

# Synergy, Meshworks, and the Nature of Anthropology: A Teaching Perspective

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Textbooks in general anthropology describe the subject as a holistic endeavor with distinct subfields. However, other than paying lip service to the concept of holism, most establish few fundamental links between the biological, social, and linguistic features of the discipline. In this paper I argue that four-field anthropology is best taught not as a set of layered blocks but as a meshwork of interacting layers of complexity. Moreover, the metaphor of meshworks in synergistic interaction changes not only how we imagine that anthropology's parts are integrated, it suggests a different philosophical orientation to the study of the physical, communicative, and social aspects of our world.

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Beginning anthropology courses as they are typically taught in the United States are either of a "general" type or they focus on one of the discipline's subfields: archaeology, biological anthropology, cultural anthropology, or linguistic anthropology. General anthropology is an especially difficult course to teach because it involves covering a vast expanse of numerous other vast territories, including under its heading such topics as genetics, taxonomy, biological evolution, prehistory, language structure and linguistic relativism, comparative religion, cultural variation, and globalization. With such grounds to cover, no wonder that many anthropology programs have done away with their general anthropology courses, replacing them with introductory courses that focus on the specific subfields. While some have abandoned altogether even the ideal of a general anthropology (Segal and Yanagisako 2005), general anthropology textbooks themselves tend to focus on each subfield as a rather separate entity, taught in distinct chapters. There is a key concept that is usually said to hold general anthropology together, however. This is the concept of "holism" and it is generally defined in the opening chapter of most books.

## **Holism and Holistic Assumptions**

Holism or a "holistic perspective" is described most simply in one popular textbook as a "multifaceted approach to the study of human beings" (Ember, Em-

ber, and Peregrine 2009: 3). The definitions from four other leading textbooks are more complex:

Michael Alan Park (2006: 15) writes in the third edition of his text that “anthropology is the holistic study of humankind; it searches for interrelationships among all the parts of its subject.”

In the twelfth edition of *Anthropology: The Human Challenge*, Haviland et al. write that a holistic perspective is a fundamental principle of the discipline that means “the various parts of human culture and biology must be viewed in the broadest possible context in order to understand their interconnections and interdependence” (Haviland, Prins, Walrath, and McBride 2008: 5).

Conrad Phillip Kottak (2008: 4, 19) states in the twelfth edition of his general anthropology text that anthropological holism refers to an interest in “the whole of the human condition: past, present, and future; biology, society, language, and culture.”

Robert H. Lavenda and Emily A. Schultz (2008: 3), in the most recent version of their general text, see holism as a “characteristic of the anthropological perspective that describes how anthropology tries to integrate all that is known about human beings and their activities at the highest and most inclusive level.”

These texts all agree that anthropology focuses on wholes and parts and the relationships between them. However, they also reveal a couple of biases. First, they all imply a bias against paleoanthropology and primatology in that they stress the study of humanity. Surprisingly for a field that is supposed to integrate knowledge, nowhere in the standard texts’ discussion of holism is the non-human primate world or a notion of deep heritage given even the briefest mention. Second, they do not say anything about process or dynamics. In general what Jeffrey Goldstein (1999: 52) says is true about the limitations of the term “gestalt” is true about the limitations of the term “holism,” namely, that both terms imply a pre-determined whole without any dynamic sense of emergence. The texts’ static language implies that the subfields can be studied as kinds of essential units, like layers of a cake that can be put back together additively. This way of seeing wholes may be related to the concept’s intellectual pedigree, especially to the rather peculiar set of assumptions in the original formulation. As the *OED* points out, the term “holism” was coined by the South African General Jan Christian Smuts to refer to what he saw as an inherent “tendency in nature to produce wholes (*i.e.* bodies or organisms) from the ordered grouping of unit structures.”

Smuts’ concept of holism, however, was by no means a static one; rather, it was explicitly evolutionary. Smuts particularly stressed the “whole” in holism because he thought there was some kind of “fundamental factor operative towards the making or creation of wholes in the universe” (1926: 98). While Smuts followed Aristotle in seeing that the whole can be greater than the sum of its parts, he followed Henri Bergson (1911 [1907]) in seeing evolution as an inherently creative process leading to progressive developments, with ever better “wholes.” Of course, one should be immediately suspicious of such epistemology. Those who know about Smuts know that, while on the one hand he was a key player in the founding of the

United Nations, on the other hand he was a leading segregationist and defender of white supremacy in South Africa. What made his apparently progressive “holism” square with his segregationism and his paternalistic racism was precisely this notion of the whole, for it is predicated on a deep essentialism. The universe is made of entities that are clear and distinct, with absolute boundaries, evolving to ever more clear and distinct entities. How nice for a person who believes in the essentialist nature of race, with his race at the pinnacle of evolution!

But must we implicate anthropological notions of holism in this essentialism? There is, of course, another version of holism that does not seem to have the associations that Smuts implied. Instead, this version is put forth as an option to reductionism. In this view whole systems cannot be completely known simply by breaking them down into their component parts. There is always a need to understand gestalt features of systems as well the details of their subunits. In other words, anthropology involves the study a variety of levels as well as how these levels combine. While in principle synthesis is always of interest, in practice there may not be very many rewards for looking for it. This is reflected in the fact that a kind of segregation of subfields is implicit in the structure of many general anthropology texts, although the text of Lavenda and Schultz does stand out for making a distinction between a holistic perspective on the subfields and holism as a “perspective on the human [sic] condition that assumes the mind and body, individuals and society, and individuals and the environment interpenetrate and even define one another” (Lavenda and Schultz 2008: 223). Yet, even still, this continues with the textbook anthropocentrism.

In practice anthropology’s division into subfields has led, if not to essentializing tendencies, then to an under emphasis on their mutualities and complementary effects. As a result, anthropology may be championed not as greater than the sum of its parts but as a whole made up of components that can be added simply together to produce the whole.

What I would like to advocate is that the idea of synergy be combined with that of holism to better convey how the domains of anthropological knowledge interpenetrate in a dynamic way. The word synergy itself, taken to mean the impact of combined effects—be they positive negative, or neutral—is rarely used in anthropology. Yet, leaving aside its legacy in Aristotle, concepts of synergy are to be found in the work of Adam Smith, Charles Darwin, and Emile Durkheim—as well as in the thought of such venerable anthropologists as Franz Boas (1962: 209-11), Alfred Kroeber (1952[1948]), Ruth Benedict (2005[1934]V. Gordon Child (1942), Gregory Bateson (1972[1942]), and Claude Lévi-Strauss (1967[1963]: 320-342). (For details on Benedict, see Maslow and Honigman 1970; for Boas and Kroeber, see Shanafelt forthcoming.) Philosophers, psychologists, economists, biologists, chemists, physicists, sociologists, and anthropologists have all contributed to a growing litany of terminology for specific kinds of combined effects, including such terms as gestalt, *mélange*, complementarity, mutuality, conjunction, economy of scale, side-effect, ecological relation, symbiosis, network, interaction, and the pooling of ideas. More recently, a type of synergy known as emergence has

become popular among some anthropologists (Mosko and Damon 2005, Beekman and Baden 2005), although the idea of emergent effects was already being discussed in the 1870s (Lewes 1874-75). Not unlike Moliere's *Bourgeois Gentleman* who discovered that he had been speaking prose all his life, many social scientists have long been speaking "synergy" without recognizing it.

Of course, as with holism, the concept of synergy is not without its problems, some of which are connected to its pedigree. As synergy theorist Peter Corning (2003:103-105) has pointed out, one of the problems is that it is an umbrella concept with so many implications and interconnections that they are hard to envision. A second problem is that the concept is too frequently thought of as having only positive effects. Unlike the wide-ranging definition given above that references all "combined effects," according to the OED the earliest documented usage of the word in English in 1660 was already linked with the positive, as it was synonymous with cooperation or "join-working together."

If synergy is to be useful it does need to be fitted into theory, with the most congenial probably being nonlinear dynamics or chaos theory. This is apparent because the interactions that anthropologists explore are not only greater than the sum of their parts; they are also interactions whose combined effects are not reducible to linear combinations of separable parts. Still, even if this sort of complexity is generally recognized as connected to the synergy concept, it is unlikely to revolutionize our understanding of basic causal mechanisms. Synergy is a descriptive concept rather than an explanatory one. Nonetheless, as a descriptive concept it can help us refocus our analytical gaze. While this is of obvious significance for reformulating both research and teaching, here I want to emphasize its value in teaching because, even though evidence of synergy is all around us, we have not been taught well enough to look for it or recognize it when we see it. Unfortunately, without the concept or at least what it represents we will continue to fruitlessly debate such false dichotomies as mind/body, reason/emotion, individual/society, and nature/nurture.

One example here is apposite. In a 2007 book, biological anthropologist and primatologist Barbara King undertook a brave foray into the question of the origin of religion. In her concluding chapters she castigates other recent scientific accounts of religion for being reductionistic, "gene-enamored," and for focusing too much on the mind as a self-contained, cogitating, entity (King 2007: 200, 204-208). In contrast, she develops a model that involves social and emotional mutuality and feedback between genes, the body and brain, and the external environment. Because all of these things combine in complex ways, our spiritual tendencies cannot be reduced to any one of them. "Too many modern evolutionary accounts of religion," she argues, "have lost a nuanced sense of what it means to be wholly social beings" (p. 210). In other words, King's alternative model is one that emphasizes what might be called "holistic synergy." Yet, neither she nor the individual scholars she critiques, or even favors, seem to have much appreciation for what synergy is, at least not in an explicit sense.

### **Holism and the Rejection of Approaches that Emphasize Combined Effects**

A little look at the history of anthropological pedagogy is useful for understanding how the teaching of a compartmentalized discipline developed and a non-dynamic sense of holism became so commonplace. The key to this is probably the influence of Alfred Kroeber, particularly with respect to the arguments he made about levels of complexity and the philosophical concept of emergence. In his heyday, from the turn of the century until the end of the 1940s, there were a number of theorists who were arguing with a measure of success, at least at the philosophical level, that the best way to view the natural world was in terms of levels of complexity in the physical, biological, and social realms. Emergence theorists saw new phenomena coming into fruition when different layers of complexity combined. As Peter Corning (2003: 32) puts it, “early theorists ... took emergence to refer to situations in which different parts merge, lose their identity, and take on new physical or functional properties.” University of Chicago anthropologist Robert Redfield in particular worked with a number of scholars in interdisciplinary efforts to bring social and physical sciences together in this way (Redfield 1942). However, although Kroeber participated in Redfield’s seminars, he rejected the views of emergent complexity he heard from other scientists in favor of an approach to anthropology in which subfield “layers” had to be kept distinct (Kroeber 1952[1948]). Particularly thanks to his widely read general anthropology text, (Kroeber 1948[1923]), Kroeber’s perspective became the norm for teaching anthropology. While it is outside the scope of this paper to provide further details here, in another paper I discuss in more detail the implications of Kroeber’s work as well as features of the thought of Boas that are misunderstood from Kroeber’s perspective on holism (Shanafelt forthcoming).

### **Biological, Social, and Cultural Forms are Meshworks of Synergy**

Anthropologists are interested in fundamental components of things, the patterns they form, and how they come together in particular cases. The traditional way of presenting this material is rather in the manner of how one stacks a child’s building blocks—one block stands atop the other, and there are clear and distinct levels. In most anthropology texts, the biological is seen as the bottom or foundation layer, with language, culture and events from prehistory and history built on top—although some may also present culture as floating rather autonomously above it all, thereby stressing the power of complex symbolic systems to shape the dispositions of the communities of individuals who operate in their terms. I argue in contrast that anthropology’s subfields are not merely separate domains that need to be looked at on their own terms. Anthropology should involve us in the study of crucial interactions and interdependencies across the divides. Despite the claims of Segal and Yanagisako (2005), evolution, primatology, and archaeology are not irrelevant to the concerns of cultural anthropologists. (And cultural

anthropology is relevant in the other direction.) All are fundamental to our understanding of what makes for our world and the world's potential trajectories today. But how do we convey this in a convincing way?

Teaching from an approach informed by the idea of synergy is similar to the building blocks approach in that there are layers of complexity, and complex forms are dependent upon the simpler components that make them up. However, the synergistic approach is different in that instead of thinking of the four subfields of anthropology as layers of blocks we think of them as a meshwork of semi-permeable domains with "strong mutual interactions (or feedback) between components" (Delanda 2000:14). While domain boundaries are still evident, a single domain does not stand alone; each is dependent on its history of interactions with others. And this talk of meshworks and synergy is meant to be more than a simple shift in metaphors. The contrast between a holistic block and a meshwork of domains relates specifically to a shift in underlying philosophy; meshworks are what complexity theorist Manuel Delanda calls "assemblages against essences" (Delanda 2006: 26-46).

I used to teach four-field anthropology as clear and distinct units. First I would talk about Darwin and Darwinism, then briefly outline the basics of DNA, genes, and simple inheritance patterns. I would follow this "bottom layer" material with sections on primate characteristics and then give details of the fossil record, human origins and physical variation--although I might change the order of presentation. Squeezed in immediately following this would be lectures on communication and the nature of language. After this, or along with discussion of the fossil record, would come a description of archaeological methods. Then we would move on to talking about types of human societies from an initial period of foraging, and look at some examples of key archaeological discoveries concerning the rise of social complexity. This would involve also a discussion of the domestication of plants and animals, technological innovations, and perspectives on cultural evolution. Finally would come the cultural anthropology parts, including the topics of participant observation, cultural and linguistic relativism, kinship, a few case studies, and recent trends in globalization. By the end of all this, I would have presented what I thought was a fairly complete description of the discipline, although this would be more in the form of an outline sketch rather than a three dimensional representation. If the English-language textbooks are anything to go by, this is more or less how most people have been teaching "four-fields" anthropology for quite some time.

To highlight the challenge of Segal and Yanagisako, we may ask ourselves just where is the unity in perspective we get when we know how a gene works, how a monkey grooms another, how a Mayan king was buried, how a Tibetan got married, how ritual items are exchanged in the Trobriands, or how status is marked in Japanese. The building block approach to holism leaves one to wonder what would be wrong with simply knocking the whole edifice over so as to better look at the blocks more distinctly at each level. Indeed, knocking over the four-field edifice seems just what many anthropologists today would like to do.

Teaching with the synergistic “meshwork” metaphor makes available a different set of images. Instead of thinking in terms of distinct layers of blocks, one describes layers of structures that are entangled together. Yes, the distinctions still remain, but we cannot so readily assume that the layers are free from subtle mutual influences. In my teaching today I try to present cases of cross-layer linkages not as exceptions but as keys to anthropological thought. They allow us to glimpse what Gregory Bateson famously called “patterns that connect” (Bateson 1980: 6-11) The connections of anthropology focuses on today highlight historical processes of identity creation, the permeability of boundaries, and interactions between small, medium, and large scales.

Let me discuss a few examples of how the meshwork and synergy imagery has suggested to me different ways to teach my “introduction to anthropology” classes. I put this discussion under the headings of: (A) DNA and cells as meshworks; (B) Links between molecular structures and complex social behaviors; (C) The entanglement of thoughts, artifacts, and societies; (D) Signs, symbols, and the Great Cultural Leap Forward; and (E) Power and the harvesting of energy. Although the first example of synergistic interaction under heading A, that between eukaryotes and bacteria, does often get a mention nowadays in textbooks, less discussed is the interaction between viruses and primate DNA. Other important examples of neglected synergies concern interactions between biochemistry and behavior. We can also step back and see some of the classic insights of sociology and anthropology in a different light from this perspective.

*Our DNA and Our Cells are Meshworks.* The cell has two distinct places where DNA is located. One place is in the chromosomes inside the nucleus. The other place is in the cell’s “power source,” the mitochondrion. According to Lyn Margulis’s well-supported endosymbiotic hypothesis, mitochondria have their own DNA because they were once independently living bacteria. Eons ago they were ingested by larger, single-celled organisms, with nuclei. Because some of these bacteria happened by chance to be only partially digested, and because they enhanced the metabolism of the larger organisms, they proliferated. We know this because a variety of the structures that make up the mitochondrion preserve evidence of their bacterial origin. Today we also know that bacteria cannot be understood as discrete and isolated entities. For example, some species communicate with one another and change their behavior accordingly in a process known as quorum sensing.

Our nuclear DNA, too, shows that the boundary between what we usually think of as inside and outside has been permeable. Viruses today affect our lives because they can invade our cells and hijack our DNA to make copies of themselves, often thereby making us ill. In evolutionary terms, it has sometimes happened that viruses get stuck inside the nucleus, but still manage to make deformed copies of themselves. In fact, some eight percent of our genome is composed of the remnants of viruses, called “Human Endogenous Retroviruses.” Elements of retroviruses are found throughout the animal kingdom, and their similarities and difference can be compared to give us a map of taxonomic relationships.

*There are Many Links Between Molecular Structures and Complex Social Behaviors.* The major job of genes is to tell the body how to link chains of amino acids. Amino acids combine to form proteins, and these are basic to our bodies' structure and functions. Some amino acids or amino acid chains also act to promote certain types of behavior. For example, a hormone called oxytocin (composed of a chain of only nine amino acids) is strongly associated with maternal behavior. (With respect to how evolution may work by "exaptation," we also have strong evidence of how this compound and the related compound vasopressin evolved and took on new behavioral functions from older ones associated with homeostasis.) Similarly, another peptide, prolactin, not only promotes lactation in mammals but in at least one New World Monkey, cotton top tamarins, there is a strong correlation between high levels of it and a male's propensity toward paternal behavior. Thanks to the work of such researchers as biochemist and primatologist Robert Sapolsky (2004; 1998) we know that other key hormones such as cortisol and testosterone do not simply cause behavior but that the behavioral environment itself may cause changes in their concentrations in the body.

Our knowledge of connections between the large and the small are increasing, and we best understand these in terms of interactions. We now know that, by way of triggering hormonal cascades, traumatic stress may damage the brain's hippocampus (and therefore memory), for example. Another prominent example that has gained a lot of attention in recent years concerns mirror neurons. Discovered by Italian researchers who were doing brain research with macaques, mirror neurons are networks of neurons in the prefrontal cortex that respond, or "mirror," the actions of another, firing as if the action was being performed by oneself (Rizzolatti et al. 1996). This suggests a kind of hardwired aspect to sociality and social intelligence.

None of these examples can be understood in a purely mechanical fashion. It is not the case that a chemical compound or a neuronal network causes a behavior in a simple linear fashion. There is interaction between external and internal environment here, and functions need to be understood as processes that have developed in deep evolutionary time.

*Our Thoughts, our Artifacts, and Our Societies are Entangled.* Before I began thinking about synergy, I would have interpreted the following passage from Emile Durkheim about the "public temper" simply as being about social causality:

We have only to notice what happens in a small town, when some moral scandal has just been committed. They stop each other on the street, they visit each other, they seek to come together to talk of the event and to wax indignant in common. From all the similar impressions which are exchanged, from all the temper that gets itself expressed, there emerges a unique temper, more or less determinate according to the circumstances, which is everybody's without being anybody's in particular. (Durkheim 1964: 102)

Notice that for Durkheim here causality is not merely downward from the social scale. What he is actually describing is a synergistic blending of individual thoughts in the formation of collective thought. It is not that there is a precon-

ceived social entity that causes thought. Rather, it is through the actual communicative process that a social opinion is created “which is everybody’s without being anybody’s.” Not only is the individual mind entangled in the social but the social is entangled in the meshwork of individual exchanges. Only in recent years do these insights seem to have become fully appreciated. Those who follow Bourdieu’s practice theory, for example, see cultural rules not as static abstractions but as forms that become manifest through action; and that which forms the patterns of our built world also works to form our psychological dispositions. More recently, with complexity theory in mind, Steve Lansing (2006) has demonstrated that the complex social organization of the Balinese irrigation system developed as a result of a similar meshing of individual and group communications, but in the course of a long historical process.

Configurationist views of culture also can be taught in fresh light if we think of them as synergies. Ruth Benedict, of course, was much influenced by the particular forms of synergy analyzed in gestalt psychology, but Lauriston Sharp’s classic case of the impact of the spread of the steel axe among the Yir Yoront (Sharp 1952) makes sense in these terms as well. Remember though, that the gestalt Sharp describes exists not in an autonomous realm of ideas but in the interplay of psyche, pragmatic tool, linguistic category, communicative acts, and others events and processes occurring at differing scales.

*Signs, Symbols, and the Great Cultural Leap Forward.* Archaeologist Philip Chase (2006) and biological anthropologist Terrence Deacon (1997), among others, have stressed that we need to look at the evolution of symbolic thought and language as emergent social phenomena. If we just think of the individual as a distinctly autonomous biological block, rather than as a socially constituted aggregate or meshwork, then symbolism and language do not make much initial sense. Symbolic representations have some real disadvantages from the point of view of the individual learner that are extremely difficult to overcome. Social animals that communicate by signs rather than symbols communicate information directly about the external environment and/or their internal states. They are thereby engaged in the immediate context. A major problem with symbolic representation is that it can be one or more steps removed from this direct experience. Language further removes us from direct connection with the immediate in that it is not merely about representation of the world but must also involve a complex set of symbol-to-symbol references. How did our ancestors jump over such a big hurdle as that between signs and symbolic processes?

To help resolve this difficulty, Chase makes a distinction between perception cued to a partially symbolic social code and perception enveloped in a fully elaborated culture. What he means is that the initial onset of symbolic representation required time to become established so that it took command of consciousness. So, *Homo sapiens* of 75,000 years ago may have engaged in some symbolic representation, but that representation was not yet sufficiently disengaged from the associations of the immediate context. Many continuous generations of cultural reproduction were required before a fully elaborated sense of symbolism could be sustained.

We need not go into further details here. The point is that a capacity for an intelligent use of signs and a potential to learn symbolically does not automatically lead to language. Symbolism does not seem to be a consequence of a greater and greater capacity to remember and recall signs. In the human past there were some special, if not unique, synergistic combinations that allowed our ancestors to jump from sign use and restricted symbol use to life in a world fully elaborated with symbolic systems, one that maintained all the design features of language and the cultural references they evoke.

In teaching about language, it is easy enough to go with the building blocks approach. In this way, the equation phonemes + morphemes + syntax seems to equal language. But this really leaves out the anthropology. As anthropological linguist Michael Agar (1996) has aptly put it, language is much more than descriptive linguistics; human language is more accurately termed "languaculture" as it consists of a synergy not only of dictionary terms and algorithms of syntax, but also of the public temper created from common social contexts, attendant illocutionary acts, and shared historical experiences.

*Power and the Harvesting of Energy.* What notion of power comes from thinking in terms of holistic synergy? Rarely do we see links, even in discussions of Leslie White's evolutionism, between power as a concept in thermodynamics and a Weberian or Foucauldian sense of social power. Yet, if power is measure of capacity to do things or have them done, then we can surely look at how the capture of energy makes this capacity possible in different domains (Adams 1988). In Marx's terms, our economic developments are the product of congealed labor power. This should not be interpreted as a metaphor but as a literal expression for the processes that managed the control of specific quantities of energy/labor. We might also say that all of our material artifacts are transformations of natural resources that literally have encoded innovative human insights. In the imagery of meshworks, through heritages of muscular and mental labor elements of the natural are reconstituted as streets, walls, houses, clothing, monuments, edifices, mechanical devices, and tangible narratives and records.

Order does not arise without the capacity to capture energy; and energy differentials are maintained by boundaries, barriers, pathways and regulation of gateways and channels. These latter are themselves the manifestations of power, be they in the world of physical, biological, or social structures. To maintain power or order is to fight entropy. And, even if in the long-run entropy wins, before that we may gain by borrowing, taking, or extracting from available sources. Meanwhile, there are ebbs and flows and interconnections. Bands, tribes, chiefdoms, and states have distinct identities but at the same time may be interconnected.

What are examples of energies harnessed or channeled? The leaf. Metabolic loops. Killing for food. Chimpanzee alliances. The production of tools. Control of fire. The ambush of rivals. Pottery traditions. Domestication. The construction of megaliths. Mana. Acquired social status. Market places. Money. Roads. Urbanization. Schools. Luxury goods. Levels of sociocultural integration. National boundaries. Globalization. And so on and so forth. Among other things, students should

be encouraged to wonder, where is the energy coming from? How is it channeled? What are the similarities and differences between natural processes and those with mind-driven interventions?

### **Conclusion**

This paper offers a challenge to anthropologists to teach our holism in a new way. The call is to teach not simply by referring to a set of four building blocks called biological, archaeological, linguistic, and cultural anthropology, but by referencing the entangled interconnections of the world that a permeable discipline of biological, archaeological, linguistic, and cultural study entails.

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