

## Talk #1 *ecoDarwinian Psychology*

Indeed, we have probably learned more about the brain in the past 20 years than in all of recorded history.

– Alan I. Leshner<sup>1</sup>

**Thea:** Now that we have a little time, maybe you can tell me what's been getting you so excited. You've been reading around in a lot of fields – mine among them – and talking about paradigm shifts, and intellectual revolutions. But I have to say that for therapists like me, it's still business as usual. For us, the revolution happened a hundred years ago with Freud, the talking cure, and the discovery of the unconscious.

Therapists know the world is changing rapidly; and, like our clients, we are affected by so much change. But our role is essentially a conservative one: Human beings and human needs remain much as they have always been, and our job is to help our clients get on with their lives somehow, despite the changes happening around them.

**Guy:** I agree that your role is a conservative one. But I think a revolution about how we understand ourselves is on its way. To help your clients, you may need to assist them in coming to terms with new ideas, with a whole new paradigm.

My sense is that people in the helping professions always find themselves pulled in two directions when conceptual changes are happening. On one hand, as licensed practitioners, your ideas must abide by the prevailing theories and methods, or at least stay on good terms with them. On the other hand, to help your clients you have to meet them on their terms. In comprehending and adapting to major change, you shrink must be near the front lines, right after the poets and philosophers.

**Thea:** Well, which changes are you thinking of? And how do they shift our understanding?

**Guy:** In a nutshell, the revolution I have in mind is Darwinism, and its impact on psychology and the social sciences.

**Thea:** But Darwinism is hardly news! Nietzsche, Freud and William James were all aware of Darwin's thought and heavily influenced by it. Its influence on the development of psychotherapy was profound from the beginning. Where's the novelty?

**Guy:** Remember that Darwin's thought is still far from fully digested. In many religious circles, there is still bitter resistance to the idea that human beings evolved from apes by natural selection. And although some religious groups have accepted evolution by now, they still avoid Darwinism's central point – that no guiding hand was necessary.

Moreover, controversial as Darwin's theory still is for many people, I think its major impact is still to come. It's only within the last thirty years or so that we've begun to understand how a fertilized ovum develops into a

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<sup>1</sup> Editorial in Science Magazine, May 18, 2007

multicellular organism with a complex brain. It's only within that time that we've begun to understand the mechanism by which a functioning nervous system weaves a mind. The Darwinian concept of spontaneously accumulating order is the key to both discoveries, but proving terribly difficult for many people to take on board and digest. Partly due to the resistance that Darwinian ideas provoke, and partly due to the fearful complexity of biological systems, the human and social implications of the new discoveries have scarcely begun to enter public consciousness.

**Thea:** All right. I think I see where you're coming from. You see announcements of some of this recent work in newspapers and magazines, but I can't say it figures much in the professional literature of therapists. To read about it systematically, as you've been doing, where would one look?

**Guy:** There is no one source. For the primary research material you'd need to consult the journals of a few dozen academic fields.<sup>2</sup> Even the serious popular and semi-popular writings would fall in several sections of a book store. A lot of it is on the Internet. A lot of it has appeared in the Science section of the New York Times and other serious newspapers and magazines. Some of the best digestive work on the new discoveries is being done by philosophers. Those who can overcome their classical training sufficiently to stay abreast of the research findings are well equipped to consider their human meanings.<sup>3</sup>

**Thea:** Does this new science have a name?

**Guy:** What's happening is not just new science, but a new paradigm – a new way of doing science, a different way of thinking about change and cause. Aspects of this new approach are discussed under various headings: general systems theory, information theory, cybernetics, sociobiology, semiotics and neuropsychology to name a few. But these names refer to areas of specialization, not to the paradigm as a whole. I think of it as the ecoDarwinian (eD) paradigm to emphasize the bottom-up, evolutionary perspective at its core.

**Thea:** That's rather provocative, don't you think? You were just saying a moment ago that Darwinism is still highly controversial in the public mind.

**Guy:** Darwinism is controversial precisely because of the paradigm change involved. I have no wish to offend; but it's important to be clear how our habitual ways of thinking are being challenged: Instead of thinking of the world as planned, designed intended, and authorized from the top down, we are learning to think of it as spontaneously configuring itself, and finding loose ecological balance from the bottom up. It's a radical change of perspective, with implications everywhere you look.

**Thea:** You could drop Darwin and speak of "eco-psychology," couldn't you? It

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<sup>2</sup> For an idea of the scope of this research, see *Further Reading* at the back of this book.

<sup>3</sup> Daniel Dennett, Owen Flanagan and Paul and Patricia Churchland, for example.

would be more succinct and less annoying. It even has a warm fuzzy feel that might diffuse some of the hostility.

**Guy:** Too warm and fuzzy for my purposes. That term “eco-psychology” is already co-opted by Theodore Roszak and others for a mix of psychotherapy with a save-the earth social platform. But what we’re looking at, really is a new *science* – a psychology re-grounded in biology and the theory of self-organizing systems.

**Thea:** What’s a self-organizing system? I don’t begin to understand what you mean.

**Guy:** A self-organizing system is one that shows increasing order without patterned input. Without external design, in other words. Even some physical systems are known to do this – not always by natural selection. The Darwinian co-evolution characteristic of biology is a special case of self-organization – a very important case. Species of organisms and the domain of life as a whole tend to become more and more complexly ordered, just from the effort of creatures to survive and reproduce in an indifferent universe. No “intelligent design” is needed.

**Thea:** And you think the mind is such a system?

**Guy:** That’s where the research seems to be going. More and more, we understand the brains of organisms as configuring themselves through cell specialization (into different types of neurons and other brain cells), followed by evolutionary processes of neuron migration and synapse formation. The mind too can be thought of as a self-organizing ecology of competing desires, perceptions and plans. Eventually, human culture and society as a whole may be brought under this same paradigm as an ecology of co-evolving ideas, artifacts, relationships and institutions – an “ecology of mind,” in Bateson’s phrase.

**Thea:** I can’t imagine how we’d do that, and I doubt many people will want to see themselves and their societies in those terms. I still don’t really understand what you’re saying: What would it mean to think of ourselves as ecologies rather than conscious agents? Or to think of whole cultures or societies in those terms?

**Guy:** The concept is radical, but entirely consistent with the notion of unconscious mind, already well-known to you shrinks and largely accepted by the public. Taking the concept of unconscious mind seriously, and seeing it from a biological perspective, we begin to understand ourselves as complex, ecological systems in which the contents of consciousness emerge on their own from mental processes that are not conscious. All our feelings, beliefs, desires, intentions, and actual behaviors are emergents of this kind. Your thoughts are *you*. There is no “you” apart from them.

It’s not just that “existence precedes essence” as the existentialists said. Rather, our concepts of self and agency – the sense in which a metaphysically real *self* is conceived to imagine and will and do things – is called into question. Conscious agency becomes an emergent property, analogous to the blueness of the sky or the liquidity of water. It’s an

interpreted property emerging from a complex process. It's not a metaphysical given.

**Thea:** But this is scary. If we can't think of ourselves as competent agents who intend and plan and do things, then we are just machines. We don't exist at all.

**Guy:** I don't think it's quite that bad. On good days, at least, we can function as conscious, competent agents, and can still think of each other as such. Our sense of self is shifted but not overturned completely. You still know who you are; and I still know. The self-sensing, proprioceptive self and the narrative self are still intact. But it's clear, once you acknowledge that "a mind is what a brain doing," that there is no room for a separate, metaphysical "self" apart from the physical organism with its thoughts and feelings. William James said more than a hundred years ago that "the thoughts themselves are the thinkers." Today we'd add that thinking is a self-organizing process, mostly unconscious, that exists and sustains itself in ecological balance.

**Thea:** But that can't be right. We are beings that *have* minds and bodies, not bodies with brains that somehow spin their minds. It doesn't feel right to think of the self in those terms. Surely, human beings are something more than biological organisms.

**Guy:** When you say that, what exactly are you claiming? If all you mean is that there is more to a human being than the vital processes of a living animal, then I (and all the neuroscientists I know of) would agree. It's surely true that to think of humans merely in biological, homeostatic terms is to miss most of what is characteristically human. On the other hand, if you want to argue for some kind of dualism – with the mind not an emergent of the body's functioning, but a separate substance that somehow "animates" the body – well, all our evidence points the other way. There is no reason to think of mind as something other than first-person experience of what a brain is doing – or better: what the whole creature is feeling and doing.

*science and folk psychology*

**Thea:** To be honest, I'm not sure what I believe, or want to believe about the nature of mind. I'm repelled by the reductionism of these sciences that obviously appeal to you. I don't want to think of mind as an exercise in data processing, nor of life itself as a matter of chemistry. On the other hand, I'm aware that all the old stories seem thin and implausible by comparison with the story that present-day science is telling.

As a therapist also, I find myself pulled in two directions, just as you were saying. We like to imagine our field as solidly grounded in science. We'd prefer not to think of ourselves as witch doctors, practicing a modern form of faith-healing. At the same time, we must accept that our clients come to us for help with their problems as they perceive them, not for instruction in scientific psychology. It would not be acceptable to most clients to learn that their self-understanding is defective in light of current knowledge about the mind and brain – even when such knowledge might be helpful to them in principle.

There are things most people do not want to know about themselves.

As Freud saw, they don't want to know about their unconscious desires and impulses – which is one reason these remain unconscious! They also don't want to know that what they feel and think are just results of their brains' workings.

**Guy:** The free will problem seems to be the crux. When it suits us, we want to think of ourselves as unconditioned beings – uncaused causes of whatever we are doing. And sometimes we want to let ourselves off this hook of personal responsibility by making out that we are victims of life history and circumstance. My reply would be that both these stories are self-serving in opposite ways, and that neither accords well with the current science. The lines of causation are really loops; there are no ultimate causes in the story we are telling. It's just as correct (and just as nonsensical) to think of the mind as driving the brain as the other way round. The fact seems to be that mind and brain are just alternative perspectives on the same system.

**Thea:** Now, that idea – that there are no ultimate causes for what people do – accords well with the therapist's experience. We seem to enjoy a degree of functional autonomy, but nothing like an absolutely free will. But I doubt it would be possible to explain this distinction to many of my clients.

**Guy:** I'm sure you're right, but I suspect you'll find yourself having to explain certain aspects of scientific psychology to your clients in much the same way that physicians have to explain something about the medicines they prescribe, or the operations they perform. You can offer the new self-understanding tentatively, on a try-this-on-for-size basis. Indeed, I don't see how else you could offer it. But among the things troubling your clients will be a barrage of new ideas in a changing society. At a minimum, I think therapists will find themselves having to help their clients adapt to the cultural changes taking place around them – among these, suggestions from biology and the cognitive sciences to understand themselves in this new way.

**Thea:** Suggestions about who they are?

**Guy:** More about what they are. What is a human being? What kind of thing? “Who are you?” – the question of identity – is a social and biographical issue. “What are you?” is a question of biology, physics and physiology.

**Thea:** Yes, I see your distinction. But these questions of who and what are not independent. Already, the metaphor of the brain as a digital computer has replaced the Freudian image of the mind as an overheating steam engine with valves that get stuck sometimes. Now you speak of the human being as a kind of Darwinian meat-robot, programmed first by evolution and then by a culture.

You're right. People's identities are already being touched, by this new psychology. They are threatened and frightened by these changes, and angry at all the changes forced on them. The potential for conflict is terrifying and, as you say, we therapists are caught in the middle. I can tell you one thing we're afraid of: Like it or not, psychotherapy is seen by most people as aligned with the progress of science against traditional beliefs and values. Partly because of Freud's theories, therapists came to be seen as apologists

and instigators of a new hedonism. Now we'll probably be seen as preachers of a biological determinism that denies all that is special about human beings.

**Guy:** Of course, that will be a complete misunderstanding.

**Thea:** No doubt. But there will be plenty of radicals pushing psychology in a scientific direction at the expense of human values, and plenty of fundamentalists screaming about our blasphemous denial of the immortal soul. Between them, it's hard to see how sanity could prevail.

**Guy:** Unfortunately, you're probably right. But this conflict has been brewing since the Enlightenment – since the mid-18th century. Now, once again, it's coming to a head.

*unconscious mind*

**Thea:** I suppose so. Freud certainly made it clear that the folk psychology, identifying the mind with its conscious beliefs, desires and intentions, had serious problems. He forced psychology to make room for an Unconscious that can resist, sometimes completely stymie the conscious will. But to this day, therapists still don't know what to make of the unconscious. The phrase "unconscious mind" still sounds like an oxymoron.

**Guy:** The idea of the brain as a processor of suggestion (rather than information) may help a bit. The concept of unconscious knowledge feels paradoxical, while that of suggestions automatically turned down or acted on does not. We have no trouble accepting that many actions are unconsciously initiated and guided, not because of cognitive dissonance or repression, but because they are done more efficiently without conscious intervention. Driving and the detailed control of speech are good examples: complex cognitive functions for which no conscious-ness is needed.

**Thea:** When you stop to think about it, it's amazing that you can drive a car on a downtown street and carry on a conversation at the same time. Clearly, in this case, a mind is managing two very complicated activities at once, with the details of both completely unconscious.

**Guy:** Yes. We should not have made the blunder of identifying mind with consciousness. Most of what we do is coordinated and even triggered beneath the level of consciousness. And it's clear that animal brains can handle very complex tasks without being conscious in anything like the human sense.

**Thea:** But normally, we think of our actions as deliberate. We go after something because we want it, or avoid it because we don't. We understand each other as doing things for reasons – usually, for fairly rational reasons that we're at least partly aware of. We resist the idea that our thoughts and actions have causes. Or worse, that those causes are hidden and irrational.

**Guy:** Reason and cause are different modes of explanation. Just like causes, many of our reasons are conscious; some are not. We seldom think about the ultimate causes of our actions. And when we do, we find no clear answer.

**Thea:** Certainly, as a therapist, I know people often do things for reasons that they cannot own or recognize. I'm aware of folk psychology's limitations. I'm just not happy with your physiological replacement. I know this ecoDarwinian paradigm excites you, but it leaves me cold. Its reductionist program is not what therapists need! Our clients surely don't want to hear that their minds are disturbances in a soup of chemicals. Nor will it help us to think of them in those terms. Psychiatrists, treating physiological disturbances of the brain, may need that language. We talking-cure psychotherapists need to think about our clients in ordinary language terms.

*ecoDarwinian psychology is not reductionist*

**Guy:** But even the professional distinction you've just pointed to depends on this new language!

Anyway, I think you miss the point if this physio-logically-grounded psychology strikes you as reductionist. The idea is certainly not to show that life and mind are nothing but disturbances in a soup of chemicals – rather that the soup has wonderful properties – much more wonderful than had seemed possible.

**Thea:** Yes, the glass is either half empty or half full, depending on how you look at it. But either way, there's just half a glass to drink. If your story is true, the concept of mind is much diminished – no longer master in its own house.

**Guy:** Why would you think that any story scientists might tell about the mind would spoil that word's common usage? Why should we drop such a convenient word, however much we learn about its relation to the brain's functioning? This conversation and our whole relationship is a meeting and sharing of minds – surely not a sharing of brains.

**Thea:** You can say what you like. The fact remains that science has taken an idea of mind that was familiar, intelligible and comfort-able, and put a very difficult one in its place.

**Guy:** That is true. But science has done that right across the board. Many people think of science as a bag of tricks to help us live more comfortably and kill more efficiently. Much more fundamentally, however, science helps us understand what is and is not possible, and it replaces a magic-filled world conceived on the human scale with a world too vast and complex for human comprehension. This replacement began with Copernicus and Galileo, took shape with Newton, reached a turning point with Darwin and is now in a gathering crisis (the crisis we call "post-modernism") because the cumulative progress of science is overturning not just our world-view but our fundamental self-understanding.

**Thea:** I thought post-modernism was rather passé by now.

**Guy:** I see post-modernism as a double shockwave. The first, hitting intellectuals around the last decade of the 19<sup>th</sup> century and the general public with the First World War and its aftermath, was a cumulative outcome of Darwinism in biology, the scandal of interpretation in philosophy, and relativity and quantum theory in physics – (compounded by the exploding complexity and root-lessness of daily life). It was the end of the Newtonian clockwork

universe; and of a rational world governed by a single master narrative: Pluralism and relativism (not the same at all) were common responses to it. By now, I think these ideas have mostly been absorbed. Not that any consensus has been reached. Rather, this first wave of post-modern ideas have become familiar, and various positions toward them have been staked out.

But a second shockwave, from ideas still mostly in the laboratory, is on its way. The impacts of ecology, bio-technology and what I'm calling eD psychology and sociology have still to make themselves felt. When they do, we'll find that the old ideas of ourselves, as soul, spirit, mind or will no longer serve except as metaphors – poetic images. Good metaphors, useful metaphors for most everyday purposes, but no more than that.

**Thea:** My fear is that we may be left with no coherent self at all.

**Guy:** We'll have to give up the idea of the self as a metaphysical entity. We'll need to embrace ideas about the self-organization, self-presentation and self-understanding of a human animal – akin, in some respects, to the *no-self* doctrine of the Buddhists.

But the concept of self will keep at least two clear meanings: On one hand, as a grammatical convenience, a way of pointing to *this* human creature – *this* loosely stable living process with its nervous system configured and functioning in some particular way, as when we speak of ourselves in the first person. The same word also refers to a self-concept – an idea that a human creature sustains of itself – a cognitive construction that may be life-furthering or life-constricting, realistic or deluded. In this second sense, the self is a personal interpretation or story about the first sense. It's what you understand yourself to be. Of course, these concepts are also invoked when we deal with or refer to other selves – in the second and third persons. These senses of the word “self” are the only ones left standing, but I think they're all we need. What disappears is the redundant notion of an *essential* self – a perdurable self-within-the-self that watches your life unfold and takes decisions for you.

**Thea:** That seems a pity if it's true. Don't you think we're poorer without that idea of an essential and eternal self?

**Guy:** No. I think we're better off without it, with more leeway to understand and re-invent our lives. Besides, if you care to think of it that way, the self remains as “eternal” – outside of time – as ever. For all eternity, you always will have been what you are now. And if you cherish the fantasy of an *essential* self – placed and sustained by God, you're free to keep it, like any other pet fantasy. Just remember that it's your own – or one you share with a certain cultural community. The superstition and danger lie in confusing cherished fantasies with universal truths.

**Thea:** Well, maybe. But what will it mean for us when mind is no longer a mystery – just an ultra-complicated, dimly-understood process?



*the program of ecoDarwinian psychology*

**Guy:** That I can't tell you yet. No one could. The best answer anyone could give now would be no more than a guess. We're talking about the outcome – and ultimate human meaning – of an enormous, cross-disciplinary research program to understand minds and societies as co-evolving ecologies, and ultimately as a single self-organizing system.

**Thea:** That should take a good few years of research.

**Guy:** Obviously. Perhaps that may be the best answer to your question: This eD paradigm is opening a research program that was not previously conceivable with potential rewards, hazards and costs that are only just now entering public discussion. This program's aim is probably too vast to be fully realized even by a whole society's collective effort; and it is surely beyond the reach of any individual. But even knowing what questions to ask is already valuable, powerful and dangerous.

Early scientists aspired to read the mind of God in the order of Nature. Understanding the world of Mind as an evolving, self-organizing system (however dimly this may be possible) is as close as we're likely to come to this tremendous dream.

**Thea:** At the price of removing the idea of a divine mind behind Nature.

**Guy:** At the price of conceiving Nature's "mind" (if that is the right word) in evolutionary and ecological terms, just as we're learning to understand human minds.

**Thea:** What does this research program involve? Can you sketch it for me?

**Guy:** I can describe what I've understood of it:

- 1) Its basis is the eD paradigm itself. As the Bible's creation story already grasps, the emergence of order from chaos is the fundamental mystery to be explained. We want to know how the structures of the known universe – particles, atoms and molecules, galaxies, stars and planetary systems, cells, living organisms and ecologies – came to exist. It seems now that general principles of self-organization govern the emergence of structure at every level, so we want to understand those principles, and how they work.<sup>4</sup>
- 2) In particular, the human body, in one finite, fragile envelope, is a vastly complex self-organized system that we would like to understand for medical purposes if nothing else. The key question here is the relation between genes and traits – the precise role of genetic information (and whatever else) in specifying and/or building a living organism. The central question is: how does a whole organism manage to build itself out of a single fertilized egg?

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<sup>4</sup> See Talk #2.

- 3) One aspect of this same question is the riddle of organic individuation<sup>5</sup>: Why is the living world comprised (for the most part) neither of separate individual cells, nor of a single inter-cooperating mass? Why, in the biosphere as in human societies, do we see so many individual organisms, like “profit centers” of a vast business enterprise, with a high degree of local autonomy and awareness of self-interest? To what extent and in what ways is the organism’s autonomy constrained? What are the strengths and weaknesses of autonomy vs. coordination as biological design choices?

**Thea:** The Gaia hypothesis would have it that the whole biosphere really is a single inter-cooperating entity.

**Guy:** In a sense, perhaps it is. In what sense, precisely, we don’t know yet. But we can now say that systemic order of any kind depends on communication – on the transmission and uptake of coor-dinating messages. To get a handle on such communication we’ll need a general theory of control and communication. My own notion, (I’ll tell you about it sometime)<sup>6</sup>, is that the concept of suggestion is better suited than that of information to the needs of biology and cognitive science.

- 4) But, however communication theory goes, the “hard problem” (as neuroscientists call it) is this: How do cognition, adaptive intelligence and consciousness arise through the inter-ommunication of components that are not themselves intelligent? The human organism as a whole is obviously more sentient, versatile and intelligent, than any individual nerve cell. Barring a supernatural, dualist explanation, sentience must be an emergent feature of the whole system. We want to know how this happens. Even before we know the details, we need to see how it is possible.<sup>7</sup>
- 5) Adaptive learning requires that our brains configure themselves not only in response to the promptings of their genes, but in response to the stimulation they receive, both from the external world and from their intricate self-monitoring. There’s a significant analogy between the adaptive learning of an individual organism and the collective, genetic learning of a species. In both cases, there is a process of trial and error, with increasing frequency of some patterns and diminishing frequency of others. The question then is: How are our skills and memories related to physiological changes written by experience onto the brain’s fine structure? How does it happen that some neuro-cognitive patterns get reinforced – grow stronger and more frequent – at the expense of others?
- 6) A related question concerns the functioning, predispositions and predilections of a human brain, apart from any such personal learning. What

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<sup>5</sup> Discussed by Richard Dawkins in *The Extended Phenotype*.

<sup>6</sup> See Talk #3.

<sup>7</sup> See Talk #4.

is the nature of human nature as such? Until recently,<sup>8</sup> the mind was thought to be a kind of reasoning engine – a “blank slate” waiting to be written on by culture and experience. Cultural relativism relies on such an assumption to argue that different cultures are incommensurable, and that cross-cultural comparisons and value-judgments are meaningless. But this “blank slate” model turns out to be mistaken. Human beings come equipped with numerous instinct patterns, albeit diffuse and general ones, that shape (and are themselves re-shaped) by the patterns of culture. In an increasingly global society, we need an understanding of such pan-human instinctual patterns as a basis for dealing and dialogue with persons of different cultures. We also need a theory of human nature for the purposes of psychotherapy and social science.

**Thea:** Maybe so, but with a large reservation: The therapist has to take her clients as she finds them, with human empathy and as few preconceptions as possible.

**Guy:** I agree. But is it possible to do good therapy without some well-worked-through understandings of human nature – shared with the client as appropriate? I would guess not.

**Thea:** I don't know. Go on.

**Guy:** 8) In support of our findings on human nature, we want an account of hominid evolution and the selection pressures driving it. We want to know not just what we are, but as much as we can of the conditions that made us so.

9) Finally, then, under this new paradigm, the minds of individuals, groups and even society at large can be seen as ecologies of a sort – open systems of co-evolving cognitive and relational structures. This approach may have much to offer the social sciences, including many new questions and ideas about culture, social organization, economics, politics and government. We might then expect new approaches to historiography, and even some not altogether fatuous theory of history. All from looking at the human mind as a biological process.

**Thea:** This program is, perhaps, just a little grandiose?

**Guy:** Admittedly. And much of it may be fantasy, rather than feasible science. I doubt we will ever know in detail what is happening in the brain of a person writing a poem, or even driving a car. Similarly I doubt we will ever know precisely how a fertilized egg with a particular genome develops into a particular individual, or why two identical twins are ever so slightly different. The necessary data collection and simulation may be just too complex. But we may hope to understand such processes in general terms. I would also reply that the aspiration of science to read the mind of God in the book of Nature was grandiose from the beginning.

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<sup>8</sup> Following the ideas of John Locke.

**Thea:** I have my doubts, though, about Darwinism as an adequate explanation of life and the biosphere. That's not to say I believe in a God who created the world in six 24-hour days and rested on the seventh. But I doubt that random mutation and natural selection alone, or even "self-organization" as you call it, can account for the design of living organisms, and the complexity of their interactions. I'd like to hear why you think they can.

**Guy:** In general, I'd like to tell you what I've been learning, and get your take on this stuff – if you're interested to talk about it.

**Thea:** I'm interested. If this new psychology is going to make a splash in my field, I'd like to know about it. I'm not terribly happy with it, is all.

**Guy:** Well, I'll try to cheer you up, if I can. As I see it, the ecoDarwinian paradigm brings at least two pieces of good news.

**Thea:** Namely?

**Guy:** First, the Newtonian idea of a clock-work universe running down toward entropy is now history. In its place we have something much more interesting and more receptive to life. It is likely now that life – even intelligent life – is not just a freak accident, although chance certainly played, and continues to play, a large role. But there is reason to think now that life belongs in the universe, and comes into being eventually when and where the conditions are right.

**Thea:** That is cheering. And the second bit of good news?

**Guy:** That although we are not absolutely free spirits, neither are we just "meat robots" programmed by our respective cultures. There is such a thing as personal autonomy, and it is not trivial. Culture is a crucial shaping influence but no more than that. Biology makes us human; culture shapes us as acceptable members of this or that tribe. But to be human entails a history of autonomous responses both to one's humanity and one's culture.

**Thea:** Well, since we must all rejoice in something, that may have to be enough. Please tell me more – but some other evening. I can't absorb any more tonight.