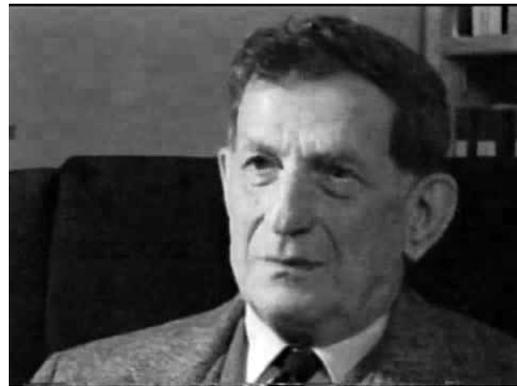
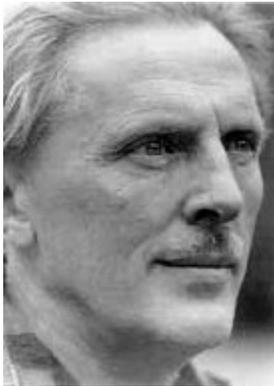


# **THE BOHM-BENNETT CORRESPONDENCE 1962 - 1964**



**Compiled by Anthony Blake**

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# BOHM-BENNETT CORRESPONDENCE 1962- 1964

## Understanding, Misunderstanding and Dialogue

### Introduction

This correspondence is incomplete but, I believe, contains enough material to show the significance of this period of contact between John Bennett and David Bohm. Of particular importance is the fresh slant that Bohm gives to Bennett's ideas of 'eternity' and 'hyperaxis' and the way in which Bennett develops his expression of systematics. It is also possible to see how the two men eventually came to a parting of the ways. Bohm was to reject the Gurdjieffian approach and form a relationship with Krishnamurti and his ideas. Our sub-title for the correspondence - understanding, misunderstanding and dialogue - will become self-explanatory through the sequence of letters.

The contact between Bennett and Bohm came about largely through Henri Bortoft and myself. Henri was working on an M.Phil. under Bohm's supervision (Bohm was then at Birkbeck College, London, where he was to hold the post of emeritus professor in theoretical physics until his death in 1992) and I had been a student of David's while at Bristol University. Both Henri and I were, in the 60's, students of John Bennett. The Bohm-Bennett connection is not noted in the otherwise comprehensive and insightful biography of Bohm, *Infinite Potential* by David Peat, but this biography conveys very well the way in which Bohm would enthusiastically enter into creative interchange with someone, only to part from him or her sooner or later.

Some aspects of the idea of three kinds of time, especially as it is discussed in this correspondence, have been taken up in recent years in the work of William Pensinger (see his book *The Moon of Hoa Binh*) and, looking back, it now appears tragical that the promise of the Bohm-Bennett connection failed to be realised. I remember sitting one evening with the two men and serving as a 'translator' between their different frameworks of thought and terminology. I was glad to be playing this role but I could not help thinking to myself: "Why was this needed? Couldn't they have done it for themselves?"

I've attempted to provide some background to the form and sequence of the correspondence in the form of brief remarks that I hope will be helpful rather than an irritating intrusion. I have also taken the liberty of cutting out sections of some of the letters which add nothing new.

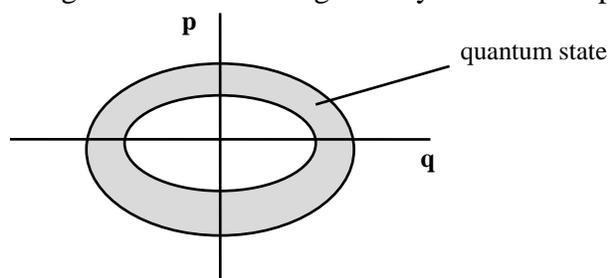
*The correspondence begins with a discussion of JGB's ideas of three kinds of time in relation to quantum mechanics. Bohm had been reading JGB's The Dramatic Universe, Vol. 1 and had picked up on JGB's idea of three kinds of time: time, eternity and hyparxis. An easy way of thinking about these is to take eternity as the region of potentials: only a small part of the potentials can be actualised in time, and the regulation between actual and potential is 'hyparctic', determining 'ableness-to-be'.*

## Letter from Bohm to Bennett, February 3rd, 1962.

I have [sic] doing some more thinking on topology and now see a relationship to your determining conditions of:

- a) Space (as presence)
- b) Potentiality
- c) Actualisation
- d) Hyparxis or recurrence.

I begin with the fundamental idea of a moment as axiomatic. Different moments are present to each other. For example, all the moments B, connected to a given moment A, by light lines are immediately present to A, being on A's light cone, in continuous geometry. These are organised into a three dimensional space. Presence takes place by a process which I call action, which presents B to A. Action is essentially your actualisation. Thirdly, there is potentiality. This would take some time to explain, but in quantum mechanics, one can come to it in a natural way. Thus, the Bohr-Sommerfeld quantum conditions ( $\oint p dq = nh$ ) can be interpreted to mean that in phase space, a region of area,  $h$ , is associated to each quantum state. Classically, a system could be anywhere in this region, but quantum mechanically, all points in the shaded region correspond to one state. Thus, quantum mechanics determines a natural mosaic structure in phase space, the basic units having the same area but generally different shapes.



Let there be a probability function,  $P_n$ , that the system is in the  $n$ th quantum state. Then with the passage of time,  $P_n$  changes, as the system can jump from one state to another.

But there is another aspect to the movement. For as time passes, the shapes of the mosaic elements change (while remaining of area,  $h$ ). Therefore, time processes have two aspects:

1.) There is a continuous change of shape of the mosaic elements. This represents a change in the potentialities.

2) There is a discontinuous change in the actualisation of these potentialities. In other words, the quantum state,  $n$ , that is actually present is a discrete thing, which changes discontinuously.

These ideas are encompassed mathematically by the density matrix (or statistical matrix).

$$\rho (X,X') = \sum P_n \Psi_n^* (X) \Psi_n (X')$$

Here, the  $\Psi_n (X)$  are a complete set of wave functions that are solutions of Schrodinger's wave equation, which in turn define a set of quantum states, denoted by the index,  $n$ .  $P_n$  represents the probability that the system is in the  $n$ th state.

Ordinarily,  $\rho (X,X')$  is said to change by a unitary transformation  $U$ , which operates only on the wave functions:

$$\rho (X,X') \text{ ----> } U\rho U^{-1}$$

This transformation represents the continuously changing potentialities. But in addition, there can be an anti-unitary transformation,  $V$ , which represents the change in the probability function,  $P_n$ . This type of transformation is not considered in current forms of the quantum theory, but it could easily be added.

This total transformation would then be:

$$\rho (X, X') \text{ ---> } VU \rho U^{-1} V^{*T}$$

where  $V^T$  is the transpose matrix of  $V$  and  $*$  represents the complex conjugate.

So now there are two kinds of time, which I denote by  $\underline{t}$  and  $\underline{\tau}$  respectively. The time parameter,  $\underline{t}$ , refers to the wave function and therefore to the continuously changing potentialities.

The time parameter,  $\tau$ , refers to the probabilities,  $P_n$ , which in turn refer to discontinuously changing actualisations. The  $P_n$  will tend to die out exponentially in  $\tau$  time.

But now we need a third kind of time. For if a certain quantum state,  $n$ , dies out exponentially, the system will disappear from existence unless another quantum state,  $n$ , surges up and takes its place. This is the time of repetition, or hyparxis, which I shall denote by  $T$ .

Evidently, the three kinds of time must be related. The movement will take place in the following way:

- (1) The potentialities are prepared. (This is described by the parameter  $t$ ).
- (2) The present actuality dies out, while another actuality arises within the new potentialities to take its place. (This is described by the parameter,  $\tau$  ).
- (3) The repetition time,  $T$ , is the parameter of hyperaxis. It represents roughly the number of periods,  $\tau$ , of exponential decay of actuality that are needed before the new (or repeated) actuality arises again. Evidently, the ratio  $\tau/T$ , represents the "ability to be". For if the ratio is small, the system finds it difficult to repeat its existence after it dies out, so that its existence is relatively "tenuous" and weak. On the other hand, if  $\tau/T$  is of the order of unity, it has a really "solid" kind of existence.

To return to space, I say that space is the order of presentation of the world to each moment. I have some arguments showing that it must be three dimensional. The arguments work this way:

- (1) I begin by supposing that space is a discrete structure but connected in a certain order.
- (2) I then find that the possibility of displacing an object in this space without having it fall to pieces can arise only (if) the space has no more than three dimensions. Here, we must recall that each object is a structure built on the basic discrete points and lines, and that no continuous space underlying them is assumed.  
All movement must be along the natural lines of the space only.
- (3) I find that if the space has less than three dimensions, certain other essential connectivity features will be absent.

So the space must be three dimensional. The three dimensionality of space and time must evidently be related, and this is what I am looking into.

*The correspondence continues into the realm of 'order' in general and how this relates to questions of continuity, connection and distance. Bohm was at this time very interested in topological representations of space-time and, at one time, it seemed as if he could provide a non-metric way of dealing with JGB's ideas of eternity and, possibly, hyperaxis.*

## **Letter from Bohm to Bennett, February 12, 1962.**

With regard to our very interesting discussion last Saturday night, I would like to add a few points.

You suggested the notion of

- (1) Possibilities - connections between moments
- (2) What was permitted - certain sets of connections
- (3) What was actual - sub-sets of these

Roughly speaking, then, permissivity means potentiality (or perhaps you would suggest still another step - that potentiality is a sub-set of what is permitted).

I would like to suggest another terminology. I would replace "permitted" by the notion of what holds "for the most part" or "in a dominant sense". Then "non-permitted" connections are not simply non-existent, but rather, they are comparatively rare and infrequent, or weak in some sense. I prefer the notion of "infrequent" to that of "forbidden" because the latter has in the background the idea of some authority which forbids these connections, and some rebellious spirit which nevertheless manages to defy or outwit this authority from time to time. I think that the idea is false, because the "infrequent" connections play a role in the totality which is just as essential as that of those, which hold "for the most part". They are a key aspect of the existence of freedom. Indeed, once we realize that any given law may hold only "almost always", we are led to search for the infrequent cases in which it doesn't hold, so that, for this reason alone, the law is not iron-clad and absolutely binding. (Of course, this is not the whole of freedom, since there is also the more fundamental point that with a deep enough understanding, one will see that the whole notion of a rigidly defined set of possibilities and impossibilities may have only a relative and limited validity).

Perhaps I could suggest a slightly different general scheme to the one we discussed on Saturday night.

- (1) We began by saying that all moments are connected.
- (2) Some connections are dominant - of major importance. (These take the place of my previous notion of direct, immediate connections).
- (3) Moments not stated directly by a dominant connection are related indirectly by a series of such connections.

(4) However, such moments may still be related directly by minor connections. In other words, all moments are directly connected, but not all of these connections are of the dominant type.

(5) We might then try to establish an order of intensity of connections (This would be in your sphere of “being”).

(6) If a unit of intensity could be established, then we could even have a measure of intensity of connection.

In the large-scale limit, this would lead to the inverse square law ( $1/\gamma^2$ ) which holds for the basic modes of connection (light, gravitation, etc.)

The measure of intensity is deeply related to the measure of distance, for roughly speaking, things are distant from us in the measure in which they are only weakly connected to us. The key problem will be to relate the measure of distance through intensity of connection to the measure of distance by congruence (repetition of series of unit lengths, end to end). The inverse square law then has a topological meaning. To appreciate it, we should, however, read it upside down and backwards. Thus, let  $I$  = intensity of connection,  $d$  = congruence - measured distance. Then we write  $d \sim 1/I^{1/2}$ . In other words, intensity measure is logically prior to congruence measure. Or in your language, “being” is logically prior to “function”. And mathematically, if ‘ $I$ ’ represents “being” we see that “ $d$ ” is in fact a function of  $I$  so that one sees also that mathematical function is a special case of function in general.

The notion of continuity that we discussed on Saturday night can also be developed a bit further. I would like first of all to replace the word “discontinuity” by the word “a-continuity”, meaning - outside the question of continuity and discontinuity. For the word “discontinuity” implies by its structure that continuity is the logically prior concept, and that discontinuity is nothing more than a break in continuity. The fact seems to be the other way round. One must begin with the “a-continuous” which is that which “just is”, the question of its continuation or non-continuation not being relevant at this stage. In other words, “a-continuity” is the dominant concept. A certain set of connections, however, is distinguished in that these are continued. (This set has “measure zero” in relation to the dominant set). Everything that is continued must come to an end.

In other words, everything that is continued is also discontinued. But the idea of discontinuation is very different from that of a-continuation. The notion of the time-less and space-less connections of moments in a light quantum is an example of a-continuity, for since there is nothing that is ever continued in it, there is also nothing that is ever discontinued in it.

Our previous source of confusion has been to tend to thinking continuity as the dominant concept, so that discontinuity could only be defined after we knew what continuity was.

On the other hand, the a-continuous is defined before we can ever raise the question of what it means to continue, so that the natural order of concepts is

- (1) A-continuity
- (2) Continuity
- (3) Discontinuity

The dislocations are breaks in continuity. Therefore, they are not the a-continuous. The moments themselves are the a-continuous, as are the primary connections between them.

I hope we can continue this discussion soon,

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### **Letter from Bennett to Bohm, 14th February, 1962.**

Cc. Mr. K. Schaffer, Mr. R. L. Brown, Mr. A. Blake.

I agree with the presentation in your letter of February 12th. The use of the term “prohibited” for events of exceedingly low probability seems fairly current, but it would be good to be able to replace it. “Infrequent”, which has a temporal connotation, is also awkward. “Rare” has the right meaning for an Englishman, but I suppose an American might take it to mean “under-cooked”!

In attempting to reproduce our conversation for the benefit of our Science Education Group last night, I distinguished four stages. These are

- 1) The partition of being into realms of possibility and impossibility. This is the fundamental law of existence, and the basic principle of order.
- 2) Next comes in my scheme (The Dramatic Universe, p.27) the distinction between potentiality and actuality that gives rise to the specific conditions of existence which I think include your connectedness. It certainly can be here divided into frequent and infrequent or predominant and rare.
- 3) The third stage would be the distinction between potentiality and actuality which agrees with your own scheme.
- 4) I have been wondering whether there is another dichotomy of intensive and extensive connections that would lead to your own argument.

In any case it does seem to me that you have taken up in a form that lends itself to analytical treatment, the notion of Chapter 24 of the second volume of The Dramatic Universe, which treats creation as partition. I am not at all satisfied with the way in which I have carried through my own analysis, and would gladly change over to a treatment that you would find satisfactory. I very much like the scheme on page 2 of your

letter (which by the way I have copied, as I presume you have not obtained a copy, and therefore send you one).

When we were writing the Royal Society Paper on Unified Field Theory\*, we found it very difficult to arrive at the inverse square law in terms of a 5-fold, whereas with your approach it arises quite naturally.

I have only had a chance of glancing at your 1957 book\*\* which someone at our meeting last night showed me. I shall get hold of a copy of it, because I can see that it will make all the difference to following your thought. It is clearly right to distinguish between a-continuity and discontinuity. It seems to me that the three steps that you take correspond to the first three of my series of multi-term systems. The monad is a-continuous, the dyad is continuous, and the triad discontinuous. The reason for this is that the triad makes relatedness possible. I saw this in your development of the network of connections which allow only parallel displacements and therefore no relatedness until the notion of discontinuities is introduced and therewith rotations.

In your scheme a triangle cannot be constructed until the third stage is reached. This would connect the notion of lines with no boundary with that of relatedness.

As I was driving Brown home from our meeting, he expressed an enthusiasm extremely rare for him, and said that he had for years ceased to think about these problems, because he did not see how the next step was to be made. He feels that you hold the key to this, and I think will willingly re-enter the fray.

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\* 'Unified field theory in a curvature-free five-dimensional manifold' by J. G. Bennett, R. L. Brown and M. W. Thring, *Proceedings of the Royal Society, A, volume 198*, 1949. Thring was an engineer, specialising in robotics and Brown a physicist. Both men worked with JGB on the ideas published in *The Dramatic Universe, Vol. 1*. In recent years, Ken Pledge has more successfully worked out the metric for a five-dimensional geometry, deriving electro-magnetism for example; but found a sixth (time) dimension (hyparxis) intractable.

\*\* *Causality and Chance in Modern Physics*.

*Now, the correspondence broadens even further into questions of principles of understanding in which JGB puts forward his ideas on systematics and multi-term systems. In Causality and Chance in Modern Physics, Bohm had suggested the concept of the qualitative infinity of the universe and JGB seeks to incorporate this into his scheme of things. Bohm's final paragraph in his book begins: "In conclusion, a consistent conception of what we mean by the absolute side of nature can be obtained if we start by considering the infinite totality of matter in the process of becoming as the basic reality. This totality is absolute in the sense that it does not depend on anything else for its existence or for a definition of any of its characteristics. On the other hand, just what it is can be defined concretely only through the relationships among the things into which it can be analysed approximately."*

### **Letter from Bennett to Bohm, 21st February 1962.**

C.c. Messrs. R. L. Brown, A. Hodgson, K. Schaffer, A. Blake.

I can only hope that last night's talk was as stimulating to you as it was to me, and I am sure Brown also.

May I try to set down the general postulates that express what I was trying to say:-

- 1) There is a totality variously called the universe, existence and the world.
- 2) All knowledge refers to existence. What does not exist cannot be known. This agrees with Wittgenstein's Tractatus.
- 3) Experience is not confined to existence, but is able to contemplate also non-existence. Because of this, understanding is more than knowing.
- 4) Through understanding, but not through knowledge, we accept a totality of which all existence is but a sub-group, and we call this super totality, Being or the Unfathomable.
- 5) Through understanding we are aware that existence is qualitatively infinite.
- 6) There is a scale of existence that can be known by observable properties, such as capacity for independent existence, for change without destruction, for self-renewal, for self-initiated action, and so on.
- 7) Through understanding we recognize that there are also qualitative differences that distinguish the different knowable levels.
- 8) There is thus a hierarchy of existence both known and apprehended through the understanding. Up to this point there are no quantities but only forms, functions and qualities.
- 9) Studying existence by methods that are homogeneous with existence, that is, sense perception, we find isolates and relationships governed by laws.

10) Isolation exhibits a periodic change of intensity in ascending the scale of existence. There are thus levels at which the isolates are well defined, and there are other levels where the isolates are vague. There are, however, no systematically empty levels but probably empty places everywhere.

11) As between levels, it is usually possible to recognize the relationship of inclusion and exclusion, so that level B contains A, and is contained within C. Where A, B and C are fairly well defined, the region between them is vaguely defined.

On the whole, causal laws operate in the well defined regions, and probabilistic laws in the vague regions.

12) The relationships between levels are not wholly knowable, but require participation of the understanding.

13) There is a transition in the kinds of laws as we pass from one level to another, and on the whole the causal laws tend to predominate on the lower levels and give place to an element of spontaneity at the higher levels. Spontaneity is not to be confused with uncertainty or blind chance.

14) Quantitative characters are recognizable only at the stage when laws are discriminated. Enumeration begins with isolates, from this comes causal laws, from these again measurements of time, place, potentiality, etc., and finally the quantitative expression of probability.

I have dictated these notes as I am on the point of leaving for Manchester while they were still fresh in my memory after yesterday's talk. They are only intended to serve as a help in remembering what I was trying to say.

***Bohm extends the discussion to consider the principle of truth, following up JGB's distinction between realisation and actualisation.***

### **Extract from a letter from Bohm to Bennett - February 28th 1962.**

A few preliminary comments:

- 1) Could not the term “renewal” or something like it eventually substitute hyperaxis? Or do you think that this is not a broad enough idea? It would be desirable in presentation to make the terminology as simple and familiar as possible, choosing, wherever it can be done, a common English word that suggests the essential content of the idea immediately to the reader who does not have a philosophical background.
- 2) There is a network of reciprocal relationships in the totality of existence. What I think is that everything is reflected in the totality of existence, but that not everything is (or has its being) in existence alone.
- 3) Your distinction of realization and actualisation is very illuminating here. It is correct that values are realised, not actualised. As an example, take truth.

In this regard, I am sending you a copy of an article on truth and understanding that has a few ideas in it that may be relevant to the question.\*

Now truth may be taken to be the supreme value, for all other values depend on it. Even the words “true” and “valid” are interchangeable. Clearly, truth is not actualised, but it is realised through understanding, so that understanding is the hyperaxis of truth.\*\*

Now you may think at first sight that values have nothing to do with science. But they do. For all science is done in the light of the value of truth. Its essence is that it seeks truth. Moreover, truth is not just realised in an abstract sphere, but once realised, it acts. In other words, ordinary things are actualised in the sense that their existence requires that something else shall act (the efficient cause of Aristotle). But truth is not a reaction to anything else. It just is; and it acts when it is realised. Truth has no efficient cause for its being what it is (though understanding may be regarded as a kind of efficient cause of its realisation, in a rather strained sense of the word cause).

All this is important to take the questions that we are talking about here. Whatever is actualised is conditioned, in the sense that it enters the web of reciprocal relationships, which determine not only whether something can exist, but what it is (through the qualitative infinity of nature). Whatever can be realised either is or is not; but what it is is not conditioned. Nevertheless, it can act on what is conditioned, without itself being acted on. So in realisation, there is something that is exempt from reciprocal relationships (like Aristotle's unmoved mover).

It seems likely that we cannot put values (such as truth) directly and positively into a theory, but the form of the theory may reflect that there is something behind the whole that is not conditioned.

If we define existence axiomatically as the total sphere in which all phenomena take place and all actions have their outcomes, I think that one must recognize that behind this sphere is a broader one, going beyond space and time.

Is it clear that quality is unknowable? Could we not say that insofar as something can be qualified, then it is knowable. Behind the measurable is the qualifiable, and behind this is the unqualifiable. Which is the unfathomable. As I suggest in the article enclosed, the most fundamental is the implicit, which cannot be asserted in any way at all, but which just is (beyond even being in the sense that you have defined it.)

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\* An extract from what I believe to be the article referred to is given at the end of this document. In the next phase of the correspondence, Bohm is taking up the idea of multi-term systems.

\*\* The statement 'understanding is the hyparxis of truth' conveys one of the most powerful insights emerging in this discussion. Later, JGB talks about the 'moment of understanding' in much the same vein, but the connection was lost.

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**Extract from a letter from Bohm to Bennett      - March 3rd 1962.**

Perhaps you would be interested in knowing that I have been greatly struck in general by the spirit that is present in your group (including Brown, Blake, and Schaeffer whom I have met thus far). There is a real desire for understanding and truth which is quite rare, at least in the very general and sustained sense. Sometimes one finds it in a group for a limited period of time and directed towards some limited objective, such as science or philosophy. But the arising of such a group as this one, however small and modest in numbers, is I think of value in itself, and besides, it may well lead to important developments if it continues and grows ( and has the proper "hyparxis" if I may use the word here - to mean a principle of renewal). However, it may be that one should not stress the results, but truth and understanding itself, leaving the results to be by-products. As is said somewhere in the Bible (in rough terms) "and all this shall be added". Of course, it is said elsewhere "By their fruits shall ye know them". But if a tree kept on concentrating on the fruits, it would not properly do the job of being a tree, and thus might not bear any fruit at all. I stress this because modern physicists only want the fruits and are not interested in understanding itself. If a man possesses an orchard and treats it from this point of view, he would be trying to get a lot of fruit out of it immediately, but this might be at the expense of the orchard. It is interesting that those physicists who made really great contributions like Einstein and Planck were most interested in the understanding itself, and regarded this understanding as the main fruit of their work.

To change the subject, I have been trying to think a little more about the subject of realisation, actualisation, along with reality and actuality. As we were saying, what is actualised is conditioned. It depends on the action of something else not only to come into existence, but also, to determine what it is that will come into existence. On the other hand, it seems to me that what is actual is not only that which is actualised, but can also be that which is realised. For what is actual is that which acts. Values, being realised, are also acting. They operate. Thus, they are actual but not actualised.

With regard to the question of fact, it occurred to me that this could be looked at in two senses. In one sense fact is actualised, since it is a part of the totality of existence. On the other hand, fact can be taken in a more general sense as that which is actual. For example, I can say, "It is a fact that truth is (or is not) being realised in this particular work." In this broader sense, the fact refers to the inner as well as the outer. It means roughly "What is so."

Then there are two aspects of judgement (or perception in the broadest sense of the word). First, we must perceive "What is so" - which is to say, the facts of the case. Then one must perceive the truth or falsity of what is so (or more generally, one can see that one doesn't understand well enough to perceive this). But if we take perception in the total sense of the inner, the outer, and the two together in their proper relationships, then one perceives:

(A) What is present outwardly. This is usually what is called the "facts" in science and in everyday life; and this kind of fact is actualised as you say.

(B) The ideas, feelings, urges, goals, etc. that are present inwardly and that arise in response to what is present outwardly. Their presence and character are also facts, more often actualised than realised

(C) One must perceive, first, the truth or falsity (or realise the non-understanding) of (b); and this will also enable us to criticise (a) too. Sometimes it turns out that what was accepted as a fact is not really one. So even the outward domain is not completely exempt from perceptions (or judgements) of value; but we may say that in the outward, the actualisation of fact is dominant, while in the inward, the realisation of truth (in proper functioning of the mind) is dominant. In the inward domain, therefore fact has to do not only with actualisation but also with realisation. But when in the outward domain, fact has to do with realisation in certain exceptional but very important kinds of cases.

This raises the question of reality and actuality. I would like to suggest that all reality is actual, in the sense that it operates, but that reality does go beyond existence in the usual sense of the word. It may be relevant to consider the Hebrew word for existence (in view of our conversation on Semitic languages). The word means roughly one or a combination of the following English words:

a) To arise

- b) To establish
- c) To establish itself.

Perhaps it would be interesting to compare this with the Arabic. Another line might be to compare with Sanskrit. Perhaps we could get a better idea of the concept by seeing how it was considered at different times and by different language groups.

In Latin, it seems to me that to exist carries the connotations of coming out of something (perhaps your hyle). What about Greek? And Hegel said of existence that it arises out of its ground and falls back into its ground.

Now, it seems to me that existence is essentially a relative sort of thing; that is, it must be relative to its grounds, everything being in reciprocal connection. As such, each form of existence is only partial. But determination, possibility, impossibility etc. In other words, perhaps the real is the unfathomable.\* The real includes reciprocal relationship as a special but important case. (As the imprecise includes precision and relationship includes difference). I would suggest that the real includes everything in this same way. Thus, it may be that the real is the infinite as well. It seems to me that to try to go beyond the real would lead to sheer nonsense. What do you think?

What is very important here is to develop the ideas of the multi-term system, both philosophically and mathematically. On balance, I now feel that this is the most important thing that you have suggested (not that I wish to minimize the importance of the many other things in your books). I feel that our conversation of Friday contained an important hint. For we saw that as we go up one, we obtain a new concept which contains all those that came before, but in special distinguished roles (that is, as special limiting cases). So we have the possibility of blending the higher term systems with the lower. But more exactly, this comes about by abstraction, and not by synthesis. We must begin with the highest, in what is already blended, then we go on to separate out the distinguished elements, and finally, we see the special role (or operation) of these elements, in the totality. So when we go the other way, the simpler concept takes on a new meaning in the more concrete one.

I have a feeling that group theory and algebra can say something like this. There could be a distinguished sub-group. Actually, there is an infinity of potential candidates for this distinction, all related by automorphisms. This infinity spans the whole group. Actuality is in part determined by the one that fills the distinguished role in the moment in question. When another fills this role, then by definition, there is another moment. That is, we do not begin with time, but rather, we define moments by the elements that fill distinguished roles. It is a bit like a complex dance in which each person eventually takes each part. As a particular person comes to take a central part, this characterizes the moment in question. Only it is more complicated still, as the figure itself changes from one part to the next in a way having some genuine spontaneity.

To come back to the determining conditions, is there a natural order of abstraction? Or are they all on more or less the same footing? This is not yet clear. In other words, we begin with ordinary existence, which blends all four of them. Then we start to try to abstract, to find those having a distinguished role as special and limiting cases. Would it be worthwhile to regard the dropping of hyperaxis as the first step, for example? Or would one consider four alternative ways of dropping something and proceed by following all these possibilities?\*\*\*

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\* The term 'unfathomable' was used by JGB in a technical sense in *The Dramatic Universe* as that which is beyond all conceivable distinctions and of which nothing may be asked.

\*\*In point of fact, we explored this suggestion in the Integral Science Education Research Group (ISERG), which at this time met every week in London under JGB's direction. ISERG was composed of young scientists and educators and Bohm himself took part in a few of its meetings. It was a fascinating subject, raising the prospect of different orders of 'ghost' as it were. We discussed 'spaceless', 'timeless', 'eternity-less' and 'hyperaxis-less' states and then combinations of privations, the final state being pure hyle. Unfortunately, none of the discussion was recorded.

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### **Letter from Bennett to Bohm - March 13, 1962**

I have had to put aside for a couple of weeks, the work on the themes that interest us in order to finish the proofs of Volume III of the Dramatic Universe. Nevertheless, I want to let you know how stimulating I found your letter of March 10th [missing]. You are the first person to grasp, merely by reading the book, the notion of hyperaxis as I have understood it. If we ask ourselves how it is that the 'specious present' is not instantaneous: the usual explanations in terms of synaptic lag do not account for the character of the experience in itself. There is evidently some power to 'hold' time, and this power varies in intensity. It seems probable that it works rather like a cinema by integrating many impressions each too short to be distinguished. Experimental psychology shows that  $10^{-4}$  secs. is the threshold of perception of even the most intense impression, such as a brilliant light or an electric shock. The integration of the subliminally short impressions and also the peripheral sensations requires a connectedness that is not causal, but, rather, orthogonal to time. The difficulties of dealing with problems of sensation largely disappear when hyperaxis is taken into account.

Your illustration of levels that mutually image one another, and especially your phrase "dynamical stability and ability to adjust" express just what I mean. The same applies to your interpretation of "meaning". It seems to me that the recognition of meaning is always timeless. The "Moment of Understanding" only appears to have a duration because it leaves its trace: but the moment itself cannot be analyzed into successive sub-moments.

It is probable that this has a direct bearing upon our talk about understanding and truth. The moment of understanding is valid and complete in itself; it has no past or future, but

only a variable 'depth' . But the connectedness of time is also operative, so that we move away from the moment and in the next moment there has to be a new understanding. This new understanding is valid and complete (e.g. special relativity), but it also deepens the previous understanding (e.g. Newtonian mechanics). The previous understanding must be grasped in its own place.

The place is hyparchically assured. Moreover, the earlier moment is connected in understanding with the later: e.g. Newton's first law foreshadows the notion of a geodesic which becomes significant in special relativity and central for general relativity. In our treatment, it develops into the cosmodesic, which generalizes the notion of connectedness as the minimum interval.

I would like to try to express what I mean by 'pure' affirmation. Your objection that affirming A is equivalent to denying all not-A is valid within existence where A and not-A are distinguishable by mutual exclusion. But, if we relax the determining conditions and allow an unlimited connectedness, then it is both A and not-A, and an infinity of new qualities enter. It is no longer possible to define A by the via negationis: there is too much to deny. We have to distinguish essential and existential affirmation. This distinction does not appear until Volume III Chapter 28, because it does not arise within the natural order which is by definition wholly existential. The essential affirmation does not require a correlative denial. It is implicit in the notion of creation ex nihilo of Genesis. "In the Beginning, God ..." really means "The incomprehensible notion of an Affirmation unrelated to any Denial must be our starting point". But when the Affirmation becomes an act of Creation - that is of limitation and determination, then it can no longer be isolated from the denial. The imperative "Be!" is directed towards absolute emptiness, not to the 'pregnant void'. The imperative impregnates the emptiness which then "becomes" the pregnant void, and from that the creative process.

Leaving aside theology - though I believe that theology is a genuine science, not a philosophy - I would say that we can also reach the notion of pure affirmation by way of limits. Totality differs from all its sub-groups by being free from the 'included-in' characterization. We can visualize a progressive transition from "included-in-more" towards "included-in-less". As inclusion diminishes, affirmation becomes less and less dependent on denial. In the limit, there is no not-A left and then A - the Totality - can only be affirmed by what it is, not by what it is not. This affirmation is possible only if we place ourselves in a position which is apart from the Totality - that is the Unconditioned and Unfathomable.

This does not mean that the notion of essential affirmation must be transfinite. It is possible to abstract from Totality in such a way as to preserve the essential affirmation. This permits the presence, within Existence of beings endowed with freedom, responsibility, etc. If this abstractive sequence were not possible, all affirmation would be depended on denial and there would be no real freedom. This does not detract from the significance of dependent or existential affirmation, which is always correlative to denial as you say on p.1 of your letter.

I hope to get to work on the notion of abstractive sets by which one reaches hyle as the limit of being abstraction, universal laws as the limit of Will abstraction and cardinal numbers (bare classes) as the limit of functional abstraction. The suggestion you made that hyle is best reached abstractively is very fruitful.

Your reference on p.3 to the interpretation of the averaging interval  $\Delta t$  as an interval in hyperaxis suggests to me that we should examine the connection between hyperaxis and action. In space-time-mass terms, action appears as a complex notion: and yet it is obviously not complex. Angular momentum is an exceedingly simple and fundamental notion: why do we have to represent it by  $ML^2/T$ ? But if we regard renewal or repetition as being as closely associated with hyperaxis as successiveness is with time, then angular momentum appears to be the projection of hyperarchic renewal into space-time. The connectedness of hyperaxis introduces the constraint that converts microscopic reversibility into macroscopic irreversibility.

Now I must get back to my proofs. I glanced again at the last paragraph of your letter. I must go back and read Henri Poincaré's "le Temps et l' Espace" where he starts from the psychological experience. I have not looked at it for years, but I believe he came very near to some of the ideas we are working on.

*In the preceding letter, we see the seeds of mutual dissension, with Bennett favouring the reality of separation – in this case, of the affirmative impulse - while Bohm argues for pervading mutuality and wholeness.*

*We take up the correspondence again when JGB is trying to justify his scheme of six forms of the triad, or three-term system. This line of enquiry was never completed, and the scheme, even though elaborated at some length in *The Dramatic Universe Vol. II*, was never adequately formulated - as a calculus of propositions, for example. I give only some extracts from the letter, which ends inconclusively.*

## **Letter from Bennett to Bohm - July 20 1962 (extract)**

I am going to make an attempt to show how some typical relationships can be reduced to one of the six [triads] or a combination of them.

### 1. Causality

There are various types of causal statement and not all of them refer to the same type of relationship. I think that the true causal relationship belongs to the triad of expansion where A, the cause is affirmative, B, the object of the action is receptive and the resulting situation is reconciling.

Example 1. The heat of the sun causes evaporation of the waters (1)

This kind of causal statement can always be reduced to the form A acting upon B causes C

|                       |             |  |        |
|-----------------------|-------------|--|--------|
| A                     | B           | C  |        |
| (the heat of the sun) | acting upon | (the waters)                             | causes |
|                       |             | (a change of state from water to vapour) | (1a)   |

If any of the three terms in such a statement is not explicit, it is always implied, e.g.

The heat of the sun causes evaporation (1b)

This is a meaningless statement unless we imply that there is a liquid that will evaporate under the sun's heat.

The third element C is that which connects the first two and is also the result of their being connected. We can write:

A = affirming = 1  
B = receptive = 2  
C = reconciling = 3

This kind of causal statement belongs to my type 1 relationship.

Examining further, we see that all such situations have a one-to-many character. The situation is one of expansion. From the evaporation of the water, various further effects come and these are more diversified than the primary situation.

.....

The term affirmation could as you suggest be replaced by dominant or active or even causal.

The term receptive can be replaced by subordinate, passive or field of action.

The term reconciling can be replaced by connective, resultant or continuing.

There is the further feature that the outcome of one causal triad can be the initiating factor for another causal triad. Hence thus type of causality is self-renewing.

There can be pseudo-causal statement which really belong to the triad of interaction. They are merely statements of association or connected [sic] according to the triad 1-3-2. On this view the true test of causality is the observation of affirming and receptive elements in a juxtaposition with a situation of expansion.

.....

## 2. Ends and Means.

In this type of relationship there is a concentration towards a specific situation.

Example 6. We eat in order to live

This can also be stated

|            |       |        |             |        |     |
|------------|-------|--------|-------------|--------|-----|
| A          |       | B      |             | C      |     |
| (the body) | needs | (food) | to maintain | (life) | (6) |

It is evident in this case the body is [the] passive or receptive element and food is taken as a means towards the end of preserving life. In any example of this kind, there is a transition from a passive to an active state.

The point about all purposive relationships is that they are a movement from passive to active, and can be called syntropic as opposed to entropic.\* The means by which we achieve an end dominates the situation until the relationship is established and the end alone remains.

I will continue the discussion of some other relationships in my next letter.

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\*As far as I know, JGB made no further use of this correlation between the triad of expansion and causality, and the triad of concentration and teleology; even though it is intuitively helpful. We must remember that he had been working on the significance of the six combinations of three, or six 'laws', for more than thirty years. In the next letter we have, JGB is concerned with fundamental ideas underpinning the ideas of systems.  
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## **Letter from Bennett to Bohm, 7th January 1963.**

Your letter of December 24th [missing] was a delightful Christmas present, and has kept me interested ever since it came.

I would like to comment in the inverse order, starting with confusion. I agree with you that this is supremely important. According to my cosmological notions, it is inherent in the very existence of Existence. If the latter is defined as all that is possible, then all impossibilities remain outside. But since the impossibilities of a situation are always relevant, it follows that it can happen that any existing centre of consciousness can be aware of all the relevant considerations. We must therefore always allow for "unknowables" in every situation. This allowance cannot be made unerringly and therefore confusion is inevitable.

Since this applies to all the content of existence it must include moral as well as factual judgements. Hence 'sin' is also inevitable.

Now in Indian and Buddhist philosophy, confusion is regarded as the source of all ill - moral, intellectual, physical and cosmic. It is called in Sanskrit avidya (or in Pali avijja). Now vid is the root for seeing. In Greek [], in Latin videre, in Germanic widmen, in Slavonic bugumo. Hence, it follows that the notion that failure to see is the source of all our troubles, must be very ancient indeed. Western commentators have objected to the Hindu doctrine of avidya on the grounds that it makes intellectual inadequacy (not-knowing) the source of all trouble and hence treats moral judgements as derivative and not primary. But this is a mistake due to not realizing that vidya is a total awareness of things as they are and as they ought to be. It is the power of seeing that is the condition for all right action and conversely non-seeing, avidya, confusion is the condition for both error (in the sense of mistakenness) and evil (in the sense of departure from the norm in action)

Now as you rightly remark, confusion breeds confusion. Therefore what starts as mere error and (innocent) mistakes in action, ends up by becoming wilful ignorance and 'conscious evil'. The order of confusion in which we live, must evidently be very great: so great in fact that we often approximate to a condition of randomness where predictability reappears through the 'law of large numbers'.

So it seems as if confusion is self-correcting by leading to probabilistic situations, just as order is self-destroying by leading to confused situations.

I would like to make a remark on your example of confusion (I wish and do not wish to get out of bed). You write: "I am the same person who wants to sleep and to get up...."

According to Gurdjieff, you are not the same person. He would say that there is no "I" in the situation, but merely an opposition between two brains. The intellectual centre wishes to get up, the instinctive wishes to sleep. This is an unresolved dyad. A third centre intervenes, probably the moving centre that has the habit of rising and like activity, and this centre simply gets the body out of bed making use of the 'hole' created by the conflict of 'yes' and 'no'.

Hence Gurdjieff's dictum: "In ordinary man, will is nothing else but the resultant of desires."

Your second illustration is also to be explained in terms of the isolation of separate parts creating a pseudo dyad. Gurdjieff uses the word 'buffers' to designate the psychic barriers that form during childhood and later in order to protect us from painful shocks. These buffers make life more comfortable, but at the price of avidya, that is not seeing things as they really are. We do not 'see' that our anger and the other man's anger are identical. A buffer prevents it. By means of buffers, people are always in the right. We can lie and firmly believe we are truthful, cheat and be convinced of our honesty, cruel and be certain we are kind and forbearing. All this is the work of buffers.

Buffers are a necessity for the type of sleeping man: but they are also the chief obstacle to his awakening. Why? Because we awaken through the perception of contradictions. This makes the transition from the dyad to the triad.

It seems very probable that there is some universal principle of confusion such as: "Perfect finite systems cannot exist, so that every finite system is imperfect. All imperfection is confusion. Consequently, in all finite situations, there must be some degree of confusion." It also seems probable that the confusion in a system of the Nth order, can be resolved or, at least reduced, in the context of the (N + 1)th order.

This brings me back to systems and the first part of your letter.

Monad. I agree that the moment of awareness is the paradigm case. It is unbroken and undivided; but it is diversified. Thus diversity is a more primitive concept than homogeneity. This important point is often overlooked. We never encounter true homogeneity - even high degrees of approximation are rare. So that the "Undivided, Undifferentiated Absolute" of philosophy is an abstraction and a weak one at that. The unbroken, undivided moment is a universe in which everything (momentarily) is possible. It is "one and many", i.e. universal. But it is confronted with impossibility and therefore by the challenge to make the impossible possible. This is act. Act realizes the monad;

but, in doing so converts it into a dyad. There is perfect complementarity only within the moment of the self-realizing act.\* Outside this moment complementarity degenerates into opposition, conflict or mere difference.

You refer to truth as perfect complementarity of act and fact. This is good, but it is probably only a special case of the more general proposition: Truth is the realization of harmony within a system of a given order. There is thus absolute truth for every system: but since there is an infinite set of systems each paradigm is completely distinct in the character of its harmony from all the rest, the Truth is an infinite regress. Each system in reaching its Harmony pre-supposes the next, so that each truth requires a further truth to make it true. In spite of this regress, the idea of truth is always valid, because for any given system it is complete.

I like your insistence upon the requirements of independence and complementarity. It is an interesting problem to distinguish your transition from dyad to triad, from hylic progression of the notion: Being-Non Being-Becoming is not a real paradigm case. Why not? I think it is because one must not define the second term of a true dyad solely as the contradictory of the first. Your bringing the dyad out of the monad seems to be the right safeguard.

I have been working on the harmony of systems of different order and when the manuscript has been typed out, will send you a copy.

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\*It is possible that JGB was here thinking of the 'theological' example of perichoresis, which is the perfection in synthesis of the two natures - human and divine - in the one person or hypostasis; i.e. Christ. As he says elsewhere, he regards theology as a true science and not a philosophy. In this sense, the multi-term systems have been studied most intensively and precisely in theology.

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***The next piece we include is a paper by JGB on the first three systems, and may be the document referred to in the last sentence above. It owes something to Wittgenstein's format in the Tractatus. It belongs here as a very crucial document: JGB was attempting to lay the ground for establishing the one-term system, or monad, as equivalent to Bohm's one, total awareness (see below, the last letter); thereby liberating the possibility to make distinctions in the two-term system or dyad, and connectednesses in the triad and so on. As far as I know, Bohm did not recognise the fundamental idea that there were different, multifarious, orders of understanding. For him, the one total awareness was primary in an absolute sense.***

***Thus, whereas for JGB the idea of an 'observer' was simply an aspect of 'dyadic understanding' and perfectly valid in its own terms, for Bohm it would be more a matter of misunderstanding. The two men could never, finally, agree on the 'frame of reference', or the underlying matrix or field of discourse.***

***There are some haunting ideas in this paper, which one comes across in passing, for example: if there are 'high modes' of the scientific activity 'they are usually not made explicit' (2.433). I have omitted the last part of this paper, describing the 'six laws' of the triad since this offers little new and doesn't fit very well with the earlier material. It was left unfinished, presumably because JGB regarded it as unsatisfactory - as with the previous material on the 'laws' mentioned above.***

## TOTALITY - DIFFERENTIATION - RELATEDNESS

1. There is a given total experience.
  - 1.1 In its primary self-presentation the totality is neither one nor many but simply diverse
    - 1.12 There are no objects in the primary self-presentation.
  - 1.2 There is no distinction of I and not-I.
  - 1.3 There are no urges and no action for everything goes on as it is.
    - 1.31 The totality in its primary self-presentation is neither known nor not-known.
    - 1.32 There is no distinction of knowing and being.
  - 1.4 This primary totality has no limits
    - 1.41 The question whether or not there is anything but the totality has no meaning.
  - 1.5 The self-presentation of the totality and our awareness of it are not distinguished or distinguishable
    - 1.51 Awareness is a mode of self-presentation.
      - 1.511 Awareness need not imply a self to be aware.
    - 1.52 In the primary totality there is no subject-object.
  - 1.6 Connection and dis-connection are not discernible in the primary self-presentation.
2. The secondary self-presentation is the **awareness** of distinctions.
  - 2.1 Distinction is limitation.
    - 2.11 In its secondary self-presentation experience of the totality is limited.
    - 2.12 It is possible to conceive an 'other' that is distinguished from the totality.
  - 2.2 There is a distinction between 'this' and 'that'
    - 2.21 And hence between 'this' and 'not-this' .

- 2.22 And between 'I' and 'not-I'.
- 2.23 And, probably, though not certainly, between all that can be distinguished and all that cannot be distinguished
- 2.3 Then is certainly a distinction between existing and knowing.
- 2.31 Knowledge is of distinction.
- 2.311 We can only know what we can distinguish.
- 2.32 The possibility of knowledge is inherent in the secondary self-presentation of the totality sub specie differentiae
- 2.32 To exist is to be different
- 2.321 There can be no existence without differentiation
- 2.4 Differentiation is analytical.
- 2.41 No principle of integration or even of relatedness is given in the secondary self-presentation of difference.
- 2.42 Knowledge is the placing of differences (secondary) within the given totality (primary).
- 2.43 Thus the primary self-presentation gradually becomes known.
- 2.431 This is the progress of science.
- 2.432 Science discovers regularities in the natural order because these regularities are already present - though not distinguished - in the primary self-presentation of the totality
- 2.433 Nevertheless, we cannot say that the scientific activity is confined to the first two modes of self-presentation: but if there are higher modes they are usually not made explicit.
- 2.44 Analysis adds nothing new to the self-presentation but it does convert primary into secondary awareness.
- 2.5 The totality discloses contradiction and opposition.

- 2.51 These are also within the secondary self-preservation.
- 2.52 The awareness that A stands opposed to B is knowledge of the dyad (AB)
- 2.53 The dyad (AB) is experienced as force acting between A and B
- 2.532 Hence science discovers forces.
- 2.5321 Forces when placed within the primary self-presentation are known as fields.
- 2.54 The nature of the field depends upon the singular or multiple characters of the terms
- 2.541 When A and B are both single the force (AB) is polar.
- 2.5411 As a magnet or two bodies joined by a string.
- 2.542 When A is single and B is multiple then the dyad (AB) gives rise to a force field centred upon A.
- 2.5421 As the sun and planets or any gravitational system - even if B is a set of fictitious test pieces
- 2.534 When A and B are both multiple the field (AB) is non-centred.
- 2.544 In their simplest aspect fields are sets of dyads that may be actual or fictitious.
- 2.55 Contradiction is total difference.
- 2.551 Contradictory terms do not overlap in respect of qualities that contradict.
- 2.552 In its simplest aspect contradiction is unresolved separateness, it is difference pushed to the extreme.
- 2.553 There is no affirmation or denial in the general field of differentiated terms.
- 2.6 An important difference is that which divides subject and object.
- 2.61 It is in the nature of things that awareness should be distinguished from its object.
- 2.62 But this is the secondary nature and does not arise until we pass from the monad to the dyad.
- 2.7 Another important difference is between the knowable and the unknowable.

- 2.71 This distinction is not itself knowable but is implicit in the distinction of subject and object for there is always some element in the subject which must stand apart from knowledge in order to know.
- 2.72 If all distinctions can be known it follows that the unknowable must be without distinction.
- 2.73 But it does not follow that the unknowable may not present itself to us otherwise than by way of knowledge.
- 2.74 At least two kinds of unknowable can be conceived: one is within the primary self-presentation but not distinguished and the other is without the primary self-presentation and therefore not presented at all.
- 2.75 Common usage tends to call the first kind of unknowable quality and the second kind God.
- 2.751 Qualities cannot be known apart from the knowable object in which they inhere.
- 2.7511 As sweetness cannot be known apart from sugar, or some other sweet tasting object.
- 2.7512 We do not know the qualities though it is also true that we do not know the object without the qualities.
- 2.7513 Thus in the primary self-presentation qualities and objects are not distinguished.
- 2.7514 Qualities interpenetrate as distinct objects cannot do.
- 2.7515 Thus there can be a yellow soft beautiful good object.
- 2.7516 This is true even when qualities are opposed. An object can be soft and hard, beautiful and ugly; but it cannot be both table and chair or both present and absent.
- 2.7517 We do not know “this is yellow” but “this is a yellow object”. There is no way of knowing “yellow” as distinct from an object.
- 2.7518 We do not know yellow as such, but we can distinguish shades of yellow.
- 2.7519 We do not know colours such, but we do distinguish one whole from another.

- 2.7520 Colours are a way of distinguishing objects, but colour cannot be distinguished say from pitch - or shape - or goodness. This is because we cannot separate qualities except by separating objects. So pure qualities are not distinguishable.
- 2.76 There are qualities that bridge the gap between the subject and object.
- 2.77 'Beauty is in the eye of the beholder' expresses this notion.
- 2.78 Values are the name we give to all kinds of 'bridging-qualities'.
- 2.79 Values requite subject-object as a totality.
- 2.80 So they are immediately given in the primary self-presentation - though not given as such, that is, as distinct objects of knowledge.
- 2.81 Fact and Value constitute a dyad that in every presentation links the knowable with the unknowable quality.
- 2.82 There is no reconciliation of Fact and Value within the limitations of primary and secondary presentation.
- 2.83 God as the unknowable beyond presentation is beyond quality. Nothing can be said about God in this sense.
- 2.84 We are at liberty to postulate a higher synthesis which unites the presented and the non-presented. God as the Supreme Unknowable can nevertheless be presented through this higher synthesis.
- 2.85 Hence the notion of a personal God is not illegitimate.
- 2.86 But this notion cannot be reached through the analysis of second-order presentations - that is, science.
3. Every mode of self-presentation is a system.
- 3.1 Systems are sets of connected and mutually relevant terms.
- 3.12 Terms presuppose distinctions and hence systems begin with distinctions, that is, with the dyad.
- 3.13 Every system is a totality composed of terms.
- 3.131 The simplest totality - beyond the dyad - is the triad, that is, the system of three connected and mutually relevant terms.

- 3.2 System implies the notion of mutual relevance which is more than mere difference.
- 3.21 It is also more than mere connectedness.
- 3.22 If two distinct terms A and B are mutually relevant some part of A is in B and some part of B is in A.
- 3.23 This could occur if A and B are only partially distinct like two overlapping figures on a surface.
- 3.24 Therefore condition 3.22 is not sufficient to establish mutual relevance.
- 3.25 We can postulate a third term C such that A is presented to C differently because of B and similarly the presentation of B is different because of A.
- 3.251 This kind of connectedness is nearer to the notion of mutual relevance.
- 3.26 If A B and C are connected in such a manner that none of the three is adequately presented to another without the third then we have a condition of full mutual relevance.
- 3.3 A set of N distinct terms A, B, C ... such that all are mutually relevant is called an N-term system.
- 3.31 A term is any object that can be distinguished from other objects.
- 3.311 Qualities are not terms, but they enable us to distinguish terms.
- 3.32 Qualities attached to terms may be sensible, intelligible or value-bearing.
- 3.321 Sensible qualities may be perceptible (colour, shape, etc.) spatio-temporal or potential.
- 3.3211 A potential quality is convertible into a perceptible one: as an electric charge may give rise to a spark or a shock.
- 3.33 Qualities are variable. Blue includes many perceptible and more perceptible shades.
- 3.331 The qualities attached to a term are usually not single-valued. They may be represented by a closed figure rather than a point.
- 3.3311 Qualities can overlap.

- 3.34 Connectedness is observable by the overlapping of qualities. If A and B are connected there must be some quality *P* that A and B share over part of its range of variation.
- 3.341 Two yellow bodies A and B are connected by their yellowness even though the yellowness of the A can never be identical with that of B.
- 3.342 Two bodies A and B joined by a piece of string share in the quality of stringiness.
- 3.3421 The string may be yellow, long, smooth, etc. as well as stringy. These other qualities are irrelevant to the connection between A and B.
- 3.35 We have already distinguished between simple connectedness and mutual relevance ( 3.24 )
- 3.4 Every system has a systemic quality that is uniquely its own. The systemic quality arises from the terms, their qualities and the manner in which they are connected and mutually relevant.
- 3.41 The quality *P* of a system (A,B,C,D...) is distinct from the qualities of A, B, C etc. taken separately or of their sum N or any combination of them.
- 3.42 The character of systems consists in the plus value of every system taken as a whole that makes the study of systems important.
- 3.421 For example, the knowledge of one or many single terms however complete or however diverse is not the same as the knowledge of difference. Even the sum of the qualities of two terms does not convey the notion of difference which is present in every dyad.
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*In the last period of correspondence that follows, the topic is provided by JGB's scheme of four 'mental energies', which he uses in many contexts such as creative thinking. This brought into focus the differences of attitude that eventually divided the two men.*

## **Letter from Bohm to Bennett - March 28 1964**

I received a copy of your talk Energy And Scientific Creativity which I have just finished reading. I found it most interesting indeed, with certain similarities to my own point of view on the subject, and certain differences. I thought that you might be interested in hearing about these, so I am writing you on the subject .

Firstly, creativity is certainly based on a kind of mental energy, which has some deep source, far beyond consciousness. I go along with your division of this energy into four main aspects : -

- Creative Energy  
in its Totality:
1. Creativity as Such
  2. Consciousness (Judgement as to what is True and False)
  3. Sensitivity (in the Form of the Specious Present)
  4. Automatic Nervous Activity.

With regard to Automatic Nervous Activity, there is little to say, as our views on the subject are not different in any essential regards. Our first differences arise in the discussion of Sensitivity, which you identify with awareness. I myself would call it a highly conditioned and restricted kind of awareness. Beyond automatic activity in the immediate present, there is, as you say, the ability to consider a broader range of things together in awareness, past and present, what is before us and what is absent, what is visible and what is, at least for the moment, invisible, etc. This is what Piaget would call Pre-Conceptual awareness, which is highly Egocentric, in the sense that the things to which attention is paid, as well as our attitude to them are determined by like and dislike, praise and condemnation, pleasure and pain, fear and the feeling of security etc. These latter all arise, as far as I can see, from the automatic activities of the nervous system, in a way that is determined by our conditioning, but which is accidental with regard to the content of what is in the field of awareness. We may therefore regard it as mechanically limited and conditioned awareness. It is probably the principal form of awareness of most very young children.

We then come to the stage of consciousness, characterized by Conceptual Thought, which sees the possible as well as what is Actual. Probably Freud is right in attributing this form of thought to a Conscious Ego which arises as an intermediary between our deep desires and the possibilities afforded by the world for satisfying them. The Conscious Ego is able to make calculations as how to go about achieving an optimum satisfaction and a minimum dissatisfaction, but it has much more in it than this, for it is, in its highest

form, capable of seeing fairly objectively what is true and what is false, in the conceptions that it is examining. (This you seem to call "judgement", but I think that the term is somewhat misleading, as it suggests condemnation and praise, agreement and disagreement, etc., which are functions of the lower level automatic reactions).

I would call this phase "conscious awareness", to distinguish it from pre-conscious awareness, on the one hand, and the next (creative) phase, which I would call "total awareness". In the case of conscious awareness, you have called attention to the characteristic impression of a separate disinterested observer, who can examine both the external world and the pre-conscious awareness objectively, to see what is false and what is true. But here, I would say that the impression of being separate from what it examines is misleading actually, there is only one mind, and all awareness is really one. Between the apparently separate observer and the field that he seems to be observing are "hidden" conscious links, such that the conscious observer, even at his most disinterested, is unconsciously biased towards certain thought perceptions, and feelings, and biased against others. The bias arises basically because conscious awareness is not yet free from the automatic activities of the nervous system. It is not free because it is not aware of the source, from which its interests and judgements originate. For this reason, the source is more than likely to be mechanical, though it may occasionally be creative.

I now come to the phase of total awareness, which I think (as you do) is beyond consciousness. This kind of awareness can be aware of what is happening in the external world and in the internal world as well. It can be aware of all the automatic reactions, leading to a bias in consciousness. It can be aware that there is no absolute separation between the "observing" consciousness and the field that is being observed, but that these are two aspects of one inter-connected totality. Generally speaking for most of us, such moments of total awareness are fairly rare. In addition, the conscious awareness, being conditioned by our customary language and modes of experience, is almost entirely incapable of accurately translating this total awareness into communicable thoughts and concepts. However, in limited fields, such as science and art, it has been a bit more common for this kind of awareness to find a more or less adequate external expression, because the "languages" involved in these fields are more suited to this end than is our everyday language (Poetry is another field in which this can happen - and you may be right that for many people, sexual relationships provide the only language that is adequate).

I would say that creation is possible in the field of total awareness. This is a kind of awareness that is not based the consciousness of self as a separate "observing" entity. However total awareness does not exclude the lower forms of awareness, which latter are necessary for our lives, as well as for expressing creation outwardly. The difference is that when awareness is total, the lower forms of awareness are no longer autonomous, but instead, accommodate as other, and fit into the total act of creation. Thus, they cease to give rise to contradiction and conflict, which latter are incompatible with creation, in the sense that the nervous energy. involved in conflict destroys the state of mind needed for creation.

The term "unconscious" is confused as long as we do not realize that it has two poles. There is the pole of automatic activity on the one hand, and the pole of total awareness on the other. Automatic activity is not only unconscious, but also unaware. However, in total awareness, the consciousness of a separate observing self may either be absent, or else present, but evidently playing a secondary role, as the transmitter of creative activity originating in a source beyond consciousness. Probably the consciousness of such a separate "self" tends to get in the way of total awareness.

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### **Letter from Bennett to Bohm - March 29, 1964**

I am most interested in your letter of March 26th, and am going to give a quick reply now, though I want to consider it more carefully.

I have come to the conclusion that the sensitive energy is the same as people usually mean by the word "mind". I think that all experience is thrown on to the sensitive energy as images are thrown on to a mirror.

In the ordinary state, man has his attention fixed on the mirror rather like Plato's simile of the cave, where the prisoners are forced to look at the opposite wall and cannot turn their heads. In other words, it is the consciousness that is, to use your phrase "highly conditioned and restricted".

When in the Gurdjieff sense a man "wakes up", his consciousness **is** set free from this polarization and is able to stand back from the sensitivity. In this state his awareness and his consciousness are undoubtedly separate. One can verify beyond possibility of doubt that there can be a separation of consciousness and sensitivity. It requires a certain amount of practice to bring this state about voluntarily, and a very considerable transformation to maintain it for any length of time.

In the ordinary state of sensitivity there can be concepts but these are ready made and projected to the mind usually through some process of learning. The independent formation of concepts does come from consciousness.

I agree with you that it is the sensitivity that carries polar reactions of like and dislike, etc. Judgment in the proper meaning of the word is not like or dislike, but an objective evaluation which must take into account at least three factors and may under favourable circumstances take more. Judgement is "seeing how things are" as distinct from having a reaction to them.

Your total awareness is an interesting notion that probably agrees with my understanding of creativity. I say this because you describe your total awareness as being beyond consciousness.

The psychological experience of creativity seems more like an inversion of consciousness. Instead of consciously being centred in oneself, one appears to be immersed in a total consciousness in which one loses any awareness of self. It is more than seeing things as they are, for it includes seeing "how things are".

Your last paragraph is of course fully in accord with my understanding. There can be no greater mistake than to treat the subconscious and the supra-conscious as the same.

I am just completing a book on energies which is in part a development of Chapter 32 of The Dramatic Universe and partly a statement of the results of applying systematics to the notion of "a scale of materiality". I am going off for nearly all April to try and get the third volume of The Dramatic Universe finished, but would very much like a chance of meeting you again when I come back.

*The following is the last letter we have. One can see how Bohm is separating himself from JGB's views and finds difficulty in accommodating Gurdjieff's emphasis on 'separation'. This may have been the key note that explains why Bohm soon went on to make a connection with Krishnamurti (whom he had come across already in 1961) and abandoned any connection with the Gurdjieff line. In his biography of Bohm, David Peat writes: ". . . he came across the work of P. D. Ouspensky and G. I. Gurdjieff. Gurdjieff had taught that people are driven by forces and reactions that are largely unconscious. When everyone behaves like a somnambulist, where is human freedom? If Gurdjieff had stated the basic problem facing human beings, what was the next step? How was the sleeper to awaken and achieve true freedom? To Bohm, the solutions Gurdjieff had proposed were mere psychological tricks." (p.194)*

*Bohm remained attached to the notion of there being 'one mind, one awareness' which encompasses all other partial minds. The representations we make of 'All and Everything' (to use Gurdjieff's language), or of awareness and total awareness, have been of burning contention for thousands of years. Working to find a 'better' representation is difficult and hazardous to say the least. On the one hand we have those who mutter 'all is one' with a vague look in their eyes and, on the other, we have those who are at each other's throats, saying "My version of the One is better than yours!" Ideas about the One, the Whole, and the All are engaged in bitter battles for cultural and intellectual supremacy. The sub-text of these battles is the question: "Who or what is in charge?"*

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## **Letter from Bohm to Bennett - March 31 1964**

Thank you very much for your letter of March 29th.

I think that there is a broad area of agreement between us. My principal difficulty is with Gurdjieff's notion of a consciousness that is separate from "awareness". Also, I would prefer to use the term "awareness" for the totality of the process, while I would use the word "sensitivity" as "reactive sensitivity" for the ordinary state of "consciousness".

As far as I can see, as long as there is the expression of a separate observing consciousness that is looking at a "reactive sensitivity" that is apparently separate from

itself, there will always be hidden unconscious connections between the two. After all, there is only one total structure process in the mind in which sensitivity and consciousness are two interconnected and reciprocally related aspects. I myself find that in “self-consciousness”, there is always a hidden bias, such that the observing consciousness cannot see things as they really are, until there is a yet deeper awareness of the hidden bias in the observing consciousness.

The key issue seems to be an all-pervasive movement, in which “awareness is going on”, but in which there is no “self” which seems to be the source of the awareness. This, I agree with you, is probably the origin, or at least the precursor, of creativity.

Another point that I do not follow is the distinction between “seeing how things are” and “seeing things as they are”.

To sum up, I do not see the role of Gurdjieff’s observing consciousness. I wonder if it is really able to stand back from the “sensitivity” or whether this is not apparent, in the sense that it fails to see certain hidden reciprocal relationships between them. I therefore feel that the key issue is “total awareness” and creativity, which are needed to see beyond the limitations of any “separated” consciousness.

I hope you have a good trip and am looking forward to discussing with you when you return.

***What is striking in reading this correspondence is how close the two men were; yet, notwithstanding all their intensive discussion of confusion, truth, understanding and so on, they came into dissonance over interpreting the basic psychological experience of consciousness. Instead of taking this dissonance as the authentic point of departure, they simply went their separate ways.***

***In hindsight, it seems obvious that JGB was speaking from the perspective of consciousness while Bohm was adopting the perspective of creativity. It was never taken into account that all four ‘mental energies’ - automatism, sensitivity, consciousness and creativity - would look differently according to the energy the observer or thinker was centred in (even this description would not have found favour with Bohm!). This highlights the hazards of establishing any ‘universal scheme’: who is it that is able to see the whole scheme? In what way are the ‘lower’ terms included in the ‘higher’? Years later, Bohm was to publish *Thought as a System*, which furthers his critique of any notion of a separate observing consciousness.***

*Extract from a paper by Bohm for a book presented to Karl Popper on the occasion of his 60th birthday.*

The notion that we can completely separate the mode of understanding from the object of understanding is then evidently false. If our understanding is to follow its object and thus to remain true, it is necessary that even our methods of research, criteria for truth, and general perspectives and “world view” shall be free to change from one occasion to another. For it must be seen that in each concrete situation and problem, the proper (i.e. the true) mode of understanding is an essential and indispensable part of what is meant by truth in that situation and problem. Both the notion of a fixed and absolute truth, and that of a fixed and absolute method for establishing and understanding truth are therefore not valid. Rather, each truth must contain within it the true mode for its being established and understood in such a way that without this mode, the truth has no meaning.

If truth has the character described here, it may be that our whole mode and level of understanding things in general, which has evolved in response to a certain range of specific kinds of problems, practical and theoretical, is not adequate to the problem of understanding truth itself; i.e. of grasping the basic principle of truth. To do this would require of us not the mere repetition of some set of words, but rather a real act of comprehension, in which truth would be seen as a totality, coming into being, as it actually does, from moment to moment, but always with some radical differences in its essential characteristic. It seems evident that to understand truth in this way would be an extraordinarily difficult task. But if this is the way that truth really is, then such understanding may well be just what is needed for seeing its basic principle. Our customary excessively narrow and limited approach to the problem may therefore be what is responsible for the confused and self contradictory nature of most of our ideas on the subject.

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### *Notes*

At the time of this correspondence, Bohm had published his text book on *Quantum Theory and Causality and Chance in Modern Physics* (written while he was in ‘exile’ in Brazil). He was yet to write the books for which he gained a wider audience, such as *Wholeness and the Implicate Order*, *Unfolding Meaning*, *Thought as a System* and *The Undivided Universe*.

David Peat in *Infinite Potential* describes how Bohm became more and more keenly aware of the lack of communication between otherwise intelligent people. It was this that led him into the exploration of *dialogue*. Again, we see a similarity and contrast between the two men because, soon after this episode with Bohm, Bennett began research into *structural communication*, essentially concerned with the same thing but from a completely different angle. I have attempted to reconcile the two approaches in my book *Structures of Meaning*, but am aware that I have barely scratched the surface of this crucial issue.

Over several years, Bohm conducted dialogues with Krishnamurti, often concerning the same themes he had discussed with Bennett. These are fascinating. In the end, Bohm was disappointed that Krishnamurti did not take up some of his ideas, such as that of the ‘implicate order’ which, he felt, could have enabled the dialogue to go much deeper.

Patrick de Mare also had considerable influence on Bohm, not only as his therapist but in introducing him to the principles of dialogue, which he had long pioneered. It was many years later, after Bohm’s death, that I made contact with de Mare through my own work on dialogue method. His book *Koinonia* contains a psychoanalytic account of the significance of ‘hate’ which can illuminate aspects of the correspondence.

Henri Bortoft himself came to reject JGB’s ‘structural’ approach in favour of hermeneutics and made a study of Goethe in this regard (see below). For a period, he was a student of Idries Shah.

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