

# The Scientific and the Imaginative - a dialogue

by Lloyd Fell and David Russell

*The characters 1 and 2 are always found together, but not always on good terms . . .*

1. WILL YOU STOP, for God's sake, and hark at what you're doing!
2. Ho hum?!
1. You fool! You idiot! You unmentionably rancid clot! You puny speck of detail in a foam of discontent! You . . .
2. Hang on. What is this?
1. You don't begin to understand, do you? Extending the science of biology to the science, the new science, of social claptrap etcetera. . .
2. You don't like science? You never told me this before.
1. Oh, go on! You didn't want to hear. You are writing a scientific explanation of everything . . . human cognition, knowing, even life, I do believe. Where is the soul, or heart, or vision, or music, or imagery, or beauty . . .?
2. Hang on. I think you're going overboard a bit.
1. Or the feeling, or the metaphor, or the life, the life, for God's sake . . . ?
2. You keep saying 'for God's sake'. Are you becoming religious, or something?
1. Oh! Go away and don't confuse me. Can't you see I'm upset. I have lain here quietly in the shadow of science since this book began and now I'm feeling bad.
2. Well, look . . .
1. No, listen! There is far too much looking and not enough listening for my liking.
2. Yes, I've heard about your penchant for listening and, look, I do respect it. Honestly, I do. I am trying. (BECOMING ANGRY) Can't you see, I've been trying, ever since the whole damn thing began. I have agonised, at every turn, to try to put some soul into the science of cognition and I simply won't accept that you've been locked away somewhere, feeling sorry for yourself. Whoever you are. . . I don't even really know who you are!  
But I may be able to tell you a few things about yourself that you apparently don't realise. Like what is soul and what is heart and what is metaphor and imagery . . .
1. Spare me, please.
2. Well, you tell me! Go on, you tell me! You have a presence, but you don't explain yourself. You never say exactly who you are. I want to be on your side, too, you know. If it's not to be my explanation, what is it to be? I SAY YOU CAN'T EXPLAIN YOURSELF!
1. (SOBBING)
2. Oh! Come on! I'm sorry. I didn't mean to browbeat you like that. Will you sit here and talk with me about it? I . . . , I . . . do still love you . . . you know. It's a long time since we talked - properly, I mean.  
I really want to understand you better. Will you . . . ? What's it to be?

1. To be, to be, what's it to be? That is a magic verb with which you play, you know.

2. It is?

1. Oh, yes, indeed, a magic verb. And all verbs have some of its magic, too. Plato said that the verb 'to be' was a statement of infinity. It is the primary verb, of course, even in your scientific work.

2. I'm not sure what you mean. For someone who can't ever explain much you seem very big on verbs. But magic! I don't deal in magic, I'm afraid.

1. Oh! So you are Mr Science, are you? At least it's coming clearer who you are.

2. No! You're wrong. In fact, I'm most offended by a label like that. I'm not a thing, an object, something to be labelled and stuck in a drawer. I thought at least you would understand that I'm a process, a way of doing something . . . , a . . . , a continuous moving stream . . .

1. That's rather nice.

2. I should use the word, dynamic, - and it hurts me to be labelled as a thing.

1. And it hurts me when you say I can't explain things. I can make meaning at least as well as you. And I'm a movement, too, just as much as you are - a way of doing - or knowing. And a way of being. Are you a way of being?

2. I don't know. (PAUSE)

But, now that we're talking, and since you're quoting Plato, I'm reminded that it was one Buckminster Fuller - who was an extraordinary person and a scientist, too - who said 'I seem to be a verb.'

1. Yes, I know he did. (CALMING) And he resisted labels, too. But what he did was very scientific. So, are you a sort of representation of the scientific process?

2. Well, yes, in a way. I think that's what I represent. But somehow, when I hear you say that, it doesn't seem adequate. I think that is largely what I am, but, to tell you the truth, there is also some kind of mystery in me which I just cannot quite explain - although I try so hard.

1. That's the nicest thing I've heard you say.

2. Oh! (TOUCHED) I know I need to talk with you. There is something about you which I seem to desire so much. Yet you never tell me who you are.

1. You never stop to listen - as I said before.

2. Are you the verb 'to be'?

1. No! Good heavens no! (LAUGHING) But I am indeed a figure of speech - like you. We really exist in our languaging, you know. You and I, in this situation, we are two aspects of a languaging process that belongs to someone - I don't know.

2. I hope it's a nice man.

1. Or woman.

2. Yes, of course.

1. Are you male or female?

2. Really, I don't know. If you say that I'm just language, does it matter?

1. In some languages it certainly does.

2. Yes, I see - but I think I can be either - as long as I make it clear. I would hate to be ambiguous about it.

1. Would you? I can't understand that. I think it's lovely to be both.

2. Are you always vague and uncertain?

1. Well, no. I'm very sure - in one way. Like about the verb 'to be'. But I just

don't understand that you need to make so many distinctions - and to be so clear about what the difference is between them.

2. This may sound strange - (HESITATING) but I think that it's because I want to talk with you about them.

1. (PAUSE) I . . . do feel somewhat lost, sometimes. And I think I'd like to talk with you - if you really want to. Actually, I think you're very good with words.

2. So are you. (AN AWKWARD PAUSE)

1. That is what we are.

2. What about . . . I'll go over the story of Co-Drifting once again - that is, my scientific explanation - and you tell me what it sounds like to you. You see, I do respect your listening sense!

1. I can see things, too, you know. It's just that I think there is too much emphasis on clarity and sharpness and definite objects - all for the sake of their manipulation and control. Seeing is very active, very yang, very egocentric. Krishnamurti said 'the eye says I.' Hearing is more passive and encompassing and so it comprehends a deeper mystery. We go out to the world with our sight, but the world comes in to us through our ears. Hearing is not an alternative to seeing - it is its complement. Does that make sense to you?

2. It does.

1. Go on. Tell me the story. Even though I've heard it before - and I may understand more than you realise - I will listen intently.

2. It is the story of what constitutes our human existence - not an abstract theory, but a story about how it comes to be. It's a generative mechanism.

1. Mechanism, I can accept, because it's scientific. It has to be basically deterministic, even if it's not determinable - that's a mechanism. But in what way is it generative?

2. We take great care to distinguish different domains in our scientific explanation - that is, different sets of phenomena, with different terms of reference. Whereas you and I might jump from one subject to another when we talk across the kitchen table, the passion of the scientist is to speak carefully - to be literal, not metaphorical about it.

1. Literal as in what Patricia Berry calls "nothing-but"?

2. Yes, that's the point. And our task is - if two domains appear to be related in some way - to explain how the phenomena of one domain could arise from the quite different phenomena in another domain. That is the generative quality. Do you see?

1. Give me an example.

2. We have a living organism - in its surrounding medium, its environment. We choose to explain the process whereby the organism experiences itself in relation to its surroundings - or constructs its world, you could say - or constructs its meaning - as a process called cognition. That is the label which we give to this generative mechanism.

1. Do you mean how it knows something?

2. Well, yes, it is knowledge in the sense that we "know" whatever it is we "do" - knowledge is no more or less than adequate or effective action in a particular situation. However, knowledge is really the meaning granted to one by another living thing (because it is regarded as effective behaviour). We can't ever claim knowledge for ourselves - it is granted to us by another as a gift.

1. Well, I grant you some knowledge about cognition because I have a vague

feeling that I can understand what you mean.

2. It will be clearer as the story unfolds. I can't repeat all the background, now, but you may remember that the condition of life - the essential characteristic of the living - we have chosen to explain as its autopoietic organisation.

Cognition is logically necessary because it is the complement to the autonomy which is implied in autopoiesis. It is also logically sufficient because it explains all essential operations of a living organism.

1. I would have accepted it, anyway, you know.

2. Yes, but that is why it is a useful and important distinction to make in my scientific explanation. I could have said it was consciousness, for example, as distinct from unconsciousness, but that would not do us good service as a generative mechanism - it would be just a word, like Molière's academic character saying that a 'dormitive principle' explained why opium put him to sleep. My explanation provides useful information in the sense that Bateson used the word - 'the difference that makes a difference.'

1. So, how then does cognition operate? I am at the interface between the phenomena of the organism and those of its environment.

2. To be in such a place you must be using your imagination. This is exactly what I have to be so careful about. I cannot see exactly where the two meet unless I can make a satisfactory generative link between them. They are non-intersecting domains, so if I made the mistake of phenomonic reduction of one with another, it would be like two circles partly overlapped. My view of either would be blurred and my explanation would become confused. This is the essence of my scientific mode of explanation.

1. What a wonder you are! I have some more to say on that. But go on with the story.

2. First I will say more about each of these domains. Then I will come to the link. The phenomena which I can observe directly, that is, the behaviour of the organism, has this strange characteristic we've discussed before - it exists in language. What I will call languaging is indeed a most wonderful process. It is not some isolated bits of behaviour or some words we use. I explained before how it arises as a second-order process in that part of our consensual domain where ontogenic and communicative behaviours are combined. It is a coordination of behaviour about the coordination of behaviour. I also explained how all objects and events arise in our languaging and, by becoming aware of this, we can apprehend the languaging process itself. Only in this way do we begin to take responsibility for knowing how we know. We come to respect the network of conversation in which we co-exist.

1. I also spoke of this before.

2. You did, but I need to explain it further. So accustomed are we to the idea that thinking, or awareness of something, takes place within our nervous system (which is an error in logic, confusing two domains), that it is not easy to grasp the notion that it is in languaging, that is, in our behaviour, that this occurs. It does involve our nervous system, of course, but, as Maturana says, 'the mind is not in the head.'

1. So that is the behaviour - or what is observed from the outside. Can we say anything in this respect about the supposedly inner phenomena?

2. Yes, indeed - if we take great care. Oh, of course, we can say much about neurophysiology and hormones and cells, but only in the other domain of physiology. The confusion arises if we say, for example, that memory is a

trace in the brain, or anxiety is a neurochemical disorder. This we must not do, if we claim to be scientific.

But, in respect of cognition, we can say that languaging is not just any old behaviour - it is integrally linked to the bodyhood process. I have explained structural coupling whereby stimuli do not cause responses, they merely trigger, non-specifically, some change. The interaction is not instructive in the sense of information being transferred because the autonomous unity which is a living organism is operationally closed so far as meaning is concerned. It constructs its own meaning as it interacts. However, the mutually-selecting tendency which is implied by this coupling is what constrains the system within such narrow limits at any particular moment in its flow.

1. Yes, I have wondered whether structural coupling was not your basic generative mechanism. It describes a process which is also a connection.

2. Perhaps. I will grant that it is an essential element of my generative mechanism. But, insofar as we can see that the range of options in our languaging is constrained differently at different times, we can see a fundamental characteristic of our bodyhood itself. This is what we call our emotioning. Our emotions are recognisable as bodily predispositions to action. We do not say that what we see in our behaviour was caused by our emotions - simply that our behavioural repertoire is constrained by our emotional state. An analogy of this is to say that a car whose internal structure (gearbox) is in reverse gear does not have forward motion in its domain of operation at that time.

1. By emotions, do you mean our feelings?

2. No, not really, because I see our feelings as being a reflection on something that has happened. David Bohm calls them 'felts' to correspond with 'thoughts.' Often, they do not correspond closely with our actual bodyhood as it is reflected in our behaviour.

1. That is certainly true. Perhaps it is more like our moods.

2. Yes, perhaps. If I am in a loving mood, an almost unlimited range of behavioural options seems apparent, but if I am angry, I am stuck in a certain gear and there are many ways of acting that are not available to me at that time.

1. So our moods and our behaviour move together. That makes sense.

2. Yes. The cognitive process can be explained as a recursive operation, hugely iterative, in which emotioning and languaging are always coupled - without actually driving one another in a linear cause-effect. They select from one another's possibilities, but at any moment we are free to change our attitude or orientation - within limits - as we cognitively bootstrap along.

1. So they are connected, by this generative mechanism, but you will not have them overlap. Is this the braiding of which I've heard you speak?

2. Yes. (EXCITED) Look, perhaps you can tell me - what does it look like? What is its shape, this vital connecting link? That's what I have been dying to know?

1. In your kind of image, perhaps the double helix shape of a strand of DNA might be something like it. It is intertwined, but never actually overlapped. And it has an identifiable structural coupling with some very interesting characteristics.

2. Yes, we have touched on these throughout our work. But - in your kind of image?

1. Ah! (PAUSE) Well, it is very beautiful, I can say that.
2. I don't think you understand. I have a great need, a terrible need, to come closer to what it is you are - or represent, within this conversation.
1. Ah, yes! (PAUSE)
2. As I am the scientific, are you the imaginative process?
1. Oh! (GASPING) Your directness shocks me! I thought I was being very scientific following the tortuous logic of your explanation.
2. Yes, indeed, you have been. I appreciate your ability to do that. But I have to know more about you. (PAUSE) I am frightened . . . to tell you the truth. You see, I have feelings, too.
1. Yes, I noticed that before.
2. I am deeply fearful that . . . should you go away . . . I may be left with nothing. All my work may become a . . . mudheap - is all I can think of.
1. Yes.
2. Don't you care. Do I mean nothing to you!
1. (LONG PAUSE) I do care deeply. You know, I am also filled with fear - and, as you have explained, that also limits me in talking about myself. There is much that I long to say, but . . . if you apply your logic to it - that seeing logic on which the world seems mainly to operate, today - I fear that it may be represented as worthless - and mean absolutely nothing. And that might be too much for me to bear.  
And yet, has that fear ever stopped the imaginative voice from speaking out? Poets cry and artists scream in every corner of the world, but that part of someone which I represent still hides here too afraid to express itself openly.
2. For what it's worth, you have my promise of a careful listening.
1. (LONG PAUSE) It's about form and pattern. At least there is one scientist who never shied from seeing form and pattern.
2. Gregory Bateson?
1. The idea of form has intrigued philosophers through the ages, but not too many scientists have tackled it. The more adventurous thinkers like Rupert Sheldrake do, I suppose. Yet the basic contrast between Plato - for whom form was transcendent, eternal and in the mind of God - and Aristotle - for whom form was immanent in nature - is underlying even the most mechanistic and materialistic scientific explanation  
Goethe, you know, was an extraordinary scientist in this regard. His way of seeing, scientifically, he called 'exact sensorial imagination' - a way of 'seeing into' the phenomenon to apprehend its unity in its 'belonging together.' Form was immanent in nature for him, as for Bateson.  
I think Bateson captures the difficulty of explaining this - which is also my difficulty. He refers to Jung's *creatura* and *pleroma* - the latter being inanimate, the former including mind etc. - to show that our language is 'pleromatised.' It is suitable for things, but rather hopeless for pattern and relationship - which is the living quality.
2. What do you think of my distinction between structure and organisation? Do you remember that? It is their complementarity which brings forth autopoiesis - in my explanation.
1. Yes, I recall. Yes, organisation, if I grasp it correctly, is rather like the immanent form.
2. It arises out of a process, not the existence of components. It has a boundary which takes part in the process - an identity in wholeness.

1. It sounds okay . . . , but . . .

2. But what?

1. I appreciate that you are not ignoring me like many scientific thinkers might. But, if your expectation is that we can explain my qualities in mechanical sort of terms, then . . . I can but fail. The type of sensory input which sees the points and lines so clearly must be set aside because I sense differently, somehow. I deal in images. Images have a dignity of their own. (PAUSE)

2. Please go on . . . about images.

1. They occur in our languaging, of course. That is how we recognise them here. But I have to try to understand them as a part of our bodyhood - as you call it.

It would seem, from our experience, that the emotions are inherent to images. Berry expresses this: 'we cannot entertain any image, in dreams, or poetry, or painting, without experiencing an emotional quality presented by the image itself . . . which further implies that any event experienced as an image is at once animated, emotionalised . . .' So, by granting due dignity to our imaginative life we tap the primary source of intellectual vitality, enthusiasm for living, and making meaning.

I think that every imaginative experience deserves due recognition because it is an expression of the way we are - the way we are made. As Richard Winter says: 'we do not store experiences as data, like a computer . . . The process of imagination is the process of generating new insights because it is the imagination that designates the process of thinking by which the familiar patterns of experience can be both deconstructed (familiar linkages broken) and reconstructed (unfamiliar linkages made); it is the fundamental notion which refers to the human capacity for thinking new thoughts.'

2. Connecting the familiar and the unfamiliar! This is the very heart of the process of cognition!

1. Yes, but this is metaphor. Making metaphor - which is the language of the imaginative experience - is building a bridge between the familiar and the unfamiliar.

It is by relating the metaphorical to the literal that we show our respect for the metaphorical and the validity of its function in cognition. For the imagination to work its magic it has to be given its rightful space. Recognising that we know the world, not only through the logical explanation of our languaging, but also through the language (or behaviour) which emanates from - and is shaped by - the image-forming process of our bodyhood - this is a significant enlargement of our understanding of cognition.

You have said before that every way of knowing is also its own blind spot. A language based solely on empirical judgement cannot make statements about what is not seen or heard or otherwise directly sensed. New insights arise from the co-drifting of these two aspects of human cognition - from the dynamic relationship which holds them together - not from either of them acting alone.

2. So much for my reliance on distinctions. But, I must say, without the distinctions, we could not put them together - in our communication.

1. True, but it is the imaginative shaping of our language which creates the very quality of communication which seems most universal. The community (or club) which is able to agree on the experiential quality of imaginative phenomena is seemingly the entire human race (see how Joseph Campbell, for

example, shows us the universal nature of mythological themes).

This is not surprising if we acknowledge that the source of all images - in dreams, fantasy, poetry or music - is the self-generating activity of the body itself. The metaphorical projections which are dependent on bodily function and come and go with their own rhyme and rhythm, triggered but not determined by everything we do, are what Mark Johnson has called: our "embodied imagination."

2. I am certainly impressed - and rather humbled - by what you say, but I'm also a bit concerned. I wonder, what might we be losing, here, through lack of scientific discipline - or rigour?

1. (SHARPLY) Oh, to hell with scientific rigour!

2. Okay, please go on. Let the pendulum swing, by all means.

1. Our culture has pushed the imaginative out to the periphery, making it secondary to the pursuit of science, commerce and engineering. The supposedly firm ground of empirical science has prevailed over the mercurial bases of the imagination. Thus art is now something which only artists do. Yet it is the imaginative that embodies the energy we use every day in creating our very world - in our living together. If we should lose our ability to explore the conversation of the imagination, we may lose our way entirely. Our tenuous and troublesome relationship with our environment - pollution, land degradation and climate change - is a chilling example of the split with our own world which could occur.

This Social Ecology business, of which we both speak so lovingly, could provide a framework in which the imagination can work together with science for the sake of our delicate ecosystem - not simply in order to dominate and control it. We must not only know the objects and events, but be able to transform these into an imaginative vision - a process such as Hillman calls the 'making of the soul . . . a perspective rather than a substance, a viewpoint towards things rather than the thing itself.'

The imagination can play with concrete knowing and transform it into an experience of love and mutual respect such as many indigenous people refer to as 'singing the land.' That is a beautiful image which combines our hearing and our seeing. Tell me, can the scientist in us ever really understand that the aboriginal person who is said to have 'gone walkabout' is on a sacred pilgrimage, following the songlines and singing the land for his very survival?

2. Well . . . only with the aid of his or her imagination - indeed. Wow!

(PAUSE)

Here, have a drink of water.

Does that feel better? Saying all that, I mean.

1. What did you mean by scientific discipline? That about the two domains not overlapping, is it?

2. Well, yes.

1. That struck me as quite absurd! To have images overlap is what creates a new image in my being! It seems to me that, when a new meaning arises in our process of cognition, it arises out of the very blur of overlap which frightens you so much.

2. Well, only if it is a generative mechanism - at least, in scientific explanation.

1. But in a fuller explanation of our living, it is what 'is.' We are talking of our being - something is something - that is the verb 'to be.' I think your generative

mechanism is the verb 'to be.'

2. But that is exactly what it is not! (PAUSE)

Sometimes, I despair of this conversation - yet I can't give it up.

1. I think that 'is' and 'is not' could be the same.

(BLOCKING INTERJECTION) Not in your logic of opposites, but in the logic of complementarity to which we refer often in this work.

I think that the meaning of every word and every statement contains its opposite meaning within it. Do you remember this idea?

2. Yes, I recall now that we talked about this earlier in our work - the new physics, the polarity between latent and manifest meaning, the circular motion of life.

One of the greatest of all scientists, Niels Bohr, espoused this, too. Above the yin-yang symbol on his coat of arms was inscribed 'contraria sunt complementa.'

1. And Varela showed, too, how to go beyond Hegel's dialectical principle in which opposites clash - but can be synthesised - to a process he called imbrication of levels whereby duality occurs by one emerging from another. At one level, opposites contradict, but at another level, they specify each other. Then there is 'not one, not two, but a trinity', he says.

2. This idea of moving through different levels has a powerful logic. The hierarchy of levels is a fundament in Bateson's story, working as a sort of zig-zag ladder of movement between form and process. Thus he thought so highly of 'the pattern that connects' - which sounds like metaphor to me.

1. He often spoke of metaphor as something basic to the creatura - or to life. Amongst his very last work he was exposing the folly of classical logic which denies the validity of that confusion of syllogisms which is a metaphor. Yet the interconnection of ideas at other than the verbal level must be based on something like this, he thought. It is a kind of homology - such as between fins and wings and arms - or even empathy - a kind of formal resemblance to make connection. He used the term 'abduction' as distinct from deduction and induction. To Bateson, metaphor was certainly more than a literary device.

2. But we are only talking language. We can't really say about the 'other than the verbal level.'

1. Even so, we can say that both metaphorical logic and classical logic exist in our languaging process. This is an alternating decomposition and recomposition, analysis and synthesis, without which there could not be continuity in the cognitive and living process. And continuity is crucial because it is only by 'changing in order to stay the same' that biological adaptation occurs - as we have said before.

2. So the dual process of our languaging is dividing and uniting - something like the self-motion of which we spoke before in 'Just Keep Moving'. It's obvious that we could not deal with this creatura quality - consisting of many parts which have a unity about them - with a purely analytical or literal language.

1. No. It needs the two modes of expression to make one way of being.

2. I suppose this could be compared with Ornstein's two modes of consciousness: the analytical - which he says is sequential, linear, of external entities and separation, and verbal-intellectual - and the holistic - which he describes as non-linear, simultaneous, intuitive instead of verbal-intellectual, and concerned with relationships rather than entities themselves.

1. Yes, I suppose it could, but we are not talking about consciousness - we are talking about cognition! (BOTH LAUGH) Its imaginative side.

2. (PAUSE) I wonder if what you are talking about really is poetry - or the experience that we have of art, music and poetry.

1. Ah! yes, this is true - the poetic experience. Let me tell you what the Australian poet, Les Murray, has to say about that. 'The poetic experience is as primary and distinctive as sex or the enjoyment of food . . . at bottom, an experience of wholeness; if a poem is real, it is inexhaustible; it cannot be summarised or transposed into words.'

2. This is your difficulty explaining yourself.

1. Murray goes on: '. . . as the experience oscillates within us . . . we may say that the poem is dancing us to its rhythm, even as we sit apparently still reading it. It is, discreetly, borrowing our body to embody itself. We speak of being struck by an image or a phrase . . . and couldn't explain it to ourselves. We are, as it were, watching someone on a tightrope, and so caught up in the skill, the danger, the whole shimmering alternation of grace and teetering in the performance that we are really on the tightrope ourselves, in sympathy, exhilarated, dreading that their fall would be ours.'

He speaks of two modes of consciousness, too: one in waking, using the 'new' part of our brain, and one called dreaming. Harmony between these two promotes health - and the poetic, or aesthetic, experience does that. A real poem is 'at once truly thought and truly dreamed. The fusion between the two represents incipient wholeness of thinking and of life. A poem, or any work of art, enacts this wholeness and draws us into it, so as to promote and refresh our own.'

2. That is tremendous. It reminds me - because I need reminding - of those words of Blake about his four-fold vision: 'May God us keep, from Single vision and Newton's sleep!'

1. Which is a popular quote, nowadays! It is interesting that people like William Blake, T.S.Eliot and Walt Whitman now appear in so many scientific books. It shows that many others have a similar quest to ours.

2. It shows that, as we put science together with experience, the purely rational explanation does not provide the satisfaction that we need.

The philosopher, Friedrich Nietzsche, speaks of the need to write with the 'whole heart and soul.' He says, 'I do not know what purely intellectual problems are. You know these things as thoughts, but your thoughts are not your experiences, they are an echo and after-effect of your experiences: as when your room trembles when a carriage goes past. I, however, am sitting in the carriage, and often I am the carriage itself.'

1. Not modest, perhaps, but powerful! It reminds me of the novelist, Alice Walker, describing how she creates the space for her imagination: 'You dream a world and you climb up into it . . . Before that you feel part of the fabric. Afterwards you sort of step inside the weave. And you see things that you never really noticed before . . . When I write in that fashion it is to share with the reader the magic of creation. It's not literal!'

2. No, indeed.

1. Les Murray also abhors the 'delusion that perpetual rational wakefulness would even be bearable.' He believes that our very evolution does not tend that way, but towards 'a wholeness of which art is the model.' He encapsulates my situation by saying that 'a dream is the explanation for a lot of things, it itself

never explains!'

2. I have heard that a myth is a true story about something which never happened.

1. Earlier we spoke of these two aspects of our language - of not relegating the dream side - making space for the non-rational. Murray coined the terms Wholespeak and Narrowspeak and he bemoans the fact that Narrowspeak which is made to look like poetry, but not truly dreamed, is everywhere, today. But at least it is in the service, as he puts it, of some large 'poem' such as Biology or Science. That is better than nothing. Yet our spiritually impoverished time cries out for true poetry which reeks of the imagination.

2. Again, you have reminded me of something enormously powerful which I had forgotten. Once I heard a storyteller say something like this: There are five great appetites: one is to eat, and a man can go for days without eating; one is to drink, and a man can go for hours without doing that; one is to breathe, and a man can last minutes without breathing; one is to think, and a man can go seconds without that; and one is to imagine, and if a man stops imagining, in that instant, he dies.

1. Bravo! Now it is my turn to salute your poetry.

2. Not mine - someone else's. But then I suppose it is mine at the moment that I say it in our conversation. There is so much that is strange to me. It's so hard to accept mystery when I have such a passion for explaining.

You speak of images, which I know are essentially poetic, but I still crave to know them as - commodities, too. I crave to know how images connect with one another, for example.

1. You know your overlapping circles - well, did you know that image makes an ancient Christian symbol which is known as the mandorla? It's the almond-shaped segment where two circles overlap.

Robert Johnson has described how this is used for reconciling differences, drawing duality into unity, as a fundamental healing process. For example, in Jungian terms, one works towards owning one's own shadow in this way. The mandorla which occurs in speech has enormous power in this regard. If one can say a true sentence it is a healing experience - we could add from our biology that, if a sentence is healing, that means it is true. We see this in effective counselling and in genuine self-help communities such as Alcoholics Anonymous. Johnson likens a sentence to a mathematical equation where the equals sign is equivalent to the verb 'to be.'

2. Your favourite! What was that about the magic in verbs?

1. For one thing, verbs are not either/or because process goes in both, or all, directions. And verbs are a strong form of many nouns because the name implies the process rather than the thing. This we appreciate from our experience of second-order, or higher-order, thinking - the self-reflective process which we value so much. (PAUSE) Some time we will have to look at what this tells us about ethics.

2. Yes.

1. All this work we have been doing must bring forth some statements about human ethics before it ends. Otherwise . . . (PAUSE)

2. I am mostly masculine, you know. Oh, this is important for our ethics. When you asked before, I hadn't really thought it through. Now I see why so many authors have described the problems of our time as an imbalance between male and female qualities. We have all got too much yang into our

doing - and science is a part of that.

But - listen to this - to be able to blend male and female qualities in a complementary way, we must know the distinction clearly. Part of the problem is that we males have lost our trust in who we are - since the advent of the feminine speaking out. We need to hear the voices of Robert Bly, James Hillman and others calling out to us to rediscover the compassion in our masculine strength of purpose.

1. I certainly agree with the first part. This goes to the root of our ethical problems. I must say, though, that my attraction for you has to do with a certain kind of strength - what does Robert Bly call it? Your 'sword' - your ability to state precisely what is what for you in our conversation and create a firmness in your doing it.

But I hasten to add that I do not regard myself as purely female. Nor do I stand simply for unity, either.

2. I know now that the either/or is only a part of me and its particular quality is something masculine - a certain kind of clarity and vision which, on its own, is too hard and sharp. It calls for the feminine embrace and mystery to make it whole. I am glad that I have some of that as well. I would not have realised that without talking with you.

1. And I like your way of making patterns which connect, too. Perhaps it is just the mirror image of your ability to make distinctions. Perhaps you are simply seeing that reflection in your conversation with me. (PAUSE)

2. (SUDDENLY) Have you noticed how the so-called laws of science - which we take so seriously that sometimes one has to laugh - have a metaphorical significance as well? This is quite remarkable. I am just now beginning to appreciate its significance.

1. I'm not sure what you mean.

2. Gary Zukav (whose 'Wu Li Masters' helped bring physics to the world at large) brings it out beautifully. For example, the third law of motion - for every action there is an equal and opposite reaction - he uses as a metaphor to illustrate the mystical concept of karma. He says such laws reflect, in physical reality, a larger non-physical dynamic - the physics of the soul.

You can even see an evolutionary progression. Ptolemaic astronomy shows a being which placed itself at the centre of the universe. Copernican laws show the change to being a part of the universe. Newtonian/Cartesian principles show our confidence in explaining the physical world through reason.

Relativity introduces the participatory effect and quantum mechanics is an awareness of the interaction of our consciousness with the physical world.

1. By this interaction, do you mean in constructing our reality?

2. Yes, indeed. There are two engineers at Princeton - Robert Jahn and Brenda Dunne - using thoroughly conventional scientific methods, who have documented strange human effects on instruments, precognition and remote perception - things like that. They refer to reality as the interface between consciousness and the environment. Their explanatory model uses quantum physics as a metaphor. Their point is, though, that any physical theory would be just as good because these so-called laws are no more than convenient information-organising categories themselves and therefore they cannot help but reflect the characteristics of our consciousness interacting with its environment.

1. It's no real surprise to me that we can use scientific laws in a metaphorical

way. I think that metaphor is the 'guts' of our communication - if you will forgive a biological pun! It is the vehicle of connection, the only means of making relationships.

**2.** Does that mean that my generative mechanism is a metaphor?

**1.** It could be! At a certain level, that is. It depends at which level we wish to use it in our conversation - whether we give metaphorical meaning or literal meaning our attention.

**2.** I believe it was Einstein who said that 'body and soul are not two different things, but only two ways of perceiving the same thing.'

**1.** And Jonas Salk, who coined that lovely phrase 'the survival of the wisest', said: 'By using the processes of Nature as metaphor, to describe the forces by which it operates upon and within Man, we come as close to describing reality as we can within the limits of our comprehension. . . . In this way, Man's imagination and intellect play vital roles in his survival and evolution.'

(PAUSE)

**2.** Much earlier, you mentioned ethics - the subject to which I know we will have to turn at the close of our work. I think Jonas Salk believed that, because the pace of change has now gone far beyond the reach of our intuitive (or instinctive) knowing, we must rely more heavily on our intellect (or learned behaviour) to guide us, ethically, if we are to survive as a species.

**1.** Well, I think it is an understanding of co-drifting - of our relationship with everything living - which has to be the basis of our ethics in a biological sense. But this surely contains some meanings which cannot be explained too well by science.

I refer back to Goethe, whose greatest work, perhaps, was not his science, but the metaphorical story of his own life, told in Faust. At the end of Part 1, the terrible anguish of a soul divided between good and evil and knowing the impossibility of a rational solution is vividly revealed. He worked most of his life on this book, and Part 2, which was not published until after his death - wow! - what a tour-de-force of the imagination that is! It tells of the only possible way in which the manifestations of good and evil can be brought together, mutually redeemed by a pure love which is like the puer aeternis symbol of the child within.

Faust, the cynical intellectual who makes a pact with the Devil to try to understand as we are trying to understand, can be one model to suggest an ultimate braiding of our science and imagination. Those images of reclaiming the land from the sea, of the choir of angels after the dark night of the soul, are amongst our most powerful expressions of hope for humanity. It is in the meaning of our imagination that our ethical wisdom can be sensed. Yes, we must pursue this in the next stage of our work - which is the final stage.

**2.** It seems that, in diverting our faith from religion toward scientific explanation as the best guide to our style of living, we have lost some of our trust in the meaning of our imagination. Now that this science has begun to apprehend how mysterious are some aspects of our being, we are moving to restore our faith in the reliability of what we know through our imaginative experience.

**1.** And the scientific and the imaginative are not as different as it might have seemed.

**2.** Indeed, no! Sometimes it is said that scientific means real and imaginary means unreal - that this is the difference between reality and illusion. I have

also noticed that the difference between illusion and reality is taken very seriously in psychiatry. But the scientific and the imaginative are just different faces of the same reality - which is our living experience in the process of cognition.

1. To maintain a balance between them does seem to be important for our health and wellbeing.

2. That brings me back to our co-ontogenic structural drift - or what we call, co-drifting. That beautiful metaphor by the poet Antonio Machado, 'laying down a path while walking', which Varela has used so effectively, describes the cognitive process of living better than any other phrase I know. It seems we need the explanation of structural coupling both in its literal sense and also as a means of seeing the pattern by which we progress in our manner of living. We cannot make the whole picture which you have espoused unless we make the dichotomy as well.

1. I grant you that, of course, but not all dichotomies are so useful, are they?

2. No, that is true. I think the useful dichotomies are those which show the interdependence most clearly. Take structural coupling and autonomy - neither can exist without the other. There is not really an inner/outer split (nothing could be more ridiculous) - yet without that idea in biology there would be no autonomous unity, no structural coupling and no explanation of living. It's the same with us.

1. Would you ever want us to split up?

2. No! Good gracious, no! A thousand times, no! All too often such marriages as ours do become strained, but while an individual exists - is living - I believe we are firmly wedded in the conversation - metaphorical with literal, the imaginative with the scientific - whatever one calls these things, at least we know they both are because they belong together.

1. There is so much of you in me and me in you.

2. All of me, I think. Without you . . . I am rather lost.

1. (SINGS) I'm getting complementary over you.

2. I love you, too.

1. Want to sing along?

2. Da do di da da do di da da do.

1. and 2. Da do di da da do di da da do.

*DRUM ROLL AND CHANGE TEMPO*

**1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, 1, 2 . . . . .**

### Sources:

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