NATIONAL ACADEMY OF SCIENCES

DANIEL S. LEHRMAN

1919—1972

A Biographical Memoir by
JAY S. ROSENBLATT

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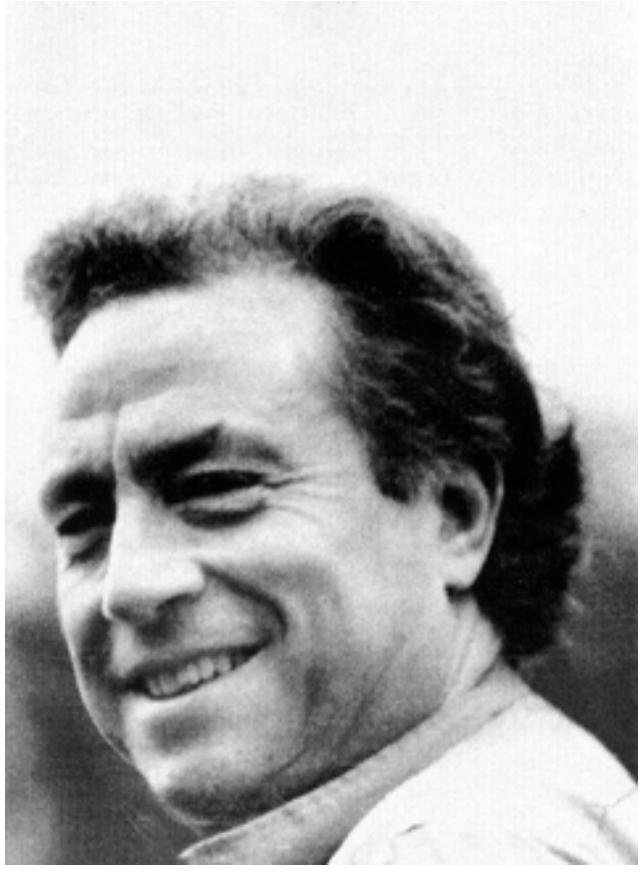
Biographical Memoir



DANIEL SANFORD LEHRMAN

June 1, 1919–August 27, 1972

BY JAY S. ROSENBLATT

DANIEL S. LEHRMAN DIED in Santa Fe, New Mexico, in the early morning of a day late in August 1972 at the age of fifty-three. He was scheduled in a few days to give a major address at the American Psychological Association meeting in Hawaii and had prepared for the trip characteristically by collecting lists of birds he wanted to see in Hawaii and by arranging bird watching expeditions with several resident ornithologists. The immediate cause of death was a heart attack. His obesity over many years had weakened his heart. Because Dan had been able to keep his deteriorating heart condition from his closest friends and colleagues, his death came as a shock to all of us. He was unable to change his way of living. With his characteristic optimism and boundless energy, he continued to live his life to the fullest despite his declining strength. He kept up his travel throughout the world and especially to places like Kenya where he could see animals in the wild. He gave many talks at universities, visited colleagues, enjoyed the finest eating places, and attended conferences worldwide.

In the last years of his life he received many honors. He became a Fellow of the Salk Institute in La Jolla, where he spent several months a year. He was elected a member of the National Academy of Sciences and the Society of Ex-

perimental Psychologists, and he was a Fellow of the American Academy of Arts and Sciences. In addition, he held a coveted lifetime Research Career Award from the National Institute of Mental Health to pursue his research.

Among his other accomplishments, he founded the series *Advances in the Study of Behavior* with Evelyn Shaw and Robert A. Hinde in 1963 and was its editor until his death. He also served a three-year term as associate editor of the *Journal of Comparative and Physiological Psychology*.

Dan's reputation as a research scientist was acknowledged, but he was also an excellent teacher and lecturer. As a lecturer and teacher, he influenced a whole generation of students in animal behavior in this country and abroad, in addition to those who studied with him at the Institute of Animal Behavior. As a research scientist, he initiated a new era in the study of hormone-behavior relations, which emphasized the important role social interactions play in reproductive behavior and physiology. As a theorist, he had a strong influence on how psychologists and zoologists thought about questions of instinctive behavior, behavioral development, and the evolution of behavior among animals.

The center of Dan's activities was the Institute of Animal Behavior at Rutgers University in Newark. Dan established the Institute and served as its director until his death. The Institute had its beginnings in 1954 in his own laboratory, which was located on the top floor of what had been a brewery. There he began his research on the neuroendocrine basis of reproductive behavior in the ring dove. In 1958 the laboratory was enlarged and moved to a nearby building in which two floors were renovated to accommodate additional researchers including my own laboratory. In 1959 the university Board of Governors authorized the Institute of Animal Behavior to grant a Ph.D. in psychology with a specialization in psychobiology. Over the next sev-

eral years the Institute gained its independence from the Graduate Psychology Department in New Brunswick, the location of the main university campus. The Institute moved again in 1968 to its present, greatly expanded quarters. These expansions of the Institute were funded by the National Science Foundation and the Ford Foundation at the urging (and with the enthusiastic support) of William C. Young.

From the late 1950s through the early 1970s until his death, Dan recruited additional staff for the Institute. Characteristically he chose scientists whose research supplemented and complemented his interest in both the naturalistic study of behavior, primarily in birds, and the experimental analysis of social and reproductive behavior and physiology in birds and mammals. A list of the faculty he recruited shows that his aim was to establish a multidisciplinary staff of scientists representative of the most active areas of research in ethology and comparative psychology and in neuroethology and behavioral biochemistry. They included Colin G. Beer (a New Zealander recently from Oxford, where he took his degree with Niko Tinbergen), who established a field station at Brigantine, New Jersey, to study laughing gulls and other shorebirds, and Ernst W. Hansen (a recent student of Harry Harlow), who established a colony of rhesus monkeys at the Institute for studying primate social behavior, a newly developing area in animal behavior. I joined the staff after studying with Theodore C. Schneirla and Lester R. Aronson at the American Museum of Natural History. I established a rat colony for studying the hormonal basis of maternal behavior. Barry R. Komisaruk, a graduate of the Institute and a recent postdoc of Charles H. Sawyer, was recruited to set up an electrophysiology-neuroendocrinology laboratory. Harvey H. Feder, a student of William C. Young and a recent postdoc of Geoffrey Harris, established a steroid biochemistry laboratory for studying action of hor-

mones at brain sites mediating sexual behavior. Monika Impekoven was recruited as an associate of Colin Beer; she was a former student of Tchanz from Switzerland and she studied pre- and post-hatching behavioral development in birds. Mei-Fang Cheng, from Taiwan, recently from the University of Pennsylvania, was recruited as Dan's research associate to study the ring doves.

Through Dan's efforts the Institute was awarded center support grants by the National Institute of Mental Health to support basic research and administration. We were awarded training grants to support the training of students and postdoctoral fellows. Dan made the Institute a national and international center for animal behavior by inviting visiting scientists to spend six months to a year in residence at the Institute to be available for discussion with students and faculty. In addition, he established a colloquium series, which continues to the present day, where leading scientists from throughout the world, passing through the New York area, present their research. As an example, Niko Tinbergen, later to win the Nobel Prize as co-founder of ethology, gave a series of talks at the inauguration of the new Institute building in 1968. Dan was popular with (and highly respected by) the administration of the university, which fully supported the Institute.

The location of the Institute in Newark was always a subject of curiosity. On several occasions Dan was invited to move it to New Brunswick. However, out of his loyalty to the college that had generously supported the Institute during its early years, he insisted that the Institute remain at the Newark campus, then mainly an undergraduate college. For a similar reason he refused offers from other universities, Harvard University among them, to move the Institute. Dan's entire twenty-two year career was spent at Rutgers University in Newark.

Dan attended public schools around the New York area and the elite Townsend Harris High School. His education at City College was interrupted by four years of army service and he received his B.S. degree in 1946 with majors in biology and psychology. Because of his intense interest in bird watching, he was an erratic college student. Several times he would be suspended for missing classes, often during the spring bird migration, only to be reinstated. He became an expert ornithologist, which he credited to the influence of a scoutmaster who remained a close friend throughout his life. His ambition in his early teens was to become the warden of an animal preserve and live in a small cottage at the edge of a woods guarding the animals. It was not until quite late that he realized he could make a career of his love of bird watching. At the urging and help of T. C. Schneirla he was admitted to the graduate program in psychology at New York University and received his doctoral degree in 1954. His doctoral thesis was on parental care in the ring dove and specifically on the effect of experience and the role of the crop gland as a source of stimulation motivating parental regurgitation feeding of the squabs.

Dan began doing research as a teenager under the eminent herpetologist G. Kingsley Noble, curator in the Department of Experimental Biology (later the Department of Animal Behavior) at the American Museum of Natural History. In 1938, at the age of nineteen, Dan published his first research paper on egg selection behavior during incubation in the laughing gull. The research was done at New Jersey's Brigantine Wildlife Preserve, which later became the Brigantine Field Station of the Institute of Animal Behavior. As a teenager at the museum he met Theodore C. Schneirla, William Etkin, Frank Beach, Ernst Mayr, Libby Hyman, and Niko Tinbergen (who was visiting the United States). He was drawn increasingly to the study of evolu-

tionary biology, particularly reproduction and specifically the influence of hormones on reproductive behavior. Dan acknowledged that he was most influenced in his theoretical approach to animal behavior by T. C. Schneirla, who was, until his death in 1968, curator of the Department of Animal Behavior, and under whom Dan did his doctoral research at the museum from 1948 to 1954.

Dan had varied research and teaching experience before he came to Rutgers University. He worked for a period at Haskins Laboratory on the development of prosthetic devices for the handicapped and studied facial perception in the blind. He held a summer fellowship in a newly established program in animal research at the New York Zoo and worked alongside Nicholas Collias, a leading student of animal behavior. In 1947 he began to teach at City College as a fellow and lecturer. This was an important period in his life, because during this period he developed close relationships with clinical psychologist and psychoanalyst Max Hertzman and with Jules Nydes, his own psychoanalyst. They served as role models for him and Dan acknowledged their influence on his thinking and especially on his understanding of what motivated him as well as other scientists to engage in the study of animal behavior, a subject that emerged in his later writings. Dan joined the Psychology Department in the Newark College of Arts and Sciences at Rutgers University in 1950. However, he continued to teach in the evening at City College until the early 1960s, because he said he recruited some of the finest students for the Institute from his evening classes.

Dan began his research on the behavioral interactions during reproduction between male and female ring doves in 1954. He was able to show that the consequence of these behavioral interactions and the endocrine responses they evoked gave rise to each of the phases of the reproductive

cycle in the ring dove. This research established for the first time that behavioral stimulation by one animal could elicit an endocrine response in another, a phenomenon that is commonplace now, but at that time had not been clearly established. The research had originated from Dan's naturalistic observations of the interactions between mates during reproductive behavior among the birds he observed in the field and the recent discovery by Geoffrey Harris of a humoral pathway between the brain and the pituitary gland. This link between the neural and endocrine systems enabled behavioral stimulation to reach the brain through the sensory systems eventually to stimulate the release of substances in the brain that would be carried to the pituitary gland where they would cause the release of pituitary hormones. Dan, studying ring doves in this country, and Robert Hinde, studying canaries at Cambridge University, grasped the significance of this discovery for the study of reproductive behavior and physiology among birds. The field of behavioral neuroendocrinology can be said to have grown out of the studies of Lehrman and Hinde, who became close friends and communicated frequently about their research during this period, while exchanging personnel between the Institute of Animal Behavior and the Sub-Department of Animal Behavior at Cambridge University.

A high point during this period was William C. Young's request that Dan write a chapter for the 1961 revision of the classic volumes *Sex and Internal Secretions* that he was editing. Dan reviewed the entire literature of field and laboratory studies on the behavioral neuroendocrinology of parental behavior in birds and mammals in his now classic chapter.

In 1953 Dan published "A Critique of Konrad Lorenz's Theory of Instinctive Behavior," his famous criticism of ethology that launched him as a major theorist in the field of

animal behavior. It was written at the urging of Schneirla and required that Dan translate all of Konrad Lorenz's writings, which had not yet appeared in English. This was a task for which he was prepared by his army service as a cryptanalyst, during which he had become fluent in German. (He often recounted his role in planning the route of the daring American raid, originating in Italy where Dan was stationed, that destroyed the Ploesti oil fields in Romania. It required listening over many months to German air spotters reporting plane sightings and working out a route for the airplanes that would enable them to reach their target without being sighted by the spotters.)

The critique was leveled at the concept of innateness used by Lorenz and presented, as an alternative, a developmental approach to many of the behavior patterns viewed as innate by Lorenz. He introduced to ethnologists many of Schneirla's ideas of the role of stimulus intensity and of approach—withdrawal responses in the ontogeny and phylogeny of behavior—and he emphasized the role of experience, including self-stimulation as a source of experience. These were offered in opposition to Lorenz's concepts of innate releasing mechanism and innately based sign stimuli.

The story behind one controversial aspect of this article is worth recounting. While translating Lorenz's writings, Dan came across articles written during the 1930s in which Lorenz provided what purported to be scientific support taken from animal behavior for the racist policies of the National Socialist Party (Nazi) under Hitler. This was based upon Lorenz's concept of the hereditary nature of innate behavior patterns and the need to maintain their distinctness by preserving their hereditary purity. Dan wrote (1953):

> He (Lorenz) states that a major effect (of unrestricted breeding) is the involution or degeneration of species-specific behavior patterns and re-

leaser mechanisms because of degenerative mutations, which under conditions of domestication or civilization are not eliminated by natural selection. He presents this as a scientific reason for societies to erect social prohibitions to take the place of degenerated releaser mechanisms which originally kept races from interbreeding. This was presented by Lorenz in the context of a discussion of the scientific justification for the then existing (in 1940) German legal restrictions against marriage between Germans and non-Germans.

In an early draft of the "Critique . . ." Dan included a final section presenting this material in Lorenz's own words as indicating the ideological significance of his scientific theory. However, in the final version of the article the section was significantly reduced and inserted earlier in the article where it did not attract as much attention. It was a difficult decision for Dan to make to reduce the prominence of this material, but he was counseled to do this by several of the leading scientists of the day such as Karl Lashley, Hans-Lukas Teuber, and Donald O. Hebb, who had read an early draft of the article containing this final section. They supported Dan's scientific arguments but they advised that the strong negative emotional responses still evoked in audiences to Nazi racial doctrines would obscure and weaken the impact of these scientific arguments.

Although the "Critique . . ." could have divided American comparative psychologists from European ethologists, its actual effect was the opposite. The European ethologists, whose own backgrounds were in evolutionary biology and often in ornithology, soon learned upon meeting Dan that he was not a typical American experimental psychologist who studied animals in contrived laboratory settings. They discovered that he was an evolutionary biologist, a naturalist, and an ornithologist like themselves. Like them he was interested in and knowledgeable about the natural behavior of animals, but unlike most ethologists at that time,

he was also knowledgeable about experimental methods in comparative and developmental psychology, endocrinology, and neuroendocrinology. He, therefore, played an important role in the rapprochement between the European and American scientists that culminated in a month-long meeting of these two groups organized by Frank Beach and held at the Center for the Advanced Study of Behavior in Palo Alto in 1957. The meeting was attended by comparative psychologists mostly from North America (Dan, Hebb, Harlow, Beach, and myself) and European and American ethologists (Tinbergen, Hinde, van Iersel, Baerends, Vowles, and Hess). Dan's influence on the relationship between comparative psychologists and ethologists and the relations between them was solidified at this conference and he maintained close personal and scientific relationships with many of them throughout his life.

Dan was a most inspiring teacher and an accomplished speaker whose performances were famous for his imitation of ring dove bow-coo calls, wing flapping movements, and incubating eggs that accompanied his presentations. He spoke extemporaneously and was able to sense the level of understanding of his audience, speaking to them at their level and carrying them along with him as his story unfolded. On only one occasion that I know of did Dan use notes to give a lecture. He substituted for a famous professor at City College who made a show of the fact that notes for his two-hour lectures were scribbled on a single side of one envelope. Dan entered the classroom and, with an exaggerated gesture, produced an envelope, tore off the triangular flap that contained his notes for the two-hour lecture, and threw away the remaining envelope!

Dan was able to describe his research to scientists from other fields so that they understood it and shared his enthusiasm. This ability to convey ideas and information clearly

and interestingly was an important reason why he was sought after by multi- and inter-disciplinary scientific groups, such as the group at Salk Institute. He was also quite generous in describing the research of his colleagues at the Institute during his many lectures in this country and abroad. He presented their research with the same enthusiasm and excitement as he presented his own research. He was eminently successful in this as we discovered later, because many scientists in the field who were knowledgeable about our research thought they had heard it from us and knew us personally rather than through Dan's descriptions.

During the last three or four years of his life Dan turned his thoughts and writing to general issues in the study of animal behavior. He was concerned with what motivates scientists in the study of animal behavior. He thought about the kinds of problems that interest them, how they choose the concepts they employ, and how ideology plays a role in theoretical differences among them. Dan perceived that deep emotional and ideological differences, revealed by semantic and conceptual formulations, divided scientists on important issues in the field of animal behavior and these could not be resolved by empirical data alone. Having in mind the then current controversy about the role of experience in species typical (i.e., innate) behavior, he wrote (1970):

> When opposing groups of intelligent, highly educated, competent scientists continue over many years to disagree, and even to wrangle bitterly about an issue which they regard as important, it must sooner or later become obvious that the disagreement is not a factual one, and that it cannot be resolved by calling to the attention of the members of one group (or even of the other!) the existence of new data which will make them see the light. Further, it becomes increasingly obvious that there are no possible crucial experiments that would cause one group of antagonists to abandon their point of view in favor of that of the other group. If this is, as I believe, the case we ought to consider the roles played in this disagree-

ment by semantic difficulties arising from concealed differences in the way different people use the same words at different times; by differences in the concepts used by different workers (i.e., in the ways in which they divide up facts into categories); and by differences in their conception of what is an important problem and what is a trivial one, or rather what is an interesting problem and what is an uninteresting one.

In this regard Dan had a good deal of respect and admiration for Konrad Lorenz despite the deep differences in their theoretical views on the nature of innate behavior and the role of experience (and, of course, Lorenz's more political writing cited above). In fact, referring to his earlier "Critique . . ." directed at Lorenz, he wrote (1970):

When I look over my 1953 critique of his theory I perceive elements of (my) hostility. . . . It does fail to express what, even at that time, I regarded as Lorenz's enormous contribution to the formulation of the problems of evolution and function of behavior, and his accomplishment in creating a school based upon the conception of species-specific behavior as part of the animal's adaptation to its natural environment.

Despite their theoretical differences, Dan felt a kinship with Lorenz because their feelings towards the study of animals and the contemplation of nature were similar. Lorenz, he felt, was also receptive to (and excited by) the myriad phenomena of life and nature when he observed animals. Moreover, as Dan pointed out in comparing Schneirla and Lorenz's similar attitude towards the study of animals (1971):

They share the orienting attitudes that the life of the animal itself poses problems to the investigator, that the units of behavior studied should be natural units evolved through natural selection, and that the contemplation and appreciation of the complexities of nature are valuable human aims, independent of their usefulness in understanding human life (a problem to which both addressed themselves).

He believed his and Schneirla's differences with Lorenz were ideological; they arose from different cultural traditions and could not be settled by empirical evidence. These

traditions dictated that for Lorenz the categories of innate and learned were sufficient to deal with how behavior became adapted to natural environments during evolution. But Dan believed these categories were too restrictive and narrow; he required the fluidity allowed by the developmental analysis of animal behavior, not restricted to these concepts, to understand the variety and complexity of adult behavior.

Dan was also concerned about the use of animal data to understand human behavior. On the one hand, he was sympathetic to the efforts of scientists who wanted to deepen their knowledge by seeking relations between phenomena in their own field and a discipline underlying their own. He was aware that those of us who studied animal behavior often evoked concepts from neurophysiology and neuroendocrinology. On the other hand, he was skeptical of this possibility in relating data from subhuman primates to humans and expressed it as follows (1971):

> The way in which the sources of aggression in human beings are not only transformed, but arise in the course of social experience, does not leave us with any great hope that simple formulations about the way in which an animal has its hostility turned on and off by signals from other animals (in the way that we describe the behavior of gulls) really would be useful in dealing with human behavior.

The danger in using the data of animal behavior to understand human behavior, he felt, arose from the fact that in all animals the nature of individual and group functioning is embedded in complex frameworks of differences among species. These behavioral characteristics adapt them to different natural ecological and social conditions. Human behavior has its own place in this broad framework but that place cannot be established by finding similarities between human and animal behavior on the basis of seemingly simi-

lar phenomena. As an example of the misuse of animal behavior to understand human behavior, he argued against the then current use of mother-young relations in the rhesus monkey as a model of human mother-young relations. He pointed to the fact that in monkey species other than the rhesus (e.g., the spider monkey) known at that time, the mother-infant relationship was quite different in part because of differences in the kinds of individual relationships that existed in the social group. As a consequence, separation from the mother in the spider monkey was not as psychologically devastating as separation from the mother was in the rhesus monkey. This was because among spider monkeys other adults took care of the infant and it did not suffer the loss of its mother as much as the rhesus infant, which did not have the benefit of care by other adults.

To provide Institute of Animal Behavior students with the opportunity to learn about human behavior, and in line with the breadth of his own interest in human behavior, Dan organized the Institute of Cognitive Studies as a graduate doctoral program in the Psychology Department in Newark. He recruited to this program the leading Gestalt psychologists in the fields of social psychology, learning, perception, and cognitive psychology such as Solomon Asch, Irvin Rock, Dorothy Dinnerstein, John Ceraso, and Howard Gruber. Their theoretical orientation to human behavior, Dan felt, was compatible with the approach of the Institute of Animal Behavior to animal behavior.

In 1961 Dan married Dorothy Dinnerstein, who did research in perception and wrote on the relationship between men and women in her classic book *The Mermaid and the Minotaur.* Each of them grew through the support their relationship provided.

Almost the last thing Dan wrote expressed the understanding he had arrived at concerning the role animals had

played in his own life. He wrote about one's orientation as a scientist to the study of animals (1971):

> There is another aspect of the activity and the life of a scientist and another function for science, which is not often enough stressed. In addition to (or instead of) serving a function like that of an engineer, the scientist can also serve a function like that of an artist, or a painter, or poet—that is, he sees things in a way that no one has seen them before and finds a way to describe what he has seen so that other people can see it in the same way. This function is that of widening and enriching the content of human consciousness, and of increasing the depth of the contact that human beings, scientists, and nonscientists as well, can have with the world around them. This function of arousing and satisfying a sense of wonder and curiosity about the riches of the natural world, and of strengthening the civilized human being's weakened feelings of being part of the world around him, is a function which you can see being served in any hall or gallery of the American Museum of Natural History.

Dan died at the threshold of a period of vast expansion of the field of animal behavior and behavioral neuroscience along lines that would have won his enthusiastic approval. The study of the natural behavior of animals in the fields of behavioral ecology, mating preferences, parental behavior, and foraging, which are concerned with the adaptiveness of behavior, has clearly won out over the study of arbitrary, experimenter-oriented animal behavior in laboratories. The renaissance of developmental studies in the flourishing field of developmental psychobiology and the near obscurity of the innate-learned controversy indicates the correctness of his early views. Moreover, Dan would be impressed with the fact that since its inception, due to his efforts, the Institute has trained more than 100 doctoral students and postdoctoral fellows who have taken up research positions at leading universities and other research institutions in this country and abroad. Finally, the research carried on by Mei-Fang Cheng on the ring dove reproductive cycle since his death indicates, first of all, how much is still to be gained by

studying the ring dove and, second, how correct he was in his belief that studies should proceed from an understanding of the complexity of social interactions to the analysis of underlying neuroendocrine-neurophysiological mechanisms.

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