, not exhibited in my optical or physical space, they are mentally added, and I conceive them *causally*, not spatially, annexed to the brain observed or represented When I speak of *my own* sensations, these sensations do not exist spatially in my head, but rather my "head" *shares* with them the same spatial field, as was explained above (Compare the remarks on Fig 1)

[The extent to which the old notion of the soul still pervades modern physiological research, the purpose of which is precisely to overcome that ancient view, may be learned from Hauptmann's *Metaphysik in der Physiologie*, Dresden, 1893, with whose remarks I am in general accord —Mach 1895]

simply as a more strongly coherent group of elements, less strongly connected with other groups of this kind, questions like those above discussed will not arise and research will have an unobstructed future.

In his philosophical notes Lichtenberg says "We become conscious of certain percepts that are not dependent upon us, of others that we at least think are dependent upon us Where is the border-line? We know only the existence of our sensations, percepts, and thoughts We should say, *It thinks*, just as we say, *It lightens* It is going too far to say *cogito*, if we translate *cogito* by *I think* The assumption, or postulation, of the ego is a mere practical necessity" Though the method by which Lichtenberg arrived at this result is somewhat different from ours, we must nevertheless give our full assent to his conclusion

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Bodies do not produce sensations, but complexes of sensations (complexes of elements) make up bodies If, to the physicist, bodies appear the real, abiding existences, whilst sensations are regarded merely as their evanescent, transitory show, the physicist forgets, in the assumption of such a view, that all bodies are but thought-symbols for complexes of sensations (complexes of elements) Here, too, the *elements* form the real, immediate, and ultimate foundation, which it is the task of physiological research to investigate By the recognition of this fact, many points of psychology

and physics assume more distinct and more economical forms, and many spurious problems are disposed of

For us, therefore, the world does not consist of mysterious entities, which by their interaction with another, equally mysterious entity, the ego, produce sensations, which alone are accessible For us, colors, sounds, spaces, times, are the ultimate elements, whose given connexion it is our business to investigate [1] In this investigation we must not allow our-

[1] I have always felt it as a stroke of special good fortune, that early in life, at about the age of fifteen, I lighted in the library of my father on a copy of Kant s *Prolegomena zu jeder künftigen Metaphysik* The book made at the time a powerful and ineffaceable impression upon me the like of which I never afterward experienced in any of my philosophical reading Some two or three years later the superfluous rôle played by "the thing in itself" abruptly dawned upon me On a bright summer day under the open heaven, the world with my ego suddenly appeared to me as *one* coherent mass of sensations only more strongly coherent in the ego Although the actual working out of this thought did not occur until a later period, yet this moment was decisive for my whole view I had still to struggle long and hard before I was able to retain the new conception in my specialty With the valuable parts of physical theories we necessarily absorb a good dose of false metaphysics, which it is very difficult to sift out from what deserves to be preserved, especially when those theories have become very familiar to us At times too, the traditional instinctive views would arise with great power and place impediments in my way Only by alternate studies in physics and in the physiology of the senses, and by historico physical investigations (since about 1863), and after having endeavored in vain to settle the conflict by a physico psycho logical monadology have I attained to any considerable firmness in my views I make no pretensions to the title of philosopher I only seek to adopt in physics a point of view that need not be changed the moment our glance is carried over into the domain of another science, for, ultimately, all must form one whole The molecular physics of to day certainly does not meet this requirement What I say I have probably not been the *first* to say I also do not wish to offer this exposition of mine as a special achievement It is rather my belief that every one will be led to a similar view, who makes a careful survey of any extensive body of knowledge Avenarius, with whose works I recently became acquainted, approaches my point of view (*Philosophie als Denken der Welt nach dem Princip des kleinsten Kraftmasses*, 1876) Also Hering, in his paper on *Memory* (*Almanach der Wiener Akademie* 1870 p 258, English translation, O C Pub Co Chicago 1895), and J Popper in his beautiful book *Das Recht zu leben und die Pflicht zu sterben* (Leipsic, 1878, p 62), have advanced allied thoughts Compare also my paper, *Ueber die ökono-*

selves to be impeded by such intellectual abridgments and delimitations as body, ego, matter, mind, etc, which have been formed for special, practical purposes and with wholly provisional and limited ends in view. On the contrary, the fittest forms of thought must be created in and by that research *itself*, just as is done in every special science In place of the traditional, instinctive ways of thought, a freer, fresher view, conforming to developed experience, must be substituted.

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Science always takes its origin in the adaptation of thought to some definite field of experience The results of the adaptation are thought-elements, which are able to represent the field The outcome, of course, is different, according to the character and extent of the province surveyed. If the province of experience in question is enlarged, or if several provinces heretofore disconnected are united, the traditional, familiar thought-elements no longer suffice for the extended province In the struggle of acquired habit with the effort after adaptation, *problems* arise, which disappear when the adaptation is perfected, to make room for others which have arisen in the interim.

To the physicist, *qud* physicist, the idea of "body"

mische Natur der physikalischen Forschung (*Almanach der Wiener Akademie*, 1882, p 179, note, English translation in my *Popular Scientific Lectures*, Chicago, 1895) Finally let me also refer here to the introduction to W Preyer's *Reine Empfindungslehre* and to Riehl's *Freiburger Antrittsrede*, p 14 I should probably have much additional matter to cite as more or less allied to this line of thought, if my knowledge of the literature were more extensive.

is productive of a real facilitation of view, and is not the cause of disturbance So, also, the person with purely practical aims, is materially assisted by the idea of the *I* or ego. For, unquestionably, every form of thought that has been designedly or undesignedly constructed for a given purpose, possesses for that purpose a *permanent* value When, however, research in physics and in psychology meets, the ideas held in the one domain prove to be untenable in the other From the attempt at mutual adaptation arise the various atomic and monadic theories—which, however, never attain their end If we regard *sensations*, in the sense above defined, as the *elements of the world*, the problems referred to are practically disposed of, and the *first* and most important adaptation effected This fundamental view (without any pretension to being a philosophy for all eternity) can at present be adhered to in all provinces of experience, it is consequently the one that accommodates itself with the least expenditure of energy, that is, more economically than any other, to the present *temporary collective state of knowledge* Furthermore, in the consciousness of its purely economical office, this fundamental view is eminently tolerant It does not obtrude itself into provinces in which the current conceptions are still adequate. It is ever ready, upon subsequent extensions of the domain of experience, to yield the field to a better conception.

The philosophical point of view of the average

man—if that term may be applied to the naïve realism of the ordinary individual—has a claim to the highest consideration It has arisen in the process of immeasurable time without the conscious assistance of man. It is a product of nature, and is preserved and sustained by nature Everything that philosophy has accomplished—the *biological* value of every advance, nay, of every error, admitted—is, as compared with it, but an insignificant and ephemeral product of art. The fact is, every thinker, every philosopher, the moment he is forced to abandon his narrow intellectual province by practical necessity, immediately returns to the universal point of view held by all men in common [1]

To discredit this point of view is not then the purpose of the foregoing "introductory remarks." The task which we have set ourselves is simply to show *why* and to what *purpose* for the greatest portion of life we hold it, and *why* and for what *purpose* we are provisorily obliged to abandon it. No point of view has absolute, *permanent* validity Each has importance only for some given end [2]

[1] [Molière's scourged philosopher (in *Le Mariage forcé*) does not say, It *seems* to me that I am pummelled, but, I *am* pummelled —1895]

[2] [A kindred view will be found in Avenarius (*Kritik der reinen Erfahrung*, and *Der menschliche Weltbegriff*) Avenarius has also undertaken the commendable task of explaining the development of philosophy on the basis of the facts furnished by the history of civilisation For a further development of this view, which was evoked by a correspondence with Dr Paul Carus, see the Appendix to this volume —1895]