On the Edge of Chaos: Complexity and Ethics

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> *Yes, in this step, we give up our dominion over the earth. But we regain nothing less than the wonderful complexity of existence, and, at the deepest level, a reunion with our prodigal and deepest selves.*
>
> —Susan Griffin[1]

Setting Out

In this explorative paper, I shall consider what kind of ethical theory befits the picture of the world that the mathematics of complexity, also known as dynamical systems theory,[2] describes. This work is premised upon the notion that what we think how best we should live (a moral question) is informed and shaped by what we think the world is like (an empirical question).[3] However, I must also set the expectation aright and apprise my readers that a full and detailed exploration of the proposed topic is not possible in this limited space. For one thing, I cannot go into a full exploration of complexity theory, which is quite complex and involved, even if I could do it full justice! For another, ethical theorizing, too, is very complex and involved. This paper, then, has to be a preliminary and tentative exploration, guided by a specific aim. My aim is to see how complexity theory may help us to envision an ethical paradigm that could take us out of the prevailing and entrenched mode of control, domination, and exploitation so characteristic of human presence on our planet today. To this end, I shall explore a

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few key notions or principles found in complexity theory, such as nonlinear causality and unpredictability, priority of relationships and emergent patterns, interpenetration rather than linear connection, and draw ethical implications from these.

Ethics and Worldviews

Roughly speaking, there are two contrasting accounts of morality: one account conceives of morality in ahistorical terms, transcending time and place, and being inscribed in some kind of original human nature. Call it the absolutist or deontological view of morality. For those subscribing to this view, morality does not change just because times and places change. What is right is right no matter what, where, when, and how, in addition to for whom. The other account, typically known as moral relativism, sees morality as totally tied to the contingency and historicity of the local ways and views. For moral relativists, there are no universal and absolute moral norms or standards of practice to appeal to when we face conflicting moral views and ways in the world. Of course, these two opposing accounts are not the only available ones. Stretched out between these two extreme positions is a spectrum on which a whole variety of moral accounts exist. I am interested in position on this spectrum an account of morality informed by the complexity theory, also known as the chaos dynamics theory. We may call this account an ethic of complexity.

In making a case for an ethic of complexity, the first argument I shall make is against the absolutist account of morality. Morality is not about some unchanging, universally valid prescriptions on how to live our lives. That morality tells us, or should tell us, how to live is not the problem. Indeed we should expect morality to be about just that. We expect our morality to guide our actions towards our individual and collective well being in the world. We want it to be able to advise us whether what we are doing is right or wrong. Also, it might very well be that all human beings, regardless of where they live and what cultures they are born into, want certain things from life as their most vital needs. We all want love and care, and food and shelter. But not everyone wants the same institutions of love and care and arrangements for food and shelter. The difference concerning these cultural traditions, institutions, and socio-political arrangements has to do with the way we as individuals and collectives construe the world—its historicity or the *Geist* of the time, life's conditions and purposes, and underlying all these, some sense, however vague and unarticulated, about the fundamental nature of the universe, life, and humanity. Call the latter the worldview, or, if you like, *Weltanschauung*. The absolutist account of morality ignores this essential connection between the views we hold about the

world and what we think is the best way to live. It is unaware of the connection that R.D. Laing succinctly observes: "As we experience the world, so we act." [4]

Our intellectual history—and we should not leave out our pre-history—amply demonstrates that humanity has been entertaining a wide variety of worldviews, indeed something like a fashion show of worldviews, since antiquity.[5] What should follow from this observation is that our moral views must have been changing, too, to reflect our changing worldviews. That indeed this is the case is again amply demonstrated when we historically survey different cultural and societal groups' and their subgroups' changing codes of ethics. For example, it was morally wrong in most cultures in most of the times to treat women on an equal basis to men. People believed in the natural inferiority of women to men in most respects of life functions. People even believed that women could not be as morally developed and competent as men. In some parts of the world, these beliefs are no longer held but in many other parts, they still are. Another example: Consider the status of homosexual unions from culture to culture today. Yet another: Consider the variety of spiritual views, including atheism. Those who believe in personal gods must have a profoundly different sense of the world they live in from those who do not. Examples abound.

Moral relativism at the other end of the spectrum is equally unviable as a moral theory, not because it ignores historicity and local contexts, or does not admit a variety of different worldviews, but because it lacks a moral rationale. In a pure version of moral relativism, we have no moral reasons to choose one moral view over another. If we were so inclined to choose one, it would have to be for non-moral reasons like convenience, prudence, habit, or sheer personal taste. But an account that cannot provide a moral rationale as to why we should be moral or what it is to be moral (as opposed to being prudent, for example) cannot qualify as a moral account. Moral relativism in this pure version is no theory of ethics at all. 'Moral relativism' is an oxymoron.

An ethic of complexity is both informed by a worldview and has a moral rationale of promoting human and planetary well being or flourishing. [6] A special feature of this particular worldview is that it is drawn by the contemporary Mathematics and Physics. Of course, this fact itself is no special reason why we should endorse the ethics of complexity. I am not implying that Physics and Mathematics have a privileged authority over the matters of morality! But whether we like it or not, our Science and Mathematics do present us with compelling pictures of the world. Especially, because these pictures presented to us are considered true descriptions of the world, they hold enormous prescriptive power over us. Such has been the case with the picture of the world according to the Mechanical Universe that has domi-

nated the last few centuries up to the present. This picture is the foundation of the modern, westernized world. Today, there is every sign that the world we have created according to the blueprint of the Mechanical Universe is ecologically deteriorating, socially disintegrating, economically declining, and psychically alienating. How much more reason do we need to want to change the hegemonic picture of the universe? It is noteworthy that it is from within the traditions of Mathematics and Sciences themselves that an alternative picture is developed: the dynamical systems theory or complexity theory. But what is the worldview of Mechanical Universe?

Substantive Universe versus Relational Universe

Many of us perceive that the modernist Industrial worldview that has dominated our thinking and action in the past three centuries is not viable, has come to grief, and that we need to radically alter or replace it by a different understanding of the world and what we are doing in this world. Whether this different understanding comes under the name cybernetics, systems theory, quantum mechanics, or chaos and complexity theory, names aside, they all are signaling an end of, or an end to, a certain metaphysical picture of the world that has guided our perception, thinking, and consequent action for a few centuries.[7] Again, there are many names for the to-be-rejected worldview: Cartesian dualism, anthropocentricism, instrumentalism, Mechanical Universe, and so on.

Central to this latter view is a metaphysical picture of the world that exists independent of our subjective experiences like sense perceptions, feelings, emotions, intentions, and values. In short, it is a world of extension, not a world of intention, a world in which consciousness and quality, experience and relationality, have no legitimate and proper place, a place of honour, but only a shadow existence in the chimerical realm of the imaginary, scornfully labeled by many as "the subjective." To arrive at the objective world of extension, which is deemed to be truly "real," as opposed to the subjective world of the "apparent," what we have to do is to categorically separate mind from matter, objects from subjects, and the perceiver from the perceived. This is the first step of "purification," the end result of which is the fragmentation of our lived world.[8] The next step in this process is to impose a value scheme of privileging the objective and debasing the subjective. Thus the pursuit of so-called hard sciences that deal with the observable and measurable became socially privileged. The core reason for the privilege here is the ability to control and manipulate matter. In other words, it is the privilege of coercive power. Scientists are the privileged ones who wield coercive power. But matter over which such power is wielded becomes degraded, having been rendered inanimate—dumb, mute,

and insentient. In the words of Raimundo Panikkar, we torture not only animals and human beings but also Matter. Of course, we do not see our domination and manipulation of matter as torture since we see it as totally inanimate. But this seeing matter as inanimate is the work of the worldview we have termed as Mechanical Universe. There is a direct relationship between the present day ecological disaster that is blighting the whole planet and this worldview of Mechanical Universe.

There is another dimension to the damage, as I shall explain. The objective world is composed of separate, independent, discrete, bound, therefore, measurable entities called objects. A universe primarily composed of objects is not a relational universe. Any changes that occur as these objects hurtle through time and space are externalized: they are not the intrinsic part of these objects. Objects themselves do not really change: their essential, core identity remains self-same. Only their circumstantial arrangements change. If we call these arrangements relationships at all, then change happens to the relationships but not to the objects themselves. In this picture, there are two different categories: objects and relationships. But what if we were to see objects as nothing other than or separate from their dynamically changing relationships? Is this not in some sense truer to the nature of experience? Speaking of our selves, why postulate an adventitious entity "I" apart from the matrix of relationships that the "I" is embedded in? Just because we are conditioned to see the world that way is no indisputable reason to affirm it as absolute truth. We can always learn to see the world differently, if we need to. From the eco-ethical viewpoint, the need has to do with how well we as the whole planetary system are doing. Is there a sense of mutual flourishing or not?

In the relational universe, to speak of an object is to speak in a shorthanded way of the patterns of complex, dynamically interpenetrating relationships. These relationships are dynamic, non-linear, hence non-deterministic. The relational universe is not the world of discrete, atomistic objects that behave deterministically, therefore predictably, according to linear causality. As A interacts with B, the identity of A changes to reflect its interaction with B. Likewise for B. As A and B continue to interact with each other as well as with innumerable others, changes to their "identity"—perhaps it is more accurate to speak of "multiplicity"—complexify beyond measure, beyond prediction. When something undergoes continuous transformations, it is misleading to speak of the entity as *having* relationships, as if there is this self-same, unchanging entity whose interaction with the world results in external, circumstantial changes only. This impression is illusory. The changes are internal, changing its very identity, subtly or fundamentally. We *are* our relationships. We are nothing other than our relationships—with each other, with the world.

Control and manipulation ideally require a linear universe that runs deterministically, hence, predictably. We cannot have successful control over a non-linear universe. Thus, Mechanical Universe is a perfect fit for the modernist project of control and manipulation, which we have been seeing for the past three hundred years all in the name of Progress.
What does it mean to be a human being, a person, in a relational universe? How does one human being relate to another? What is it for relational human beings to have responsibility towards each other? With questions like these, we are entering the domain of ethics. In the next section, I want to make the case that the ethical paradigm that befits the relational universe defies control, domination, and exploitation.

Nonlinearity and Relational Ethics

The notion of control has no meaning if it is not backed up by predictability. We cannot have control on something that is unpredictable. The more predictable something is, the easier it would be to control it. Conversely, if we want to control something, then we would first have to render it predictable. Given this logic, if we wanted our way in the world to be control, domination, and exploitation, then we would want a predictable universe.

Predictability is a property of linear causality. We can predict precisely what will happen if only causality worked linearly, with no uncertainties and surprises, without creativity, since the conditions that determine what will happen would always and already be contained in what did happen. With linear causality, we can deduce, hence calculate, any future event from its prior conditions. Hence, linear causality operates in a deterministic universe. This is the universe that Descartes and his contemporary scientists and philosophers pictured. They entertained the notion that the day would come when we would have precise mathematical calculations of how everything worked in our universe. We can predict the future from the Omega point of creation, be it God or the Big Bang. Such was Descartes' dream.[9] The dream continues to this day.

What if we were living in a non-linear universe?[10] Non-linearity is a property of an open system "far from equilibrium," to use Ilya Priogine's phrase. Contingency and instability characterize such a system. "Catastrophe bifurcations," forking points of alternate reality and choice, abound. Nonlinearity implies impossibility of total predictability. This does not mean we live in a random universe. Between complete predictability and complete unpredictability there lies a vast terrain of chance and intervention that are not predictable but not without patterns. These patterns, though not formulas or templates, and though not amenable to calculation, reveal an underlying complex order in the phenomena under observation.

Now, in thinking of patterns in complexity theory, our tendency is still treating patterns as if they are properties of things out there. We objectify them. It is not just laymen who think this way; it seems scientists and mathematicians themselves often slip into this mode. Let us not forget that patterns are something that is perceived. Patterns are not independent of perception, which means that the perceiver's act of perception and interpretation is part of the pattern that is perceived. Perceiver sees patterns by way of creatively integrating, therefore transforming, elements in the environment. In the phrase of Gregory Bateson, these are "patterns that connect."[11]

Seeing patterns implies the participation of the perceiver, the subject, in the perceived, the object. It is an act that psychologically transcends the subject-object duality and its inevitable power differential of privileging the subject and debasing the object. It is an act that brings about a sense of co-emergence or unity of the subject and object. Through such acts of intersubjectivity, a relational ethic is born. Ethics do not just tell us what to do; they shape who we are by shaping our consciousness, the very mould of perception. A relational ethic shapes a participatory, that is, intersubjective, mind.[12] In contrast, the ethics of subject-object duality sets up the power differential between the subject and the object that naturally leads to an instrumentalist, exploitative consciousness of seeing the object as merely a means to the subject's end. The object only *exists for* the subject, not for itself.

Seeing patterns that connect requires a type of cognition that is different from the mathematico-logical thinking in linear, analytic operations.[13] The latter is the domain of propositional knowledge where Cartesian clarity and certainty are cherished and pursued. It is a form of knowledge that is best achieved through abstraction and disembodiment, and the resulting externalization or objectification of the other. The knower has to abstract herself from the known by removing any feelings and emotions—the sign of psychic interpenetration—that the presence of the other might evoke. But for seeing patterns that connect, one needs to do the opposite: sensuously and feelingly embedding oneself in the perceived phenomenon. We can see patterns that connect, not because there are pre-given patterns presented to us but because we can be part of, not apart from, the emergent patterns that integrate the whole. *Gestalt* is what we are talking about here. The emphasis here is that we have to be part of the pattern to know the pattern. Let us call it participatory knowing. The key aspect of participatory knowing is that the "knowing subject" or the "seer" has to become part of the phenomenon encountered, become embedded and embodied in the context and be epistemically intimate with it. Here, the "object" ceases to be something that lies outside the subject, "out there," independent of the perceiver, but becomes a phenomenon continuous with the self and

unfolds creatively through the self's perception. In this way, the knower is part of the equation of what will come to be known. The observer becomes a part of the observed. And vice versa. Contrast the above to the representationalist conception of knowledge. [14] Here, the object is understood as a source of pre-given information ("data"), and the task of cognition consists of the knower retrieving the data. But this notion of pre-given data is epistemologically problematic for the simple reason that, insofar as we are dealing with human cognition, such as perception here, it makes no sense to speak of the world independent of the knower/perceiver. We can never catch the world outside our cognition, can we? We cannot step outside our cognition to witness the world independent of ourselves. By the same token, if it makes no sense to speak of being outside cognition, neither does it make sense to speak of being inside cognition. If we must speak of the knower and the known, inside or outside, the least we can do is to speak of the co-arising of both parties, moment by moment.

Ethics is not just about how we act. For, how we act follows from how we think and perceive. Hence ethics is intimately tied to epistemology. The representationalist conception of cognition leads to what we may call the ethics of power where the subject wields control and manipulation over the object, naturally leading to exploitation and violence, whereas the participatory conception of cognition leads to the relational ethics of the co-emergence of the subject and the object.

Principles of Relational Ethics

In the Mechanical Universe of linear causality, relationships are external to a person. We *have* relationships but we *are not* relationships. The difference between seeing oneself as *having* relationships and seeing oneself as *being* relationships has many profound ethical implications. In this penultimate section, I shall attempt to draw a few of these and present them as principles of relational ethics.

In acting, we inevitably bring about changes in the world. Changes are the result of our interpenetrating the world. In assuming an externalist—that is, representationalist—viewpoint, we think of the change we seek in the world in terms of what we have to do *to* the world. This tendency is everywhere, whether we are talking about our interpersonal conduct or our environmental treatment. We think in terms of doing something to the Other, the object, to fix our perceived problems.

The tendency to externalize (in psychological terms, to project) our problems, that is, seeing the problems as being *out there*, residing with others, predisposes us to interact with the world in the mode of control, domination, and exploitation. The latter is what happens when the self-other di-

chotomy is set up and the self sees the other as having a problem or even being the problem. I would argue that the deontological ethics, the mainstay for our moral orientation, befits this externalist psychology. Rules, maxims, regulations, and policies: they are often imposed on others to control and manipulate their behaviour.[15] In contrast, if the other were seen as an interpenetrating matrix of relationships, and thus forming an *inter-being*[16] with the self, and the self is seen likewise, then, likely, we would not think of our action in the world in terms of controlling the other but in terms of establishing a union between the self and the other. It is through working within such integration that there may emerge a desired pattern of interaction for both parties. I proffer this establishment of inter-being as the first principle of relational ethics.

The second principle that I shall present is generosity. Of course, we all know that we ought to be generous. It is a supreme moral virtue. However, in the relational ethics pursuant of the non-linear causality, the principle of generosity is derived from the conception of responsibility that coheres with non-linear causality. Who is responsible to whom, for what, and to what extent? This nested set of questions is central to any ethical discourse. In approaching these questions from the viewpoint of complexity, we need to first of all abandon the usual expectation that there has to be a precisely determined answer to each question. How could there be such an answer if there is no completely determinate, simple, unchanging 'who'? The notion of inter-being, that is, interpenetration of the subject and the object, the knower and the known, makes such accounting impossible. Or, we should say, whatever accounting system we adopt for figuring out who is responsible to whom, and so on, is not absolute but only relative to the moral purpose we want it to serve, which in turn will open up a meta debate about the merit of such purpose itself.

It is well to note that such evaluation would be difficult and challenging. In this evaluation, there is no certainty, absolute truth or rightness. One is continually surrounded by a shape-shifting penumbra of ignorance. Yet the need for us to take up responsibility remains to the extent that one knows that how one acts in response to the world changes the world. To those of us in tune with the complexity universe, we are mindful that what seems only very minute and insignificant may be causally linked to major, significant events later on. I'm referring to the so-called "butterfly effect" in chaotic dynamics. We cannot avoid responsibility because we cannot avoid responding in some ways to each and every person and situation we encounter and thereby affecting the world in some ways. The first requisite to being moral is to worry about the effects our action or very presence have in the world. It is to worry about the consequences of our responses to the world. Even a non-response can have a significant consequence. But as lim-

ited beings operating in an under-determinate, non-linear universe, we can never know with certainty how our action will affect the world. Given this ignorance, how should one act as a moral being committed to human and planetary flourishing? Like a farmer who sows extra seeds just in case many do not germinate, one should strive to do more than what is conventionally required or necessary. This is the practice of generosity. Thus it is to compensate for the ignorance that we have to practice generosity. This is the second principle of relational ethics.

The third principle I want to present is universal beneficence. Again, it is derived from the thesis of inter-being, according to which all beings of the phenomenal world are relational beings, that is, not substantive beings, because they constantly transform through their interpenetrating exchanges. Through these transformations, the whole universe becomes one colossal, psychophysical dynamic system. If all phenomena interpenetrate through and through, then our tendency to seek and enact the good of one being in exclusion of the good of another is incoherent. That our economic, consumer world of today runs on this principle of exclusion and exploitation shows us just how far we are removed from the perspective of inter-being. Today, the notion of self-interest has found a secure home in the mainstay ethical discourse. Looking after one's self-interest, even if in consideration of others' competing self-interests, is accepted as a self-evident moral stance. But, as pointed out above, this ethic of self-interest goes against the thesis of inter-being for the simple reason that the belief that there is a unitary, separate, atomistic ego-self who looks after his or her individual interests is delusive. What makes most sense in the worldview of interpenetration of all beings is universal beneficence. However, this does not mean that practically we as materially limited beings can bestow equal care on all beings. Enaction of any principle is always constrained and compromised by the local and the personal circumstances. We are then compelled to choose and prioritize. But this is a practical limitation that does not diminish or dismiss the principle itself. In living by the principle of universal beneficence, each person enacts it in his or her particular terms of circumstance and abilities.

Arriving

I am drawn to the complexity theory, not just out of intellectual curiosity, but out of the sense that an ethical paradigm or orientation pursuant of this theory promises a better world in the sense of being less entrenched in control, domination, and exploitation that mark the present humanity's presence on the planet. This last has been a century of violence and damage at a scale that is simply beyond belief. Must we continue on this course of carnage and destruction into this current century? Facing the sheer magnitude

of depravity, I can invoke either the evil human nature or the erroneous belief system. The former evocation leads to no fundamental change. I am more hopeful about the other interpretation. What has been learned and conditioned can be unlearned and de-conditioned, even if difficult. This is the province of Education. Education can have this most urgent and serious mission. Thinking thus, I find the present Education's preoccupation with stuffing students with increasing quantities of information and skills, all in the name of viability in a market economy, morally irresponsible.

Notes

1. Susan Griffin, "Daring Witness: The Recovery of Female Time," in *Revisioning Philosophy*, ed. James Ogilvy (New York: State University of New York Press, 1992), 59.
2. For a layman's comprehensive overview of the mathematics of complexity, or more technically known as dynamical systems theory, see Fritjof Capra, *The Web of Life: A New Scientific Understanding of Living Systems* (New York: Anchor Books, 1996), 112– 53.
3. Right away, we are confronted by the worries about naturalistic fallacy that says that we cannot derive a normative account of how we ought to live from a descriptive, empirical account of how the world is. For example, that we have gravity does not tell one that he or she ought not to jump off the bridge. My project in this paper, however, is not a case of such derivation. Rather, I will be arguing that there has to be coherence between the description of the world and prescription of how we ought to live in such a world. The view of how the world is, which is traditionally understood as metaphysics, sets up the parameter of meaningful and viable ways of thinking about our action in the world.
4. R.D. Laing, *The Politics of Experience and the Bird of Paradise* (Middlesex, England: Penguin Books, 1967), 117.
5. For example, see William Irwin Thompson, *Coming into Being: Artifacts and Texts in the Evolution of Consciousness* (New York: St. Martin's Griffin, 1996).
6. Unfortunately I cannot get into an explication of this justification here, but I shall mention that, at the foundation, there are two competing streams of ethical theorizing: good life versus moral rights. The good life discourse posits that the fundamental aim of morality is leading a good life, that is, how to live well. The moral rights discourse posits that the fundamental aim of morality is doing what is right. Between these two, I believe that the good life discourse is more fundamental than the other because the concern with the good is more basic than the concern with the right in the sense that the good, once we figure it out, can be the criterion for the right but the reverse does not hold as well.
7. Of course, exact dating is not feasible, nor intelligible. Nonetheless, if we go by the evidence of texts, we may locate the date of inauguration of a new worldview to be the 17th century when philosophers and scientists—notably Hobbes, Descartes, Galileo, Bacon—were rigorously arguing for a universe composed of inanimate matter, characterized as objective, measurable, quantifiable, and ruled by laws of mechanics. Whatever is not part of this universe of *extension* belongs to the unreality of *intention*—mere illusions that we may delight in as human beings but have no "real," objective value.

8. Here is R.D. Laing's incisive summary of the mental process involved in transforming the subjective into the objective: "(1) the ablation or elimination of some or all sense data; (2) the temporary suspension of any subject of cognizance; (3) the cutting off of any relation of intersubjectivity, or interiority; (4) the de-realization of any subjectivity out there." See R.D. Laing, "What is the Matter with Mind?" in *The Schumacher Lectures*, ed. Satish Kumer (London: Sphere Books Ltd, 1980), 9.
9. Philip J. David & Reuben Hersh, *Descartes' Dream: The World According to Mathematics* (Boston: Houghton Mifflin Company, 1986).
10. Fritjof Capra, *The Web of Life: A New Scientific Understanding of Living Systems* (New York: Anchor Books, 1996); Joanna Macy, *Mutual Causality in Buddhism and General Systems Theory* (New York: State University of New York Press, 1991)
11. Gregory Bateson, *Mind and Nature*: *A Necessary Unity* (New York: Bantam Books, 1979).
12. Morris Berman, *The Reenchantment of the World* (Ithaca, NY: Cornell University Press, 1981); Eric Havelock, *Preface to Plato* (Cambridge, MA: The Belknap Press of Harvard University, 1963); Henryk Skolimowski, *The Participatory Mind: A New Theory of Knowledge and of the Universe* (London: Arkana, 1994).
13. Guy Claxton, *Hare Brain, Tortoise Mind* (New York: The Ecco Press, 1997).
14. F. Varela, E. Thompson, & E. Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge, MA: The MIT Press, 1993).
15. To note, though, rules, maxims, and the like need not be and are not always used as devices of control and manipulations. True, they most often are, but they can be utilized differently, as learning and teaching tools that are consequently adopted by people for the purpose of each person cultivating a certain quality of being with himself or herself. Thus, use does determine the meaning of something, to affirm the spirit of Pragmatism.
16. Thich Nhat Hahn, *Peace is Every Step: The Path of Mindfulness in Everyday Life* (New York: Bantam Books, 1992).

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