Human Behavior: Do Animals Have the Answer

How valid are animal studies and ethology for learning about the human psyche?

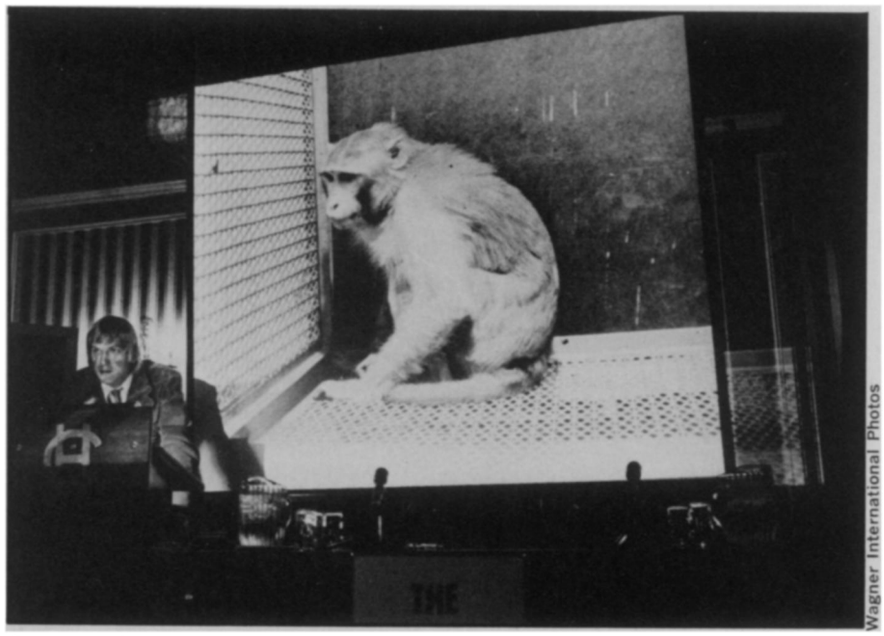
by Robert J. Trotter

Analogies prove nothing, that is quite true, but they can make one feel more at home. —*Sigmund Freud*

Freud may have been right but without analogies psychiatry would have run out of places to go and things to do a long time ago. The Freudian model is limited. Analysis may work for people who have the time, the money and the ability to communicate with an analyst. It does not, by a long shot, cover the spectrum of human mental and emotional illness. Psychiatry and psychology know this and have come to rely heavily on analogy—the animal-human analogy.

Thousands of animal experiments are performed daily. Animals of all kinds take drugs and get shocked or operated on. But the human psyche presents more problems and asks more questions than animal experiments can answer. Finding a schizophrenic or manic-depressive monkey to study, for instance, is not as easy as monitoring the effects of a drug on an animal's brain. In the first place, nature or biological evolution does a good job of weeding out any mistakes it makes in the animal world. Humans protect, care for and try to help emotionally disturbed people. Communication is another problem. Many human mental disorders are detected through communication—abnormal speech patterns, inability to talk, etc. In animals, such problems would go undetected.

So researchers have had to rely on less than perfect analogies. Rats, for instance, can be driven crazy with electric shocks. The chemicals in their brains can then be studied. But just how closely does this craziness approximate human abnormal behavior? Does any experimental-animal model yield information that can be applied to the problems of the human psyche? Such questions were asked at a recent three-day international symposium sponsored by the Kittay Scientific Foundation titled "Relevance of the Animal Psychopathological Model to the Human."



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Suomi explains how mother-infant separations cause deep depression in monkeys.

One of the most useful animals on the psychologist's shelf has been the rhesus monkey. Almost 15 years ago Harry F. Harlow demonstrated that infant monkeys separated from their mothers are capable of a reaction similar to that seen in some human infants after separation. Neither the monkeys nor the children can speak, but their actions indicate a type of emotional distrubance. Vocalization or crying increases; socialization and normal activity decrease. Monkeys and infants become depressed. If the separation is prolonged in monkeys the lack of socialization inhibits mental development. A monkey that sits in a corner and cries instead of playing with other monkeys does not learn how to function properly as an adult.

Harlow's work was done at the University of Wisconsin Primate Laboratory. Extensive work along the same lines has continued there in an attempt to fill some of the gaps in the animal model of depression. Different types of separation have been investigated. Much of this work is being done by Stephen J. Suomi.

Peer separation has been found to produce depression in some cases. Young monkeys raised with other young monkeys, instead of with their mothers, develop a strong peer attachment similar to the mother-infant attachment. When animals are separated from their cage mates, they become depressed. An immediate massive increase in vocalization is followed by a depressive withdrawal syndrome. Self-clutching, huddling and other self-directed behavior increases; locomotion, sex and play activity decrease. Maturation seems to stop at the age at which separation occurs. Peer separation does not always lead to depression, but the general finding, says Suomi, is that the stronger the attachment before separation, the stronger the depression.

The environment during separation also seems to be important. Infant monkeys separated from their mothers have been housed alone and with peers. All showed the initial disturbance upon separation, but those housed with peers seemed to recover somewhat. They seemed to be only slightly retarded, while those housed in isolation continued to display signs of depression and arrested development. The same holds true for older animals. At age four and a half (almost adult), animals were separated from a normal family situation. Those housed with peers continued their normal activities. Those housed alone became depressed.

To be really useful, such a model must offer suggestions for therapy. This too has been done at Wisconsin. By

varying the environment after separation, Suomi has found that some depressed animals show signs of rehabilitation. Very active and playful peers are sometimes able to pull the disturbed animals out of their depression.

What seems to be a fairly complete model for one form of abnormal behavior should offer some helpful hints for studies of human behavior. Why else study monkeys? But Harlow has always been cautious about making the obvious human analogies. Suomi, likewise, cautions that monkeys are not furry little people with tails.

Robert A. Hinde of Cambridge University is even more emphatic on this point. Superficial comparisons between animals and humans, he warns, may be false and misleading Biology can make use of the similarities between animals and humans, but behavior has multiple influences. Adaptation and constant variation, Hinde says, casts doubt that psychology can use animal models.

With some of his own animal experiments on mother-infant separation, Hinde has shown just how misleading behavior can be. In one set of experiments monkey mothers were taken out of the home cage while the infants were left with the other monkeys in the group. The aim was to separate the mothers and infants without adding to the shock by placing the infants in a strange new environment. In another set of experiments the mothers were left in the home cage and the infants were temporarily removed.

Hinde expected that the infants who had suffered the separation and the new environment would have had the more traumatic experience. They should have shown more signs of distress than the other monkeys. But this was not the case. The infants who stayed at home while their mothers were removed were the ones that seemed most disturbed when their mothers were returned to the cage. This is the opposite of what is seen in human reactions. Children who are sent away to a strange place are more distressed than those whose mothers leave them at home.

Closer examination of the monkey separation showed that the original observations were incomplete and did not represent the real situation. It was maternal behavior, not the separation, that was responsible for the infant behavior. When the infants were taken away and then returned, the mothers would spend a lot of time caring for and comfort-

Speaking of ethology

The word ethology was used in the 19th century by John Stuart Mill and others to refer to the study of human character. In the 20th century, Konrad Lorenz used the word to describe his naturalistic studies of animal behavior. But Lorenz came full circle and brought ethology back to human behavior. From intriguing studies of geese and ducks, Lorenz moved on to pessimistic pronouncements about the inability of humans to control their aggressive tendencies. Lorenz feels that aggression is inborn rather than learned and that because of this instinct the human race may eventually destroy itself. A spirited debate followed Lorenz' publication of this thesis. Environmentalists argued that aggression and all human behavior is learned and can be unlearned. The cloud of dust raised by this controversy has tended to obscure much of what the ethologists have had to say on subjects other than aggression.

Irenäus Eibl-Eibesfeldt, a colleague of Lorenz at the Max Planck Institute for Behavioral Physiology in Germany, agrees that too much attention has been paid to aggression. He does, however, insist that humans have inborn motor patterns and innate releasing mechanisms that enable them to act without the need of conditioning.

Releasing mechanisms, for instance, evolved as stimulators to release survival behaviors in certain species. A red spot releases pecking behavior in young herring gulls. The adult gulls have such a red spot on their beaks. Young gulls see this and instinctively peck at it, getting the adults to open their beaks and feed them. Primates have releasing mechanisms for sexual behavior. Females of certain species have brightly colored rear ends that they present, when they are in heat, to the males. This, along with certain odors, releases sexual behavior in the males. As humans evolved and began to walk upright, the female genital area was no longer visible from the rear. Releasing mechanisms developed in the front of the woman's body—red lips and protruding breasts.

Animal and cross-cultural human comparisons have helped ethologists understand releasing mechanisms and determine which behaviors are genetically preprogrammed. But advocates of the environmental view continue to argue that the human brain is a blank slate to be written on or programmed only by what is learned after birth. Eibl-Eibesfeldt challenges this view with his studies of children who are born deaf and blind. They can never see another person laugh, cry, smile or display anger but they still are able to display these basically normal facial expressions. "It could be argued," Eibl-Eibesfeldt says, "that they informed themselves of others' expressions and gestures with their sense of touch." But he had the opportunity to study deaf- and blind-born thalidomide children who had not even the opportunity to explore their environment with the help of touch. They too, he reports, manifest normal facial expressions. This, he says, strongly indicates that these expressions are part of an innate human behavior repertoire with which human babies are born.

There are many inborn behaviors, says Eibl-Eibesfeldt, and the job of ethology is to understand the laws governing them and "to determine the extent of phylogenetic perprogramming. . . . Environmentalistic philosophies, in lack of basic biological knowledge and partly blinded ideologically, have failed to take these facts into consideration." This, the ethologist concludes, leads to the imposition of frustrating programs on people and to "dangerous totalitarian consequences as far as the strategies of education are concerned."

Holt, Rinehart and Winston

Eibl-Eibesfeldt stresses the human biological heritage.

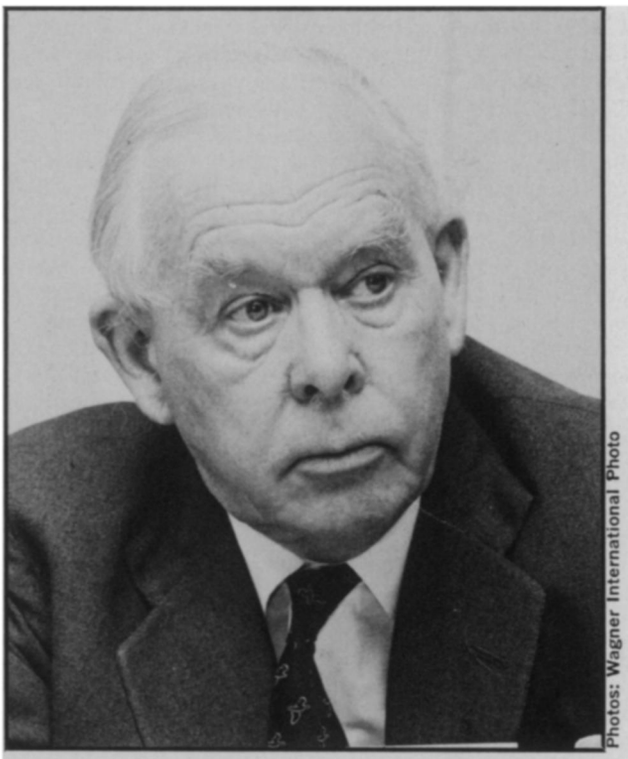
ing them. When the mothers were taken away and then returned, they did not have as much time to spend with their infants. The mothers had to reestablish themselves among their peers and could not direct all of their attention to the infants. Their infants continued to show considerable distress after reunion.

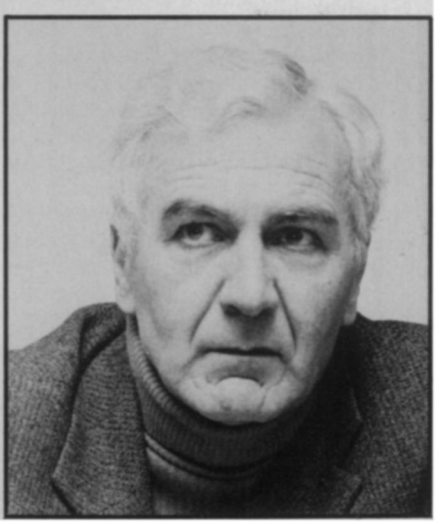
This case, says Hinde, illustrates "the importance of examining the whole situation in depth, and not merely isolating a fragment in which one is initially interested." Accounting for all factors in such a situation is almost impossible.

If animal experimental models are inadequate, where can psychiatry find valid principles of behavior? Jane van Lawick-Goodall studied chimps in the wild and has reported that peer relationships there do not substitute for mother-infant relationships as well as they do in the lab. Perhaps humans should be studied in the wild or in their natural habitat.

Separation anxiety is seen in human children up to three years of age. In the early 1950's a child's attachment to its mother was thought to be based on the child's dependence on its mother for food. The loss of a food source was thought to be the cause of the anxiety. But ethologists like Lorenz and Tinbergen were studying animals and describing much more complex forms of attachment such as imprinting. Harlow, with cloth monkeys, was doing the same thing. Now it is known that an alternate food source does not replace a mother. Perhaps, suggests British psychiatrist John Bowlby of the Tavistock Institute of Human Relations, ethological principles can be applied to psychiatry. Ethology was developed in Europe and has remained a European science, says Bowlby, but the awarding of the Nobel Prize to Lorenz, Tinbergen and von Frisch (SN: 10/20/73, p. 244) may help ethology catch on in the United States.

From an ethological and evolutionary point of view, Bowlby explains the mother-child relationship as the result of instinctive behavior designed to keep mothers near their children. Proximity keeping, even in adults, he says is a basic type of human behavior. It is seen in primitive hunter-gatherers as well as in modern western civilizations. Once this is seen as an intricate part of human behavior, the next question is, what is its biological basis? Warmth and protection, answers Bowlby. An infant needs to stay near its mother to keep its body temperature up to normal. This behavior is necessary to life and is therefore selected for. An infant needs to stay near its mother for protection. Thousands of years ago infants needed protection from wild animals. Today, says Bowlby, the situation is much the same. Children need protection from automobiles and other modern dangers.





Photos: Wagner International Photo

Bowlby (left) and Ainsworth (bottom left) use ethological principles to point out the dangers of separating mothers and infants. Hinde (bottom right) distrusts animal models.

How does such an instinctive behavior apply to psychiatry? It provides a new approach that psychiatry has been looking for, says Bowlby. Many neuroses, he explains, may be related to attachment behavior. A child's fear of darkness, for instance, need not be explained as an unrealistic fear. It could be due to a fear of loss of attachment. Even such a minimal risk can cause fear if it is associated with more dangerous risks. Much adult symptomolgy, Bowlby goes on, could be based on social loss. The human fear of separation from a friend could be a biological desire to keep out of danger.

Mary Salter Ainsworth of Johns Hopkins University backs up Bowlby's position. Human infants can't talk, so traditional psycholanalytic studies can not be carried out. Direct observation in the natural environment must be used—just as ethology says. The behavior of species must be looked at from an evolutionary point of view, she says, because the original reason for the development of a behavior often helps to explain that behavior.

She used the naturalistic approach in a longitudinal study of 26 white, middle-class infant-mother pairs. The effects of crying were studied for one year. During the first few months, a mother's responsiveness to a child's crying seemed to have no effect on the amount of crying. When the mother responds and the baby continues crying, some mothers begin to pay less attention to their infants. Others continue to respond every time the child cries. Ainsworth found that at the end of one year those infants who were not answered were still crying a lot. Those

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who were answered were crying much less and had learned other methods of communication.

Some traditional studies have suggested that mothers should not spoil their children by responding to every cry. Such behavior, it has been said, will keep the child from developing independence. Ainsworth's observations indicate the opposite. Those children who are responded to develop a feeling of trust and safety. Knowing that someone is there when needed, such children are likely to develop more independence. Many studies have shown that independent children are usually high achievers as adults.

Other ethological studies have pointed out that humans are a carrying, rather than a leaving-and-returning-to species like birds and some other animals. For this reason ethologists say that separating infants from their mothers at birth and putting them in hospital nurseries is an unnatural practice. Separating very young children from their mothers every day to put them in day-care centers is just as bad. "Day-care centers are a dangerous waste of time and money," says Bowlby.

But are the conclusions that Bowlby and the ethologists reach valid? Are there universal human behaviors or instincts, or should ethologists confine their observations to animals as many psychologists say? After all, the human brain did evolve and grow to its enormous size precisely so that instincts if instincts are no longer necessary, they would not be necessary. The human brain allows for a multitude of behaviors that can override instincts. Ethology can't explain these behaviors.

Ethologists argue, however, that even still exist. And even if instincts are very weak, it is better to recognize and understand them and work with them than to try to shape behaviors that go against the biological heritage. But still, the ethologists have isolated only a limited number of possible inherited behaviors. When all the arguments are considered it seems that the ethological model is no more complete than the animal-experimental model. And neither the Freudian nor the behaviorist approach offers a complete explanation of abnormal human behavior. But each has something to offer.

George Serban, medical director of the Kittay Foundation, concludes that no single model of human behavior can stand alone, and psychiatry cannot sit back and try to extrapolate from other fields. For psychiatry to be an effective and scientific force, says Serban, it must expand its perspectives and make room for possible new approaches to the understanding of human behavior. □