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Interview

EVERYTHING GOES, BUT NOTHING WORKS

INTERVIEW OF IRENÄUS EIBL-EIBESFELDT

Peter LaFreniere

Professor Emeritus, Department of Psychology, University of Main

peter@bluehillbaygallery.com

Irenäus Eibl-Eibesfeldt was born in Vienna on June 15th, 1928. Former President of ISHE, he is currently Professor Emeritus, Max-Planck-Institute for Behavioral Physiology, and still active as Head of the Film Archive for Human Ethology of the Max-Planck-Society at Andechs, Germany and the Ludwig Boltzmann Institute for Urban Ethology in Vienna. From 1951 to 1970 he was a research associate of Konrad Lorenz. From 1970 to 1996 he was Head of the Research Group for Human Ethology in the Max Planck Society. An important aspect of his research has been the long-term study and filming of the social ecology of several different cultures including the San, Himba, Yanomami, Eipo, and Trobriand Islanders. This work over a span of more than a quarter century has provided a legacy of about 275 km of 16mm film from

which over 200 documentary films have been published by the Encyclopedia cinematographica in Göttingen. Among his many publications are: Ethology, the Biology of Behaviour (1970, 1975), Love and Hate (1970, 1996), The !Ko Bushman Society (1972), The Biology of Peace and War (1979), Human Ethology (1989), and Indoctrinability, Ideology, and Warfare (1998) co-edited with Frank Salter.



The following interview took place over several days in mid- February, 2000 in Andechs, just after Professor Eibl-Eibesfeldt and his wife, Lorle, celebrated their 50th wedding anniversary.

HEB: Ernst Mayr has commented that the major contribution of the leaders of biological thought has been the development and refinement of concepts and occasionally the elimination of erroneous ones. Evolutionary biology owes a remarkably large portion of its concepts to Charles Darwin, and ethology to Konrad Lorenz. I would add that Human Ethology owes a significant portion of its conceptual foundation to yourself. What are the key working concepts for present day human ethologists and have any concepts been discarded along the way?

EIBL: First of all, let's start with Konrad Lorenz whom I met just after he returned from Russia with a manuscript of 750 pages written on cement sacks while he was a prisoner of war. This was in February 1948. But already before the war, Lorenz was internationally known for his theoretical contribution which already provided a foundation for a new science of animal behavior. In 1935, *The Kumpan in der Umwelt des Vogels* (The companion in the world of birds) was published. In this work the first overview of the field which was later to be called "ethology" was presented. Up to that time the study of instinct was linked to a kind of mystical enterprise. With Pavlov's introduction to stimulus-response learning, all of this was relegated to the behaviorist's black box, and for good reason. But eventually, Lorenz was able to force this black box open again by providing a scientific method and conceptualization that would go beyond radical behaviorism to provide a comprehensive theory of behavior. Although he recognized the validity of Pavlov's laws at a certain level, he never accepted such a limited view of the organism as a passive recipient of conditioning, a tabula rasa that had nothing inside the black box, just inputs and outputs.

And so he provided us with our working concepts. He introduced the terms, innate template (*angeborenes Schema*), in which knowledge about specific situations is encoded so that specific trigger stimuli (*Auslöser*) release instinctive actions or motor patterns (*Instinkthandlungen*). In collaboration with Tinbergen in 1938, the term fixed action pattern

(*Instinktbewegung*) was introduced to distinguish them from behaviors that are more or less responsive to the presence of ongoing stimulation. This term led to much misunderstanding. What is fixed is the script of the muscle actions, but there can be variation in the intensity or speed of the behavior. You may write your name quickly or slowly, but I can still recognize your distinctive signature. In a later paper, Lorenz began to apply these concepts to the understanding of human perception and action. For example, he introduced the term Kinchenschema, which is now well known to all of us. Here he already pointed out that his findings might be useful for understanding human behavior. One of the most important tasks of human ethology would be to check by the study of man whether or not the concepts he developed would be of any heuristic value to the study of human behavior.

When Lorenz came back after the war, I was very young. At that time I was living at a small biological station in the Viennese forest. Like ranchers in the wild west, we were cutting trees in the forest in winter to fuel our stoves.

HEB: So you were back to nature before it became fashionable.

EIBL: (Laughs, then adds) Vienna in 1946 and 1947 was quite a place to live after the war with hunger and all that. The living conditions were poor, but exciting in many ways. As a student I joined a small staff of biologists working in the Viennese forest in a biological station founded by Otto Koenig. We lived in small barracks, scattered in the forest around a small lake. Hand reared herons would greet us when we passed. I was raising a small badger and animals were all over the place. With Lorenz's return the world re-opened for us and visitors came from all over the world; Julian Huxley was one of the first to arrive. In 1951 Lorenz received an invitation from the Max-Planck Society to come to Germany and I was able to follow him as a research associate. Conditions in those days were still quite simple. For example, I was living in a bowling alley with my animals and with my wife, or with my

wife and then my animals (laughter). But we were all in high spirits, and from all over the world people came Eckhard Hess from the United States, then Lorenz' old friend, Nico Tinbergen, and we had lively discussions. But then in 1953 Danny Lehrman's critique of Lorenz' theory of instinct came out. Lehrman stated that one could never prove that something was innate, since one could never raise an animal in total isolation of environmental stimuli, which could act as potential "experiences". His critique turned out to make a very interesting contribution. Since Lorenz was forced to think: How can I define the concept of innate positively, rather than solely in terms of the absence of learning?

Lehrman had quoted some experimental studies on nest-building in rats in a standardized test situation with papers and sticks; the rats carried them around but failed to build a nest. Now I knew rats and other rodents and I knew that they would never build a nest in a strange environment, they must first have a sleeping place. So I revised their experiment and I again provided the rats with shredded paper, but this time in their living cage where they had a sleeping place, and of course they built a nest. (recounts other similar experiments).

Finally, Lorenz wrote a response to Lehrman's critique, which is still worthwhile to read. In his 1961 publication, which was translated into English and published in 1965, as *Evolution and modification of behavior*, he gave the precise definition of instinct. His reply to Lehrman's critique was that the ethologists are primarily concerned with the phenomena of adaptedness. In order for adaptation to occur, information concerning features of conspecifics or of the environment toward which organism proves adapted, must have been acquired either during phylogeny or ontogeny. Whether this happened by the mechanism of mutation and selection or by learning can be tested by depriving an individual of patterned information relevant to its adaptation during ontogeny. Innate, then, refers to a particular level of adaptation.

Lorenz introduced the term phylogenetic adaptations, pointing out that these adaptations mirror facets of the external environment (including conspecifics) that impinge on the organism's fitness. Whether experience is needed or not for a particular adaptation can be checked by the deprivation experiment. If a mallard raised in complete social isolation nonetheless produces at sexual maturity all the highly specific courtship patterns, such as grunt-whistle, head-up tail-up, nod-swimming, etc we can conclude that the behavior at this level owes its specific patterning to the process of phylogenetic adaptation, since the relevant information to the patterning of behavior was completely absent in the environment in which the experimental animal was raised.

Then came a very interesting time since all the basic concepts were now in place. We now know down to the molecular level how the brain gets wired for its function during embryogenesis and how the growing axons of neurons, with their thread like molecules in the growing tips show attachment to the nerve endings and are guided by chemoaffinity, to sniff out as it were, the end organs and can find them even if they are translocated. In the now famous experiments of Roger Sperry, this was beautifully shown. For example, he transplanted a piece of skin from the back of a frog embryo to the abdomen. If one then tickles the frog on this transplanted piece of skin on its abdomen, it will scratch its back. It's fantastic! I mention all this, of course, since ethology inspired neurobiology in many ways and now a whole new field of neuroethology is flourishing.

HEB: Your anecdotes about Lorenz and his geese and jackdaws remind us that Lorenz's method was not detached observation of birds from a blind, but rather actual involvement in their lives, which led him to basic discoveries that he otherwise would never have made, such as imprinting, a phenomenon of learning characterized by a sensitive period and irreversibility.

EIBL: Of course imprinting is a good example. It has now been shown exactly how this imprinting takes place at the neuronal level. It is learning by synaptic reduction. Wallhäusser and Scheich imprinted chicks to an object, which emits a pure, rhythmic sound, just one tone. If you look at the neurons which process this stimuli, they knew, of course, in which area of the brain to look, then you find many spines on the dendrites, so to speak, many ears are listening. After imprinting most other synaptic connections to other neurons are melted down, that means that you have a receiver that is tuned to a perceptual range. If a natural sound by the mother is emitted then more synapses survive, since it is a richer spectrum.

We also know how an innate releasing mechanism functions at a neuronal level. It's fantastic how you can find out how the different brain areas get determined by the genetic outfit and then determine behavior, and we know now quite a lot about this process. And so you can say that the basic concepts have proved valid - the concept of phylogenetic adaptations, the concept of innate learning disposition, etc.

After twenty years of animal ethology, I decided to write a textbook that covered the field. In this first textbook (Eibl-Eibesfeldt, 1967) I had a chapter on humans. I was now ready to begin my work on human ethology. I began experimenting in the early 60's with a life-long friend of mine, Hans Hass. We had come to agree that we should make a film of human beings as an exercise. First, we thought we could get films from existing archives, but we soon found that films of social interaction in everyday life did not exist. There were only films of hut-building, weaving, pottery, etc., which is interesting but it doesn't cover the field. I wanted to know how mothers hug their children in different cultures, how people greet each other in different cultures and that sort of stuff. I also decided to study the deaf and blind-born. We made two trips to collect cross-cultural data on human social interaction using the reflex-mirror lens invented by Hans Hass in order to film natural interactions in an unobtrusive manner. This project eventually led to the

establishment of an independent research institution of the Max-Planck Society, which has kept busy until now. The children that we started to film in 1969 are now adults and I have such longitudinal films in a number of cultures. I now have over 280km of 16mm film in five cultures with longitudinal data, and samples of a number of other cultures as well. Of course, this is all well known and we need not elaborate.

HEB: Are any of the films edited toward an English-speaking audience?

EIBL: Not yet, but I wonder if maybe we should do it. We could do it.

HEB: This I think would make an important contribution to the study of culture in the English-speaking world. It is imperative, in order to establish human ethology, that we convince the skeptics who view culture as something completely relative and disconnected from nature. The films make such a convincing case that this view is fundamentally flawed. Your film archives have become world famous chiefly through the publication of sequences of frames in your books and articles as well as through many other authors like myself who use your photos to illustrate the eyebrow flash, and other species-characteristic expressions.

EIBL: Yes, the films are published in German with the natural sound track translated and published in a printed text accompanying each film. And there is no doubt that there are many, many universals in human behavior. However, the critical experiments were conducted early on. The deaf and blind born did not just grimace, they smiled, laughed, they showed anger frowns, distress. All the basic expressions were there. My cross-cultural studies revealed then that these same expressions were present universally. The eyebrow flash, which I discovered, for example, was initially questioned by Ekman, but it has come to be accepted as a species-wide display with little cultural variation. You see it all over the world. But even more interesting are the cultural patterns, which on the surface look very different, but are based on the same rules of etiquette.

This means that there are underlying rules of grammar for social behavior that are universal as, for example, display behaviors in greetings that involve both friendly and aggressive components. Among the Yanomami when an invited guest comes into a neighboring village the guest performs a dance in the open space surrounded by the huts of the villagers, but it's a war dance. Now in this display, the guest prances around with his bow and arrow and utters aggressive phrases like "With this bow and arrow, I am hungry for flesh", etc. But at the same time a small child is dancing with him and waving green leaves. Now if you look at other cultures you may not find such a war dance as a greeting behavior, but if you look, for example, at what happens when in our culture a visitor of state comes, you will see that the military parade or a gun salute is a sign of respect, but at the same time it is a display of power, of strength. At the same time the visitor of state gets a bouquet of flowers presented by a lady or by a girl, so again you have the antithetical combination of an aggressive display and a friendly display. The display of arms is essentially affiliative, almost like saying: "Look we have guns, but we don't aim them at you".

Even in a personal greeting, like a handshake, a firm handshake is a display, and if someone gives you a hand like a dead chicken's foot, then you certainly have your odd feelings. In other instances, the handshake is a display of strength and vitality, we say friendly words, we smile, and so on. There is then a grammar of social interaction that is universal, but which can be elaborated in culturally diverse ways. For example, the object transfer is controlled by the norm of possession. First, if you own something then you can give it, and be friendly by giving. Second, if someone offers you something, you can accept it or you must provide reasons why you cannot accept it. Third, there is the reciprocity rule, you have at least to thank and later reciprocity of some form is expected. Even small children in a great variety of cultures that were filmed in interactions like this obey these basic rules. You see sometimes a breach of etiquette, that a boy tries to grasp something, but the pangs of

conscience are also shown by his expressions. Even if the owner is weaker in a group of people that belong together, the argument that I had it first is convincing. Priority is of great importance in the norm of possession. Then he or she will generally give it back, and I have very nice documentation of this. Only if it is not a close member, or if the person is of higher rank, then he may take something, but then you have no friendly relation. You have to accept that something has been taken from you.

But if you have this universal grammar, you may ask why is there such cultural diversity, why this cultural pseudo-speciation by the elaboration of different rituals, as Erik Erikson said. Again you can ask what survival value does it have and how it contributes to inclusive fitness. Selection does not take place on just the individual level, on the level of close kin, but several levels of selection can be observed. Man lived originally in relatively small groups based on individual acquaintance. This is the reason why evolution took place at such a rapid pace, since evolution works very fast when small groups engage in competition. However, there was a selection pressure, which went in another direction against the small group. That means if you have two competing groups, the group that is able by certain social techniques to keep a larger group together will have the advantage. Normally bands of hunter-gather groups split when they reach a hundred people since they have no real leadership and individuals are fairly independent. But a larger group has an advantage since they can recruit more people for attack and defense. You observe then the formation of groups, which get larger and larger.

In communities in New Guinea, the Eipo and their related dialect groups split up into valleys. In newly settled valleys, you find the local group, village against village. But if they have been established in a valley over a longer period of time, they form alliances and suddenly you find an identification with the whole valley community by means of cultural mechanisms which allow for the identification of the level of fictive kin. One mechanism is that the boys of the whole valley go through

initiation rites and then this group of boys in a given cohort are considered brothers because they have experienced something that binds them, much like school boys in our culture. Furthermore you have a clan system. In clan exogamy kin networks are formed that binds the group together. Then, you have the myth of the common ancestor that all members are of one blood. The cultural bringer is the ancestor of the whole group and inserted rocks in the mud so that the land could be cultivated, he is the common ancestor of all the clans further uniting them into a larger aggregate, the fatherland, etc. the result for all cultures is the understanding of a larger network of kin, the nation, those who share the same roots. So we tap into existing mechanisms.



Photo credit: Unknown

HEB: An important theme in your recent work is that Homo sapiens experienced selection pressure for ever larger groups because of conflict between groups, but at the same time they experienced selection pressure for more cohesion and cooperation within the group because they were getting larger. Human indoctrinability is one way to meet

these dual selection pressures for cohesion in groups that go well beyond that maximum size of hunter-gather bands. Would you comment further on your concept of innate indoctrinability?

EIBL: Yes, indoctrinability has its roots in the mother-child bond, like all prosocial behaviors, in mammals and birds. In my book, *Love and Hate*, I pointed out that the original motivation for all nurturance came from the nurturant behaviors that we see in caretaking, grooming, feeding, etc. Second, with the evolution of individual parent offspring bonds like we see in imprinting, we have the basis for evolving indoctrinability. Whenever such things take place in evolution, evolution takes advantage of them in an opportunistic way. Thus, in courtship these behaviors could be incorporated to form a bond between adults. You will observe that many nurturant behaviors such as courtship feeding, grooming, etc., often in a highly ritualized way, are used to establish a friendly bond.

In birds and mammals you have the recognition of individual offspring that often occurs during a sensitive period when the mother and newborn interact immediately after birth. In sheep, for instance, if you allow for mother-offspring contact for five minutes and then separate them for an hour and re-introduce the lamb with another strange lamb, the mother will reject the unfamiliar lamb but accept her own offspring. But if you allow no contact between mother and offspring and introduce the two lambs, one a genetic offspring, the other not, the mother will chase both of them away. What is the physiological mechanism? We know now that oxytocin plays a decisive role. This hormone is triggered when the newborn passes through the cervix and extends it and if you mechanically extend the cervix in a sheep which has never before given birth, then you can trigger the reflex. If you present a newborn to the nulliparous sheep, she will behave as if she was the mother. And you can repeat the experiments just described and she will accept her “offspring” and reject the unfamiliar lamb just like the biological parent. Similar mechanisms function in human beings too.

Provided with these mechanisms that allow for individual bonding, which is in a sense what we call love, since love is never anonymous but rather individualized. Thus, with this nurturance we were outfitted to develop a cultural family ethos which we extend to group members based on individual acquaintanceship, later creating symbols for group identification, clothing, hairstyles, etc. Closely related communities of pastoralists often develop the most fantastic hairstyles in order to set themselves off from the others. God knows in Africa they have these fantastic hairstyles!

HEB: In the United States too we have these fantastic hairstyles.

EIBL: Yes, yes, it is very interesting, which all shows that we are related and that we act in similar ways, driven by similar urges, such as the urge to distinguish ourselves from others. But the 'we' group, the human family, is able to grow by the development of cultural mechanisms that tap into existing familial ones, the mechanisms of indoctrination of symbol identification seem to have a special period for imprinting for the larger family, around puberty. On the one side this is positive, since it creates an emotional basis for solidarity. If you do not have this basis of solidarity, you have internal warfare within a large group involving ruthless competition which leads to reduced fitness vis-à-vis other groups. If we can achieve peace in the world, then this type of identification would not be harmful. We could make agreements that from now on we stick to our territories. Compete in a civilized way, but not with arms anymore. Then you could have different cultures even within one state. Look at Switzerland, where you have four peoples, the French, Germans, Italians, and the Romanic. But you have them indifferent territories where they each have their own schools, their own laws, etc. What they share is a common economy and defense and foreign politics. In addition, the living together with another culture is something very inspiring and it's nice to have Italians being Italians in

Italy, and the French being French in France, and Germans in German countries, and so on. This multi-cultural Europe is something unique.

HEB: Let me return to your concept of indoctrinability. You have explained its positive function, but it can become dysfunctional. What does this depend on? Can you elaborate further on the pivot point between functional and dysfunctional indoctrinability?

EIBL: That will depend on the world we live in, unfortunately. If we can get a worldwide agreement that domination of one ethnic group over another can securely be made impossible. Then we could achieve a state where we don't have enemies, common tasks would hold us together. In the past the common enemies served this unifying function, and for a long time in our history it worked like this, but there is no need for that to continue.

HEB: In a sense what you are saying is that humans must recognize their responsibilities, need to recognize long-term implications as opposed to short-term self-interest. If you look at the problem of intervening between warring nations, for example, Chamberlain who was willing to appease because of the difficulty of moving his nation to war which was seen as a last resort. And so it is true today. If vital interests are not being jeopardized we seem to prefer to remain on the sidelines with force even if genocide is being practiced. So in a sense, what you are requiring is human responsibility based on long-term thinking or even perhaps a certain degree of altruism. Would you agree with this?

EIBL: I would agree with that. As far as altruism is concerned, I am not happy at all with Sociobiological terminology, after all altruism is something that we experience like pity and joy, etc., altruistic feelings are there. To say that they are not there because they are recast as genetically selfish is nonsense, since genes have no emotions. What actually takes place is that there is a selective advantage to be simply altruistic, experience these feelings and act accordingly. The use of

“catchy” terms just to be original is counterproductive since it promotes confusion, especially among those outside the discipline. Now if I speak to a cultural scientist about selfish genes he just stops talking to me.

What I feel is that we need to bridge the gap between the cultural and the biological sciences. And therefore we need to be careful with our language and not to be provocative, and to stick with the facts and avoid undue speculation.

HEB: There appears to be a major schism among evolutionary theorists who are attempting to address human issues. In your recent book, edited with Frank Salter, a number of papers make the claim that group selection has been an important force in shaping human evolution, particularly in the context of indoctrination and warfare. Ernst Mayr was also emphatic on this point in an interview less than a year ago with Bill Charlesworth. However, sociobiologists view group selection dogmatically as heresy or simply nonsense, and as a result altruism is always viewed with skepticism, as in the phrase “Scratch an altruist and a hypocrite bleeds”. In other words there was always a “selfish gene” explanation for anything that looked altruistic and group selection was viewed as impossible.

EIBL: It was already in accord with protocapitalism and this we now see in the world.

Solidarity to a group is despised and globalism is enhanced as something good and in reality it is sheer capitalism that is advanced without any form of civilization. We have had so far a social market economy in Europe but if you throw open this is a social market economy it could be dangerous. If many people slide into misery then the stage is set for new revolutions, and one of the first things that will be endangered is liberal democracy.

Since people are fairly open to risks, we could say we human beings have an appetite for risks since we see this in so many activities, skiing, car racing, hang-gliding, mountaineering, and how do you call it, yes,

bungee jumping. But one threat human beings did not experience in most of our evolutionary history was this complete dependence on other people for subsistence. The hunter-gatherer stood on his own feet and had no division of labor, except between husband and wife. But the bushmen can never lose his job, he can make his hut, he can make his implements for the work, everything. Now nobody will doubt that in modern societies specialization and division of labor are prerequisites for a high standard of living. And have to accept this and we can be happy that our species has achieved this spectacular progress in one century, from the first stuttering automobile to space travel, from the mechanical age to the electronic age. You are led to wonder what can such a species achieve in another thousand years, in another ten thousand years. Biologists think in different timescales.

But, of course, we have to face the very fact that our emotional outfit remains much the same as the hunter-gatherer. And emotions cannot be learned; you can teach a person whom to love and whom to hate, but you can never teach a person how to feel fear, how to feel hatred, how to feel love, anxiety, jealousy, and all that. That's our basic outfit. We have to face the fact that presidents with stone age mentalities are now guiding superpowers, with all their bleeding hearts and girlfriends. Some of our phylogenetic adaptations are probably no longer adaptive, or even maladaptive in certain situations. But we are cultural beings from our nature and we can learn to civilize, to regulate our emotions. And we do it in all sorts of ways. In competition it is necessary to keep internal peace, ruthless competition is not the way. The pioneer way of simply pushing one's way through with one's elbows is still present. I think it is time to think it over.

HEB: Thank you very much.

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