

# Chapter 3

## Folder C131. Perception and Panpsychism, Jung and Biederman. January–June 1967



Jan 7, 1967

Dear Jeff

Thanks very much for your long letter, which I read with great interest. This question of creativity is certainly a difficult one to be clear about. I am glad that it is now one of your main interests, as otherwise, there would be very little chance of your ever learning much about it. And it is, in my view, the key question, not only in science and art, but also, in the whole of life. But we shall have to come to this fact by stages.

Firstly, let us consider the mathematical “game” that you gave as a first example of DROPS.<sup>1</sup> Of course, you were right eventually to give this line of approach up, because creativity is not merely a game (though it includes a kind of “play” as a part of what it is). Even more significant, the example is drawn from too narrow and fragmentary a field. That is why the abstraction of DROPS seems so arbitrary. In a narrow field, there is always an almost unlimited set of DROPS that might fit the facts. As the field is broadened, this set begins to narrow down. And if we include the whole of life, all that is perceived at a given moment, then in a certain sense that I shall explain later, the arbitrariness is gone.

But first, let me emphasize that any set of DROPS is always provisional. It must be tested by carrying out inferences drawn from it, and relating these to the observed fact. This is not the same as conventionalism. It is not merely that it is convenient to abstract the known DROPS in a certain way. When this abstraction is carried out with deep insight, then it leads to concepts, permitting a wide range of correct inferences to be drawn, very often in totally unexpected ways. But deep insight depends on a psychological state of mind, in which the problem touches the whole of a person very

---

<sup>1</sup>See Appendix C—CT.

deeply. Thus Einstein's new insights into space and time did not come mainly from abstractions of DROPS in technical data. Rather, from deep reflection in a wide range of experience in everyday life and in the laboratory, Einstein began to feel that the speed of the observer should not be very significant, in determining the fundamental and universal DROPS that are relevant to the basic constitution and motion of matter. As I indicated in my Relativity book, this is merely an extension of the Copernican notion that the location of the observer also does not matter in this field. And if one goes still deeper, this is in turn an extension of the notion that generally speaking, the peculiarities of the individual observer have little or no bearing on the essential, fundamental and universal characteristics of reality.

Now, would you say that this latter notion is only a convenient convention? Surely, it is a very well confirmed fact that the peculiarities of individual observers have no deep significance. The longer we live, the more we see this fact exemplified in different ways. But just how do we become aware of this fact? Evidently, this happens in a way that is too subtle and deep to specify in much detail. Nevertheless, this is not merely a metaphysical notion (although, of course, it is a part of your general metaphysics).

Now, let us come to your second point. You say that what I said about perception, creative and destructive, seems metaphysical. Again, let me say that this is because one is starting from too narrow a field, i.e., science (or even science and art). It is necessary to begin with the whole fact, involving all of life, and then to focus down on various aspects of this fact, being aware that we have focused on an aspect, as we do so. Otherwise, we will mistake a part for the whole. And this part will seem arbitrary, because what really makes it inevitable will be just the rest of the whole, that we have forgotten about, as inferred to be "irrelevant to these questions".

Now, I say that this notion of "facting", "understanding" etc. is primary and comes before the result, is evident in every phase of life. It only takes a certain attention, awareness, interest, and sensitivity to see it. Without these qualities, no amount of philosophy has any meaning. It will all be just arbitrary "metaphysics".

You can begin, for example, with the fact about flattery. This is a malfunction that arises in human relationships. So how does one meet it properly? Evidently, one must be sensitive and aware, paying attention to what one is doing, and seeing what happens, as a result of what one does. Usually, we don't do this at all, and thus get caught in the trap, either of accepting flattery because it pleases us, or flattering someone else to obtain an advantage. But what is it that we must see? First of all, it is the difference between real joy and the false pleasure that comes when one has a pleasing image of the "self". Secondly, it is the relationship between this false pleasure and a general tendency to falsify perception, so as to increase this false pleasure. Thirdly, it is the order of cause and effect, in which failure to differentiate leads to a whole series of mistakes, each one piling up on top of the next. Then, it is the general pattern of one's life, in which one's drive towards status, security, the appearance of "success", gratification of various cravings, etc., becomes a major feature of the "self". And then, it is seen that this pattern is abstracted from a gigantic structure, involving the individual and society, which is almost totally wrong, self-defeating and poisonous. So each example of flattery is only a tiny aspect of a deep

and gigantic structural process, in which all of us are submerged, for most of the time.

What I have just described is the act of learning. As we engage in relationships with nature, with other people, and with ideas, we always pay careful attention to what we do and to what happens, and especially, to the discrepancies between our apparent intentions and the actual results of our actions. Each discrepancy points to something wrong in our basic assumptions, which has to be corrected, with the aid of intelligent perception and insight. This is surely the proper way to do scientific research and what is not generally realized is that it is the proper way to approach the whole of life. Unfortunately, there is a common tacit assumption that we learn in order to live better. But the truth is the other way. The “good life” can only be an outcome of a spirit in which unending learning is taken to be the very essence of life. In each relationship, it is always necessary to be learning how we approach it with the wrong DROPS drawn from false generalization of inferences made in the past (either tacitly or explicitly). When the error in the DROPS is seen, then one discovers that there is a sensitive, intelligent creative perception, which reveals the new order of approach that is appropriate. This is always provisional. Yet, generally speaking, it tends to be right, for the most part. And where it is wrong, it is corrected by an extension of the process of learning.

Now, can you understand this by conventionalism or by traditional approaches? Is it only metaphysics? I would say that all of this is a fact, which any man can establish, if he is at all sensitive, observant, aware, attentive and interested. (If he is not any of these, then he may as well give up trying to learn about such deep questions.) It is a fact that perception of what is new and original is always a process of learning, in everyday life, in science, in art, and in every other field. Only routine and mechanical perception can be carried out by manipulating known DROPS and making “choices” among these. So we are in complete agreement on this point. Evidently, one cannot properly meet flattery, for example, by a “conventionalist”, “traditionalist”, or “metaphysical” approach. Rather, when one actually meets it, one comes into direct awareness contact with the mind, creatively “sorting out” the DROPS of the whole process. However, many people feel that such questions are “irrelevant” to science. In my view, this “specialist” approach is one of the most destructive poisons of our era. It takes only a little attention to see that real scientific progress involves the same kind of learning that is involved in properly meeting the fact of flattery.

Another principal difficulty of our era is overemphasis on the role of words (and formulae). The example that you gave of the “numbers game” is a case of this difficulty. Evidently the whole problem is mainly a verbal one. But as I indicated in the letter to Schumacher, verbal DROPS have little significance, unless they either reflect or “point to” a vast field of non-verbal DROPS, either external to us, or in the mind, or in both. It is in this vast field that the arbitrariness of our actions is seen to be removed. And this must include the psychological field as well. For after all, one’s psychological attitudes act as “major premisses” in all our reasoning. For example, one is trained to do physics with the tacit premiss: “The purpose of this operation is to give me status, security, prestige, success, etc., etc.” If one is at all

observant, he can factually see how this premiss is in the long run, far more significant in determining our “choice” of hypothesis than are the experimental data or theoretical conclusions that have been drawn in the past. What one generally does not notice is this: When all the tacit psychological premisses are taken into account, along with the other premisses, then our DROPS are no longer arbitrary in any way at all. They only seem arbitrary, because we tacitly assign our psychological premisses to an imaginary entity called “I”, “me”, or “the subject” who is assumed to be “completely free” and to “stand above” the field about which he is thinking. We don’t notice that all of thought is one field, whether this be the thought of the electron, the thought of getting a better job, or the thought of eating a satisfying dinner. It is in this field that the DROPS of our thought are determined, as anyone can verify directly and factually, if he will only pay fairly careful attention to what is actually happening, as he is in the process of thinking.

Evidently, then, what is called for is that everyone, scientists included, shall be always learning about the whole fact, not only what is external to man, but also about the DROPS with which man approaches the fact. When he sees how these are inappropriate, there is a sensitive creative intelligence that can “feel out” and “explore” new DROPS provisionally, until a set is found that is appropriate. This, I say, is a fact, that anyone can observe by paying proper attention to what happens when he faces a somewhat new situation.

In each instance, one’s ideas are determined by the total field of thought, whatever it is at that moment. Careful observation of the DROPS of thought leads to their being changed, in the way described above. Clear thinking demands that our intention be to establish DROPS that are appropriate, in each case. Of course, man can never be perfect. Indeed, perfection would mean to be following a pattern, and therefore to be in a wrong order of mental operation. So we cannot reasonably expect that any man will ever be totally free of arbitrary “subjective” features, among the factors that determine his thinking. But an enormous improvement is evidently possible, in this regard.

Now, to come to Existentialism, about which the remarks of Jammer,<sup>2</sup> quoted by you, seemed very interesting. The Existentialists do see the fact that man cannot by thought alone really determine the whole of life. This is not only because thought is always concerned with parts, aspects, and fragments of totality. It is also because one does not know all the tacit features of the “self” that are actually the major premises, determining the general pattern and structure of this thought. But the Existentialists are totally wrong in saying that this fact calls for an act of “decision” or “choice” that seems to be irrational and unfounded in reason. For in reality, “irrational” decisions are determined mechanically by our conditioning, which leads to our perceiving through a tacit set of DROPS. Thus, a man who is sick of the dull deadly pattern of daily life may react by “going berserk” or by engaging in “wild orgies” of pleasure. But in doing this, he has merely surrendered his whole being to the residues of his childish conditioning. Far from being free, he is now a slave of even more mechanical impulses than are those that cause him to conform to the boring routine of everyday

---

<sup>2</sup>Jammer (1966), pp. 185–189 (information from Jeffrey Bub)—CT.

life. Or if he suddenly “chooses” a new religion or political party, he is still a slave of the conditioning that makes these seem attractive and right. In such a situation, no “choice” or “decision” has any real meaning.

Now, what the Existentialist is tacitly seeking is a meaningful kind of freedom. This is not arbitrariness of “disorder”, nor is it the arbitrariness of an imposed pattern of order. Rather, true freedom means to realize “what has to be”, because of the very order of external nature and human nature. But this is meaningless, unless one can first learn what is wrong or arbitrary about one’s present state of order. So what the Existentialist leaves out is the need to be always learning how what is called the “self” is imposing arbitrary DROPS on the whole field of awareness. Then the Existentialist complains that it is all “arbitrary”, not noticing that it is the very act of apparently “observing” from a separate “self” that has introduced the “arbitrariness” in the first place (Of course, it is not really arbitrary, but in fact determined by the tacit assumptions that are mistaken for inferences from the supposed character of the apparent “self”). As one learns how all this is taking place, then the mind is freed of arbitrary DROPS, because they cease to be confused with DROPS that have been seen to cohere with the whole fact. So fundamentally what is needed is to learn the difference between arbitrary DROPS imposed by past conditioning, and genuinely appropriate DROPS that cohere with the whole fact. This requires sensitivity, interest, attention, and awareness. (If any “philosopher” feels that he doesn’t know what these are, then it would be best, in my view, if he left this field altogether.)

The existentialist is right in saying that no metaphysical framework is adequate to determine the order of what is. But he is wrong, in saying that one cannot always be learning about this order. The fact is that everybody, whether he likes it or not, cannot do other than have a metaphysical framework, either tacit or explicit, relating to this order. For metaphysics is just the name for one’s most general structural assumptions about nature, society, the “self”, the universe, God, or whatever else one feels to be deeply significant. All of one’s thinking tends to be shaped by tacit metaphysical premisses. (E.g., the conventionalist’s metaphysics is the assumption that our theories are only convenient conventions.) What we can do is first to be always observing and learning how our thinking is in fact conditioned by metaphysics.

But then, is all metaphysics necessarily destructive? I do not think so. Rather it seems to me that one can distinguish two kinds of metaphysics. Firstly, there are the general structural assumptions that we know we have, or that we are at least ready to learn about, and to change if they should not cohere with the fact. Then there are those that we don’t know about, and don’t want to learn about, because to do so might seem to threaten the order in which the “self” appears to be founded. These two kinds we may call “useful” metaphysics and “destructive” metaphysics. Many philosophers, reacting against destructive metaphysics, failed to distinguish these from the useful kind, and thus attempted to do the impossible – i.e., to get rid of all metaphysics.

Why do we need metaphysical assumptions? One reason is that (as demonstrated recently by science), interest and attention are determined by the thalamus and the reticular structure at the base of the brain. This structure does not respond directly to abstract thought. Rather, it responds mainly to feelings and images, which contain

the essence of the DROPS of abstract thought. If one is to do creative work, it is necessary that the thalamus shall collaborate whole-heartedly and fully. That is why a good conceptual “model” that presents the DROPS of thought to the thalamus is so necessary. For if interest and attention has to be determined by laboriously working out all the inferences of abstract thought, one will not be able to deal with subtle and difficult questions, requiring rapid, accurate and penetrating perception.

In classical physics, one was at least able to present the general structure of thought to the thalamus in terms of mechanical “pictures”, but in quantum theory, this possibility is largely gone. But even in classical physics, the general metaphysical “model” is very far from what is experienced “intuitively” in direct and immediate perception. Thus, if one looks at a stream, it is easy to see that it is constituted of a certain substance, “water”, that one has known in other contexts. But no one can directly and “intuitively” appreciate the atomic constitution of the stream. So we have a situation where our metaphysics and our intuition fail to coalesce. This is very harmful, as it causes man to fragment, either into an “intuitive” type that rejects reasoning and logic, or into a “hard-headed” type that rejects the intuition and the deeper feelings that are our basic contact with reality. The wholeness of man demands a new kind of metaphysics that coalesces in its general structure represented in direct and immediate perception. But this in turn will require careful attention to what we actually see in direct and immediate perception. At present, we seldom distinguish what is actually seen from the thalamic “display” of the content of thought, in the form of images and feelings. This failure to make a proper distinction leads us to confuse the influences of thought with directly perceived reality – a comparison that is the ultimate source of all illusion and delusion. So to learn about our metaphysics and our direct and immediate perception has almost unimaginable potential significance. For if mankind were even relatively free of illusion and delusion, this would in itself be a revolution that would put all other known social change in the shade, (as would happen to a candle placed in the direct sunlight).

It is perhaps best to approach the metaphysical question indirectly and obliquely, because our “direct” approach would be determined by the DROPS of past conditioning, and therefore false. Indeed, we can usefully approach this question by considering your third point – i.e., the suggestion that man’s constructive “architectural” activities are essential, to be taken into account, if one is to avoid a “metaphysical” (in the bad sense) version of creativity.

First of all the word “architecture” is a bit too specialised for the meaning that you wish to assign to it. Biederman once pointed out to me that the ancient Greeks had a word “Techne” meaning an indissoluble union of science and art, working in all of man’s “constructive” activities. (Note how different this is from technology.)

But then, could we accept your assumption that inventive art and science are two aspects of what could be called “Pure Techne”? You must ask Biederman about the situation in art. But in science, can you imagine that even in an ideal society, there would no longer be such a thing as “Pure Science”, whose culmination was taken to be discovery of new DROPS and which was regarded as crowned by factual proof that the inferences from these DROPS are correct? In such research, the aspect of utility for Techne would still be a by-product of the discoveries. In other words,

scientific research is most deeply a part of the process of learning, which is intrinsic to human existence. Out of this learning, man may discover the emergence of a creative intention, in the field of Techné. But in my view, one should not say that one learns in order to create something. Rather, learning is the foundation of the life of the psyche, as breathing is of the life of the body. And as Beiderman has frequently pointed out, what one learns about nature and about man (including the mind) is the very “soil” in which creation can emerge, whether in Techné, in art, or in relationships in everyday life (e.g., parent and child). It is meaningless to try to create something new and original in a field that you do not understand. If you are an artist, you must learn about light, space, color, structure, and form. If your field is Techné, you must understand all this, and science (including sociology) as well. If your field is the raising of children, you must understand human nature, body and mind, in addition.

To sum up, learning is itself a creative activity of intelligent perception and it is the true foundation of all other orders of creativity. We do not learn in order to create any more than we breathe in order to create. Of course, our learning process is now diseased, suffering from various functional disorders, so that it is often painful (as happens with breathing when the lungs are diseased). But when the mind is healthy, learning is natural and joyful, as is breathing fresh pure mountain air.

One difficulty is that we seldom notice how we actually do learn from the DROPS of immediate perception. This has become so dull and automatic that we don’t even notice how it takes place. In order to reveal what happens more clearly, I propose an experiment.

Get hold of a pencil or a long stick. Grasp it tightly and close your eyes. Start to “feel out” objects in your neighbourhood. Notice that the stick now seems to be an extension of “the observer”. Get up and start walking, “tapping” your way along, like a blind man. Notice how the mind pays little attention to the stick as an object. Rather, one is interested almost entirely in DROPS of the tapping. It goes: Similar, similar, similar, different. Then similar, similar, similar, different. Each difference denotes an edge or change in shape or orientation of the surface that the stick is contacting. Notice now, how a vague conception or “image” of the room is slowly being “constructed” in the brain. It is very striking to “see” the objects emerging into consciousness. Some of them are proved to be “wrong” by further tapping, and these disappear. If you blindfold yourself and enter a room into which someone else has introduced objects unknown to you, it all grows much more interesting. Try it for an hour or so, and you will see that the “space” of the room has been pretty well constructed in the mind. Your muscles begin confidently to be guided by the “space”, with the main “objects” in it. You see how action starts from this mental “space”, and how the brain is always looking for discrepancies between the DROPS implied by this “space” and the ones that are actually experienced.

All of this is a plain fact. It is not explained conventionalism, traditionalism, or any form of metaphysics. You see clearly that the “space” is constructed in the mind. Yet it is not merely a convention. For it serves as an accurate “map”, from which inferences of the DROPS observable with the stick can correctly be made. After all, a

map has certain conventional features, but yet, it reflects DROPS that are not purely conventional.

It is not a big step to see that optical perception works in a similar way. However, the operations that built up our optical “space” in the mind took place mainly in the first few years of life. So we have forgotten all about it. Indeed, we habitually see in terms of our conditioned notions of space, not even realising that we are thus conditioned. And all scientific research is also evidently a basically similar process.

One can see in the “tapping experiment” that one is tacitly dividing the world into two parts. One of these is the body plus the stick. The other is the rest of the world. The first of these is the “subject”, and the second is the “object”. In the “subject”, the brain is mainly interested not in the essential DROPS, but rather, in those that are, for it, “accidental” (e.g., the pattern of the tapping). It is these “accidental” DROPS that reflect the intrinsic DROPS of the “object”. When the brain “constructs” the latter, the “subject” is largely tacit and implicit, being vaguely indicated only by the “feel” of the body and the stick.

One can generalize this. In the “subject”, one is aware mainly of DROPS that are accidental to it, but that reflect something else called the “object”. The division of subject and object is freely movable, because the brain can look at any object (e.g., a photograph), and treat its DROPS as reflective of something else (e.g., the person portrayed in the picture). Indeed, most generally, the “subject” is that aspect of awareness whose DROPS are mainly reflective of something else. This reflection is however active. That is, it includes the outgoing movements needed to produce the DROPS in question, as well as the incoming sense impressions that carry these DROPS as “accidental” features. (i.e., not necessary in the limited context of the body by itself).

Now, as you look at the world, you can treat the skin as the boundary between subject and object. But (remembering the “stick”), you can regard the light as an extension of the body, which is somehow “probing” the environment. You are not interested in the DROPS of “light itself,” (e.g. Maxwell’s equations), but only in how the DROPS of light reflect those of the “object”. So the space is now seen as part of the “subject” while what you see in the space are the “objects” (as if the light were a set of “sticks” tapping against the objects). But now you can go further. Even the objects can be seen primarily through their DROPS. The whole universe is their “subject”. But if the whole universe is “subject”, is there a separate observer! Evidently not.

But now, the “Gestalt” can switch. Suppose we consider that the whole universe, including the body, is the “object”. Once again, according to the point of view that I am proposing, all objects, from macro-objects to atoms to electrons – etc. are, most deeply, determined by their DROPS. There is no fundamental level. It is all DROPS. Therefore, in a deep sense, the “subjective” and the “objective” coalesce. True, their DROPS are different. But in any case, all DROPS are different. That is their most basic characteristic. In being different, subject and object are similar to everything else.

The main new point is that we cease to regard any particular set of DROPS as basic, whether these be atoms, or neutrinos, mind or matter. In a certain way, all DROPS



are similar, in that they are DROPS. Therefore, when one is aware most strongly of the character of immediate and direct perception as DROPS, one is in direct and immediate contact with what may perhaps be called the fundamental “energy-substance” of the universe, in all of its manifestations and aspects. Everything is DROPS. With regard to what we are, it then follows that we are what everything is. It is as if every mental event were a direct contact with the essence of existence. Indeed, we can say that the totality of appearance (not merely its results, but also its process) is the essence of existence. For appearance in awareness is the creation of DROPS. But every form of existence is the creation of DROPS. So we can get a kind of direct “intuitive” feeling for our basic metaphysical notions. By assuming in our metaphysics “All is DROPS” we have removed the gulf between immediate intuitive perception and our basic metaphysical notions.

But to exist is not only to be DROPS. It is also to reflect other DROPS. Thus, the mind reflects what transcends awareness. In this regard, its reflection is limited and particular. That is, although, in a way, we are everything, we do not know everything.

Nevertheless, the mind can reflect certain relatively universal features of DROPS. Mind can also reflect on itself. In this respect, mind is like a flame, fed by the brain. Each flame has particular features. But in being a “flame”, it is universal, – just “mind”. Different people can observe different “samples” of “mind”, that are “fed” by different brains. As different observers in different laboratories can study different samples of sodium, and discuss their results, coming to a common understanding of properties of sodium, something similar can happen when each person is looking at the “sample” of mind accessible to him, and communicating what he sees to others who are doing the same. So, in a way, a “science of mind” is possible. But here, the only instrument of perception is “mind itself”. This science requires that “mind” be of a very high order of clarity and purity of perception. Most scientists, in their present states of mind, do not constitute sufficiently good “instruments” to allow the necessary observations to be carried out.

In a way, a “science of mind” would also have to be an “art of mind”. For mind is so subtle and dynamic that in each manifestation, it has individual features of its DROPS that are like those of a work of art.

Understanding all this, let us now go on to see what it means to be aware of DROPS as the foundation of perception, experience, and even all existence. When you are listening to music, notice that the DROPS in the sounds correspond to DROPS in the feelings. Thus, in a drama, music may be played which stirs up feelings of fear or joy. Every feeling has its set of DROPS. Observe your feelings of fear and listen to them, as you would listen to a new piece of music. You will see that there is a pattern and rhythm in them, which is very interesting. The pattern of steady background and sudden “vibrating thrills” or “jolts” is expressed in the music that is used in the film to stimulate fear in the viewer. Or listen to Beethoven’s “Ode to Joy” in the Choral Symphony. Watch how the feelings are always climbing in an ever rising hierarchy, moving up – up – up toward an all encompassing structure of indescribable and unimaginable beauty. Surely, Beethoven must have perceived all this and much more, when he wrote his music.

As you open up to the perception of all these DROPS in the feelings, you say that in turn, the feelings are “carrying” the DROPS of some yet deeper and more encompassing order of reality. This deeper level may also carry the DROPS of something that transcends it. Then, with a tremendous energy, one may have the impression of a vast totality that is the reality behind it all. Were not people like Einstein perhaps moved by such a perception? In this totality, subject and object seem trivial.

Now, let us look at nature in a similar way. Science has shown that the nerves in the brain have an immediate response in perception, which is followed a short time later by the response of memory, which shapes perception in terms of DROPS that are known. A young infant must be strongly aware of the DROPS of immediate perception, which in a way, might resemble what could be called “visual music”. As we grow older, the response of memory gets stronger, until we hardly notice the DROPS of direct and immediate perception. Is it possible, however, to be sensitive, once again, to the structure of what we perceive, regarded as a kind of “music”, rather than as “information”, permitting the “construction” of the perceived “object” in awareness? Look at a tree and get a feeling for its structure, for the way in which light and space are essential to this structure. Be aware of how the word “tree” is always projecting a routine, mechanized structure into perception. See if it is possible not to think the word “tree”. Rather, just be sensitive to the optically perceptible DROPS and let these work in the mind freely. Notice how the distinction of “self” and “tree” or “nature” begins to fade out. As happened with the music, one sees that the feelings are “carrying” the DROPS of nature. One can at least imagine how this can lead to a deeper reality that is the totality behind it all. However, because man’s vision is even more deeply and broadly bound up with his whole mind than is his hearing, the effect may be much greater than that of music.

Very probably, this is the mode of perception of the real artist. But why should it be restricted to the artist? Do we not all need it in every phase of life? Can one be aware of another person through the totality of DROPS, rather than through images and stereotypes from past conditioning? Imagine what it would be if two people were aware of each other in this way. All barriers of “self” and “other” would come down. This would be such a revolution that we can hardly conceive of it.

Then we can be aware of scientific fact in this way. It is not merely “information” that may be useful for various purposes, or that may be the foundation of future achievements. It is, like music, a set of DROPS. One sees its beauty and ugliness, its harmonies and disharmonies, its truth and falsity. But there is no “self” who is “doing the looking”. Rather, observation is just “going on”.

When the division of subject and object ceases to be given top priority in awareness, then the DROPS of the mind are determined creatively, in a way that is appropriate to the whole fact, inward and outward. Indeed, as indicated earlier, these DROPS are always determined by the total content of awareness. But if this content includes the “false information” that is being observed by a separate “self” of sublime beauty and supreme value, then the brain will naturally produce a set of correspondingly false and arbitrary DROPS. To the extent that this illusion producing mechanism is not operating, the DROPS are appropriate to the total content of the moment. This includes not only direct and immediate perception,

but also, all that we know, at that moment. The brain is aware of contradictions and disharmonies in this knowledge. So it is always spontaneously and naturally learning about them, thus coming to create new DROPS that are more nearly appropriate.

After all, as I indicated in my Relativity book, even science is primarily a mode of perception, rather than an accumulation of knowledge. What has been learned is often useful and relevant. But the essence of the life of the mind is the movement and process of learning, itself. When this stops, mind starts to deteriorate, no matter how much it may already know. Moreover it is meaningless for man to hope to know the totality of all existence, or even its essence. It is enough for him that he is of the same “energy-substance” as this totality. So he is of the essence of totality, and in particular, the DROPS of immediate perception are his most direct contact with the essential nature of this totality.

I hope that this begins to indicate what I mean by the role of DROPS in creation.

Up till now, I have been sending copies of these letters to Biederman. Since the typist is now rather busy, I am sending this to you directly. Perhaps, after you have read it and thought about it for a while, you could let Biederman have it, until he has time to read it.

With best regards

David Bohm

P.S. When I say that our most direct contact with the nature of reality is in direct perception, I refer not only to external sensual perception, but also, to “inner” perception of the state of mind, its feelings and thoughts, etc. For these too are apprehended in terms of DROPS. Indeed, one can go on and say that in the act of understanding, the mind creatively “grasps” or com-prehends a new totality of DROPS, in many cases referring more to the over-all structure of thought than to what is perceived sensually. In my view, the act of understanding is based on the immediate and direct response of the mind to the DROPS reflecting its own state of perception and thought. This is to be distinguished from the response of memory, which comes from the conditioning, and which is, generally speaking, not creative. Rather, it is at best adaptive and inventive. (Invention is the application of known means to new problems or the combination of known means in new ways – in a certain sense, a kind of synthesis.) Creation is of an entirely different order of mental process, immeasurably transcending mere invention.

This raises an interesting question. Is inventive art creative? Evidently, it can be creative. The aspect of invention seems to me to be the process of always trying out new combinations of things, new approaches, etc., to make something that is novel. As such, it is like the synthetic aspect of language and thought. Of course there is always the “analytic” approach needed to test what has been invented or synthesised. But something creative is not merely an invented novelty. Rather, it has the aspect of unity and totality of its DROPS, which can come only from deeper levels and higher orders of mental operations.

Biederman is able to go much more thoroughly into the creative character of inventive art than I can do. In any case, this letter is already so long that it would not be useful to extend it in this way.

---

Jan 28, 1967

Dear Jeff

In answer to your recent letter, I am glad to hear of your proposed research programme.

I enclose a copy of the paper in the Japanese Journal.<sup>3</sup> Part II is not written yet. I expect within a year or less to publish the mathematical basis, with some of which you are familiar.

Best regards

D Bohm

---

Feb 22, 1967

Dear Jeff

Thank you very much for your letter. I have read the proposals for your research program and think that they are very good. I have also sent the recommendation requested by you to the National Science Foundation.

What you say about Bohr in your letter is very pertinent. It is true that he saw that the quantum implies the wholeness of physical phenomena. We tried to show something similar in our Rev. Mod. Phys. articles when we suggested that the micro laws are dependent on macro environment. Neither point of view really gets the essence of what is meant by “indivisible wholeness”, which I shall call henceforth by the name of “totality”. Indeed, the trouble is that both the common language and mathematics are too crude and impoverished to allow the quality of totality to be discussed to any significant extent. Therefore, people are inclined to assume that “wholeness” is subjective and private, simply because they cannot communicate their genuine perceptions in the subject to other people. Thus, they fall into the confusion of assuming that only the parts and their consideration are real. But the consideration of parts is basically what is done in any good machine. So people are led to assume that only the mechanism is real, while all talk of wholeness and totality is at best a convenient fiction, introduced by the mind to deal practically with the vast complexity of what is in reality the universal mechanical process of external nature and human nature. And Bohr fell into basically the same trap, when he asserted that while reality was of the quality of wholeness, only the mechanical could be described in language. Therefore, he in effect condemned scientists to emphasize the computation

---

<sup>3</sup>Presumably Bohm (1965), also <http://www5.bbk.ac.uk/lib/archive/bohm/BOHMB.149.pdf>—CT.

of experimental results as the supreme value in science. For as long as one could in principle at least describe the mechanism, then one could get a glimpse, however inadequate, of how it worked in a coordinated way as a totality. This is indeed a pale and emasculated form of the genuine perception of wholeness or totality that we can get for example in listening properly to some of Beethoven's later quartets. Yet, it is at least something. By a curious irony of history, Bohr's wish to get a deeper intuition of wholeness in physics actually helped make it impossible for physicists even to get the intuitions that they had previously had, and left the latter with nothing to do but to seek wholeness in mathematical schemes of computation of the relationships between the fragmentary orders of different kinds of experimental results.

The key to really seeing wholeness in nature is both to enrich the common language on this subject, and to develop new forms of relevant mathematics. But today, physicists have an attitude which leads them to assume that the synthesis of existing ideas expressed in terms of existing languages will be adequate to the task. In this, they are very unlike Newton, who developed an entirely new mathematical language, the calculus, in order to express his new ideas on mechanics.

Now, the first step is to enrich the common language on the subject of order. I propose that a preliminary step in this direction to introduce the terms of similar differences and different similarities to describe order, as I explained in my Japanese article. So we can say a straight line is a curve of first order, determined by the first similarity in its differences. The circle is a curve of second order, the spiral of third order, etc. Thus we can go on to curves of ever greater "complexity" to curves of infinite order. Examples of these, I suggest, are the "chaotic" orbits of a particle in Brownian Motion.

Now, people generally say that these curves are "disordered". But it seems to me that the word "disorder" is a meaningless term, since it is impossible to have a curve with absolutely no order at all. Rather, the Brownian motion curve has a well defined order, which is infinite, in the sense that an infinite number of similar differences is needed to describe it. In addition, such a curve has statistical symmetry, in the sense that in the long run and the average, it spends nearly the same time in each unit volume of space accessible to it. All these features of the infinite order of Brownian motion are factual, communicable, and testable. They are in the no way subjective, private or personal. And they have nothing to do with "disorder", which would be an impossible situation, containing absolutely no order of any kind whatsoever. Indeed, the word "disorder" is an inappropriate name for the complex kind of order described above. This name is never useful and it is always a source of confusion. To remove this confusion, it is necessary to describe in each case the kind of order that is actually present. This can be done in terms of the language of similar differences and different similarities (as we use the language of units of length to communicate about measurements).

Now, in nature, we have a further kind of creative order. That is to say (e.g., in biology) each order has only approximate and relative symmetry. The breaks in symmetry of each order provide the basis of similar differences, that can constitute the symmetries of the next order. And so on in principle without limit. Thus, there is an unending series of hierarchies of order, leading to the evolution of new structures

and new orders of structure. This order is potentially infinite. Thus, it resembles the random curve of Brownian motion. However, it is different, in that it does not lead to statistical symmetry, but rather, to creative evolution of new orders, structure, as described above.

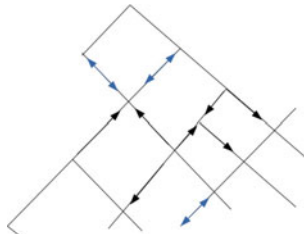
In the evolution of order, there can be the growth of a state of harmony, within a structure of unified totality, within which all parts work together coherently. Or there can be a state of clash and conflict of the partial orders, leading to overall destruction and decay. (E.g., the unlimited growth of a cancer clashes with the order of the rest of the body, causing both the body and its cancer to die). Both harmony and conflict are factual real properties of the order, and are not merely private and subjective opinions.

Now, let us try to go further into developing a language for talking about creative order. To begin with, in physics, we are restricted today mainly to coordination (e.g., that is what are “coordinates” are doing – coordinating the movement of particles, to those of reference frames). As long as we stick to this language, we can never get out of mechanism, and into the field of totality and wholeness.

Consider instead the government of a country. To say that the prime minister coordinates his movements to those of each factory worker would be a very misleading way of talking. For in fact, there is a hierarchy of order of function. Unfortunately, this has gotten mixed up with a fictitious order of status. When the democratic revolution tried to overthrow the hierarchy of status, (without much success) it unfortunately confused the issue, by tending to imply that society could operate without a hierarchically organised order of function. The whole notion of hierarchy thus wrongly felt into disrepute. But this is clearly absurd.

Evidently, there is a two-fold stream of order moving hierarchically in every government. Thus the prime minister orders the general goals of his ministers, who order those of their department heads, and so on all the way down the line. This, I shall call downward ordination, or ordination of outgoing action. Then there is an upward flow of knowledge, going from one level to another. In each stage, there is a process of abstraction of essentials. On the basis of this abstraction, the downward ordinating action is guided and directed. So we have upward ordination, download ordination, and the links between them at each level.

I illustrate these below:



Now, if we look in any given level, the net result of all this is to produce what can be abstracted as ordered movement in that level alone. This I call co-ordination, or “sideways moving order”. Basically, coordination is mainly the net result of up-

ordination and down-ordination, but we tend to forget that we have abstracted it, so that it seems spuriously to have a kind of separate existence in itself.

Now, I would give to the whole process (up-ordination, down-ordination, their linkages, and coordination) the name “PANORDINATION”. This is a new term, meaning “ordering of the whole” or “totality” (after the Greek word “Pan”). It is a quite new concept of order, not present today in mathematics, or in the common language.

To illustrate the new possibilities of this concept, note that the laws of physics thus far deal only with similar differences in the field of coordination (e.g. Newton’s laws of motion). But now let us consider similar differences in the field of panordination. The simplest situation in coordinated movement is the free particle. Here, the differences in distance travelled in successive intervals of times are not only similar, but also, equal. Let us now look at panordination. The simplest situation would be to have not only similar differences in the structures of successive levels, but also, equal differences. This would produce a rather interesting looking hierarchy, that it would be nice to investigate. Of course, the real situation is more complex than this. But still, it would give us a nice paradigm case for study, especially to show how the coordination on each level is the outcome of the panordination, working through the upward and downward streams of ordination (E.g. as upward information and downward orders determine the “horizontal” coordination of a government department).

This view would imply that nature engages in abstraction in a way that is similar to man’s, but different. I explained earlier that light rays abstract the whole structure of the environment, and even of the universe. But now, I propose that this abstracting movement is not contingent and accidental. Rather, it is universal and necessary – indeed the very essence of the order out of which all that there is is constituted.

This implies that nature has in it a series of orders of abstraction, plus the ability for outgoing action to be “guided” by these abstractions, that is akin to intelligent perception (similar but different). So no observer is needed. Man himself is a yet higher order aspect of this stream of abstraction, leading to yet higher orders of panordination. Indeed, while man’s government is panordinated to a finite degree of order, nature’s process and man’s mind are panordinated to at least a potentially infinite degree of order.

The extreme paradigm case of panordination was to have a constant difference of order between the levels. In this case, any single “horizontal” cross-section of coordination contains the whole story. Thus, it can correctly be abstracted as mechanical and coordinated. The human observer can come into the stream of panordination at any level. This corresponds in Heisenberg’s language to the arbitrariness of the location of the “cut” between observer and what he observes. But in a deeper sense, this “cut” is very misleading. For the very essence of the law is the “vertical” movement of panordination, so that a “cut” makes a description of this law of panordination impossible. Only coordination and mechanism are then left to us.

As soon as the differences of levels are no longer constant, panordination takes on a new content, which is essentially quantum theoretical rather than classical and mechanical. The usual case discussed in quantum theory is that as we consider

successively higher levels of order, we approach the situation of constant differences. Eventually, then, at a suitably high order, it can be treated as classical. And here, the human observer can enter the stream of panordination without a significant effect on the lower levels.

However, in the lower levels, the laws are no longer those of mechanical coordination. Indeed, we can take two cross-sections. The “horizontal” discusses coordination – as Leibniz said, Space is the order of co-existence.<sup>4</sup> So the horizontal cross-section would refer to the space order. The vertical cross-section would refer to pan-orders, which transcend space and time.

Time is the order of successive existence of structures that are defined by their co-existence. So time is a mechanical concept of second order, space being of first order. In other words, until there are coordinated orders of coexistence, time has nothing to “sink its teeth into” in defining orders of successive existence.

My own feeling is that in simple cases, the pan order has to do with momentum space in quantum mechanics. This then determines velocity (space-time relationship) in the horizontal cross-section of co-order. But this determination is generally only statistical (e.g., as in the infinite order curve of Brownian motion).

To sum up, the concept of a hierarchy of discrete orders, panordinated into an undivided totality, has the following relations to quantum theory.

(1) Its discreteness is ultimately the origin of the discrete aspects of the quantum properties of matter.

(2) The creative origin of all “horizontal” mechanical co-orders in the “vertical” streams of pan order implies the indivisible wholeness of each structure, all the way up to the observer. Indeed, the observer is still part of the stream of pan orders.

(3) The wave-like properties are in the pan-order. Consider, for example, the structure of a government. Where is the government located in space? Does it “move through space” like a mechanical object? Actually, the space-location of a government resembles a wave. An action originating in one department spreads like a wave first to lower departments and then back up. In this movement, the government is not something that is located in the “government buildings”, scattered throughout the country. For the movement of information and orders between the buildings is the very essence of what the government is. If we were conceptually to place a “cut” around certain government buildings, we would prevent ourselves from being able to understand the very essence of what is going on.

(4) The uncertainty principle is inherent in this view, in the sense that the more uniform the “vertical” order of panordination, the more the effects will “spread out” in lower government departments, so that the less precisely will we localize the activity on the levels of coordination. On the other hand, to try to localize the process of coordination is to make it impossible to determine the process of panordination as a simple one with constant differences.

(5) The statistical effects are in this point of view. For the panordinative process leads to coordinated processes of infinite order, resembling those of Brownian motion.

---

<sup>4</sup>Alexander (1956), pp. 69–70—CT.



Of course, this all has to be put in mathematical terms. I must emphasize that existing mathematics is too crude and limited to allow us to do this. We need a new mathematics. I have some general notions on the subject, which I shall send to you later. Meanwhile, let me say the following:

(1) The concept of “coordinate” is to be replaced by that of “panordinate,” which refers to the vertical stream of order. Coordinates will be abstractions from panordinates.

(2) We must go beyond mere topology, or the theory of “places”. We need to inquire into the order of space, i.e., the order of co-existence, and the order of time, (the order of successive existence).

(3) These orders are determined creatively, and not mechanically, as abstractions from the pan-order.

About our own Rev. Modern Phys. paper, I would say that the effect of the environment on the movement of the electron was a crude way of discussing pan-order. It contains, in effect, an ordering of the lower level quantum process by the macro-environment, but it fails to contain a clear expression of the process of abstraction of information about the micro-level at the macro-level.

I have recently given a talk on Creativity<sup>5</sup> to the Architects Association here. It will be stencilled soon, and then I’ll send you a copy. Perhaps it will help clarify what I mean by the term.

I wonder if you could please also send this letter on to Biedermann, when you are through with it.

With best regards

David Bohm

P.S. I wish to add a few remarks on the “disturbance” due to an observation. Actually, since the lower orders are always being ordered by the higher orders, it is no disturbance at all, but instead, part of the normal order of movement. In this process, there is upward abstraction, symbolised by  $(A \uparrow)$  and downward ordering action, symbolised by  $(A \downarrow)$ . Now  $(A \downarrow)$  is dependent in some way on  $(A \uparrow)$ . But each  $(A \downarrow)$  will produce a different  $(A \uparrow)$  which in turn produces a different  $(A \downarrow)$  and so on. Thus, there is a new order of successive “observations”, which is simply not describable in the conventional quantum theory. It is this new order that will be the key test of the new point of view. We have to develop the mathematics far enough to see more or less what sort of order it should be.

This order is similar to (but different from) the order of intelligent perception. Here, the brain abstracts, then on the basis of this abstraction initiates an ordering action, directed outwardly. The results of this action are in turn abstracted, especially the difference between these results and inferences drawn from previous abstractions. This difference enables the brain to learn what it did not know before.

In a way, nature then has a kind of intelligent perception. Its evolutionary process therefore need not be a purely random one of “chance variations” followed by

---

<sup>5</sup>Bohm (1968) also Nichol (1998), pp. 1–18, or <http://classes.dma.ucla.edu/Fall07/9-1/pdfs/week1/OnCreativity.pdf>—CT.

“natural selection”, and nothing else. Rather, nature can intelligently “learn” from its “mistakes” as we can.

If nature was able to lead to the human mind, with its intelligent perception, it is hard to believe that nature was, in the beginning, absolutely nothing more than a randomly functioning mechanism.

Of course, this does not imply that external nature is conscious. For consciousness is awareness of awareness. (Some people call it “awareness of self”. But the term “self” is so confused that it means almost nothing.) Awareness of awareness implies a hierarchy of orders of abstraction, such that each order intelligently perceives and orders those below it. If this hierarchy is of a potentially infinite order, then there is consciousness.

It might be said that man is the highest known order of nature’s awareness (i.e., intelligent perception). Or as Cezanne put it, man is the consciousness of nature.<sup>6</sup> This can be taken to mean that man is nature’s consciousness, or that the content of one’s consciousness is the whole of nature (including human nature). In my view, both meanings are essential parts of the whole truth.

---

To change the subject, I want to say a little more about the wave-particle properties of matter. In the pan-order, one might imagine a particular government department, coordinated to other departments in the same level. An action takes place there in a particular building. Because it is localised, we say it is like a “particle”. The action drops to lower levels, where it spreads out like a wave, with complex inter-related movements resembling “interference”. Then, in the abstracting movement, it comes up to another building, on the original level, where it is localized, thus resembling a “particle” once again. Thus, we have something like the particular interference experiment.

---

May 15, 1967

Dear Jeff

I have just returned from my trip to Israel, and am just now getting around to answering your letter of April 7.

I have read about Jung (and Pauli’s) thoughts on synchronicity many years ago.<sup>7</sup> No doubt, there is something right about the idea. Nevertheless, it has so many confusing aspects that I was led to doubt that, on the whole, the idea is a useful one.

First of all, it seems to me that the notion of archetypes basically contradicts that of creativity. An archetype could perhaps be compared to a kind of hereditary conditioning. As such, it could be useful under some conditions, and a source of perceptual “blinding” under others, where the archetypes in question would not have

---

<sup>6</sup>This quote does not appear in Biederman’s book on Cezanne, Biederman (1958), or in the published Bohm-Biederman correspondence, Pyllkänen (1999). However, as noted in the Introduction, the latter are only a small part of the Bohm-Biederman correspondence where Cezanne’s views are often discussed, so it may appear there—CT.

<sup>7</sup>See Introduction pp. 4–5—CT.

an appropriate structure. But whether useful or harmful, archetypes would be, in essence, a denial of what is original and different in perception, and therefore a denial of creativity.

It is, in addition hard to know how much to believe about Jung's accounts of "meaningful coincidences", or else how much may be the result of perceptual distortion by wishful thinking on Jung's part.

Thirdly, I wonder whether meaning really comes from archetypal preconscious organization [of] your train of ideas. Perhaps conditional meanings arise in this way. But do new meanings arising in the act of understanding also arise in this way?

Finally I wonder whether von Franz<sup>8</sup> is right in saying, "I can watch disorder without doing anything about it". This raises the question "Is there such a thing as disorder, and if not, how can one watch it?" "If it is disorder, how can one establish order in it?" Don't forget that "disorder" means "no order at all". If there is a complex but as yet unknown order in it, it was never disordered. So I don't understand what von Franz is trying to say here.

I think the aspect of truth in Jung's ideas is that the causal order is insufficient, both for mind and for matter. But from this it does not follow that Jung's approach is a right one.

Even in classical physics the a-causal order appears in what are called "initial conditions". A tacit assumption of classical physics is that the a-causal order is completely contingent or arbitrary, while only the causal order is necessary and inevitable. On the other hand, it seems odd to suppose the arbitrariness of what is (i.e. the a-causal order existing at a given moment) while one supposes that the necessary order is merely the causal one, in which what is is followed by what will be. An alternative view of the world is that the order of what is is no more arbitrary than the causal order. However it has evidently to be determined by different principles. Thus, in a work of art, the order is determined by the principle of harmonious totality, and not by the causal order, describing how the picture was painted. The two orders do not contradict each other. But the causal order is basically determined by the order of the picture itself. Perhaps in the deepest sense, the order of external nature and the mind are determined in a somewhat similar way.

Anyone who said that a creative work of art was determined by archetypes would any fact be denying the reality of creation. The same holds true for the laws of mind and matter.

I think the solution is indicated by Biederman's approach to nature and to art. The order of nature is an infinitely rich one, with a tremendous number and variety of relative and limited symmetries. The breaks in these symmetries are the "elements" of the next order of symmetry. Thus, there is a dynamic hierarchy of symmetries of order.

Consider a tree for example. Look at it. You will see on each level a set of similar differences (in the leaves, the branches, etc.). The breaks in these similarities form the basis of the next level of order. And (in a forest) between different sets of trees

---

<sup>8</sup>Marie-Louise von Franz, a Swiss Jungian psychologist—CT.

we get more similar differences. Thus the whole forest is in a hierarchy of orders. And so on to the mountains, the sky, the clouds, etc.

Nature's order has in it the feature that each partial order is thus participating in an infinite hierarchy of orders. The principal is infinitely rich and yet harmonious.

On the other hand, most of man's structures are arranged in limited mechanical orders. For this reason they do not combine harmoniously with other man-made structures or with natural structures, to produce an infinite hierarchy of harmonious orders. Rather, they tend to clash, to produce an ugly and jarring impression of conflict.

Now, scientific thinking has thus far assumed that nature's stable forms are the "real reality" while all the rich orders that I have mentioned above are contingent and accidental, therefore of no deep significance. The causal laws are those that explain the evolution of nature's stable forms. These are assumed to represent what is really necessary and significant about the laws of nature. The same is assumed to hold for the as yet unknown laws of the mind. Such an assumption expresses itself naturally in mechanically ordered architecture, city planning, etc., which regards the solid mechanical forms and their causal function as the fundamental reality, and which ignores the creative aspect of nature's forms – i.e. the fact that they are in an infinitely rich order, such that, generally speaking, each aspect participates in an infinitely rich hierarchy of orders.

Now, I want to propose that this aspect of nature is even more significant than are the stable forms and their causal evolution. I propose that this character of nature is necessary and inevitable and indeed that eventually even the stable forms and their causal evolution can be understood through the infinitely rich order and its creative evolution.

I propose also that the basic order of the mind is similar to that of nature, in the respect described above. The mind also has stable forms, defined by thought. The order of succession of thought moves towards a logical order (analogous to, but different from the causal order of nature's forms). Modern culture assumes that thought with its logical order represents the fundamental reality of the mind. But I propose instead that there is a deeper creative order, similar to that of directly perceived nature. This is not the order of the archetypes of Jung, nor of the unconscious of Freud. Both these, if they exist at all, represent mechanically conditioned orders. Rather, it is an order such that each partial aspect of mental process tends to cohere with others in an infinitely rich hierarchy of orders.

How are mind and matter related? As is well known, the order of external nature functions in the brain through the sense organs and the nerves which abstract this function to ever higher levels. Thus nature's order, working in the brain, is an inseparable aspect of the total order of the mind. So when the mind is functioning properly, in a harmonious and total way, it will go on abstracting from the perceptual order, to ever higher levels. At each stage, the corresponding total structures in the mind will be infinitely rich hierarchies of order, harmonious and beautiful. The total harmony and beauty in this process is its meaning. Since nature's order is an inseparable part of the mind's order the "meaning" will refer as much to nature as to what is "in" the mind itself.

To understand this view, one must note that almost all previous activity in recorded history has been mechanical, conflicting, uncreative and essentially meaningless. Real creation has been very rare. In this regard, I suggest that you read my Creativity article carefully to see what I mean here.

It is possible in principle for man to be creative, not only in his immediate mental response to reality, but also in his outward actions (e.g. in science, art, or other fields). In such action, man creates material structures (e.g. in art) as structures, ideas (in science) each of whose aspects is in a vast and unlimited harmony, combining with others, in many levels of similar difference. In addition, these artistic structures are in harmony with nature's infinite structure of light, color, space, form. The scientific structures of ideas are in harmony with those aspects of nature that are perceived with the aid of instruments.

However I must emphasise that creativity has been very rare. Nevertheless, as I explain in the Creativity article it is in reality the necessary and proper norm for healthy human life. From this, it follows that healthy human life has also been rather rare.

I hope that this clarifies things a bit. Please let me hear what you think of these notions.

Regards

David Bohm

May 16, 1967

Dear Jeff

This is to supplement yesterday's letter.

Firstly, I want to emphasize the role of learning, in establishing the relationship of "mind" and "matter".

Now Jung's idea of synchronicity strikes me as a very mechanical solution of this problem. The "unus mundus"<sup>9</sup> imposes a certain order in matter and a corresponding order in the mind. If it were really all as simple as this, why would an active process of perception be needed? And how would error ever creep in? Does the "unus mundus" wish also to deceive us by setting up false correspondences? In Einstein's terminology, is God malicious?

In my view, it is necessary to go deeply into the role of learning (as I emphasized in the Creativity article). As far as we know, most knowledge requires an active process of learning based on sense perception. The kind of pre-conscious ordering of mind and external world that Jung speaks of is, at best, fairly rare, if indeed, it exists at all. Once we have learnt how to perceive something, then to perceive a similar thing, we may impose a previously learned order. It is possible that the human race

<sup>9</sup>i.e. "one world", the concept of an underlying unified reality from which everything emerges and to which everything returns. An idea popularized by Jung—CT.

learned certain forms of order long ago, which have since then been built into our hereditary mental structure. So there would be a pre conscious ordering of perception through something like an archetype. But the question of originality and creativity is precisely that of how we see something new, that has not been built into us, as a kind of archetype.

In my view, learning is a creative process. It “feels out” the perceived order, in an active way, by creating certain new orders and testing them against more directly perceived orders. Those orders that do not fit are discarded. That we learn from our mistakes and as we try out various orders, we note the order in which there is an improved fit. In other words, if we note that a certain difference of orders improves the fit, we try a similar difference in the next step. But as this order of fitting breaks down, the brain tries a different kind of difference. Thus, it is always moving toward an order that correctly abstracts the order in sense perception.

In this whole process, what is commonly called a “mistake” is actually an essential part of the process. No perception is “exactly right”. Rather, by noticing what is wrong and what difference of order corrects this “mistake”, we start to abstract the order of changing orders that is always moving in higher and higher levels toward approximate correspondence with orders in direct sense perception.

I feel that any theory of perception that does not incorporate the key role of “errors” in the development of correct perception is deficient in a basic way. As far as I can see, Jung’s theory has no real place for the role of “mistakes”. Does the “*unus mundus*” present us with mistaken correspondences between mind and matter? If so, what is the nature of these mistakes? Or even more important, what is the nature of the higher mental faculties that recognise these mistakes and correct them? If there are such faculties they imply an intelligence that transcends the “*unus mundus*”. Therefore the “*unus mundus*” is not the totality. It is only one part, while the higher mental faculties are another part.

To change the topic. I do not understand the Chinese qualitative concept of number well enough to comment on it. There may be something in it. But even if there is, it does not follow from this that Jung’s theory of archetypes renders an adequate account of the process of perception.

Best regards

David Bohm

---

May 18, 1967<sup>10</sup>

Dear Jeff

I would like to supplement my last two letters to you.

As I said before, I regard Jung’s Theory of archetypes as too crude and mechanical to account for perception, especially its more creative aspects. But it might be useful

---

<sup>10</sup>First letter with this date—CT.

to show how it can be extended and transformed, so that it approaches what I regard as a more nearly adequate view. If you will focus, not on the resulting notions themselves, but on the hierarchy of similar differences that are revealed as they are developed, then you will perhaps see the directions in which I would like you to look.

Now, we first imagine the “unus mundus” creating a certain order in the external world and a corresponding order in the mind. As I indicated in earlier letters, this does not account for the role of “errors” or “mistakes” in this correspondence. Indeed, even to recognise such an error, there must be a higher order of intelligence that transcends the “unus mundus” and the orders that it creates. Thus, the “unus mundus” is seen to be itself nothing but an abstraction, created by this intelligence.

Can we get out of this division between the “unus mundus” and the perceiving intelligence, without assuming, with Bishop Berkeley, that the world is nothing but an aspect of the perceiver? We might at least try to do this by assuming that the “unus mundus” does not create perfect correspondence between mind and matter. But then, we assume also that in the mind, the unus mundus creates a hierarchy of correspondences, in which each level of correspondence of mind and matter is itself abstracted in a next order of correspondence. In this next order of correspondence, the unus mundus creates the order of truth and falsity, in such a way that some first order correspondences are felt to be true while others are felt to be false. But since this feeling is itself not always right, the unus mundus has also to create a third order correspondence, which orders the second order feelings of truth and falsity according to their truth and falsity. And so on ad infinitum.

Admittedly, this theory is very unsatisfactory. But it at least indicates the kind of problems there are in Jung’s point of view. Let us now look at some of these problems.

Firstly, it seems wrong to attribute an infinite hierarchy of order to the mind while external nature has only a simple order on one level. How could the infinite hierarchy of mind evolve from a simple one level hierarchy of matter? So it seems necessary to assume that nature is also a hierarchy of infinite order, and that it contains correspondence between its parts and aspects that are in some ways similar to those of the mind. In other words, nature is itself already abstracting one part of itself in another, (e.g., as light rays through each point abstract the whole universe). And some of these abstractions provide relatively true correspondences of order, while others provide less true correspondences. So something akin to mind is already in the order of nature. Man’s mind is an extension of this aspect of nature. One could say that nature is, in a certain sense, aware of itself, but that in being conscious, man is aware of this awareness. There is no sharp division of mind and matter. The intelligence in matter flows imperceptibly through light, heat, forces, etc., into the sensual nerves the brain, where it eventually reaches the quality of consciousness, which is similar to nature’s abstractive intelligence, but also different. (Everything that exists is similar but different). Thus, there is no need to postulate an abstractive perceiving intelligence that is utterly distinct from the matter that is the object of its perceptions, and separated from the latter by an unbridgeable gulf.

Secondly, we must consider the fact that it requires a creative action for man to perceive the truth properly. It does not happen automatically and mechanically. It is not as if the *unus mundus* created the order of nature and the order of the mind in an infinite hierarchy that inevitably approached perfect correspondence in its totality. For then, how could we explain the fact that almost the whole human race in almost all of its history has been lost in confusion on almost all questions of deep importance, while only a few have only occasionally had correct and creative perception? Evidently we have to think of perception as a creative process, rather than as an automatically accomplished fact.

Here, we get into confusion over the notion of perfection. If man automatically had complete and perfect perception, he would be only a kind of machine. What is essential to creative perception is not mainly the correspondence of perceived object to the order in the mind. This has a certain kind of importance, to be sure. But what is deeper and the very substance, energy, and order of perception is the movement in which man is learning to extend his perception in new ways, to new horizons, depths, etc. So what is the key point is not resultant adequacy of correspondence of order of mind and matter. This is necessary but it must come mainly as a by-product of a dynamic order in the mind, which contains a structure leading always to a movement toward truth. If man automatically had the truth, (e.g., from archetypes projected by the *unus mundus*), he could not have this principle of movement toward the truth. And if nature were finite in its order, man's mind could arrive at the complete truth, so that he would lose the possibility of realizing his deepest nature, which is to be in the order of moving toward truth. But because nature is infinite, this will not happen. And because the mind is infinite, it can always be in the state of moving toward truth, no matter how much it may already have learned in the past.

You may say that that all this is too vague, that you want a more accurate "pinning down" of the nature of creativity. But please remember that any definition that one gave for creativity would itself have to be created. The process of creation of this definition would inevitably transcend its mere result, i.e. the created definition. I wonder if our being in the academic profession does not cause us to give supreme value to results, because these can be pointed to, worked on, discussed, published, etc. Yet, this emphasis on results also leads to the mediocrity that is characteristic of most academic work.

What I'm trying to say is that you cannot do valid work on creativity without yourself being in the creative state about which you wish to talk. Many philosophers imagine that they can understand the essence of the work of a man like Einstein solely by analysing the results of this work. But in my view, unless they are in a state of creation similar in some ways to the state Einstein was in, they will miss the whole point and produce a superficial and mediocre piece of work, that is really not deeply related to what Einstein did at all.

In short, the main point is not to describe creation. Nor is it even to understand creation. Rather, the key point is to be creative. From this creative state, you can understand creation and describe it. But the purpose of such a description is mainly to help communicate to another what it means to be creative. It is not mainly to provide an interesting structure of ideas to talk about, as if it referred to something



entirely external to the mind of the one to whom one is talking. In other words, when I talk of Einstein's creativity, what I really am referring to is creativity in me and in you. If this is not present, then to talk of Einstein's creativity is to make empty noises, that do not refer to anything at all. After all, what Einstein wrote is only the results of creativity, and not the creative process itself. Whatever I say about creativity (e.g., to refer it to the *unus mundus*) is also at best a result of some creative process. What is needed is to communicate, not merely the abstract structure of the results of creation, but also, the concrete reality of creation itself.

Now, I think that Biederman is suggesting that there is a non verbal way of looking at nature, which will directly show you the meaning of all this. Explanations are not enough. Eventually, one must come into direct perceptual contact with what is being referred to. Generally, we look at nature mechanically taking the stable created forms and their causal evolution to be the basic and fundamental substance, the "reality", while we regard the infinite hierarchy of similar differences leading to harmony and beauty as contingent, accidental, unimportant, etc. But it is possible to perceive directly that in our immediate contact with nature, it is this infinite hierarchy of ever-changing order that is the fundamental reality, while the stable forms and their causal evolution are abstracted from this hierarchy of orders of movement. To perceive this is to see what creation really is. One can then go on to perceive a similar but different creative process in the mind.

On the other hand, because of our professional training, we tend to proceed as if we could start purely from verbal definitions. Perhaps we vaguely think of some creative center in the mind, that would be creating the definitions. But we don't notice that an act of observation, of learning, is needed here. Actually, nobody knows what creation is. How are you going to find out? You must somehow perceive a creative process, at first non-verbally. And then, if you wish to communicate it, you will abstract it verbally, first at the descriptive level, and then at the inferential level. But where will you look for the creative process? You cannot find it, for example, by trying to observe the "*unus mundus*", because this is, at best, a verbal distinction. You can talk about an apple, describe it, make inferences about it. But if you are hungry, you will want a real apple to perceive, to handle, and to eat. If you are really "hungry" for creation, you won't be satisfied to talk about its being done by the *unus mundus*. Rather, you will want to pursue it directly, to come in contact with it, and assimilate it so that it is a part of your own very substance. Perhaps you can do this by seeing nature's creative process directly without words, and letting the perception "flow inward" to reveal the similar but different creative process of the mind.

If all of this is valid, you will have to think carefully of why you are doing research in this field of perception, in the first place. Do you wish to add your bit to the accumulation of man's "knowledge" of the creative process? If so, I suggest that your aim is confused. For whatever you say about the creative process will be empty words, unless it is the outcome of what is observed from the creative state, about the creative state. So one's first objective has to be to discover the creative state, to come upon it. I think that Biederman has discovered something of this, and that what he has to say about it is worth listening to with full attention.

Best regards

David Bohm

P.S. Perhaps I could now sum up my objections to Jung's ideas as follows: Jung suggests that you look for creativity manifesting itself in acausal synchronous combinations of events that are "meaningful". In my view, such events are at best, a very superficial manifestation of creativity, if indeed they even exist at all (which is not proven). I suggest that creation is always being demonstrated directly before your eyes in the immediate perception of nature, which has an a-causal synchronous order of an infinite hierarchy of similar differences and different similarities. Why not begin by learning what it means to be sensitive to this order, and to go from there to a sensitivity of the creative order of mind?

---

May 18, 1967<sup>11</sup>

Dear Jeff

This is just to add a bit to this morning's letter.

I wrote there suggesting a model in which the "unus mundus" creates a hierarchy of orders in the mind. The first order corresponds in some way to what is outside the mind. Let me add here the notion of a truth value as a domain of validity for each order of correspondence. In the second order, the "unus mundus" creates a certain "knowledge" of the domain of validity of the first order of correspondence. In the third order, there is knowledge of the domain of validity of the second order knowledge. And so on ad infinitum.

Now, this whole picture is still mechanical. For the "unus mundus" is just projecting a hierarchy of information into the mind, at the same time that it is projecting some hierarchic order into what is outside the mind. It is also projecting a hierarchy of knowledge about the truth, falsity, and domains of validity of its various projections.

In my view, the essential creative art of man is continually to see new limits to the domains of validity of his knowledge, and to create new orders in the mind that enable him to extend his perception in new ways. Even more, I have proposed that while the results of this extension are significant, what is most fundamental is the very movement of extension itself. It is this movement which is the creative process in the mind of man. The corresponding creative process in nature is the extension of evolution of natural process to new orders, and the continual creation of new orders of abstraction of one aspect of nature in another.

If we were to try to stick to the "unus mundus" hypothesis we could say that the "unus mundus" was always extending man's perceptions in new ways. But this would make it automatic and mechanical, hence not really creative. Moreover, it would not explain why most men for most of the time do not enjoy a creative extension of true perception, but instead engage in destructive extension of confusion of perception.

---

<sup>11</sup>Second letter with this date—CT.

Why does the “unus mundus” project ever increasing confusion into most people and extension of perception into a few?

I think that any theory of perception that leaves out error and confusion is so incomplete that it has missed the main point.

I think that if you follow the “unus mundus” hypotheses to its full conclusions, you see that it is not really an adequate one. Rather, eventually, you have to admit that creativity must first be perceived and experienced non-verbally, before you can meaningfully say much about it. In my letter of this morning, I tried to indicate further what this means.

Best regards

David Bohm

---

May 30, 1967

Dear Jeff

Thank you very much for your letter of May 25. On the whole I think it would be best if you discussed the artistic questions you raise there directly with Biederman, as a lot of it concerns his views on art. I will say a little about it, however.

Of course you are right to say that perception is unlimited in its possibilities of creative evolution. I am sure that Beiderman says the same. You are right to say that the mechanical recording of images is in itself a rather trivial goal (apart from its utilitarian significance). I would agree with much of what you say in your letter on this point. However, there are a few other points to keep in mind as well.

Firstly, whatever an artist sees in nature, if he is a mimetic artist, his goal must be to imitate what he sees. As his ability to do this improves, he eventually gets burdened down with a tremendous mass of of mechanical detail (moving the brush in certain ways, etc.) The invention of the camera made this unnecessary, and thus freed the artist to record what he sees by mechanical means. Naturally, better instruments have been invented (the movie camera, television etc.) and still better ones are called for. You are quite right to say this. But now, a creatively perceiving artist could use all these instruments to make a wonderful mimetic representation of what he sees. Unfortunately he rarely gets the opportunity to do so, because of the corrupt and confused nature of society. This latter insist mostly in the mechanical use of mimesis, either in news photography, in advertising, in propaganda or in stories and drama intended to “entertain”, i.e. to take people’s minds off the grim and ugly and dangerous nature of human reality, at least for a short time. So, very rarely does an artist get a chance to show us in color films and by other means what he really can see in nature. I have seen this attempted in a rather halting way, and even then, the result is very powerful and moving.

Can the artist by his use of a brush still make a contribution that the camera cannot? This seems questionable to me. Firstly, let us look at what such modern artists have actually done along these lines. I have never myself seen one who has portrayed

some new aspect of reality to me. For example, my first reaction to Picasso was that this is very ugly indeed. Later, I tried to convince myself that it meant something, because it was taken seriously by so many people. But I can't say that I ever saw in Picasso anything that I did not already know before, and that I did not "read into" the picture from this knowledge.

Of course, I may be prejudiced, but in the last analysis, each person can only go by what he actually sees in a painting. When I think of Picasso's paintings, I see that he is in contradiction with his medium, and trying therefore to do what is actually impossible. As I see it, a painter works in a two dimensional structure of paint marks. With this, he tries to imitate the appearance of a three dimensional structure that he sees (or that could be seen). Everybody who looks at a picture understands this point. But when a painter (like Picasso) begins to break out of this tacit convention, then the interpretation of what is on the canvas is largely arbitrary. If I have complementarity in mind, I'll see that in the picture. If you have the idea of similarities and differences of woman A and B, that is what you will see. The main point is that you see only what is already in your mind. Picasso's picture becomes a vehicle for projecting your conditioning. Therefore, it is not a creative perception by the viewer. The same is true in essence about all of modern art.

On the other hand, a really creative work of art enables you to see what you have never seen before. Rembrandt's picture enables you to see aspects of human character that you never saw before, in just this way. You don't "read it" into the picture. Rather, it is just because the mimesis of three dimensional reality is so good that you can see in the picture an expression of what Rembrandt felt and perceived. Similarly, a man who makes a good film also expresses character by skillful use of modern means of mimesis.

Of course, Biederman is trying to do something different. He also enables you to see what you have never seen before. But this is not by imitating nature. Rather it is by creating in nature something that does not imitate what nature already created.

It is important to maintain a distinction between the two forms of art, as also there will be serious confusion. Each has its place.

When you engage in painting, the order of the brush marks on the canvas is very different from the order of what the person is to see. If you know that the brush marks aim to imitate the appearance of a three dimensional set of things then your brain knows tacitly how to translate the painted order, structure and form into the order, structure and form of objects that are in space and bathed in light. In other words, there is the possibility of a relatively unambiguous communication of what the artist has seen. Thus, the viewer can see more or less what the artist has seen, and does not have to introduce his own privately conditioned interpretation, which is different for each person, and which is irrelevant, in the sense that it is not a creative new perception, but rather, the imposition of something that one already knows.

To confuse mimetic creation and non-mimetic creation is therefore a very serious mistake. When one manipulates the contents of a painted image (as Picasso does) one alters the form and structure in an arbitrary way, so that the viewer has no real clue as to what led the artist to do just what he did and what he was trying to communicate. The viewer can only see whether what he sees is similar to some idea that is already

known to him. It is impossible to communicate a new form, structure and order if one does not know how these are to be related to the form, structure and order, that one can see on the surface of the canvas.

This problem grows even more serious with some painters, who alter not merely the forms of objects, not merely their structures, but also the order of space itself. Some Surrealists do this to some extent, but people like Rothko specialise in making a depiction of spaces with highly ambiguous orders, (represented by changing shades of color). It is only your conditioning that can determine what you see in such pictures.

Not only is there the above described confusion, and ambiguity and arbitrariness in the mind of the viewer of a work of modern art. There is also a similar confusion in the mind of the painter. What is he actually trying to do? If he is trying to create something new, why does he still try to imitate the two dimensional appearance of nature's forms, structures, and orders? If you really were to create a new order, it could not be translated into two dimensions unless it was first present in three dimensional reality. And if people like Picasso try to transmit ideas like the similarity and difference of woman A and woman B, the proper vehicle for this is in words. To do it in a painting which inevitably evokes a three dimensional order, structure, and form of some kind is too ambiguous to be effective as a kind of communication.

Of course, you may argue that perhaps artists could make valid new discoveries in the field of mimesis by painting. In principle, this might perhaps be possible. But in fact, no real artist of great creativity (comparable to Rembrandt) has done this for over a century. Why not? Partly because mimesis had already reached the point when to proceed further by brushwork on canvas would have involved the artist in too much mechanical work. Another reason is that a man who wanted to express character as Rembrandt did would now do much better to make a film, than to try to paint a picture. The mechanical work is done by the camera and the artist can focus on what is to be seen and communicated. The camera is basically a much better mechanism for mimesis than is the artist's hand moving a brush (especially the cine camera).

Indeed, the really great artists of the last century have all been interested in questions that take them beyond mimesis. Of course, Biederman's attempt to continue their work in new ways is not the only possible direction. Biederman would surely admit this readily. But whatever the new direction may be, is it possible to mix mimesis and direct creation of something new? Biederman says it is not possible, and I think he is right. When you create something new within nature's structural process of form, space, color, light, etc, it is necessary that this creation shall not imitate something else. If it does, then you have no way of knowing what it is that has been created. Indeed, if you create something that imitates something else whose order, structure, and form are totally unknown and new, how can you find the thing that is being imitated, without first creating that too?

The scientist has a very different problem. Nature has already created the order, structure, and form that he studies. Thus, he has to create orders, structure and forms of ideas that reflect (or "imitate" in a certain sense) those that nature has already created. He does this when he explains the facts by means of a few assumptions. He tests his explanations by predicting new facts, that can be found in nature's structural

process. He has, to some extent, to “make” these facts by creating new instruments. In this sense, his work is similar to that of a Structurist artist. But his creation here is intended mainly to test how well his ideas reflect reality. The Structurist artist is interested mainly in what has been created, and not mainly in testing whether his notions of nature’s structural process are right.

I would ask you to tell me which modern artist has done work that is really creative and fairly free of confusion. Then I would ask you to see just what it is that has been created. What new perception did you get that you didn’t “read into it”? Can you see anything new in Biederman’s work that you didn’t “read into it”? Did you see an order and structure that you had never seen before?

What has to be kept in mind is not only that perception evolves creatively, but also, that creative expression of this perception depends on harmonizing one’s work with the laws (i.e., order and structure) of the medium in which one works. To try to create a vision of three dimensional reality that is contrary to nature’s three dimensional order by manipulating paint marks on a two dimensional canvas leads only to confusion and not to creation of a new order. And to try to suggest verbal ideas (such as that my thoughts and memories of woman B are similar and different to those of woman A) by paint marks on canvas is also a source of confusion. For there is no clear correspondence between marks of paint and ideas about women. Any such correspondence that seems to exist is only the result of conditioning (e.g., what is done with images of women in advertising). It is not the natural result of a process in which the brain relates a two dimensional order to a three dimensional order.

So, in art, the distinction of mimetic and non-mimetic is a key one. It is not like the distinction of observer and what is observed, which is largely illusory. The key point is that mimesis involves a real fact – i.e., the (largely subtle and tacit) law of correspondence between the order of what is imitated and the order of what is “doing the imitating”. The law does not permit arbitrary manipulation of the order of what is “doing the imitating” without confusion that is destructive. Modern artists generally do engage in such arbitrary manipulations.

To change the subject, Maxwell called me on the phone today, about my coming to Minnesota. I explained that I would like to come, but that there are difficulties. First, the department would have to make a strong effort to get me a visa. Secondly, at present, I can’t come because of the crisis in Israel. My wife’s whole family are there, and she is terribly worried about them. If and when the crisis is resolved, we can discuss more concretely when I should come. (Isn’t your wife in Israel too? Do you have a similar problem?)

Best regards

David Bohm

P.S. I did read Whitehead, and got some of my ideas on structural process in this way. But actually, I feel that my correspondence with Biedermann was a lot more important, in this regard.

PPS. Perhaps after you have answered this letter, you can send it to Biedermann.

---

June 1, 1967

Dear Jeff,

I would like to add a bit to yesterday's letter.

You discuss the idea that our memories and thoughts respond in perception, to enrich what we see in various ways (e.g. Picasso sees woman B through her similarities and differences to woman A). It is, of course, a fact that this kind of process actually takes place, and is very widespread. But this process is one of the principal sources of destructive confusion in perception. It is therefore necessary to understand it fairly well, if one is not to get caught in the same kind of confusion.

Of course, I am not saying that thoughts and memories have no valid role at all in perception. They do have a right place, a right field of action. But when they overflow into another field, which I shall call that of direct and immediate perception then things begin to go very badly wrong.

Thoughts and memories contain structural influences, based on tacit generalizations of past perceptions and experiences. These influences are higher order abstractions. They may be right or wrong. But there is no way to test this unless direct and immediate perception operates at a deeper mental level in a simple way uncontaminated by these memories. Unfortunately, thoughts and memories tend to spring into action so rapidly and powerfully, that they overflow into the field of direct perception, where their structural influences are confused with directly perceived fact. Further thought then abstracts from this apparent "fact", and is "amplified" to be "fed back" once again as apparent direct perception. So a vicious cycle, a "feed-back" loop is set up. It is as if the output of a computer were fed back into its input, in the channels that were intended for the reception of "factual" data.

One of the principal reasons for maintaining this process is that thought contains a component that I shall call "self-indulgent pleasure". Of course, there is real pleasure, real enjoyment, which happens simply. Thus I enjoy a sunset or the appearance of a woman. Then the experience is over. Thought forms a "reflection" of the experience, which contains a reflection of the pleasure. This reflection is sensed as incomplete. So thought faces the challenge of continuing the "pleasure", enhancing it, securing it, etc. But this "pleasure" is only thought itself. So thought, experimenting to find how to continue the pleasure, discovers that this can be done by manipulating the contents of thought, in a self deluding way, so as to make it appear that the pleasure can continue. For example, when one has a sense of false euphoria, the brain maintains it by wrongly valuing all factual data to make it appear that "everything is going my way". Or when the woman is gone, the mind will develop images that seem to continue and enhance the pleasure, along with the often delusory over-estimation of its ability to do so, underestimation of difficulties and complications, etc. All this leads to pain. But in its state of self delusion, the brain attributes its pain to something else. Thus, the cycle goes on and builds up. I call this the "pleasure-pain principle", meaning that the brain deludes itself into believing that it will get pleasure and that it actually gets pain, which it attributes to something else.

As you will see on a little reflection, the “pleasure-pain principle” (PPP) is the major factor in all human actions, today and over past history. It is really the entire content of nationalism, ambition, fame, greed, lust for power or for sensual stimulation, aggressiveness, and countless other motives of human action. It is completely incompatible with creativity, love, and beauty.

Now, as a result of what Picasso’s former mistress has written,<sup>12</sup> as well as a result of seeing his pictures, I feel that the structure of Picasso’s pictures is determined mainly by the pleasure-pain principle. It very probably gave Picasso a brief thrill of pleasure to “express himself” by painting woman B over woman A. He may have increased the pleasure by self-deluding ideas, such as: “I am showing that I am all-powerful, that I can do as I please, by symbolically discarding A in favor of B”. Or also he may have thought “I see that B has those features of A that gave me pleasure without those that gave me pain”. Or else he may have had some correspondingly self deluding notions of yet another kind. Their precise nature does not matter. What does matter is whether or not his mind was operating in the structure of the PPP. If so, his work was necessarily destructive, in one way or another.

It seems to me that all modern art is determined basically by the PPP and necessarily has to be. For as I said in my previous letter, any mimetic work of art depends on the law of correspondence between its own order and the order that it imitates. Once you give up the correspondence between three dimensional reality and its two dimensional appearance, there is nothing in the intrinsic structure of the situation to determine any other correspondence. So, both for the artist and for the viewer, this correspondence will depend on arbitrary symbolic associations of one thing in the picture with another in the mind of the viewer or the artist. By accident, artist and viewer may have had similar conditioning, to establish similar symbolic correspondence. Then some sort of communication may take place. But more generally, there is no communication. Each person will establish a different and generally irrelevant correspondence, according to his special conditioning.

Even when artist and viewer are similarly conditioned about this correspondence, the result is destructive. For because the result is arbitrary from a logical as well as a perceptual point of view, it is in reality determined by factors outside these fields. And if you observe, you will see that these determining factors cannot be other than the operation of the PPP. Every “distortion” of modern art is determined by the fact that this particular “distortion” seems to give pleasure and satisfaction to the artist. It is not the pleasure and enjoyment that is the by-product of real perception of beauty. Rather, it is the delusory appearance of pleasure, maintained by the PPP, which manipulates the contents of perception and thought so as to give the momentary appearance of pleasure and satisfaction. The function of the modern artist, in manipulating the order, structure and form of his imitations of nature is a wonderfully exact external manifestation of how the PPP manipulates the internal order, structure and form of perception so as to try to maintain pleasure.

The key to a deeper understanding of the situation is to realize that there is a natural order of abstraction in perception. There is direct and immediate perception,

---

<sup>12</sup>Gilot (1964)—CT.



and there are higher order abstractions, based on words, thoughts, and memories. To confuse these is like allowing “feed back” from the output of an amplifier or a computer to its input. A genuine work of mimetic visual art is always conceived first with direct and immediate perception. It has to be seen, as far as possible, “as if for the first time” – i.e., free of visual conditioning. It is very hard for us to do this, because we are so heavily conditioned by our experiences with past art, memories of these experiences, inferences drawn from them, etc. These have their place. But it is poison for them to overflow into the field of direct and immediate perception, that is crucial for all art.

Of course, there is also the art of using words, and this depends on a certain amount of conditioning (e.g. learning the language) to establish the order of correspondence between words and their meanings. But ultimately, the content of what is being said has to be understood – i.e. perceived directly – beyond the level of words. It is crucial to realize that mimetic visual art and the art of using words operate by very different sets of orders of correspondence between the art work and the reality that the art work is “imitating”. Modern art is, in a way, an effort to apply literary correspondence rules in the field of visual art. This cannot work, because the structure of the visual field does not really allow it.\*

When you are finished with this letter, will you please send it to Biederman how long with the previous one.

Best regards

David Bohm

\* It is possible to use “literary” associations with artistic images to communicate only what is in essence already known to the viewer, but not to communicate an order and structure not yet known to him.

PPS. I think you see that modern art is destructive, in the sense that it encourages the conditioning of perception. By breaking up the two dimensional order of paint marks in an arbitrary way, you force the viewer to supply a conditioned order from memory. Modern science tends to do the same. Recall how physicists are trained to start from a conditioned structure of ideas.

What is needed is that mankind should learn what it means to perceive directly without the contamination of conditioning. If this were possible, the Israeli-Arab dispute, for example, would collapse. For Jew and Arab see each other through a cloud of conditioned images. All human problems originate basically in conditioned perception. Art and science could have helped break out of this, by leading to a new order- structure perception. But modern art (and modern science) have instead helped trap men even more in the prison of conditional perception.

---

June 2, 1967

Dear Jeff,

I wish to supplement my previous two letters on art briefly.

As I understand it, Biederman's position is that the creative growth and evolution of perception is unlimited in its possibilities. There are also unlimited possibilities for this growth to work together with various kinds of mimesis, which can express this perception, as well as help it to grow (i.e., by means of new kinds of mimesis we are led to test our perceptions and see in new ways). However, he also thinks that painting as a means of mimesis has come to the end of its possibilities, not merely in the literal capacity to imitate, but even more, in its role of testing, aiding and stimulating creative evolution of perception. What has taken its place is camera art, especially the moving picture, with its extension to television and perhaps in yet other ways that will be developed in the future.

To understand this point of view, one must see clearly that by its very structure, painting is limited mainly to imitating what is literally perceived. It is true that by means of memory, training, propaganda, habit, etc., people may learn to associate painted (or photographed) images with various other things, represented by ideas (e.g., the photograph of a woman with the idea of sexual pleasure, the photograph of food with the idea of the pleasure of tasting, the photograph of a car with the idea of the pleasure of moving as one pleases, etc.). Or else, one can associate images with ideas of gods, mythological heroes, virtues, vices, etc. But none of this is intrinsic to the act of painting. What is intrinsic to painting is the correspondence between the two dimensional order of paint marks and the three dimensional appearance of objects, with forms, existing in space, bathed in light, ordered as near or far, bright and dark, etc., structured by a hierarchy of such orders. When this correspondence is modified or given up, the whole field becomes arbitrary and therefore it is determined mainly by the pleasure-pain principle (PPP). All these associations are contingent and external to the intrinsic order and structure of the painting and its correspondence with a three dimensional reality.

Unfortunately, artists did not generally realize this fact. They imagined that by re-ordering paint marks on the canvas, they were creating a new order of reality, or expressing a new perception of reality. Actually this is impossible. For the paint marks in themselves are not a new order of reality. There are in fact only paint marks on canvas. At best, they are mimetically leading the brain to perceive some order of reality. But in fact, all they can really do is either to suggest some kind of three dimensional reality, or to evoke conditioned responses to ideas (as is done in advertising). Most artists seem to agree that to go on simply with imitating three dimensional reality in paint on canvas is not worth while. Firstly, it involves the artist in tremendous mechanical work, that can be done better by the various forms of the camera and its extension to movies, television, etc. Secondly, this mechanical work now leaves little room for creative perception. Certainly, the movie camera and television in principle leave far more room for creative perception, and are therefore superior instruments for those who want to express perception mimetically. Therefore, most artists have ceased to try imitate nature literally, and instead, they try create a new order of reality in their paintings. But as I said before, this is in fact

impossible. Paint marks on canvas are capable only of suggesting some kind of three dimensional order, either a reasonable one, or a confused one. When the painter tries to infuse perceptions in other fields (e.g., ideas) into the order of the paint marks, he actually succeeds only in evoking a confused three dimensional image. This fact is often hidden because of conditioned associations of these confused images to ideas. But you will notice but these are never new ideas. They are always familiar ideas. Paintings cannot suggest new ideas. This latter has to be done mainly through the use of words. You could never get the idea of complementarity across to a man who never heard it by Picasso's paintings. Rather, you must first explain it in words. Then, when the other fellow has already understood what you mean, he may react by projecting these ideas into Picasso's paintings.

This brings us to the role of direct and immediate perception. Unfortunately, mankind is now conditioned to project his words, memories and ideas, onto all that he sees, including works of art. Who can look at his friend or enemy without the tremendous weight of years of conditioning, with their memories of pleasure, pain, hurts, wishes, fulfillments etc., etc.? Mankind's whole existence depends literally on his ability to step out of this conditioning, and to see reality "as if for the first time". This is needed, not only in visual perception, but also in every other kind of perception including the act of understanding. Otherwise man will not see the fact at all, but will be lost in illusions, delusions and fantasies imposed on perception by his conditioning, according to the dictates of the PPP.

Of course, ideas, memories, etc. have their place. We need a certain kind of conditioning (e.g., to be able to talk, to work, to know our way around the world, etc). But when our perception is conditioned in its basic order and structure, then conditioning has overflowed into a wrong field. For perception requires that we see the fact as it is, whether it is pleasant or not, whether it is convenient or not, whether it is comfortable or not, etc. This fact is always in a new and different order from that which is remembered of the past. So the mind has to meet it directly, "as if for the first time." Our conditioned responses can then be useful as a means of taking proper action etc. For example, if you are in a strange country, a good map is useful. But first, you must look at the actual terrain, and then, you relate the map to it. It is wrong to take the map as basic reality, and to relate the terrain to the map. When we all allow memory to structure perception, something like that is what happens.

Beiderman feels that our conditioned response to art is seriously adding to the present crisis of human consciousness and perception. In particular, the modern artist is tacitly helping people to see in terms of the fragmentation of nature, the arbitrary breaking up of things and manipulation of them, according to what finally turns out to be the PPP. This is particularly tragic, since in principle, it is just the artist who could play a big role in helping people to obtain a new vision of nature, (and human nature) going beyond the immediate and literal appearance of things, to reach their basic order and structure of process. The same is true of science, which in principle could also help toward the same end, but which in fact favors fragmentation, mystification, and the arbitrary exploitation of nature according to motives arising in the PPP. The trends in modern art and in modern science are therefore extremely similar in certain crucial aspects.

Biederman feels that for the artist to play their proper role it is first necessary to see the distinction of mimetic and non mimetic art, so that this dangerous and destructive confusion between them can end. Painting is not a proper vehicle for non-mimetic creation. Rather, this latter has to be done in three dimensional reality, with its structure of form, space, colour, light, etc. Whether Biederman's particular approach to this is valid, as the only possible one, is another order of question, which can be discussed intelligently only when these deeper questions are clearly understood first.

Science is also moving away from the literal appearance of things to the study of this order and structure of process. But ultimately, science will have a basically mimetic content, in that it aims to produce ideas that reflect the structural process correctly.

Of course, some day there may arise the action of "Techne" which unites science and art. But this is so far in the future that it is almost entirely speculative. Nobody can actually do this today, under present social conditions. If he believes he can, he is deluding himself.

Best regards

David Bohm

Will you please send this to Biederman when you have finished with it?

## References

- Alexander, H. G. (Ed.). (1956). *The Leibniz-Clarke correspondence*. Manchester: Manchester University Press.
- Biederman, C. (1958). *The new cezanne*. Red Wing: Art History Publications.
- Bohm, D. (1965). Space, time and the quantum theory understood in terms of discrete structural process. In Y. Tanikawa (Ed.), *Proceedings of the International Conference on Elementary Particles* (pp. 252–287). Kyoto: Kyoto University, Publication Office, Progress of Theoretical Physics.
- Bohm, D. (1968). Creativity. *Leonardo*, 1(2), 137–149.
- Gilot, F. (1964). *Life with Picasso*. New York: McGraw-Hill.
- Jammer, M. (1966). *The conceptual development of quantum mechanics*. New York: McGraw-Hill.
- Nichol, L. (1998). *On creativity*. Abingdon: Routledge.
- Pylykkänen, P. (Ed.). (1999). *Bohm-Biederman correspondence*. Abingdon: Routledge.