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CHAPTER 10

THE GREAT SHIFT: INSTINCT TO INTUITION

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In the discussion of the comparable aspects of animal communities and human society, emphasis has usually fallen on their similarities rather than on their differences. Their similarities, moreover, are often regarded as indications of basic identities in motivation, purpose, and value. But similar appearances, whether of form or action, are as often convergent evolutionary products as generic common traits. Think only of the hummingbird's flight, which looks for all the world like an insect's—a sphynx moth's, for instance, or a dragonfly's. Yet the mechanism of the hummingbird's movement is entirely avian, and quite unrelated to insect flight. Their similarity is a result of convergent developments, not of common heredity (Gregory 1951).

If you want to find the true relationships of taxonomic groups, a good method is to study the differences that set them apart. By pursuing their specializations backward as far as they go, you come to limits beyond which no distinctions can be made; then you have found the fundamental similarities of all animals of the phylum or phyla you are dealing with.

Bodily traits, both anatomical and physiological, may be hard to study *in vivo* because the observer has to disturb the fluid structures and the processes he would like to observe in an undisturbed state; but technological progress is making more and more of them accessible. In our genuine laboratory sciences of biochemistry, physiology, and embryology we are doing fairly well, and have every hope of solving the problems which at present still elude us, such as, what happens in the thinking and perceiving brain, or pragmatically vital issues like the cause of cancer formation, of cerebral palsy, and of others we all could think of. In genetics we have reached the point of checking mathematically formulated hypotheses against empirical facts. But the same cannot be said of the aspects of life—and, specifically, the life of higher animals, say the vertebrates—which interest us in the context of the present symposium: the causes of animal behavior, especially group behavior, and their relation to our own communal life, that is, to human society.

It is an interesting fact that all our advanced biological theory does not

lead systematically into an equally advanced psychology. When an inquiry does not go on, but balks at perfectly relevant questions of some particular sort, the trouble is usually deep seated and conceptual. The basic concepts with which we are operating successfully in a limited field are not capable of extension to a wider one. But scientific fields do expand, and as they do, new questions arise, as for instance psychological questions from biological facts. Then a new conceptual vocabulary—not a metaphorical use of old vocabulary—has to make a new frame (Langer 1967), capable of housing the original field of research in a wider one. Let me introduce a couple of new basic concepts in terms of which we can talk adequately about the three phenomena mentioned in the title of this lecture—instinct, intuition, and the shift from one to the other which made the great divergence of genus *Homo* from the rest of the primate stock (or stocks, our line may be polyphyletic).

The key concept with which I have been operating for the past decade is the concept of "the act" as the unit of vital process. As an abstract concept, this term is used not in any of its several popular senses in which it commonly means a moral act, a conscious act, or at least an overt act, but technically; it is used here to designate any event of a particular form occurring in a particular sort of context, both of which can be physically defined. This concept of "act," though not popularly understood, is already current in physiological and psychological discourse; and it really goes far back in scientific language. Sir Henry Head, at a symposium of the Aristolelian Society fifty years ago, spoke of a "complete sensory act" (Head 1919, p. 79); E. von Holst (1957, p. 237) speaks of a direct perception as "ein ganz unmittelbarer Wahrnehmungsakt"[1] and of the cause of continuity in vision as "ein höherer integrationsakt"[2] (op. cit., p. 241); Paul Weiss (1959, p. 16) has called "conditioning" "a non-overt act" and refers to "the mitotic act" (Weiss 1958, p. 19). This usage is highly general, but in no respect vague. The act is a form that all vital events take, from metabolism to human thinking, from putting out a pseudopodium to visiting the moon. It is marked by a formative phase, the impulse, which may be very short or quite long; a phase of development, the buildup of the act; a phase of consummation, and finally a declining phase for which I can find no good English word except the musical term *cadence*. Cadence means "fall." It denotes the closing passage of a piece of music, in which an overall tension is finally resolved.

[1] A completely direct perception act.
[2] A higher act of integration.

Similarly, I think it applies naturally enough to the final spending of the impetus built up in the impulse, rise, and consummation of an act.

The reason why the concept of "act" also involves a special sort of context is that the act form, in itself, is not entirely peculiar to vital processes. It is exemplified in some nonliving processes, especially chemical reactions. A very simple illustration is what happens if you put a spoonful of soda into a glass of lemonade. After a few milliseconds the liquid foams up, climbs to a maximum head, then the reaction subsides, and the substance resumes its resting form in a new chemical state, as a salt. More than fifty years ago D'Arcy Thompson (1951, vol. 1, p. 258) pointed out the difference between such a chemical reaction and an act occurring in an organism: the chemical reaction ends with the appearance of a new compound, but the vital act goes on, engendering other acts (often repetitions of itself) or breaking up into subacts which are drawn into other acts in rising phases (Thompson 1951). This, as you can guess, is a long and intricate story. The upshot of it is that every "true act," as I would call it, arises from a matrix of other, concomitant acts, and spends itself in this same stream of act-engendered acts as part of the self-propagating process.

Such a matrix of activities is a physiological continuum, a living system, presented as a whole by reason of the involvement of its act with each other. It is an organism, and in regard to each of its acts it is the "agent." An agent is a product and producer of acts; a living being.

As acts, which are the units of vital process, have a complicated form, so the basic operation that produces new acts from an old one and creates the continuously growing matrix is a special operation. It is peculiar only in its complexity. This complexity, however, strains human powers of conception (Platt 1961, Schmitt 1963). Every act begins as an impulse caused by the occurrence of an energy pattern in the matrix. No single event is *the* cause. Any influence that may loosely be said to cause an act has to exert its influence on the matrix, the living system. The operation which really produces the act involves a special causal relationship between the matrix and the act; this constantly exemplified operation may be called motivation. Again, the word is commonly used in a more restricted sense, namely the influence of needs, fears, or desires on the overt acts of an agent. But that is a special case of the broader sense. As P. T. Young (1955), commenting on a symposium paper, said: "If motivation is a contemporary process of energizing, then all behavior is motivated since all behavior is determined by energy transformations within the tissues. If the process of motivation is revealed only in goal-directed behavior,

then we can distinguish between motivated (purposive) and unmotivated (random) behavior. I prefer the broader concept . . ." I am following Dr. Young's usage. A word for the causation of impulses is needed, and the use of "motivation" for it is in the literature (Delgado, Roberts, and Miller 1954; Twitty and Niu 1954), so that is what "motivation" means here.

We have, then, these notions to work with: acts, having the variable but basically characteristic form of impulse, rise, consummation, and cadence; the operation of motivation whereby past and current acts engender new impulses; the dense system or matrix of acts, most of which are metabolic and trophic, microscopic acts in endless rhythmic trains. Imposed on such minuscule activities are the larger physiological activities that have larger cycles, and the whole system is a living organism.

So now, at last, we come to the problem of instinct. Let me say, first of all—categorically, for want of time to explain and justify the statement —that I do not think there are any specific "instincts," functions of special mechanisms, like reflexes and perhaps tropisms. But there are instinctive acts. That is, I will accept "instinctive" as an adjective without subscribing to the hypothetical units designated by the noun, "instinct." On this subject I find myself in complete agreement with J. B. S. Haldane (1956, p. 451) who said at a symposium on instinct in Paris: "Biffons si vous voulez, le substantif 'instinct,' mais pas l'adjectif 'instinctif.' "[3] The term "instinct" in the title of this paper is shorthand for "instinctive behavior."

Instinctive action is usually understood to be behavioral—that is, to be overt action rather than intraorganic or covert. But behavioral acts of such organisms as we are considering—vertebrates, especially the higher forms—arise before birth from somatic activities. Those muscular acts which develop *in utero* or *in ovo* belong to what embryologists call the "motor action system," which is a dynamic pattern of nervously generated, species-characteristic acts such as head turning, finger movements, flexions of arms and legs and trunk, chewing or sucking movements, eye movements (yes, *in utero*), and so on (Hamburger 1963, Ebert 1965). All these movements are unaimed yet typically formed acts. Unlike reflexes, which belong to another system that appears somewhat after the start of the motor-action phenomena, the latter gain in articulation in the course of gestation, so many of them are quite distinct and complete at term. These acts are the animal's basic repertoire, overt expressions of hereditary, systematically maturing behavioral impulses. They are not yet

[3] Reject, if you will, the noun "instinct" but not the adjective "instinctive."

instinctive acts (for reasons we are just coming to), but they are *instinctual elements*. The basic repertoire consists of such instinctual elements.

Instinctive behavior involves another factor besides native impulse, in that most acts of the organism as a whole become effective only if they are met by some extrinsic material in which they make a change. Eating requires something to eat. Digging requires something to dig into. That is, most behavioral acts presume a substrate to implement them. This part of any situation in which animals are able to act develops only after birth, and with it their instinctive life really begins. It is at this juncture that the organs of perception come into play, and are used in support of the internal feelings of desire and aversion, enticement and fear, to guide the agent in its constant search for opportunities to enact its impulses.

All animal reaction is instinctive. Animal intelligence is capability to find implementation for acts developed from the physiologically engendered instinctual repertoire. One may say that animal intelligence, where it exists, is exhibited in the pursuit of instinctive action. But instinctive behavior may also be quite devoid of intelligence; a rat with an urgent impulse to retrieve a pup when there was none outside the nest has been known to carry its own tail (Eibl-Eibesfeldt 1963). Perhaps we should credit it with the intelligence to help itself. Equally unadaptive is the spawning procedure of some large neotropical toads, which "will spawn in any kind of standing water, including narrow and shallow ditches . . . The eggs . . . contain very inadequate yolk reserves. Hatching occurs in a very rudimentary condition . . . which must result in heavy mortality" (Lutz 1948, p. 37). Yet no "natural selection" has bred toads too wise to lay in ditches and puddles that are about to dry up. Peter and Gertraud Krott, in a long first-hand study of the European bear in the wild, observed that bears neither learn to accept or ignore the presence of nonhostile human agents (such as road workers and foresters) nor learn to avoid danger when they are hungry (Krott and Krott 1963, p. 198). Dozens of further instances of such instinctual inadequacy could be added here, from bird, crustacean, and insect life.

The lengths to which the elaboration of instinctive behavior, practical or impractical, can go are astounding, especially in birds. But it is interesting that communal acts—which are the most complex in human life—among beasts and even birds remain relatively simple. The perfectly timed and coordinated movements of a rising, wheeling flock of blackbirds, and the much less perfect "V" formation of geese in flight, are about as cooperative as general group behavior becomes in birds and mammals. The "mobbing

behavior" of birds jointly attacking a predator has no collaborative strategy (Hinde 1954). Tschanz, in a very thorough study of the colonial habits of the Atlantic Murre, found that the closely settled ledges where these birds nest are not cooperatively defended against predators, but as each nest site is defended by its owners and the nests are so close that the birds sit almost shoulder to shoulder, the effect of their individual actions is that of a closed front (Tschanz 1959, p. 94).

The most elaborate performances of birds occur in their reproductive cycles, which comprise courtship, coition, nestbuilding, egglaying, incubation, feeding and brooding the young in the nest or guarding them as chicks, and sometimes defending territory, nest, mate, or the clutch. In this cycle one finds not only great variations on the single, clearly identical theme, but the most improbable variants: consider the mound-building birds in which the male, with or without help from the female, builds an enormous mound of decaying vegetable matter, digs holes in it where the female then lays her eggs; whereupon he, generally alone, tends this incubator for weeks or even months, opening and closing it to keep the temperature steady (Kendeigh 1952, Frith 1959); or the strange development of behavior in the hornbills, where the female enters her tree-hole nest before the first egg is laid and the male brings clay to wall up the entrance (at which she helps him), leaving only a small window through which he feeds her for six to eight weeks (Kendeigh 1952); or the exaggerated courtship behavior of the bower birds which build walled display grounds and decorate them with colored leaves, shells, and man-made objects like bottle caps (Marshall 1954).

Yet in spite of such extreme elaboration of individual and mutual acts, the colonial nesting of seabirds, sand martins, herons, and some other species leads to no cooperative behavior, and even the communal nesting of some weaver birds has no interesting behavioral results; nothing like the division of labor in colonial insects, which we are not here considering, because their development has diverged too far from the vertebrates to be comparable to our own, and such comparisons are what we are aiming at. The same thing holds for mammals that live in herds or in territorial communities: any apparent joint action—like the group formation of a bison herd under attack—where the bulls are said to surround the cows and calves, results from the momentary impulse of each animal, most of the bulls being aggressive and forging to the fronts while the calves push to the center for protection and the cows are caught between the two movements. In the colonial life of the highly specialized mammals such as

the beavers, there is no division of labor;[4] any number may be working together on a dam, yet the work of each beaver is exactly what it would be if he were building alone. In a prairie-dog town there is no plan except the automatic spacing-out of burrows, no urban life but the fright reaction of many at the alarm call of one, and the use of common runways (King 1959).

Elaborate instinctive practices develop predominantly, if not solely, from individual or sexual activities. Since they reach their highest evolution in birds,[5] I return to that order to consider the essential nature of instinct, which accounts to a great extent for this limitation.

Every instinctive act is roughly preformed in the impulse which it expresses. For the sake of brevity, I can only ask you to accept that assertion at present. I have given the factual grounds for it elsewhere (Langer 1967). Impulses can be very complex, so their expressions are not simple discharges of energy, but large acts with various phases, subacts, and often with both physiological and behavioral aspects. The marvel of their teleology, especially in cases where the agent could not possibly foresee the situation its behavior is to meet or to bring about, is comprehensible if you consider that every impulse spends itself if and as it can, as Konrad Lorenz pointed out long ago (Tinbergen 1951). The animal is not seeking the effect of its act, but the conditions that will implement its continuance and consummation. The goal of the act is simply its completion, and its completion involves the change it makes in the external world. The performance is guided by organic feeling and the perception of substrates, means, and obstacles. Such perceived conditions appear as enticements, lures, threats, blocks, openings; the internal needs arise and change partly by intrinsic timing and partly in hastened response to stimuli from the progressive, implementing situation.

In birds and beasts, unlike human beings, the procreative cycle—from mating to the final abandonment of the reared brood—is one act. This single act undergoes all the developments it possibly can in the confines of the situation and the hereditary potential of the stock. The influences which encourage the elaboration of particular elements are too diverse for

[4] *Editor's note*: Some division of labor is achieved through the classical division of activities into male and female sexual roles or through the serial role differentiation during the processes of extended maturation. (J.F.E.)

[5] *Editor's note:* While not detracting from Dr. Langer's statement, it may be fairly stated that Teleost fishes equal the birds in the elaboration of "instinctive practices." (J.F.E.)

discussion here, so I shall just give you one example: the fantastic courtship preparations and antics of the bower birds can be traced to a great discrepancy between the onset of sex interest in the male and in the female. He has to wait six to ten weeks for her to attain the state and the mood for actual mating. All that time she watches him, but he has to express and also maintain his excitement until she is receptive. In the course of evolution, the increase of the temporal gap has not been checked because his courtship activities have overdeveloped progressively to hold the pair-bond for a longer and longer stretch (Marshall 1954).

This unity of instinctive acts, which permits the development of their highly articulated sub-acts, is what makes it possible for animals to perform feats that seem to aim at practical consequences. The agent lives from one impulse to another in the expression of a total act engendered by hereditary organic dispositions, implemented by ambient conditions, and enlisting the native repertoire of the species. It is not hard to see that such activity would be largely individual, sexual, or parental, rather than communal, though there are some (still relatively simple) exceptions.

A notable one is the behavior of the African hunting dogs studied on their range by Wolfdietrich Kühme (1965). These animals hunt in a pack that consists of adults of both sexes and such juveniles as can keep up with them. Puppies, nursing bitches, and other individuals unable to hunt stay behind; the returning hunters vomit almost-fresh meat for them. Kühme makes no mention of castes, clubs, or leaders and says explicitly that in spite of the closest observation he was unable to detect anything like a social hierarchy.

The tendency of acts to become more and more detailed and involved in the course of evolution can lead to a point where they become too intricate to be altogether practicable. Since numberless impulses are always pushing for actualization in an organism, any blocking of one mechanism allows some other to go into operation; then there is competition between two (or even more) systems to control the effectors to the same end. It may also happen that a primitive mechanism is no longer equal to its task because the organism is developing rapidly in other ways and throws too much of a burden on it. Again, some entirely different impulse pattern, working through different physiological channels, may achieve the instinctive end in a new way and gradually take over from the old one. That is known as *functional shift*. Whole sequences of functional shifts go on in the prenatal history of the higher animals. The greatest importance of functional shift, however, is in evolutionary progress, where anatomic, physiologic, and behavioral functions shift from primitive to

higher and higher anatomical mechanisms as these mechanisms become ready to assume the functions (Bock 1959).

Before we can discuss the promised key concept of this lecture, which I think of as "The Great Shift"—the shift from animal to human life—one other principle of biological existence must be recalled: namely, that every organism is always enacting all the impulses it can. Behaviorally this means that it tries to respond to all the perceptions and other stimulations its nervous system receives. This fact underlies the final synthesis of all the nervous developments in the Hominidae that made them depart so radically from the other advancing primate stocks.

It has been said that man owes his biological success to the fact that he has remained unspecialized, meaning that he is not closely and particularly adapted to any special environment, having remained plastic and unfixed, like an embryonic form. This proposition, on which Arnold Gehlen based his widely read book *Der Mensch* (1940), has been used by several animal psychologists to explain the biological success of cowbirds, crows, gulls, rats, and mice as unspecialized animals not limited by adaptation to a special habitat. (The originator of this idea with respect to man, according to Gehlen, was Bolk [1926].)

The human stock, in fact, has undergone several pronounced specializations. The upright posture is only partly available to other primates; it is natural to man because of anatomical modifications of the pelvis, femur, knee joint, and the development of his abductor and extensor muscles. The evolution of the hand involves more than the famous opposable thumb; its finger play and high innervation make it as much a sense organ as an effector. That may have been part and parcel of the fateful advance, which was the extreme overdevelopment of the central nervous system, including the sense organs. Epicritical vision and hearing, the sensibility of a naked skin, and probably a comparable broadening of the creature's range of interest and attention tended to overwhelm its capacity for overt responses. Yet animal acts arise from immediate conditions and normally terminate in behavior.[6] If we, in our present human state, responded to all the sensory stimuli that impinge on us, we would all have St. Vitus' dance.

This discrepancy between impression and possible expression must have

[6] *Editor's note:* Yet animals do not respond immediately to impinging stimuli and indeed a given animal may have a predisposition to respond to certain key stimuli which is completely tied to the current, predominating motivational state (see also E. von Holst and U. von St. Paul, *Naturwissenschaften*, 18:409–422). (J.F.E.)

begun millions of years ago in the hominid line, when the stock was still entirely animal (though perhaps always parallel, not identical, with ape and monkey stocks), and behaved only instinctively. But the strain of excessive awareness forced some of the cerebrally initiated acts to fall short of complete expression; the effect was a great intensification of nervous action that rose to the level of sensation as an image, and spent itself that way. Perhaps this happens in beasts, too, but is just a passing occurrence. In the human strain, however, it became habitual and constant, so that it influenced the evergrowing brain which provided the great outward receptivity, so the phenomenal forebrain development snowballed on its phylogenetic way. Images became cathected so that they attained an emotional value quite separate from the emotional value of percepts (sense data) as practical indicators. But actual percepts, too, became deeply affected by autogenic images, and were often distorted by their merger with such phantasms.

Products of imagination are probably not hereditary like instinctual elements of behavior, though I would not be too dogmatic in rejecting hereditary tendencies. (C. G. Jung's "archetypes" are supposed—on romantic rather than scientific grounds—to have some sort of hereditary status. Since this has not been investigated, I would not deny the possibility of inherited natural symbols.) All that is in the human gene pool, I believe, is the image-making tendency itself. But every normal individual soon acquires a repertoire of cathectic images, and these products operate in mental activity much as the elements of the instinctual repertoire function in overt behavior; that is, images are variable, combinable, and, above all, evocable by all sorts of involuntary acts and some voluntary ones. A direct perception may set off a train of quite different imaginal experiences; the stimulus need not be in the same sensory mode as the phantasy it motivates; for instance, a nonvisual experience, like a sound, may evoke a visual image.

Now, human beings are, and probably always were, gregarious and vociferous. Under the same pressure that motivated the consummation of many neural processes in the brain, their instinctive vocalizations not only increased but became articulated like the sexual antics of other creatures; but instead of evoking instinctive practical responses they evoked imagery. Repetition of vocal sequences standardized the diverse emotive and ideational responses and inspired animal posturing and bodily movements with a new driving force—participation in a communal expression —felt by each agent, and seen by him in all the others. That is celebration, and its fixed forms are ritual. What the earliest dances and rites ex-

pressed may have been very vague, personal phantasies, but every individual enacted the excitement of something imagined. Above all, even snatches of recurrent articulate sounds would activate images with all their terror and excitement and serve as *pars pro toto,* representing the whole habitual experience.

As soon as a purely imaginary object is conjured up by the familiar sound heard or made by the agent, symbol and meaning are born. The symbol evokes a mental act—conception—without any pointing and directing function. At once the two belong together, and the perception of each through and in the other is an act of intuition.

The word "intuition" has suffered many abuses, so we had better establish at once what it means. Certainly nothing mystical or irrational, such as "woman's intuition" and "moral intuition." I am using it in the sense given to it by John Locke in his very sober *Essay Concerning Human Understanding* (1690). Locke meant by it the kind of direct perception that may go through any available avenue of sense: the perception of relations, such as greater than, before, after, between, richer than; to the right of, like, different, same, and so forth. Also, the perception of form, pattern, unity of form, wholeness, gestalt; and the generally neglected, but all-important recognition of *exemplification*—that is, the recognition that *here is a case* of such-and-such a form, connection, or structure. Besides these logical data of intuition, there are the basic semantical ones of meaning and symbolic significance. Locke did not include semantical functions, but tacitly took them for granted, and he added one which I cannot accept as intuitive: knowledge of the existence of God, which must be classed with factual knowledge or belief.

Throughout most of the *Essay* Locke avoided the term "intuition," because of its frequent wrong uses, and spoke instead of "natural light." Only in the fourth book, where he felt sure that he had made clear what he meant and what he did not mean, he used the term "intuition," and I find it a good word for *logical or semantical perception.*

Unfortunately one cannot expound a whole theory of symbolism in so little space, so I shall have to simply skip the most intriguing part, namely how I think language began. All I can say is that I do not think it began with names for ordinary objects, as children's language learning begins in a speaking society. But it began with symbolic utterance, which motivated acts that terminated in the brain as emotionally charged inward visions, conceptions; and as the long, formalized utterances were communal, they could be started anywhere, by anyone, with the same sort of meaning for all hearers, until they broke up into bits with more and more

definite conceptual meanings. The main point is that true language is essentially conceptual, as no animal expression—vocal or gestic—is. Speech is not derived from animal communication; its communicative and directive functions, though all-important today, are secondary; its primary function is the symbolic expression of intuitive cognition (Langer 1960).

Meaning and relations among meanings are impossible to perceive without symbols, because they have no independent physical existence. Intuition, therefore, is momentary and implicit and unnegotiable without words, if it exists at all. But once the symbolic function has occurred, the shift from animal mentality to human mentality has begun. In a gregarious species, the easy production of vocal symbols makes the expression of symbolic impulses at once personal and public, and an entirely new form of interaction between individuals is created—exchange of ideas, or true communication. In this sense, animals do not communicate. They automatically stimulate each other and use each other's reactions, but they do not share or oppose opinions. They cannot express, and therefore cannot conceive, aspects of situations as *facts*.

But facts, opinions, and conceptions of causal relationship (often imaginary) have become the basis of human life; and therewith human community is no longer a matter of instinctive interaction and generic group cohesion, but is always—on every level of subsequent development —society. The greatest change, however, is not pragmatic, but a change of value feeling. Animal values are felt in good and bad situations, temporarily cathecting whatever objects function as aids or obstacles to acts in progress. Like relations or familiar patterns, they are implicitly given and instinctively dealt with. Consequently, the most elaborately stereotyped animal colony is not a society. To the human mind, however, values are permanent characters that mark classes of things, and especially classes of acts. Society is organized and upheld by value symbols. It is not essentially an aggregate of beings in which a natural "pecking order" develops; that does take place all the time, but in the confines of a more stable conceptual framework, the moral structure of human social life. Society is institutional; whether it is regulated by unwritten tradition or by a formal code, it has some system of prohibitions and prescriptions, and recognized classes of acts to which they apply. Specific acts are seen as exemplifications of the recognized classes, and valued as good or evil accordingly.

The power of institutions lies in that they are not simply actual, like instinctive animal ways, but that they can survive many lapses from behavioral realization. The law, the church, the army continue to exist

though many persons break the law, sin against the church, or evade military service. They are not so-called "ethological" patterns, but *ethnological* institutions, upheld by symbols that mean large, emotionally charged ideas. Such ideas are not possible without semantic intuition, and their construction is unthinkable without the logical intuition elicited by the structure of language, and the word-making tendency that has resulted from the specialization of the human forebrain.

The stamp of language is on everything we know and do, on every behavioral response we make to things in the human ambient; and because even our vaguest concepts can be verbally related to others, the human ambient is not a loose tangle of paths, places, lures, terrors, expectations —like an animal's—but is a world. It does not arise as we go into action and collapse as we go to sleep, but holds over from day to day and season to season. World, society, and self are conceptual products. The most spectacular effect of language is, of course, interpersonal communication; and in this process the moral structure becomes deeply articulated, because words have many functions, and the most ubiquitous is that they impute emotive values—good or bad, in all possible degrees—to the concepts they convey. That is why a clever speaker can publicly make black look white; it is also why each individual cares what others think of him, and has a so-called superego and a self-image.

The upshot of the shift from instinctive action to intuitive rationality (the derivation of reasoning from direct intuition being another story we have to skip) is that human beings probably do nothing exactly like animals. They have the same basic impulses to eat, sleep, chase, procreate, and (more than most other animals) make noise; but conception alters even our most direct enactments of such impulses. The main alteration is that sub-acts contained in larger total acts become distinct and more and more independent, so the big instinctive acts of animals, preformed in their vital impulses and (originally no doubt) in ours, fall to pieces under the catalytic influence of thought. Every new power is bought at a price; in the great shift from animal mentality to mind, in the development of imagery, intuition, and social communication, we have lost our elaborate instinctive patterns, such as guide birds in sequential, procreative acts from pairing to the independence of the new generation, and guide beavers in their architecture and home life. Our instinctive behavior has degenerated to very simple forms, so that what we mean by "sex," for instance, has shrunk to little more than coitus. We have to work along other lines. And I think one may say that we can afford to lose our guiding animal faith just to the extent that we can replace instinctive by symbolic

processes. We can sacrifice natural hierarchies and pecking orders as we institute authority and rule, and bear the change from the progressive specious present of animals to our past and future and the predestined end of each life by conceiving gods, souls, and an eternal state. Such concepts, of course, can be formed and maintained only by symbolic means; and those means are our holy symbols, rites and liturgies, and magical objects.

It is the fashion today to speak of formalized animal behavior, such as courtship posturing or even the nodding and displaying of two lizards that happen to meet, as "ceremonies" and "rituals," of animal interactions as "communication," and of inherited animal ways as "traditions," lately even as "cultural traditions." I think that is a pernicious source of scientific confusion. Clearly it is intended to bridge the gap between animal and human life, as an older generation tried to do by treating man as a super-rat or a not-very-super-ape; well, if the mountain won't come to Mohammed, Mohammed will go to the mountain. First we anthropomorphize the animals and then we discover that we are just like them!

The most serious harm to science that I see in the present fashion of applying ethnological terms metaphorically to animals is that—odd as it may seem—it is really based on the assumption that the two studies, ethnology and what is called "ethology" (the slightest possible variant of "ethnology"), will never become true integral parts of biological science. If they should ever do so, the use of words literally in one context and fancifully in another would cause havoc; we would always have to say "caste, I mean caste" or "caste, I mean status," because, as Dr. McBride points out, the essential property of caste in its original, ethnological sense is that one is born into a caste and normally cannot change it, whereas in his sense an animal can pass from one caste to another. That is not a properly generalized sense of the word, but a new sense which will not even subsume the literal meaning. Of course someone may say that I have done the same with the words "act" and "motivation," but if you view my generalized use of them more closely you will find that it is really "generalized" from the restricted use, and subsumes the latter as a specialty.

The use of a word in quotation marks does not make it a technical term, as all too many writers seem to think, who introduce a borrowed word as a metaphor—a literary florish—and then drop the quotation marks; as John A. King, in his articles on prairie dogs (King 1959, p. 131), calls their naso-nasal contacts upon meeting "the identification kiss," speaks once or twice of the "kiss" in quotation marks, then drops

the marks and simply says that the animals kiss; although he points out that the "kiss" is exchanged with bared teeth, and—in his own words—"the open mouth which characterizes the kiss [no marks] probably serves as a threat rather than an expression of affection." Why, then, call that "kissing?" In view of the fact that—according to the Yerkes (1929, p. 296) and the Kelloggs (1933, p. 121), and most recently Jane Goodall, who made her observations in the wild (1965, 1967)—chimpanzee mothers really kiss their young ones. King's misuse of the word makes for confusion even in the field of ethology itself. Similarly, when Fox claims that monkeys born of high-caste mothers have a social advantage, he uses caste meaning status (a transient high status when the son was born but might not last until he grew up). The worst practice, however, is the use of "ritual," "rite," and "ceremony" for formalized animal acts; rites and ceremonies are expressive acts, symbolizing vague but highly imaginative ideas, and are characteristically human. To obliterate the distinction between typical expression of excitement and social ritual is scientific malpractice. Bierens de Haan (1940) is the only animal psychologist I have encountered who realizes and explicitly warns against the use of beguiling metaphors. So I shall here reiterate what I said at the outset: if you want to find true identities or precise relationships among biological phenomena, study their differences and guard the distinctions.

Now, how does this discussion of the "Great Shift" serve to answer the question of what we can learn from animal communities that could be applied to human society? I think the answer, though implicit, is clear: practically nothing that could be applied directly. Our problems of group life and self-realization, of involvement with our kind, and of the development of individual lives, are not like those of any other animal species. We cannot trust our instincts to see us through the most solitary and simple existence, let alone a normal human social life; they are too degraded and fragmented, their sub-acts reduced again to primitive impulses without any fitting hereditary forms. From that point of view, man is indeed unspecialized. He has specialized in symbolic activity to the evolutionary attainment of intellect, and his intellect has invaded and disrupted what he may have had by way of the marvelous adjustments of animals. Many animals are intelligent about finding the necessary external conditions for their instinctive ways of life; but no animal except man is intellectual. Our problems of handling ourselves as a society are intellectual, and as they arise—chiefly by incursions of formless instinctive "drives"—they have to be countered and steered by rational principles, formulated in tradition or, in extremity, by vigorous conception and consistent thinking.

But all this does not mean that there is nothing of human value to be learned from the study of animal behavior. We are all born as little creatures of pure instinct. A comparison of the development of instinctive behavior in babies and in animals which have a dependent babyhood shows at what early stages human impulses are no longer realizable by animal methods, and require thoughtful provisions for their socially safe and individually adequate expression. Many of our social problems, of course, begin in the crib. Thus, the point in every individual life is to learn what basic impulses we really have, and what instinctive methods of living we have lost forever and have to replace by conceptual ones. What I have tried to show is how deep the division between beasts and men goes. Very deep, indeed; but when we touch bottom, when we glimpse the beginning of man's great biological departure, we come upon the ultimate unity—the common source of his and all other animals' impulses pressing for expression, the basic vital needs he still shares with the field mouse and the crow.

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