

## C – A Collection of Connected Concepts

Dear: With “A”, I try to stimulate myself to be aware of my environment; with “B”, I try to stimulate myself to be aware of my mind: my thought processes, my “Board of Governors”, and my prime goals. “C” is different: it’s a collection of a number of different concepts (reminding myself to be “careful of confused thoughts”, the “connectedness of opposites”, etc.), maybe with the main connection being only that so many “C’s” appear! Consequently, for this chapter, I think I’d better change the format.

For what follows, first I’ll show you what I review for “C” (I’ll put what I review in italics), and then after each concept (or some grouping of concepts), I’ll try to explain what I mean. Also, to emphasize the “C-theme”, and partly just for fun, I’ll put most of the C’s in bold type.

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*There is a collective consciousness going on.*

This summarizes my awe at how much we owe to our ancestors – how much we’ve inherited. Dear, think about some of what we normally take for granted: our language, letters, the system that taught us how to write, everything written, ideas, a system in which we can govern ourselves, mathematics, music, spacecraft, spoons...

Spoons? Yes, spoons! If you, too, become overwhelmed by how much we’ve inherited, then think just of spoons. Could you make one? I couldn’t – well, maybe I could make one out of wood (if I had a knife – or at least a good sharp rock). Think of the thousands of years it took to learn how to melt certain rocks (do you know which ones?), then to shape them into such “handy” utensils, and then to perfect the techniques, not only to mass-produce them but also to blend the ores so that the spoon is stainless. And how many thousands of miles do you need to travel to find such a wondrous instrument as a spoon? To the neighborhood store, where there are thousands on display, courtesy an astounding distribution system. Each of us should start every meal by giving thanks not to some god (“saying grace”) but to all the producers who provided us with so much. For example, how about: “Thank you, one and all; you who have produced and provided us with so much – such as these spoons.”

And then, Dear, please think about computers, quilts, and quantum mechanics! Oh, sure, there are dregs of our civilization also (which I'll not yet list), but there are two other ideas that I wish you'd consider. One is: *there's a collective consciousness going on*. And the other is the following thought, created by someone whose name I've forgotten. If I searched for a while, I'm sure that I could find the author's name, but "does it really matter" (which is the title of another one of Alan Watts' books): the author is now dead, and his or her thought is now just another part of our collective consciousness. The thought is this: "The only way to repay our debts to the past is to put the future in debt to ourselves."<sup>1</sup>

What a wonderful concept! Dear, please consider it carefully: "The only way to repay our debts to the past is to put the future in debt to ourselves." I dearly hope that you'll adopt this concept for yourself – and thereby, for now, do the very best that you can in school and university. And, Dear, if you don't yet see how you can put the future in your debt, don't worry about it – it'll come. For now, just learn as much as you can: learn how others made computers, quilts, and quantum mechanics – as well as spoons! Eventually you'll see where you can contribute to helping our collective consciousness go on.

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*I'm the crowning achievement of Nature's consciousness, but we're all cousins, struggling to survive.*

I trust you understand my meaning for "I'm the crowning achievement of Nature's consciousness" – I don't mean that I'm particularly intelligent! It's another way of saying that we are the universe "I'ing". And at least in this part of the universe, we humans are the crowning achievement by which nature can experience herself. But I should explain that there are two meaning for "we're all cousins" – and I mean both.

First, all living things are our cousins: even the plants and animals are struggling to survive. In fact, there's more. I've forgotten the details now,

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<sup>1</sup> Dear: In case you are dissatisfied by my failure to identify the author of that expression (for example, in case you want to honor the memory of that author), then let me mention that what I wrote is a slight modification of the phrase that Governor General John Buchan (1875 – 1940) used in speech on 12 May 1937 to the Canadian people, "We can only pay our debts to the past by putting the future in debt to ourselves", with influence from what Shin-eqi-unninni (or Sîn-leqi-unninni) of Babylonia wrote in his version of the *Epic of Gilgamesh* approximately 3,600 years ago (in which I've added the italics): "Choose to live and choose to love; *choose to rise above and give back what you yourself were given*. Be moderate as you flee for survival in a boat that has no place for riches."

but if you'll investigate them, you'll find that they're mind boggling: not only are the genetic codes of animals almost the same as ours, we differ from trees and other plants only by a few nitrogen and other atoms in our DNA! Therefore, the plants and animals truly are our cousins, and when I say this line in the desert, I speak to all of them.

My second meaning for “we're all cousins” is to remember my kinship with other humans. And I don't mean just that everyone is more closely related to me than as 50<sup>th</sup> cousin. I mean that I understand what is driving each one of them: they're struggling to achieve their trio of survival goals (survival of themselves, their extended families, and their values) – even if (I'm sorry to say) that in a huge number of cases, their thoughts are confused about how to survive and their values are misguided (details of which I'll show you, later in this book).

And by the way, Dear, there's power in this knowledge of what drives others, just as there's power in most knowledge: if you understand what's driving others (their values and how they pursue their survival), then you can better understand and predict their actions. For example, as I'll show you later in this book, you can better understand why some people “believe” in god (any god) and why others don't.

Now, Dear, I'm sorry to relay this to you, but for completeness, I should mention that I did try to transform some of the above ideas into a “poem”, which is even worse than “usual”. It follows, but you may want to skip it! If you do read it, be aware that it was written more than 20 years ago, during the coldest of the cold war, when the outlook for the world was even worse than it is now.

### CONSCIOUSNESS

“The end is near,” or so some state,  
In “righteousness” they fan the hate.  
Still others shrug, and sit and wait,  
(For to it all they can't relate)  
While missiles move at fright'ning rate.  
Perhaps our time is waning late,  
But some still work to change our fate.

Oh stupid humans, such a mess  
Of gods and wars and brutishness,  
And those who seek to work at less,  
All buried in their pettiness

Of simple thoughts and fancy dress.  
Yet some are wearing, nonetheless,  
The crown of Nature's consciousness.

Just think of lives the fools have gored:  
The Jews were led by their warlord,  
The Christians burned the heathen horde,  
The worst in evils Nazis scored,  
While Shintos killed with sacred sword,  
And still for Islam blood is poured,  
And all build bombs they can't afford.

Each side is buzzing like a hive,  
And onward, lesser leaders drive,  
While sullen workers just contrive  
To find new ways to stay alive.  
The most of pleasure they derive:  
To win at struggling to survive.  
And so for all! And all could thrive!

Oh stupid humans, can't you see?  
It's not the way it has to be.  
This way is pure insanity.  
A little thought will set us free:  
We're all related, distantly,  
We form a fifty-cousin tree  
With roots in common ancestry.

But all who went before weren't fools;  
There's some who didn't think like mules;  
They worked to fill the knowledge pools;  
They left us what we learned in schools;  
Built bridges and new molecules;  
Just think who made our common tools!  
Let's join with them and set new rules.

When Nature made her human pawn,  
The spark of thought began to dawn,  
And though it's dim, it's not yet gone:  
Let's focus on the brains that shone;  
Let's transfer right away from brawn;  
Erase all lines the fools have drawn,  
And help our consciousness go on.



Now, Dear, let me return to displaying “C”. So far, I’ve reviewed only two thoughts, which take me less than a minute to review when I’m walking. Immediately below are the next few thoughts that I review. These are rather more personal (less general) than the first two; they focus more on some of my inadequacies that I’m trying to remedy.

*Don’t be afraid of confrontations;*

*Have the courage to change;*

*Careful of confused thoughts:*

*capitalize on confusion (for example, cloning).*

*Careful of connections;*

*Careful of chemicals.*

Because the above are more personal, I’ll spend less time explaining them to you. The first – that I seem to try to avoid confrontations (though others may not agree!) – seems to be a weakness that perhaps I derived from being the youngest of five children: at quite an early age, a child can learn to avoid confrontations with older children, especially if these older and bigger children have tendencies to settle arguments with their fists! As for the second – having the courage to change – that’s a topic that I’ll return to later in the book (e.g., in **D** and in **Y**, dealing with decisions). Here, let me just introduce the idea of “expected value” or “expected payback”.

To make a decision is to choose among different values. For example, in the case of confrontations, there is some value in choosing to proceed with the confrontation and another value in choosing to avoid it. Similarly, in the case of any change (e.g., deciding to marry or get divorced, choosing a university or a career, etc.), some value can be associated with each possible choice. Identifying such values can be difficult, and then in many cases (making decisions more difficult), the comparison of the values of different choices can seem like comparing apples and oranges (i.e., the problem of “incommensurable” values, viz., “lacking common qualities necessary for a comparison to be made”).

Now, Dear, although you may initially consider it insensitive or even mercenary, yet in many if not most cases, each choice can be given a monetary value. That is, one’s right brain can usually (and rather amazingly) synthesize all the disparate features of each choice and conclude, for example “I’d pay a million dollars if I could...” Usually, however, one’s right brain (or, at least, my right brain!) seems to have a tendency to exaggerate, whereupon, usually it’s useful if one engages one’s left brain in

\* Go to other chapters via

some haggling, e.g., “Oh, really? Well, would you do it for \$500,000? How about \$250,000?...” From such haggling, I’ve found that I can usually arrive at monetary value for each choice, values with which both sides of my brain seem satisfied!

To determine the “expected value” of each choice, however, requires more thought. For example, suppose the left- and right-hand sides of your brain came to the agreement (!) that going steady with a certain person (say A) would have a value to you of  $\$V_A$  (e.g., \$500,000) and that going steady with B would be worth  $\$V_B$  (e.g., \$300,000). Then, to determine the “expected value” of each case, you first need to estimate the probability that each case would occur (or materialize).

For example, suppose that you decided that the probability that you could go steady with person A was  $p_A$  (say 10%) and with B was  $p_B$  (say 50%). Then the “expected value” of your going steady with A,  $\$E_A$ , is its value,  $\$V_A$ , multiplied by its probability,  $p_A$  (i.e.,  $\$E_A = \$V_A \times p_A$ ) and similarly for the expected value of going with B. Then, once the expected values are calculated, a comparison becomes available from which your decision can more easily be made. For example, for the numerical values used as illustrations above, then  $\$E_A = 10\% \times \$500,000 = \$50,000$ , whereas  $\$E_B = 50\% \times \$300,000 = \$150,000$ , telling you (if the numbers are realistic!) that your choice of trying to go steady with B has three times the expected value for you compared with your choice of trying to go steady with person A.

But if you didn’t follow what I just finished writing, if you followed it but don’t agree with it, or if you followed it, agree with it, but don’t see how to apply it “in the real world”, then don’t worry about it, Dear, because later in this book, many times I’ll be returning to the difficult tasks of making decisions. Consequently, now, let me move on to the next item in my “C-list”, namely, “careful of confused thought.”

When I’m walking, when I remind myself with “careful of confused thought”, I almost always review two particular cases (one dealing with sex and one dealing with my frequent thoughts of changing career), but these two cases are so personal that there’s probably little value to you in my going into details – even if I were willing to! Instead, let me urge you just to try to analyze your own thoughts, identifying where you might have engaged in confused thinking. And when you do identify instances where your thinking was confused, Dear, maybe you would like to “flag” these ideas –

so you needn't waste your time and energy reanalyzing the same predicaments.

Also, I hope you'll consider an important concept dealing with confused thought, an idea developed more than 2300 years ago by Aristotle and recently "repopularized" in one of Ayn Rand's books (probably *Atlas Shrugged*), namely: there's no such thing as a paradox. I'll go into this concept in detail in a later chapter; for now, Dear, please just briefly consider Rand's recommendation: if through sound reasoning you ever reach a paradox, then check your premisses; one of them must be wrong.<sup>2</sup>

In the above list of ideas that I review while I'm walking, the idea "careful of chemicals" reminds me that certain thoughts seem to "start the chemicals flowing" in my mind. For example, if something has depressed me, then when I consider other concepts, they can depress me even further. And I suppose the opposite also occurs: when I'm happy about one thing, I start looking on the bright side of everything – a development that I've never worried about!

Another example, with which I've found I must be especially careful, is anger: when something (usually some stupidity) has angered me, I then find anger flooding into my thoughts about almost anything. It's as if the chemicals involved in my thought processes (for, when you get down to it, all we are is just chemical processors!) diffuse out to influence other thoughts. And worse, it's as if my mind is a nonlinear chemical system, with strong "positive feedbacks" (that is, as more occurs, even more is stimulated) – which I wouldn't be surprised could easily lead to mental instability. But I've found that I can stop these feedbacks, once I realize the cause, repeating: "Careful of confused thoughts; careful of chemicals."

Connected with "careful of confused thought" is *Capitalize on confusion (for example, cloning)*. This is an amalgamation of other thoughts, some already presented, but it contains another concept that I've found to be worth emphasizing. Thus, I've already reminded myself of "careful of confused thought" and in my mind is another thought that I'll show you that I review, "confusion is needed to reach clarity", but the new thought is this: "seek out confusion; capitalize on it." Similarly, Dear, if you're confused by

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<sup>2</sup> Dear, I know that the usual spelling of 'premiss' is 'premise', but I prefer the British spelling, in part because 'premise' can be so easily mispronounced (emphasizing the "pre" rather than the "miss") and can be so easily misread (miss-red!) as 'promise' (which also, of course, shouldn't emphasize the "prah" but the "miss"). Consistently, I'll be spelling the plural of premiss as premisses (rather than premises). Thereby, maybe you'll be able more easily to read: What premisses are found on these premisses?!

something, I encourage you not to ignore it; instead, pursue it, until you understand it. When you finally do, I'm certain you'll be pleased (i.e., it'll give you a "pleasurable" survival signal).

I sometimes remind myself of a particular illustration of the idea to "capitalize on confusion" with "for example, cloning", because this particular example reminds me of something else – which I'd now like to show you, because the new idea may also help you. What confused me is one more "set-up question" from your grandmother (she seems to enjoy confusing me). One day, seemingly "out of the blue" she asked me if I would be interested in being cloned. I responded "No." She then responded: "Why not? For someone who's always talking about survival, cloning would seem to be ideal!" So, I was confused. Your grandmother seemed to have trapped me in a paradox.

Yet, as Aristotle and Ayn Rand said: "There's no such thing as a paradox; if you reach a paradox through sound reasoning, then check your premisses; one of them must be wrong." So, pursuing my confusion, I first re-examined my premisses. One of them was my hypothesis that we all pursue our trio of survival goals (of ourselves, our extended families, and our values); I saw (and still see!) nothing wrong with that premiss. Another premiss was that I had no interest in being cloned; that, too, seemed to be firm. (Dear: do you have any desire to be cloned?!) So, then, if the premisses are sound, and if the paradox persists, there must be an error in reasoning – or in some hidden premiss.

This called for some thought. First, "I" inquired of Left Brain why "I" wasn't interested in being cloned. The first obvious response was that "I" wasn't interested because "I" couldn't be cloned. Maybe my Body could be duplicated, but my Body isn't "me"! It's part of me, but it wouldn't be possible for "my clone" to have experiences identical to mine. How, for instance, would my clone duplicate my experience of drawing the curtains in our house when I was a kid during WW II, when the siren sounded to alert us to the possibility of a Japanese invasion? How would my clone duplicate my feeling when I was six or so, while my brother and I walked with my father to see him off on the ship, he told us that he and our mother "were having troubles" and that he wouldn't be returning? And so on, for a thousand and more other "for instances". That is, I'm more than just this genetic code; in fact, if push-came-to-shove, I'd say what really is "me" is not my genetic code but the memories and the ideas and the emotions and

the values and... in my mind. So it seemed that maybe what was wrong was the previously “hidden premiss” that I could be cloned.

But suppose future science solves current limitation on cloning. Suppose, a thousand years from now (or a million years from now, or whenever), an “I” could be exactly cloned, cloning not only Body but also Mind. (Who knows how it might be done, if ever, but suppose that some “imaging technique” could be developed, whereby all electrical and chemical properties necessary to completely reproduce a human could be projected into a “new and improved clone”). My response: I still wouldn’t be interested! And of course “I” then asked Left Brain: “Why not?”

And of course a huge number of responses flooded my brain. Foremost was this: even a “new and improved clone”, who had all my memories, feelings, and so on (i.e., even if he were given my past), wouldn’t be me, because he wouldn’t have my future! That is, as soon as my clone occupied a different part of this universe from the one I occupy, he would begin encountering experiences different from mine – and would therefore evolve differently. Stated differently: even if, for an instant, he were exactly the same as I, from then on, he would be someone else. Stated still differently: I can’t be cloned, even by a “new and improved clone”, because I’m unique – not only in my past, but also in my future (that is, in my “potential”). So, again, it seemed as if the error was the previously hidden premiss that I could be cloned.

But accepting that I’m unique, not only because of my past but also because of my future, and even contemplating the possibility that this “new and improved clone” would have a future “better” than mine, I was still completely disinterested in the possibility of being cloned (save as this intellectual exercise). What would be the point? If my clone had a strawberry milkshake, “I” wouldn’t enjoy it – he would! And besides: it’s not that this particular body and this particular mind are so astounding that the world needs another! If the truth be known, I’m sorry to report that this world would have managed to muddle along just as well without even this one version – save, of course, for the existence of certain grandchildren whom I happen to know and for whose existence I claim some credit! In contrast, if Einstein could have been cloned, then almost certainly humanity would have benefited. But anyway, the whole concept of being cloned left me cold.

So, I continued to be confused: something still seemed wrong. How could I accept the conclusion that one of my top priority goals was to help these genes go on, and yet, I was clearly completely disinterested in being cloned, which otherwise appeared to be an astoundingly good opportunity to help these genes go on? Eventually, on another walk in the desert (the advantage of which is to minimize distractions), the error “I” found was not necessarily in my premisses but in my reasoning, namely, in all those “I’s” – erroneously thinking that “I” is just the part of me that does all the thinking! That is, I had neglected to convene a full meeting of my Board of Governors.

To show you what I mean, let me review “my” objectives and focus on the concept of cloning. Thus, “I” had concluded that my Left Brain’s prime goal was to promote its values – and certainly one of my most important “values” is continuing to survive! That is, any other value (such as clearing up this confusion, or solving a math problem, or...) requires my survival; therefore, my survival is certainly a high priority goal of my rational thoughts. Now, if my “new-and-improved clone” had an identical Left Brain, maybe the rest of the world might conclude that one version of me was just as good – or just as bad – as another, but as far as this Left Brain would be concerned, it has no doubt that there is only one important version of it – and it’s the one that wants to survive. The only reason my Left Brain might be interested in having a clone is if that clone was prepared to help me survive – but that seemed rather unlikely. I could imagine the clone saying: “Hey, who needs him – and even if we want still more of him, they’re easy to make!” So, again, my Left Brain wasn’t interested in being cloned, because it saw no survival value for it in being cloned.

And the same conclusion seemed appropriate for Right Brain: it “feels” nothing emotional about having a clone. If my left-brain’s analysis was correct that Right Brain’s prime goal is to enjoy (“If it feels good; go for it!”) – which, again, is its way of saying it wants to survive – then “I” felt nothing especially good (or, for that matter, nothing bad) about being cloned. Of course, if when he ordered a strawberry milkshake, then I would get the taste and he would get the fat, well then... Anyway, Dear, trying to understand my feelings didn’t clear up my confusion.

Then there’s Body (or “instinct” or “the animal within” or “l’autre moi” or whatever “it” should be called), and that’s where some light began to shine. Obviously my Body “wants” a great number of things, and its priorities shift depending on what it already has had and how long it can continue to

function without having its other needs (or demands!) satisfied. It wants air, water, food, the temperature to be within a certain range, and so on, and when such necessities as these are met, it wants a lot of other things as well (such as sleep, exercise, for pains to stop, and so on).

As I described in **B**, Left Brain had concluded that certainly a high-priority goal of Body was to survive (for example, it has this propensity to want to breath!), but Left Brain also concluded that the only way that one “outlier” data point could be fit – the data demonstrating that sometimes humans “instinctively” sacrifice their lives for others (especially their children) – is to conclude that Body’s prime goal was to help its genes to continue. That’s consistent with sacrificing your life not only for your children (whose genes would normally continue longer than yours) but also with sacrificing your life for a group of strangers (50 or so strangers, if Body is any good at math!), in an “act of heroism”.

But then, what of cloning from Body’s perspective? Well, my Left Brain’s conclusion was rather abrupt: Body doesn’t know anything about cloning! It “knows”, for example, when it’s thirsty, but it doesn’t know anything about DNA molecules, except (truly) instinctively. It “knows” to try to save its children, because those animals that didn’t learn this lesson “instinctively” no longer exist. There is obvious survival value for the genes if a parent will make “the ultimate sacrifice” (provided that the child is old enough to survive without the parent, provided that saving one child doesn’t jeopardize the survival of other children, etc.), but meanwhile, there’s nothing “instinctive” about cloning: Body doesn’t have the faintest idea about what Left Brain is talking about! “Body” or “Instinct” or whatever-it-should-be-called doesn’t deal with abstract things (such as words!); it’s on “auto-pilot”, programmed by evolution.

One of my reasons for going through all this, Dear, is to illustrate my recommendation to you to “capitalize on confusion”. That is, I encourage you to keep trying to understand, until the confusion leads to some new clarity. In this case, the new clarity I gained was the following.

First, I should improve my description of Body’s prime goal: rather than say that Body’s prime goal is “to help these genes go on”, maybe I should say that Body’s prime goal is “*instinctively* to help these genes go on”. [And, of course, Body has a huge number of lower-priority goals, such as getting air, water, food, sleep, exercise, etc.] Further, my Left Brain needed to understand that any such re-wording of Body’s goal is totally irrelevant (as

far as Body is “concerned”), because Body doesn’t deal in words. Evolution (that is, natural selection) has put our bodies on “autopilot”. For example, this body’s goal isn’t to have children; it’s to have sex. Evolution has arranged that those animals that don’t want sex are no longer here (save, I guess, for some amoebae that have worked out a different way to reproduce).

Second, I saw that at least this particular Left Brain really isn’t very interested in the survival (or propagation) of my genetic code. I suspect the same is true for many other people. Stated differently, my Left Brain really isn’t very interested in having children (or clones) – unless rational thought suggests that the children will help me survive (which is the case in many agricultural-based societies). Certainly “I” am interested in sex (as most humans apparently are – maybe especially the male variety), but that’s mostly “Body talk” (i.e., it’s the animal in us). Also, no doubt my Right Brain adds: “if it feels good, go for it!” And I know that, on occasion, this left-brain’s analysis can lead to the question: “What about having another child?” But normally, at least for this particular Left Brain, having children is not a subject of much significance; certainly it never was this Left Brain’s prime goal.

Third, I got a glimpse of Right Brain’s enjoyment in children and grandchildren. Although I would get no pleasure in watching my clone devour a strawberry milkshake, and although I doubt if you remember the incident, I remembered the pleasure I had with you, at the local airport, eating ice cream cones, watching the planes take off. With a clone, I would know pretty well what his future “flight plan” would be: I know the limitations of his engine, the lifting capabilities of his wings, the air worthiness of the craft, the crudeness of his instruments, and so on, not to dwell on the incompetence of the pilot! With you, in contrast, my imagination takes flight. What limits to the heights to which this child will carry these genes? There has never been such a child in the history of the world! After a Nobel laureate in Physics and stints as university president and head of NASA, then... who knows? That is, the difference between a clone and a child is greater than the difference between a single-engine Cessna and a Saturn-V rocket; it’s the difference between drudgery and hope.

Fourth, and most importantly, once again I saw that Left Brain is capable of being the “big boss”; that is, it can over-ride Body. Body may be on evolution’s “auto-pilot”, but Left Brain is the pilot and can switch off the

auto-pilot. Examples range from an athlete's "thoughts" that "psyche" Body into performing better, to a left-brain's analysis such as: this available sexual activity should be avoided, considering the threats from sexually transmitted diseases, emotional entanglements, the possibility of unwanted children, a promise not to engage in extra-marital affairs, or whatever.

Further, Left Brain's analysis can over-ride Right-Brain's emotions – though not without difficulty – especially for people such as I who never scored very high on the "self-discipline" scale! For example, with difficulty, sometimes you can "think your way out of sadness" (e.g., by seeing, with analysis, that threats to your survival aren't so bad as Right Brain had synthesized), and maybe you can even "think your way out of hate" (by trying to see, with analysis, why the other person behaved in a particular way). For some strange reason I've never tried to think my way out of love or happiness! Thus, Dear, I came to the conclusion that we human animals are really quite amazing in that our Left Brains (our analysis capabilities) can "call the shots" – albeit sometimes with great difficulty.

In addition, I saw that in some cases, rational thought could override even Body's willingness to sacrifice itself to protect it's offspring (some children aren't worth the sacrifice, sometimes Left Brain will decide that it's more important to stay alive to help the other offspring, and so on). That is, Left Brain makes choices, based on its sense of values (which in turn and in general, have meaning only when measured against some objective), and in some cases, pursuing a chosen value can be our prime goal, overriding our dual survival goals. Therefore, my prime goal was the preservation of whatever my Left Brain decided was most important – which then required further thought.

Thus, one cause of the "paradox" of why I'm not interested in being cloned is because of the error in the hidden premiss that "I" could be cloned: I'm not just my genes, thoughts, emotions, and memories, but also my future (my "potential"); therefore, since no clone who occupied a different portion of this universe would be me, I wasn't interested in being cloned because I couldn't be!

Stated differently, my error was in my reasoning: a misunderstanding in the meaning of "I". For one, I had overlooked the importance of hope. Hope is an extremely powerful emotion, a way that Right Brain "sees" the future; I saw the wisdom in someone else's left-brain summary that "to hope is to be human"; and I got a glimpse of the dangers of burdening our children with

our hopes, a burden that even our own clones couldn't carry. Also, I saw my error in identifying sources of my goals: my goal of helping these genes go on is an instinctive (Body) goal, not necessarily a rational (Left Brain) goal, and on occasions, my Left Brain sometimes identifies higher priority goals.

Stated more generally, the prime goal of most humans is not their own survival or the survival of their extended families, but the preservation of their values. Yet, as I began to show you in **B** and I'll show you in detail later in this book, in general the only rational goals for our values is our dual survival goals (of ourselves and extended families). Unfortunately, though, as I'll show you later, many humans have demonstrated amazingly confused thoughts about the goals of their values, leading them (for example) to drink poison, willingly be crucified, accept being eaten by lions, strap explosives around their waists, and so on.

But my purpose, here, is not so much to remind you of my conclusions about human goals but to demonstrate to you the value of "capitalizing on confusion". Thus, Dear, don't say: "Oh boy [or "Oh damn" or whatever phrase you use to express depression] I'm confused." Instead, say: "Oh good [or "Oh great" or "Oh boy" or whatever expression you use to express elation] I'm confused!" Also, don't accept anyone else's conclusion (listen to others, in case they know something of value, but accept no one's conclusion except your own).

Further, Dear, if you're confused, jump on it, wrestle it to the ground, and keep at it until it hollers "uncle"! Keep trying to understand until you've transformed your confusion into clarity. I guarantee that clarity will eventually come, if you just refuse to accept confusion. If you continue to refuse to let confusion remain undisturbed in your mind, then (quite possibly when you least expect it) you'll get an "Ah-hah!" (Zen enlightenment!) – that is, all of a sudden, your confusion will click into clarity (possibly courtesy your Right Brain), and in the process, you'll learn something new. And the more confused you were, the less likely you'll ever forget what you've learned.

.....

Finally in this collection of Cs, there's the "big one":

*The connectedness of opposites.*

When I'm walking, I spend most of the rest of "C" reviewing examples (as I'll show you, below). First, though, I'd better explain what I mean by "the connectedness of opposites".

The concept that opposites are connected contains some of the most profound wisdom I've ever encountered. It's the essence of Taoism (pronounced as if the "T" was a "D", i.e., as if it were spelled "Daoism"), which is a religion older than Judaism (which of course is much older than Christianity and Islam). The source of this wisdom is in antiquity (i.e., apparently the source hasn't been documented).

In Chinese philosophy, the idea of the interconnectedness of opposites is contained in the concept of "yin and yang". As you can find in your dictionary, by 'yang' is meant "the active, positive, masculine force or principle in the universe, source of light and heat; it is always both contrasted with and complementary to the yin", and by 'yin' is meant "the passive, negative, feminine force or principle in the universe" – and if, Dear, you should think that this definition is still another example of male chauvinism, then note that many women display more yang than yin and be aware that the goal of Zen "enlightenment" is for all people to find an appropriate balance of yin and yang, just as all of life and maybe even the entire universe seeks its own balance.

An unidentified author in the *Encyclopedia Britannica* describes such concepts as follows:<sup>3</sup>

The terms yin and yang originated in ancient Chinese philosophy during the 4th century BCE. They were first mentioned in an appendix to the *I Ching* (Classic of Changes), one of the five classic works of Confucianism... Yin and yang mean literally the "dark side" and the "sunny side" of a hill. In Chinese and much other Far Eastern thought, they represent the opposites of which the world is composed: light and dark, male and female, heaven and Earth, birth and death, matter and spirit. This is called a system of dualism, or two-sidedness. The two forces yin and yang are believed to be complementary and contrasting principles. Each makes up for what the other lacks, and the wholeness of the world would be incomplete if there were a deficiency of either.

Together the yin and yang are depicted as a circle, one half dark and the other half light. (This symbol appears on the flag of South Korea.) Within the dark half there is a small light circle, and within the light half there is a small dark one. This suggests that, though opposites, there is a necessary relationship between the two. Neither exists in and of itself alone.

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<sup>3</sup> Copied from <http://www.britannica.com/ebi/article-9277845>.

The yin and yang are both said to proceed from the Supreme Being or Ultimate [or Tao]. Their significance through the centuries has been felt in every aspect of Chinese thought, including astrology, religion, medicine, art, and government.

To try to impress on you what I consider to be the importance of the idea of the connectedness of opposites, Dear, I'd say that: I wouldn't be surprised if the Chinese (and Koreans and others with similar ideas about Yin and Yang) were found to be the most intelligent people on Earth – and if so, that the reason would be their appreciation of the concept that opposites are always connected.

Yet, the idea of the connectedness of opposites was (and still is!) well known also to people in other cultures. For example, one of its most famous proponents was the Greek philosopher Heraclitus (~540 – 480 BCE).<sup>4</sup> Only fragments of his thoughts are available, but these include such statements as: “the opposite is beneficial; from things that differ comes the fairest attunement” and “what agrees, disagrees; the concordant is discordant”.

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<sup>4</sup> Dear, when you write your first book (!), and even earlier, when you write your scientific papers (!), be careful about how you identify dates. On the one hand, identifying dates with “BC” and “AD” (relating time to when the clerics' Jesus was allegedly born) is common in our society (because of the centuries that our society has been controlled by Christian clerics), but surely the use of BC and AD is insulting to the many people of the world (e.g., essentially all Asians) who don't consider the clerics' Jesus to be such a significant historical figure (if he was an historical figure at all!) that dates should be referenced to him. To minimize such insults, it's now common to use BCE (for “before the current era” or “before the common era”) and CE (for “current era” or “common era”), but still using the same “zero” for the dates, i.e., around the time of the alleged birth of the clerics' Jesus, which not-at-all incidentally (as I'll be showing you) was the start of the astrological “age” of Pisces, the fish. In the scientific literature, you'll find “BP”, meaning “Before the Present”. But this BP is, of course, rather undesirable, because the reader then must know when the writer wrote – unless the referenced time is so distant that a few thousand years error would be irrelevant!

With these undesirable features of both ways of identifying dates, there is now discussion about a new scheme for defining historical dates – if only all people of the world would agree on what year is to be labeled as the “zero year”. In this regard, the best idea that I read (I've forgotten the author's name) was that the “zero” of the new identifying scheme should be the day when the vast majority of the people of the world agree to use the same calendar! An alternative that might find support is based on “the precession of the equinoxes”, a concept that I'll describe in a later chapter. As a result of this precession, a different sign of the zodiac appears on the horizon on the first day of spring roughly every 2200 years (with the exact year being identifiable with a simultaneous “triple conjunction” of Jupiter and Saturn). Thereby (and not by coincidence but by clerical design!), the birth of Jesus allegedly occurred at the end of the Age of Aries, the lamb (“who died on the cross”), on the first day of the Age of Pisces, the fish, and in a few hundred years, the Age of Aquarius, the water carrier, will begin. Consequently, dates could be related to these “astrological ages”, e.g., by replacing at least the smallest ~2200 years BCE by years in the Age of Aries (AAr) [and with earlier years identified with their astrological ages, including the Age of Taurus, the bull, and Gemini, the twins], replacing all AD's by APi's (Age of Pisces), soon (starting with the “triple conjunction” in about 2200 CE), starting with 0 AAq, i.e., the start of the Age of Aquarius (when finally the lyrics of the song will be correct: “This is the dawning of the Age of Aquarius...”), and so on.

Here are some additional examples from Heraclitus, quoted from an article by Christopher D. Green entitled “Heraclitus’ Theory of the *Psyche*”:<sup>5</sup>

Heraclitus frequently asserted the unity of opposites: “the road up and down is one and the same road”, “while changing, it rests”, “in the case of a circle, beginning and end are the same”, “cold things become warm, a warm thing becomes cold...”, and perhaps strangest of all, “immortals are mortals, mortals immortals: living their death, dying their life.”

Another from Heraclitus is

It is not good for people to get all they wish to get. It is sickness that makes health pleasant; evil, good; hunger, plenty; weariness, rest.

If all this sounds like “gobbledygook”, Dear, hang on a bit longer: it gets worse (!) – although actually, it’s all quite obvious (and really quite important).

The more famous proponent of the idea of the connectedness of opposites (and of Taoism) was Lao-tzu (~604 – ~531 BCE). In turn, he credited “the wisdom of the ancients”, in part no doubt referring to *The Book of Changes* or *I Ching*, which was written about 200 years before the earliest part of the Bible. Let me give you just a few samples from Lao-tzu, and then (finally!) I’ll get on to showing you what all this “gobbledygook” means!

To yield is to be preserved whole.  
 To be bent is to become straight.  
 To be empty is to be full.  
 To be worn out is to be renewed.  
 To have little is to possess.  
 To have plenty is to be perplexed.

To understand such “gobbledygook”, Dear, you really should read some of the books by Alan Watts. He does an absolutely wonderful job illustrating this wisdom. By the way, he was trained to be a Christian preacher (I’ve forgotten which sect), was one for many years, and then (he might have permitted me to summarize) he abandoned Christianity for Taoism. He died about 10 years ago – possibly from laughing too much! If that doesn’t make sense to you now, maybe it will after you’ve read some of his books. But if you do read some of his books, be careful: don’t take anything he wrote too seriously!

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<sup>5</sup> Copied from <http://www.yorku.ca/christo/papers/heraclit.htm>.

Okay, now I'll "get on with it", trying to explain the meaning for this "connectedness of opposites". I'll give you a few examples, but if you would just understand one of them, then the rest will seem trivially obvious.

As a first example, consider pleasure and pain. They're connected at a fundamental level: they're always linked; neither of these feelings has any meaning without the other. Thus, Dear, if you had never experienced pain, then you wouldn't have a reference for comparison pleasure. It's all relative. It's as if there's a long scale (like a ruler, or a yardstick, or...), on one end of which is extreme pain, and on the other end is extreme pleasure, i.e., ecstasy. They're connected – and can't be disconnected. Using different words, you could say that there's a single continuum (between pleasure and pain), along which your emotions move, and it's impossible (even theoretically!) for you to break out of this continuum: if you want to experience pleasure, you must have experienced pain.

Look at the same from a different perspective: consider threats to your survival (pain) and signals telling you that you're surviving (pleasure). It's one continuum; all these signals deal with survival. To illustrate their connectedness, consider the lives of the "rich and famous", especially those unfortunate people who inherited vast sums of money. What a horrible inheritance!

If you don't understand why I said that inheriting a huge sum of money would be horrible, then please think about the following. All people know (even if "only" intuitively) that one of their prime goals is their own survival. But by leaving their children vast sums of money, the parents have said to their children: "Here; you don't need to struggle; your survival is guaranteed; forget your 'prime directive' (borrowing a phrase from the TV series Star Trek)."

So what do their children do? They damn near go crazy (in fact, many do!): the children are then forced (by their prime directive; by their instincts) to create a huge array of artificial threats to their survival (skiing, sports-car racing, horse-back riding, gambling... until they soon run out of "thrills"), in search of pleasure (i.e., in search of signals telling them that they're surviving). That is, because pleasure and pain are connected, what parents do when they leave their children a huge inheritance is eliminate a large part of the continuum (the part containing normal pain), condemning their children to live in a constricted range. If you really hate your children,

smother them with love! (Do you see, Dear, that there really is meaning to what at first might seem to be gobbledygook?)

Try another: love and hate. They're connected. These extremes are at the ends of a continuum that could be called "engagement" or "entanglement" or "connectedness". In a sense, then, love and hate aren't different; they both deal with connectedness. In contrast, opposite to both (or, in a different continuum) is disconnectedness. For example, a marriage doesn't fail when love turns to hate, because even when they hate each other, they are still intimately connected. Instead, marriages fail when they become disconnected, for example, with disinterest.

Another example (which I'll return to later in this book): heaven would be hell. Do you see the meaning? If your survival were guaranteed, what then would you do for pleasure? One can sit around and "contemplate one's naval" (or one's god) for only so long: it then would become overwhelmingly boring, i.e., "boring as hell"!

Dear: our DNA molecules have programmed us to struggle to survive (again: those that weren't, didn't, i.e., they're not here). We're problem-solving animals. Take away the problems, take away the struggle, and we invent "fake problems" just to feel the thrill of struggling to survive. So, then, what would be the most wonderful heaven? Hell! That's the desired destination: that's where the real struggle would be! Crazy? Really? Or is the real craziness the concept of heaven and hell?!

If one wanted to be religious, i.e., to choose to live one's life by someone else's rules (although why one would want to do that is beyond me!), then the Hindu religion would seem to be better. In Hinduism, at least one gets to "lie" in reincarnation, wherein one returns to this world to try again: to try to be better next time, to experience even more pleasure by overcoming even more difficult challenges. For me, though, this "universe" (this "one turn") is enough. And it's made astoundingly better by knowing it's only a one-time affair. Then, Dear, I wonder if you already understand the "gobbledygook" that I'll return to later in this book: the "spice of life" is death!

The poet William Blake (1757–1827) put in rhyme many of these types of thoughts. Let me give you a few examples. They're not from a single poem, and therefore, I've put "\*\*\*'s" between entries:

\* Go to other chapters *via*

Man was made for joy and woe,  
And when this we rightly know  
Through the world we safely go.

\*\*\*\*\*

There is a smile of love,  
And there is a smile of deceit,  
And there is a smile of smiles  
In which these two smiles meet.

\*\*\*\*\*

To see a world in a grain of sand  
And a heaven in a wild flower,  
Hold infinity in the palm of your hand  
And eternity in an hour.

\*\*\*\*\*

Thine loves the same world that mine hates,  
Thy Heaven's doors are my Hell's gates.

Well, maybe that's enough for now. But before I list the “connections” that I normally review, let me add a note about one that will appear in the list below: “Black supports white; every ‘in-group’ needs its ‘out-group’.” This is an example that Alan Watts describes beautifully: would that all “white supremacists” would realize that they desperately need the blacks (or other colors), over whom to feel superior! Such stupidity! The Nazi's would have been nothing without the Jews. Similarly, for the past 2,000 years, perhaps the strongest “glue” keeping the Jews “intact” was Christian hate! And similarly for every “in-group”: would that “fundamentalist Christians” would see that their prime love is hate – a topic that I'll get to, later.

But enough of that for now. Immediately below is the list of “connections” that I normally review (and if some problem is bothering me, I normally spend time to see how the range of associated emotions are connected).

***The interconnectedness of opposites:***

*Black supports white;*

*Every “in-group” needs its “out-group”;*

*Pain is needed to appreciate pleasure;*

*Threats are needed to enjoy security;*

*Confusion is needed to understand clarity;*

*Confinement is needed to permit freedom;*

*Cowardice is needed to be courageous.*

*Climbing is needed to reach a new plateau;*

*For there to be mountains, there must be valleys; for there to be highs,  
there must be lows;  
Any heaven would be hell;  
“Every light that shines also causes shadows – but if there were no  
shadows, new lights would never shine.”*

The last one in the above list is a quotation not from one of my “poems” but from an essay that I wrote after I returned from a scientific conference in the Soviet Union in about 1984. I hope that the quotation is understandable as it stands, but for your possible interest and also because you may pick up a few other ideas from it about the connectedness of opposites, I’ve included this essay at the end of this chapter. And because the essay may seem to be a production “too weird” even for your old grandfather, I’ve also included some introduction to the essay, to show you why I chose to write it.

My final thought for “C” summarizes much of the above:

*All is one continuum; everything is connected.*

This idea, that all is one, means the same as Watts’ idea that each of us is the Universe “I’ing”. As I’ll show you later, it also means the same as Spinoza’s idea of “God”, namely, “everything” – and I certainly agree with Spinoza that it would be ridiculous to “worship” this “oneness”.

The point is not one of “belief”, Dear, but one of fact: your fingernail, my sore leg, Mount Everest, and the most distant galaxy are all part of this universe – it’s all just one. Further, such ideas were actually deduced by this universe, flowing from the universe of experiences to which each of us has been exposed. Similarly, everyone’s universe of experiences leads us all to the connected thoughts to help our friends and hinder are foes. The whole is one huge continuum; an individual and an individual’s thoughts are but tiny ripples or waves in this continuum – an idea that I’ll return to in later chapters.

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### Summary:

Well, Dear, that’s all there is to “C”. In this book, C may seem shorter than B, but when I’m walking, “B” only takes me a minute-or-so, whereas “C” can take substantially longer – especially if I’m “bothered” by something and then spend time trying to understand where the “feeling” fits into some

“continuum” of feeling, connecting two opposites. Here, as a review, let me just reprint the “essence” of C.

*There is a collective consciousness going on.*

*I'm the crowning achievement of Nature's consciousness, but we're all cousins, struggling to survive.*

*Don't be afraid of confrontations;  
Have the courage to change;  
Careful of chemicals...  
Careful of mental connections...  
Careful of confused thoughts...  
Capitalize on confusion.*

*The interconnectedness of opposites:*

*Black supports white;  
Every “in-group” needs its “out-group”;  
Pain is needed to appreciate pleasure;  
Threats are needed for the pleasure of survival;  
Confusion is needed to reach clarity;  
Confinement is needed to permit freedom;  
Cowardice is needed if there is to be courage;  
Climbing is needed to reach a new plateau;  
For there to be mountains, there must be valleys; for there to be highs,  
there must be lows;  
Any heaven would be hell;  
“Every light that shines also causes shadows -- but if there were no  
shadows, new lights would never shine.”*

*All is one continuum; everything is connected.*

## END NOTE

### SOME LIGHT ON “NUCLEAR SHADOWS”

Dear: Before showing you the “essay” (below), I probably should provide you with some “background information”. What follows isn’t a “poem”; it’s an essay I wrote upon my return from the Soviet Union, I think it was in 1984 (quite a bit before the Berlin Wall fell). This time was near the coldest of the “cold war” when the physicist/ astronomer Carl Sagan (and co-authors) published a paper dealing with “nuclear winter”. By this time, climate models had been developed fairly well, and what these authors did was mathematically model the climatic consequences of a nuclear war (with various assumptions about how many nuclear weapons were detonated). Their conclusion was that, with so much dirt and dust and smoke injected into the upper atmosphere by the explosions and resulting fires, the temperature at the Earth’s surface would drop dramatically, causing a “nuclear winter”.

Now, as you might imagine, their model contained a large number of other assumptions, and the International Council of Scientific Unions (ICSU, a nongovernmental organization, established by cooperation among a large number of scientific organizations) convened a meeting in Tallinn, Estonia (then a part of the Soviet Union) to examine and comment on the assumptions. ICSU invited (and paid the travel for) some of the world’s experts to attend, and because one of the important assumptions of the Sagan et al. model was in my field of specialty, I was invited to attend to present a paper (along with about 10 others).

Well, I did that, doing it all according to “established procedures”: I put as much time as I could into preparing the paper, but I certainly wasn’t prepared for what I encountered. Now, I’ll try here to avoid describing “encounters” that aren’t relevant, but I’ll need to describe some if you are to gain some understanding of why the essay is so different from the scientific paper I presented.

On our way to the Soviet Union (your grandmother came with me), we read something in a newspaper in London that alerted us for our experiences. Someone had just returned from the Soviet Union and was reported to have said (as near as I can recall): “The USSR isn’t so much an oppressive dictatorship as it is a bungling bureaucracy.” Well, of course we didn’t gain much data to test the assessment about the dictatorial character of the USSR (but some!), but the assessment of it being a bungling bureaucracy was “right on”!

Dear, think of the worst bureaucracy that you’ve ever encountered. Now, imagine how it could be even ten times worse. And now, imagine that it was everywhere (from the grocery store, to the fast-food place, to your school)! It was mind boggling – or, actually, mind numbing! On our first day of encounters with the Soviets (and we were “honored guests”), we stood in lines for 8 hours. I kid you not! Eight hours! Two hours getting on the boat (having our papers checked), 3 hours getting off (having our luggage searched – and I have some stories about that, because my daughter had asked me to send some postcards back to the U.S., to her friends, as a joke – as a result of which the Soviet custom agents searched and searched, and questioned and questioned, but could find

absolutely no humor!), and then 3 hours for the line to get on the bus and to get registered at the hotel.

Actually, it would have been even more than 8 hours in lines that first day, save for the help of an Estonian who spoke a little English. After we finally were registered, we decided to get some food at the hotel's restaurant. We were especially in need of a cup of coffee (courtesy our addiction to caffeine). And what did we encounter outside the restaurant? What else, but another huge line (maybe a hundred people), which we joined. The Estonian next to us in the line must of overheard our conversation in English and kindly pointed out to us that the line we were in was for the "locals".

But such was minor compared to the bureaucracy I confronted at the Conference. As I mentioned, about 10-or-so of us presented our "expert papers". Then, at almost the end of the Conference, some "chief scientist" of some Russian laboratory got up and started reading something, in Russian, to all the 200-or-so assembled scientists. I should add that, by this time, I had gotten to know the Russian-to-English translator fairly well (which is another story – the one good experience of our trip!), and maybe I should add that, although I may have a tendency to avoid confrontations in my personal life, I've never shied from confrontations on scientific matters. Consequently, in the middle of the Russian's "speech", I leapt to my feet and yelled: "Tanya [the translator's name]: what the devil is he doing?" Whereupon, without consulting him, she responded: "He's reading the 'Conference Summary'." To which I replied: "Well, that might be the way it's done in the Soviet Union, but it's not the way it's done at an International Conference! How dare he dictate to us what our conclusions are?!" And the assembled scientists burst into applause – including Soviet scientists!

Well, I won't go into details about what happened next (he backed off, a draft "resolution" was circulated among participants, etc.) and I'll wait until a convenient time to talk to tell you stories about other incidents on the trip (conversations with a Soviet "newspaper reporter", becoming friends with a famous Russian scientist, later having him and Tanya come to the U.S., etc.). Instead, to conclude this "introduction", let me just say that, after leaving the U.S.S.R. (when the passengers onboard the aircraft burst into applause, because we were leaving!), after returning to London (when I had the almost uncontrollable urge to stand up at the restaurant at Heathrow Airport and yell "People, you don't realize how lucky you are!"), and after returning to the lab to put my paper in "publishable form", I realized that I couldn't do it. That is, I refused to be a pawn in their political game: "nuclear winter" had become a "hot potato" in cold-war politics. Consequently, I instead wrote what follows. Subsequently, by the way, it was rejected for inclusion in the Conference Proceedings (understandably so), but Tanya kindly translated it into Russian for me, distributed it to Soviet scientists, and from them, later, I received many comments that convinced me that I had made "the right choice". Thereby, I did what I felt I could to try to end the cold war.

## NUCLEAR SHADOWS

“Ladies and Gentlemen: there is a difficult decision I must make, and I would be grateful for your good advice.”<sup>6</sup>

“Advice is cheap.”

“You get what you pay for.”

“Thank you – but spare me the platitudes.”

“What do you mean ‘platitudes’?”

“People paid dearly to gain such knowledge.”

“I suppose.”

“So what’s your problem?”

“Thank you. I need to decide how to write this nuclear-winter paper.”

“That’s simple: stick to science; never mind politics, economics, and philosophy.”

“But the science is all entangled with politics and economics, i.e., applied philosophy.”

“Never mind applied philosophy or even applied science: stick to pure science.”

“Sure:<sup>7</sup> from your Chamberlain paper, show them how the atmospheric residence time of particles depends on their sizes and that wet removal usually dominates;<sup>8</sup> remind them of Junge’s result that nucleation scavenging is of prime importance;<sup>9</sup> show them Ogren and

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<sup>6</sup> Dear: as you will probably infer, the “Ladies and Gentlemen” being addressed here are not in some audience but are those “people” who were assembled in the “board room” of my mind. I don’t identify “individual” speakers in what follows; only “their” thoughts appear; but based on what I wrote in **B**, maybe you can identify some of them.

<sup>7</sup> The science in this paragraph (and throughout this essay) can be ignored; I used it only as a “prop” for other ideas, which I consider to be more important. Nonetheless, I’ll add a few footnotes to this paragraph to explain the ideas a little more completely, just in case you might be interested.

<sup>8</sup> Here, I’m referring to a paper that I presented at what was known as “The Chamberlain Conference” (Arthur Chamberlain was one of the most famous scientists who investigated how particles are removed from the atmosphere); by “atmospheric residence time” is meant the average time particles remain in the atmosphere; such particles are removed by rain and other types of precipitation (“precipitation scavenging” or “wet removal”) and by processes that don’t require precipitation (collectively known as “dry deposition”, the most obvious process being just gravitational settling).

<sup>9</sup> C.E. Junge was another famous scientist in the field; by “nucleation scavenging” is meant the process by which particles start the formation of (or “nucleate”) cloud droplets and ice crystals; the particles are then brought to the Earth’s surface by subsequent precipitation.

Charlson's result, from the most recent issue of *Tellus B*, that elemental carbon is removed essentially as fast as sulfate (i.e., EC probably can act as a CCN, presumably because the EC develops a hygroscopic coating within a day or so after being exposed to atmospheric gases);<sup>10</sup> remind them of the Thompson et al. results, recently published in *Ambio*, that showed the substantial flow from the northern to the southern troposphere (with an exchange time of about 10 days and which obviously would stimulate substantial rain);<sup>11</sup> comment on the likelihood that cold air over the continents would result in substantial precipitation along the coastlines;<sup>12</sup> and therefore, overall, suggest the residence time of the smoke is likely to be even less than the usual 10 days."

"I disagree – those points are interesting, but they shouldn't be made."

"Why?"

"Because none of them is firm."

"It's similar to what got us into this mess in the first place: hand-waving, flaky science."

"Good point. What's been published brings to mind a child loose in a huge control room of a modern electrical-power plant, with knobs and dials everywhere; the child turns a single knob and shouts with glee: "Look what happens when I turn this knob'!"

"Agreed. None of it's good science. Not only are there no experimental tests of the theories, but the models have too few dimensions and none properly accounts for interactions between the smoke and the dynamics."

"So, you would like an experimental test of the theory?!"

"Come off it. The total theory doesn't need to be tested for it to be good science: the components can be tested, and so can the way in which the components are synthesized."

"It better be testable; otherwise it's metaphysics."

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<sup>10</sup> *Tellus B* is a scientific journal; elemental carbon (EC) particles (e.g., "soot particles"), many of which were assumed would be produced by fires associated with nuclear war, are normally hydrophobic (not preferred sites for water condensation); in contrast, sulfate particles (such as the ammonium sulfate particles in some fertilizers) are normally hygroscopic, i.e., they are effective as "cloud condensation nuclei" = CCN.

<sup>11</sup> *Ambio* is another scientific journal; the concept here is that if a nuclear war occurred in the Northern Hemisphere, the air in the Northern Hemisphere's lower atmosphere (the "troposphere") would mix to the Southern Hemisphere much more rapidly than was estimated in the original paper by Sagan et al., and such air, mixed between the hemispheres, would usually encounter the "Intertropical Convergence Zone", which is where massive tropical clouds occur, with their associated rainfall (and atmospheric cleansing).

<sup>12</sup> This was another weakness of the original paper by Sagan et al.; they convinced themselves that the continents would cool rapidly ("nuclear winter"), but the oceans wouldn't (the oceans have much larger "thermal inertia" than the continents, i.e., the oceans are slower to cool in the winter and slower to warm in the summer than are adjacent continents), and then this induced temperature change between the continents and adjacent oceans would stimulate more rainfall (over the oceans, where the air would rise, later to settle over the continents).

“But neither the components nor the synthesis has been tested.”

“Well, then, criticize them for publishing papers that are so flaky!”

“Why? Nothing that an individual could write would be so devastating as the criticism by the National Academy:<sup>13</sup> ‘The committee cannot subscribe with confidence to any specific quantitative conclusions drawn from calculations based on current scientific knowledge’.”

“Pity they didn’t say they couldn’t trust the theory even qualitatively.”

“Come off it. That’s as close as any official committee will ever come to saying: ‘It’s a bunch of bull!’”

“But it didn’t seem to devastate the theory!”

“Well, did you see the news headlines: ‘Committee Supports Nuclear-Winter Predictions’?”

“Where did they get that?”

“I don’t know. And did you see the comments, by some of the original actors, that the National Academy ‘legitimized’ their studies?”

“That’s nothing. The *Newsweek* Ad for Sagan’s TV special said: ‘U.S. and Soviet scientists agree that ‘nuclear winter’ would mean the end of life on earth... based on fact’.”

“That’s a lie.”

“That’s show biz.”

“It sure as hell ain’t science.”

“Well, that it’s ‘based on fact’ is a lie; but who knows, maybe there is agreement between at least two scientists.”

“Maybe – but there are a lot more who agree that it’s a bunch of garbage.”

“A part of the problem may be that the Academy added its own calculations.”

“Sure, with another set of slow removal rates and another set of one dimensional calculations.”<sup>14</sup>

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<sup>13</sup> This refers to and quotes from a review of the “nuclear winter” ideas by the U.S. National Academy of Sciences.

<sup>14</sup> That is, in the calculations by the committee of the U.S. National Academy of Sciences (and in the

“So, criticize the Academy, too.”

“Again, no! Then you’ll be involved in the same that you’re criticizing: flaky science.”

“Well, then, solidify the science!”

“Oh, sure: this weekend or next?”

“It can’t be done now. As the Academy said, all this stuff is beyond current knowledge. It’ll take years to clean up this mess.”

“Then hit them with some qualitative stuff.”

“Fight fire with fire.”

“He who lives by the sword will die by the sword.”

“Thanks a lot!”

“Then recommend additional research; that’s always a safe bet.”

“No.”

“Why?”

“Well, first, recommending additional research, in effect, puts a blessing on this whole business.”

“But it won’t hurt to do additional research: even if this whole nuclear-winter business turns out to be a ruse, an infusion of new research dollars will likely lead to some good new information about the atmosphere.”

“Oh sure. And what if the results demonstrate that there would NOT be a nuclear winter? Will someone then decide it’s okay go ahead with a nuclear war?”

“No one would be that stupid.”

“Oh?”

“Then show them the likelihood that there would be even more intense fires, associated with the high winds and low humidity.”

“You mean ‘cry wolf’ a second time?”

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original paper by Sagan et al.), the rates at which the particles were assumed to be removed from the atmosphere by wet and dry deposition were too slow, and the mathematical models, themselves, were woefully inadequate, for they included only one spatial dimension (height) rather than the obvious three dimensions.

“But it seems likely.”

“And is that theory any more firm than this nuclear-winter business?”

“Let’s cross that bridge when we come to it.”

“Plan ahead.”<sup>15</sup>

“Thanks again.”

“Besides: do we really need any additional evidence that war is hell?”

“Someone said that he thought a nuclear war could be won.”

“Yah, but what’s his I.Q.?”

“Enough of that: you’re back talking politics! What additional reasons for not recommending additional research?”

“Well, there’s only limited research talent and research funding, and if you support the Academy’s recommendation for additional research on nuclear winter, then you are simultaneously recommending against research on other topics.”

“You can never do just one thing.”<sup>16</sup>

“With so much money and talent wasted on this stupid arms race, recommend that some be deflected to conduct further research.”

“Oh sure – and let the other side get ahead in the race?”

“Why not recommend that the race be terminated?”

“And who is going to listen to you, when no one has listened during the past third of a century?”

“More like the past 30 centuries.”

“Why can’t people get along?”

“Everyone is just trying to survive.”

“Well, if there’s a common goal, why can’t we cooperatively pursue it?”

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<sup>15</sup> With this example (and two earlier ones), I’m trying to illustrate the concept that one can usually find a maxim to fit any occasion – and also its converse!

<sup>16</sup> This is a quotation (source unknown) that has come to be known as “the first law of ecology”.

“Because each side thinks that the other is an impediment to reaching its own goal of survival.”

“But the biggest threat to survival is this lack of cooperation!”

“There’s more: each side thinks it has THE magic formula for reaching the goal.”

“Maybe there’s more than one.”

“Maybe there’s none!”

“Everyone struggling to reach some utopia, not realizing that ‘utopia’ means ‘not a place’!”

“Everyone struggling to get nowhere!”

“Not realizing that successful struggling is what’s desired.”

“Class struggle?”<sup>17</sup>

“No – against whatever threatens one’s survival.”

“Sounds circular.”

“There is an out: the struggle for security is the cause of the insecurity.”

“Hold your breath and you lose it!”<sup>18</sup>

“Forget about the pursuit of happiness and concentrate on the happiness of pursuit!”<sup>19</sup>

“The damndest thing is that the economic methods used by both sides are converging: a compromise between free enterprise with regulations (vs. a regulated economy with incentives!), a consumer driven economy, with much of the road dominated by state traffic (vs. a state-planned economy, trying to meet consumer pressures), constraints on the brutality of efficiency (vs. freedoms to bypass bureaucratic inefficiency), and so on.”

“If so, why?”

“Same objective: survival / security.”

“What about freedoms?”

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<sup>17</sup> That, of course, was Marx’s idea.

<sup>18</sup> These ideas about utopia and security (and, I’m fairly sure, also this quotation) are from one of the books by Alan Watts.

<sup>19</sup> This is from a poster that you might have seen on my wall; I don’t know who created this stunning line.

“They follow economics.”

“Maybe so, but there is another schism: one side sees religion as ‘opium for the masses’; the other see collectivism as ‘cocaine for the intellectuals’.”<sup>20</sup>

“Sounds like a lot of drug addicts.”

“Drugged on causes; running from reality.”

“Running from ‘existential isolation’.”

“So says the isolated ego.”

“Try breathing in isolation!”

“Such a stupid species.”

“Too much philosophy.”

“‘The only serious philosophical question is whether or not to commit suicide’!”<sup>21</sup>

“B.S. The only serious philosophical question is: how do you stop laughing?”

“That’s easy: just have your survival threatened.”

“That’s reality, not philosophy.”

“Let’s get back to reality.”

“The problem at hand is with nuclear winter.”

“I disagree: it’s all politics and philosophy.”

“Then stay out of the whole business.”

“You may want to, but you’re already in it; and if you don’t comment, then you leave the field open for others.”

“Let them have it!”

“But it’s such a travesty.”

“Of what?”

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<sup>20</sup> “Religion is opium for the masses” is, of course, from Marx; I’m sorry, but I’ve forgotten where I came across the other quotation.

<sup>21</sup> That quote, which I’ll address in a later chapter, is from Albert Camus.

“Science.”

“Is that your main complaint?”

“I guess so: I’m worried that science will be damaged.”

“How?”

“The public will lose respect for science – confidence that science will yet find solutions to some of these horrendous problems.”

“Wait a minute: the goal of science was never to help solve practical problems; it was to understand nature!”

“Yes, but it was always expected that the understanding would be used to solve practical problems.”

“Sure: even Einstein engaged in an application.”

“He didn’t become involved in it; that was left for the politicians, engineers, and technicians.”

“B.S. In fact, double B.S.! First, he did become involved in the application: he spent most of the last 20 years of his life working for peace.”

“Yah, and his science suffered for it.”

“But did we?”

“I don’t know. Who knows what he might have discovered if he had kept working, full-time, on science.”

“And second: why leave the applications to others? Does someone else have better training to be a citizen?”

“But it’s such a waste of scientific talent!”

“So, is that your problem: the waste?”

“Well, sure, that’s a problem: everything about this stupid arms race is such a waste. But there’s more: people who have earned reputations in science use this reputation to promote non-scientific ideas.”

“So what? They have a right to their own ideas and a right to promote them in any way they desire, so long as it doesn’t damage someone else’s equal rights.”

“But they’re dragging science down in the process.”

“Down to applications – or up to applications?”

“You have a point.”

“No. That’s not the point here. The point is, in this application, the science is so damn weak.”

“Is that your main complaint?”

“Yes.”

“Then say so.”

“Hell: we’re going in circles; we’ve just been through all that; the Academy already torpedoed them.”

“Then let them sink.”

“But they’re not sinking; there’s too much politics supporting them.”

“Then fight the politics.”

“Great: and hurt science even more?”

“Scientists are becoming like hired guns, like lawyers: available to bolster anyone’s pet cause.”

“How did this happen?”

“What passes for science seems to be deteriorating, plus the ease with which ‘scientists’ can ‘go public’.”

“Watch out: more of that, and the politicians will step in and control science.”

“I doubt it. They can’t afford to – which leads to an interesting point: likely the largest common denominator of the two competing systems is that both must rely on scientific advances, and these are shared.”

“And it’s great that, in the main, neither side can afford to restrict the publication of scientific results.”

“Freedom of press for truth?”

“But who’s to decide what’s true?”

“There is a method for its protection: scientific peer review.”

“Was it applied here?”

“I don’t know; and even if it was, how does that stop publicity hounds from calling a press conference?”

“Hey, go easy! You don’t know that they’re publicity hounds. Give them the benefit of the doubt. Assume they are convinced that this nuclear-winter business is real.”

“They couldn’t be convinced; they must know how weak the theory is!”

“Well, they do now, courtesy the Academy.”

“But they’re not listening; they say they’ve been ‘legitimized’.”

“Then tell them!”

“Here we go again, round and round in circles.”

“It sounds like a problem for the scientific community to solve.”

“How about a committee of scientists who could withdraw scientific credentials?”

“More regulations?”

“Who will regulate the regulators?”

“Let it be!”

“It sure as hell doesn’t help science to have all these arguments in the open.”

“Are you sure?”

“Sounds to me like you have a distorted view of science.”

“Go on.”

“What’s science?”

“Well, how about: studies where there are a few knowns and an unknown number (presumably large) of unknowns?”

“What is meant by known?”

“If something’s known, then verifiable predictions can be made.”

“And who is a scientist?”

“Someone who knows the difference between knowns and unknowns, is trying hard to change some of the unknowns into knowns, and proceeds according to an obvious method.”

“And are there arguments in science?”

“Of course! But they’re about whether something yet belongs in the known category.”

“And should the public be allowed to hear these arguments?”

“Of course – but I doubt if they would want to.”

“Why?”

“They’re too damn complicated; I can barely follow the arguments in my own specialty.”

“And are nuclear-winter science arguments complicated?”

Well, yes and no: the concepts seem simple enough (the accuracy of one-dimensional models, the ability of smoke particles to act as cloud condensation nuclei, the amount of precipitation induced by the smoke, and so on), but to answer these questions will take years of research.”

“So, what’s wrong with having the public hear that?”

“Nothing, that’s what the Academy already said; but that’s not what’s going on here.”

“So, what is?”

“Well, first, what the public is hearing (for example, from Sagan) is not one side of a scientific argument; instead, it’s speculations derived from an untested and severely criticized theory.”

“And the theory just happens to support his political views.”

“A new religion?”

“A new cause.”

“Not a bad cause.”

“A be cause!”

“Because he wants to be!”

“That’s not the point: it’s not science.”

“Somewhere in all of this, presumably, there’s scientific truth – verifiable predictions.”

“Yah, years away.”

“Second, it’s becoming a popularity contest.”

“A new messiah?”

“But personalities and reputations must be irrelevant to science.”

“Come off it: you mean if Einstein said something it doesn’t carry more weight?”

“Weight, yes, but it’s different: it would mean that more people would more rapidly try to prove him wrong!”

“Agreed: an Einstein, or any scientist worth his credentials, would be extremely pleased to learn he’s wrong, if thereby he learns something more.”

“That’s why this nuclear-winter business isn’t science, these people aren’t behaving like scientists, and the whole business isn’t a scientific argument: people care if the theory is right or wrong.”

“Loss of objectivity.”

“Means loss of science.”

“And do you have so little respect for the public that you think they can’t understand that?”

“It’s not that. The problem is that this whole nuclear-winter business is disguised as science: ‘U.S. and Soviet scientists agree that nuclear winter would mean the end of life on earth’.”

“Does Nature agree?”

“These show-biz freaks no longer care about her opinion!”

“Then yell!”

“Would I be heard over the voices of the National Academy?”

“Here we go again!”

“These circles are making me dizzy.”

“They’re making me sick.”

“No, maybe there’s something more here. Here, the science is linked with international politics, different economic systems, and war.”

“Why do I think he’s drifting away?”

“Hear me out. In the past, scientific truth has caused the evolution of philosophical systems.”

“A mighty slow evolution!”

“In some cases it’s slow, I agree. But look at the evolution caused by global communications, in turn courtesy electrodynamics.”

“I suppose.”

“Who modified more: Maxwell and Marconi, or Marx?”

“That’s not the point: Maxwell and Marconi modified Marx.”

“And its nothing compared to what computers will do.”

“Man is not just a tool-making animal; man is modified by his tools.”

“And so long as science and technology continue to evolve – and they must in the present systems – then so will man.”

“If our tools don’t kill us!”

“Yes, but there’s more: in so far as we are rational and our understanding evolves, then whatever is ‘inadvisable’ in the present systems will evolve into something with a firmer scientific foundation.”

“That’s hopeful.”

“It’s about time we heard something hopeful.”

“But what’s meant by ‘advisable’? That sounds like a moral judgment; moral codes can differ for different systems; and therefore, scientific advances may not lead to any lessening of the tension.”

“I disagree: morality can only be judged with respect to an objective, and if there’s a common objective, then there’ll be a common morality.”

“What did you say was this common objective?”

“It’s obvious: every person wants to survive, which, in turn, is how these human genes go on.”

“You say that survival of the species is the common goal?”

“Of course.”

“Well, then, with such a simple, common goal, why can’t we get along?”

“A huge number of reasons: thoughts that others threaten our own survival, different devised schemes for promoting this survival, confused thoughts about how to survive, and so on.”

“What a bunch of crap: I know many people who don’t give a damn about your genes.”

“It’s confused thought, or lack of thought. They’re uneducated. When they learn that all humans are related – that all humans are closer than 50<sup>th</sup> cousins – then they’ll understand that the common goal is survival of the species.”

“Maybe, but I know of many religious people who would disagree that ‘survival of the species’ is the prime goal; they have their own concepts of how to survive.”

“Precisely! You said it: survival. And I already covered that case: confused thought.”

“But isn’t there a best way to promote one’s own survival (and therefore, if I agree with you) the survival of the species?”

“Who knows? But more: who cares? It makes life more interesting when many different methods are explored.”

“Provided that one method doesn’t include the extermination of others.”

“Yes, and therefore the need for some universal moral codes.”

“Oh great: and therefore a universal government, a single economy, and all the rest!”

“No, that’s not needed: the universal code is so obvious that it’s already known and practiced throughout the world.”

“Go on.”

“Well, look at the common denominator in the following codes, as given by Confucius, Aristotle, Christ, and Marx: ‘What you do not want done to yourself, do not do to others’; ‘We should behave to our friends as we would wish our friends to behave to us’; ‘Whatsoever ye would that men should do to you, do ye even so to them’; ‘The free development of each is the condition for the free development of all’.”

“Hmm.”

“Precisely.”

“And the reason is obvious: one’s own chance of survival is improved if all agree that everyone has an equal right to claims one’s own existence.”

“Enlightened self interest!”

“A survival code!”

“B.S.”

“Would you care to be more explicit?”

“Survival is what animals seek; man is more than animal; man seeks freedom, pleasure, art, and on and on.”

“Superficial though; Spinoza called it confused thought. Make a list of all your pleasures (and pains). Then maybe you’ll see even farther than Spinoza saw: pleasure (happiness) is just a signal telling you that you and the species are surviving; pain signals the opposite.”

“Nothing but animals? Robots programmed to survive by some dumb molecules? What’s the point?”

“Careful. More than animals because of our rational minds, the best applications of which are in science. The point? The meaning? The value? These can be judged only with respect to an objective; in this case, the objective it to help these human genes continue.”

“Is that all?”

“Another circle: the good is to survive, because to survive is good!”

“Well, at least it’s closed!”

“Running in damn circles!”

“A new religion?”

“Actually, it’s quite old.”

“And no, that’s not all: you can choose any number of sub-objectives, but you’ll find that for any, except suicide, survival will remain the prime objective.”

“Some examples?”

“Well, that depends on your background and the society in which you live. If you are free to make your own choice, then a huge number of options are available: lessening of drudgery, perfection of some style, diminution of unnecessary pain, exploration of new frontiers, pursuit of knowledge,…”

“Back to science?”

“Yes – and back to this nuclear-winter business: not only does nuclear war threaten an individual’s and even the species’ survival, now this nuclear-winter junk is likely to damage science.”

“We’ve been through that: open arguments may also help science.”

“Open scientific arguments, yes; but not political arguments disguised as science.”

“Well, open arguments about anything (politics, philosophy, whatever) sound pretty good.”

“Provided it’s made clear that one is arguing as a scientist or as a politician or as a... whatever.”

“Too many damn labels.”

“What an argumentative bunch.”

“That’s not too bad, provided we remain civilized.”

“Robert’s Rules for Arguments”

“That’s good!”

“Here’s one: when scientists argue about political matters, scientific hats must be removed.”

“A more important one: don’t get physical.”

“Like war?”

“‘All’s fair in love and war’.”

“No it’s not. Starting war is unfair. War violates the moral code: everyone has an equal right to claim one’s own existence.”

“But recourse to war, the ‘final arbitrator’, may result from earlier violations of that same code.”

“Rape a man’s life and expect a fight.”

“In a civilized society, courts set it right.”

“Poetry?”

“Versification.”

“But it’s not a civilized world. What’s needed are international courts with some muscle.”

“That’ll require a universal moral code.”

“We have that!”

“Maybe.”

“What other options?”

“Well, we could build new systems that make nuclear weapons obsolete – star wars and all that sort of stuff.”

“It won’t work; it’ll just lead to an arms race in space.”

“Well, as soon as the method is perfected, bomb the other side out of existence; then we won’t need to worry about their threats to our survival.”

“Come off it.”

“Never mind: I’m talking theory.”

“It won’t work. Even if technology allowed and even if one side clearly got there first, peace among the survivors would never succeed, built on such an immoral base.”

“Well, then, how about going, now, for peace: disarm, become pacifists, let them take over, win by surrendering, love will conquer all, etc.”

“The probability of being able to go that way is even smaller than the small probability of nuclear war.”

“Then suggest world government, as Einstein recommended.”

“Under what system?”

“Then what? Continue this way?”

“Probably so.”

“It’s too dangerous.”

“With every passing day, the probability of nuclear war decreases. It’s said that a nuclear war would take about seven minutes; if we divide the past 30 years, or so, into seven minute intervals, then the probability of a nuclear war during the next seven minutes is about  $4.4 \times 10^{-7}$ , and it’s falling continuously.”

“More likely to be killed on the highway!”

“You mean you think we WILL survive?”

“Yes, and even more: with another century of scientific and technological advances similar to those of the past century, then likely we’ll all be friends, all appreciating our common objectives and the value to each of each other’s presence.”

“I see little cause for such optimism.”

“What scares me is that some with their fingers on the nuclear trigger believe in ‘life’ after ‘death’.”

“Sounds like a pretty good ‘lief’.”

“Do words no longer need meaning?”

“But there is hope: a common goal, a common moral code, and a common method – via science.”

“And therefore, since the first two are firm, strengthen science?”

“Precisely.”

“Then do you recommend that I criticize these nuclear-winter predictions?”

“No – enough has already been said.”

“Then what do you recommend?”

“Let me remind you of what that fellow said on his death bed.”

“What ‘fellow’?”

“I’ve forgotten his name; a guy who helped build the first atomic bomb.”

“So, what did he say?”

“The world will likely blow itself to bits; and as far as I can see, the only chance that it won’t – is if no one tries to do anything about it.”

“Beware of saviors?”

“Said the savior.”

“Every light that shines also causes shadows.”

“But if there were no shadows, new lights would never shine.”

“Thank you, Ladies and Gentlemen.”

“So what are you going to do?”

“I plan to thank Tanya for the card, celebrating the birth of the sun.”<sup>22</sup>

“Is that all?!”

“It’s all that matters.”

“Does it really matter?”

“Isn’t that the title of a book by Alan Watts?”

“Yah.”

“He’s dead, isn’t he?”

“No: he died, but he isn’t dead.”

“Ideas live on?”

“Yah.”

“Too bad more people didn’t realize that words are just symbols: do you think that, in a million years from now, people will still be arguing about the meaning of existence?”

“I doubt it: in another century or so, surely people will realize that base words can’t be defined in terms of other words.”

“Maybe with math?”

“Maybe.”

“I never understood the root of minus one.”

“It follows because zero was defined.”

“You mean there is no zero?”

“Well, you can have zero buckets of water in a well, but try having minus one.”

“Zero is what gives one meaning!”

“Without nothing, there would be nothing.”

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<sup>22</sup> Dear: As I mentioned in the “introduction”, Tanya was a wonderful woman that your grandmother and I met in Russia who was a translator for one of the Russian scientists, who later became a good friend. She had sent me a card – and later she translated this essay for me into Russian and distributed it in the USSR.

“The point is: if something is negative, then it isn’t a scalar; it’s a higher-order tensor.”

“So, any imaginary number is an illusion!”

“Oh – cute.”

“Would you guys kindly shut up?!”

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“Thank you.”

“You’re welcome”

“Shh... I think he wants to snooze.”

“Remember: ‘the mystery of life is not a problem to solve, but a reality to be experienced’.”

“Who said that?”

“Shh...”

“One, two; three, four. One, two...”

“Look at the scenes.”

“Beautiful.”

“Mere illusions.”

“Quiet... or they’ll disappear.”