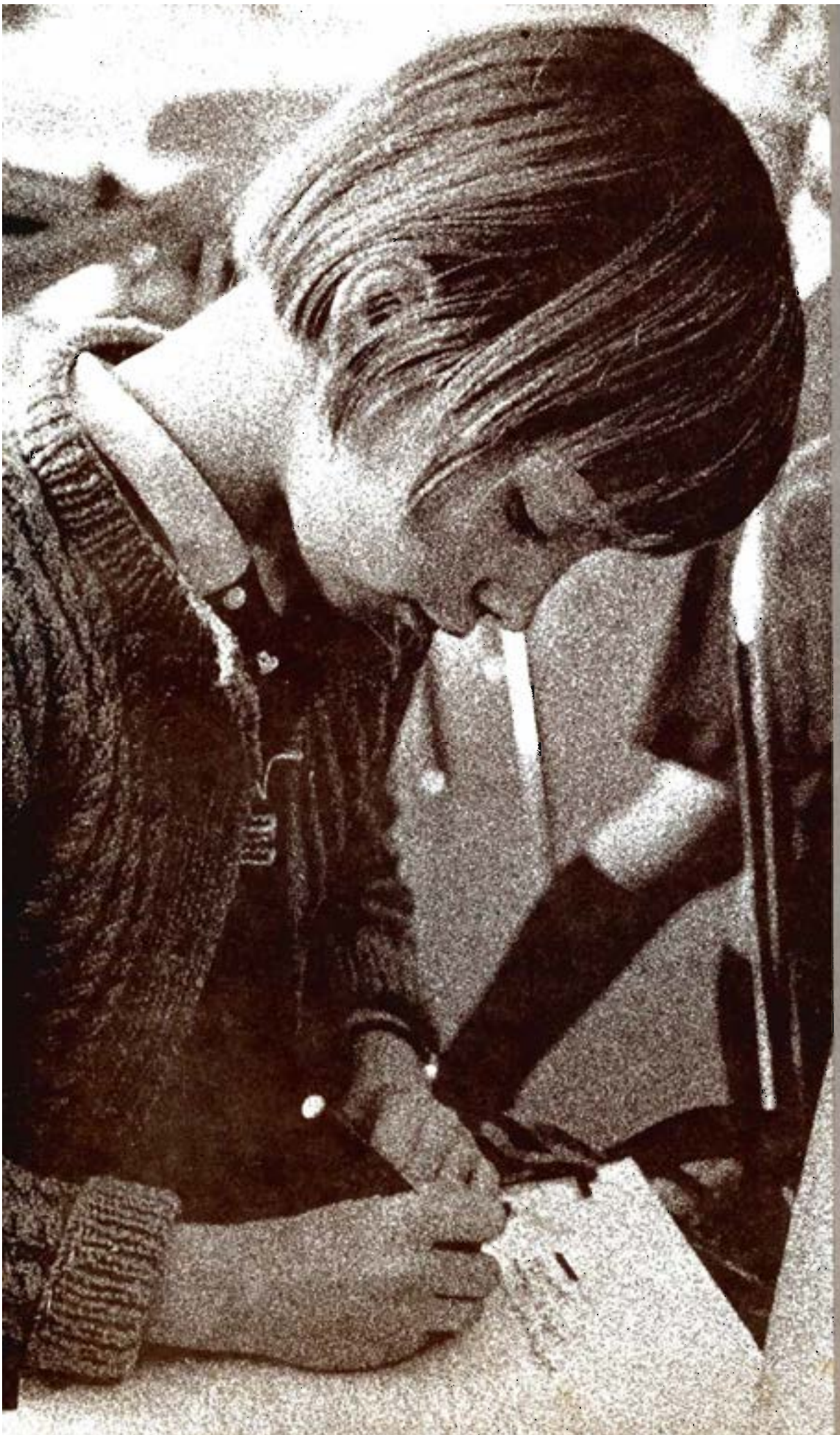




ONE

**Man:
A Course
of Study
Talks to
Teachers**

Man: A Course of Study
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MAN: A COURSE OF STUDY: A Continuing Exploration of Man's Humanness

Peter B. Dow

BACKGROUND

In 1964, Jerome S. Bruner, head of the Center for Cognitive Studies at Harvard, took a year's leave from his research on learning in young children to direct the early development of a fifth grade social studies course which he entitled Man: A Course of Study. It is fitting at this point to review the origins of this course, the intellectual and pedagogical assumptions upon which it has been built, and some of the aspirations that have inspired its creators. We hope that a knowledge of the point of view that shaped the selection of activities, materials and guiding questions will help teachers and others who encounter Man: A Course of Study to understand and to build upon the ideas and insights it tries to convey.

In 1963 a group of more than thirty teachers and social scientists from schools and universities throughout the country came together to consider ways of improving social studies curriculum in the nation's schools. During these deliberations a number of people, particularly several of the psychologists and anthropologists present, became excited about the possibility of helping young children learn more about the meaning of human behavior and culture by giving them access to materials about animal groups and simple human societies, materials similar to what was at that time exciting the interest of behavioral scientists in many universities.

The task at first seemed insurmountable, given the lack of appropriate literature and the impossibility of providing young children with field work experiences. However, Douglas Oliver, Professor of Anthropology at Harvard, was convinced that such a course could be built--perhaps even several such courses--using sparsely narrated or natural-sound

film as a replacement for field work. Accordingly, Oliver organized two film-making expeditions, one to East Africa to record the social behavior of free-ranging baboons,* and another beyond the Arctic Circle to Pelly Bay, to document the migratory life of a remote group of Eskimos called the Netsilik.**

To these films, created especially for this course, we have added other materials--still photographs, field notes and ethnographic journals--to help students construct an authentic context for what they see. Using these sources in combination allows children to come to their own understanding of the subject in ways that are analogous to the methods used by the scholar in the field.

As the materials were collected, the intellectual substance of the course began to take shape. In 1965, Dr. Bruner sketched the first broad outlines of Man: A Course of Study.

The content of the course is man: his nature as a species, the forces that shaped and continue to shape his humanity. Three questions recur throughout:

What is human about human beings?
How did they get that way?
How can they be made more so?

We seek exercises and materials through which our pupils can learn wherein man is distinctive in his adaptation to the world, and wherein there is a discernible continuity between him and his animal forbears.***

*Irven DeVore, Harvard primatologist, led this expedition in 1964. DeVore has studied baboon behavior for many years and on this occasion he supervised the shooting of 40,000 feet of technicolor film of baboon troops in Nairobi and Amboseli Game Parks.

**Asen Balikci, Professor of Anthropology at the University of Montreal, led three separate expeditions to the Arctic between 1963 and 1965. These trips produced 180,000 feet of film from which eleven hour-long films have been edited.

***J. S. Bruner, Man: A Course of Study, Occasional Paper No. 3, The Social Studies Curriculum Program, Educational Services Inc. (Cambridge, Mass., 1965), p. 4.

This brief statement encompasses the range of our concern in developing curriculum. We want children to begin to know and care about the humanity of man. To understand man's humanness we look beyond man to other animals, particularly animals whose lives illuminate special features of our own. A young salmon, for example, manages to swim, and eat, protect itself, and, if it lives long enough, find its birth-place five years later, all without the aid of parents. Why are human babies born so helpless? What part does our dependency on parents play in shaping what we mean by humanness?

Some animals act in ways that cause us to question behavior in ourselves which we may have thought had no nonhuman counterpart. Chimpanzees greet each other after separation with affectionate hugs, and baboons displace aggression with looks and gestures that remind us of ourselves. These similarities in behavior must not be overemphasized for human feelings are expressed through symbolic powers that animals lack. Nevertheless, the study of the behavior of other animals in their natural habitats provides many useful metaphors, a provocative set of images, to help us to think in new ways about the uniqueness of man.

Humanness means more than belonging to a special species, however. We use the term to describe many forms of behavior, both social and personal, which define man's cultural and individual identity. Men of all races and cultures distinguish between those inside and those outside their private definitions of humanity. A !Kung bushman, for example, makes no distinction in his language between foreign people and other animals. When we say, "That was an inhuman thing to do," or "Those people simply are not human," we are revealing the fact that we regard humanness as something more than a biological inheritance. Humanness is a changing man-made condition composed of an environment shaped to suit his needs, a society with common rules and expectations, and a spiritual community of mutually held values and beliefs. Humanness is, paradoxically, a continuous human invention.

This brings us to the subject of culture. A major segment of Man: A Course of Study is devoted to an intensive examination of the traditional life of the Netsilik Eskimos, a culture which has developed under conditions far different from those which gave rise to Western civilization. Study of a culture so different from our own makes us aware of the extent to which our view of behavior is shaped by the society in which we live. We can often observe this limitation in others, but it is far more difficult to perceive a cross-cultural blindness in ourselves. Children, for example, may view the killing of animals by the Netsilik as evidence of their brutality, or "primitiveness," without regard for the fact that almost all human societies survive by exploiting animals in different ways. What is intriguing is how man does this without disrupting the survival rate of animals to the point where they are no longer available to him, and how different cultures manage and justify this in different ways. If killing is what concerns them, they can discuss the conditions under which various cultures find bloodletting acceptable.

The aims of Man: A Course of Study are twofold. First we wish to stimulate children to think about the nature of man by providing them with interesting studies of animal behavior and human groups taken from recent work in the behavioral sciences and anthropology. By comparing man to other animals and by studying man in a cultural setting different from our own, they may reflect upon the deep structure of human experience, the common impulses and ways of coping with life which unite man as a species beneath the surface diversity of culture, and the biological ties that unite man with other living creatures.

Second, we hope that through this course children will come to understand that what we regard as acceptable behavior is a product of our culture. In judging others, particularly those from different cultures, children must learn how their judgments, and the judgments of all men, are shaped by the culture in which they live, and they in turn can shape their culture.

Our present educational system provides students with extensive knowledge about American culture. It is powerfully assisted in this effort by the mass media and by the freedom of access which children have today to many aspects of the adult world. In Man: A Course of Study students are helped to gain a new perspective on themselves and the culture that they share through an understanding of another way of life. We hope that at the same time they will develop a vocabulary for thinking about the human condition in ways that will assist them in coping with the immense cultural distances that divide the modern world.

THEMES OF THE COURSE

The first major theme to emerge in our study of man is the notion of life cycle. To most ten-year-olds the idea that all creatures share similar life patterns--they are born, reproduce, and die--seems obvious enough. But the life of the king salmon, our first animal study, has one surprising feature: the parents die before their offspring hatch from the eggs. Children wonder how life is possible under such circumstances. How do salmon reproduce? Can an animal function without learning? Can he learn by himself? How and what do fish learn? What is the "fit" between an animal's innate and learned capacities and the demands of its environment? These questions lead children to wonder about features of their own lives--the need for learning, the dominance of parents and other governing adults, the helplessness of babies.

The study of the life cycle exposes learning as a principal activity of man. In the animal studies children observe a range of behavior from the many innately programmed activities of birds and fish to the predominantly learned behaviors of baboons and chimps. They become aware of the many different contexts in which learning can occur: through exploration of the environment, association with other members of a group, or transmission from one generation to the next. The study of the Netsilik adds new dimensions to this discussion, for here

the student can explore the ways in which a culture passes along its accumulated knowledge and beliefs. The examination of learning in these various contexts provides an excellent opportunity to discuss the meaning of humanness. More than any other creature man is dependent on learning for survival; yet it is this dependency that allows for an immense range of adaptive behavior, for the differences between cultures and for the possibility of rapid changes within a culture. Herein lies man's power both for self-improvement and, perhaps, for self-destruction.

Parenthood, a topic closely linked to dependency and learning¹, is a third theme discussed in the early lessons. The herring gull study raises questions about the function of parents, for here the children see a species whose behavior appears to resemble our own: two parents, dependent offspring, elaborate care of the young. But close study of this behavior reveals that the biological mechanisms that account for it are far different from the forces that shape corresponding human activities, and this leads to a further exploration of innate behavior. When children recognize the relative helplessness of an individual gull to control its fate, they can consider the significance of a man's capacity to make decisions that influence his destiny.

Baboons, on the other hand, offer some intriguing parallels to man's condition. Here we observe a group of ground-adapted monkeys, which live in lifelong association with each other, which are cared for and protected by the troop's most mature and dominant members, and which mature and grow old at a rate similar to humans. Adults live in close association with their young during the early years of life, and the influence of males is clearly distinguishable from the influence of females. The participation of parents in the development of the young is much more complex here than in herring gulls, and it is interesting to consider how the treatment of young male and female baboons by adults relates to the organization of baboon social life and the survival of the species. There are pronounced personality

differences between individuals, and socially successful males achieve positions of dominance in the hierarchy of the group.

In this context social organization now becomes a central theme. Study of baboon social behavior invites an examination of human society. How does human social organization differ from that of baboons? Is aggressiveness necessary to achieve status and power in human society? In what ways is power achieved in societies other than our own, or in different groups within our society? What does this indicate about humanness? Are there any limits to man's capacity for creating and managing social systems? How might present systems be made more perfect? More human?

The study of the Netsilik provides some provocative insights into these questions, for this is a society without elaborate power structures and social hierarchies. Groups are bound together by a network of social bonds and sharing obligations. Kinship ties and non-kin economic partnerships of the Netsilik reflect some of the most enduring social patterns known to man, and analyzing them helps us to think about the social impulses which govern our own lives. Do blood ties and kinship groups serve a social function in a modern industrial society? If not, what kinds of social bonds replace them?

The earlier discussion of learning can now be extended to include a consideration of how child-rearing and education shape development of behavior in ways that reflect social needs. A close examination of Netsilik family life reveals the many ways in which children, often without conscious instruction, are being prepared for adult life. Through observation, play and continuous association with their parents and other grown-ups, they learn the skills, appropriate behavior, and the feelings and beliefs of the adult world. What insights does this give us into the more formally organized education of our own culture? Do our own lives reveal similar patterns of behavior in the relationships between children and adults?

Consideration of the similarities and differences between animals and humans introduces the discussion of animal communication and human language. Most children resist the notion that there is a significant difference between human communication and that of other animals.

What is exciting about the study of human language, however, is the idea that words, unlike other sounds or gestures, exist independently of the situation in which they are used. Words accumulate meanings and associations over time, enabling man to reflect upon experience, learn from it, and act with this awareness. A baboon can experience danger and learn by experience to cope with it, but no baboon can think about the idea of danger and invent new ways to deal with it. Man's capacity to symbolize, his way of transforming the external world into a set of manageable objects, images, and ideas is what in the end sets him apart from other animals.

One of the primary aims of the Netsilik study is to illustrate this symbolic capacity in man. We cannot fully understand human life without recognizing that what we do and think and feel is a product of our need to symbolize. Because man interprets his world through language, he recreates it in a symbolic form that he can think about, remember, and even imagine in a more perfect state. This man-made world we call our "culture." By studying many aspects of a single culture, the culture of the Netsilik Eskimos, we hope that children will begin to perceive this idea in a very concrete way.

Imagine Itimangnark, celebrated Netsilik hunter, fashioning a spear from pieces of driftwood and bits of caribou bone bound with thong cut from the sinew of his prey. He contemplates the coming hunt and glances at his waiting kayak, recently constructed with his brother and hunting companion, Irkowagtok. Itimangnark and his brother will hunt together and divide their kill, their families will have food, and there will be new materials for fashioning tools for future hunts. Perhaps they will tell each other and their families stories about the hunting skill of their ancestors. Their sons will listen and watch,

and they will work along with their fathers. When the sons reach manhood they will fashion tools, tell stories and provide for their families as their fathers did before them.

Everything in this brief scene is a human event with symbolic properties, a product of the creative power of the human mind. The spear and kayak represent an ingenious plan for converting the meager resources of a barren environment into a powerful set of instruments for closing the distance between man and his elusive prey. The tools are part of a comprehensive hunting scheme which includes a killing strategy, a sharing tradition based on blood ties and a set of beliefs about how men must behave to ensure that the hunt will be successful. And, what is more, the system is self-perpetuating.

What contributes most to our understanding of man is not the tools and the observable behavior, it is the thought processes that underlie this behavior. Here man is interpreting the external world and transforming it into modes of thought that he can act upon. To know man, we must learn to recognize patterns of thought and behavior and to appreciate the different forms they take in different cultures. We hope the Netsilik study will help children empathize with people of many different cultures--to see themselves, one might say, in the context of other cultures.

Underlying much of the thinking that has shaped this course are two powerful and closely related themes: the idea that a structure can be understood in terms of its function, and the concept of adaptation--the notion that an organism responds to its environment in ways that tend to promote its survival.

In studying animals we look at their physical characteristics and discuss the ways in which these structures are adaptive: the coloration of gulls, for example, or the canine teeth of male baboons. Children wonder how animals acquire these special structures, and

this leads to a discussion of natural selection. We examine the range of individual difference which we can observe in the offspring and how these differences are advantageous if the species is to adapt to a changed environment.

Behavior is also adaptive, and the baboon material provides an opportunity to discuss the relationship between adaptive behavior and social structure. Here we can study the individual members of the troop and talk about how they relate to each other in ways which are socially adaptive. What are the different roles that each of the members fill, and how does their behavior, in conjunction with the behavior of others, contribute to the survival of the group as a whole? A class especially interested in this idea might discuss the "social selection" which takes place as the most dominant males monopolize the sexually receptive females. How does this behavior help the group survive?

In discussing human behavior we use the same words--structure, function and adaptation--but because man is able to modify his structures through thought, even his own physical structure by means of technology, we examine "invented structures," including not only tools but also organized groups of people and sets of ideas and beliefs. Man adapts to his world through a process of continuous creativity whereby he imposes structures of his own invention on the natural world. By examining the functions these invented structures serve and exploring the infinite number of ways in which man shapes his own development through this creative power, we hope to know man better. Perhaps self-knowledge of this kind will be adaptive too.

SOME COMMENTS ABOUT PEDAGOGY

Man: A Course of Study reflects many of Jerome Bruner's ideas about curriculum design. In his book, The Process of Education,* Dr. Bruner

*J. S. Bruner, The Process of Education (Cambridge: Harvard University Press, 1962), p. 31.

emphasizes the power of organizing ideas as a way of shaping and stimulating thought:

The curriculum of a subject should be determined by the most fundamental understanding that can be achieved of the underlying principles that give structure to that subject. Teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge is uneconomical in several deep senses. In the first place, such teaching makes it exceedingly difficult for the student to generalize from what he has learned to what he will encounter later. In the second place, learning that has fallen short of a grasp of general principles has little reward in terms of intellectual excitement. The best way to create interest in a subject is to render it worth knowing, which means to make the knowledge gained usable in one's thinking beyond the situation in which the learning has occurred. Third, knowledge one has acquired without sufficient structure to tie it together is knowledge that is likely to be forgotten.*

With these concerns in mind, we have framed questions, arranged data and sought modes of explanation to help unify the immense diversity of information about the behavior of man that we attempt to examine.

Yet there is a paradox here, for our most intense pedagogical conviction is that oversimplification and dogmatism are the twin enemies of creative thought. Premature closure on a productive question can destroy imagination. Concepts are worthless unless they lead children to new explorations. Ideas, like facts, have a short life in memory if they are not assimilated by the child in his own way. The private world of children must be nurtured, not uprooted. Our task as teachers is to frame the problem clearly, which is often no more than asking the proper question.

*J. S. Bruner, The Process of Education (Cambridge: Harvard University Press, 1962), p. 31.

In preparing materials we have tried to provide a range of activities broad enough for children of all aptitudes and interests to enjoy. Games, role play, construction exercises, simulated hunts and observation projects are various ways of involving children in the ideas and problems of the course. The test of a good social studies course should be that it generates enthusiasm among all students, not just those of particular interests and abilities. In an era of increasing specialization in education, the social studies class is a last refuge for free discussion and the sharing of ideas between children of different backgrounds and talents.

The emphasis on organizing ideas should not obscure our equal interest in what educators call the "affective domain"--the emotional, artistic and spiritual life of the child. This interest is reflected in the selection of student materials and the spirit in which they have been designed: the drama and pathos of the stories and poems, the careful integration of texts and illustrations, the use of humor, the artistry of the filmmaking, and the invention of games and devices to stimulate the imagination as well as excite the mind.

Beyond this, we have designed some activities so that children can confront their own emotional reactions to what they are learning--discussions of the sexual behavior of animals, for example, or the aggressiveness of baboons. In the Netsilik study, children confront senilicide as a moral dilemma, and they consider the need for killing in a society where game animals are the principal source of food.

More important than the opportunities we have provided, however, are those discovered by the sensitive teacher. The best time to discuss an emotionally laden issue is when children openly express their concern. One thinks of innumerable examples: the inner-city child deeply engrossed in the study of herring gulls, who suddenly looks up and asks, "What happens if his parents don't come back? Can the little chick peck on another herring gull's beak and get some food?"

Or the argument that breaks out in the suburban classroom over whether Eskimos are human if they encourage their children to kill animals. Or the young artist who spontaneously illustrates the clarity of his knowledge and the passion of his caring in a picture of a special moment in the life of one of the animals he has studied. These are the rare and vital times when children assimilate knowledge in a deeply personal way, when thought and feeling join and ideas which once were foreign become their own. In an ultimate sense, it is to encourage learning of this kind that we have built this course.

CONCLUSION

What, in the end, do we hope Man: A Course of Study will accomplish? Surely it cannot presume to answer the immense questions it poses. Furthermore, as we said earlier, answers have a way of killing thought, especially if they are premature ones. We hope, however, that this course will make Bruner's first question, What is human about human beings?, live in the minds of its students with a reality not easily forgotten. So that it may, we have provided a variety of contexts in which the question can be considered. In the animal studies we present animals with ways of life that we hope will provoke the student to seek new ways of understanding man. In the Netsilik study we challenge students' preconceptions about human behavior by asking them to view man--to see themselves as it were--in a cultural context which is strikingly different from their own. Rather than attempting to answer questions, this course should be but the first step in a continuing search for a deeper understanding of man's humanness.

As for Bruner's second question, How did he get that way?, much of the data of Man: A Course of Study leads toward the study of human evolution. The course does not pursue this fascinating path, because in developing the material we came to feel that a comparative rather than an evolutionary approach to the study of man was the most effective way to introduce the subject to young children.

Hardest of all is Bruner's final question: How can he be made more so? Can he be? This, one might argue, is more a problem for theology than for social science. Or in any case it is best dealt with through intimate discussion between teachers and students in the privacy of a classroom far removed from the analytical pronouncements of curriculum builders. Yet those of us who have had the privilege of working on this course would argue that one way man might learn to become more human is to begin by trying to know himself, both by examining his biological kinship with the other animals with which he occupies the world, and by studying the unique patterns of behavior that he shares with men in other cultures.

THE STUDY OF ANIMALS

Niko Tinbergen

All over the world, among primitive tribes as well as in modern society, there are those who delight in the observation of animals, and there is a growing awareness of the fact that sharing our world with our fellow creatures is like traveling together -- we enjoy being surrounded by other beings who, like ourselves, are deeply absorbed in the adventure of living. There is a growing sense of marvel, and also of affinity.

But man experiences much more than just this sense of awareness of other forms of life; he tends to do more than just look at animals. It is one of his special attributes that man wonders about the world he lives in. He wants to see exactly how things happen, and he wants to understand why they happen.

This sense of wonder is at the root of scientific inquiry, and so it was inevitable that the desire to understand the behavior of animals should lead to the study of animal behavior. This inquiry -- which is still in its infancy -- is concerned with far more than just recording interesting incidents of animal life. It tries to find out as exactly as possible "what makes animals tick": why animals behave the way they do. I have spent the greater part of my life at this task, associating with animals in the field and in the laboratory, observing them and studying their responses in a variety of experimental situations. I have, in 30 years or so, seen our understanding of animal behavior grow considerably. But I know only too well that our science has still a very long way to go. I am only one single member of a guild in which thousands of psychologists, zoologists, physiologists, ecologists and geneticists are jointly building a new science. Most of the questions we ask are still unanswered. Worse, we are not always

sure that we are asking the right questions or applying the right methods. We are hardly more than groping to find our way. But these early stages of scientific exploration are fascinating; they give one a sense of adventure, and I firmly believe that many of my fellowmen are willing and indeed keen to join me in this adventure.

Where do we begin? At the beginning -- by asking ourselves, What exactly is animal behavior? What do we mean by it? The answer cannot be straightforward and simple. Roughly speaking, behavior is the movements animals make. These involve more than running, swimming, crawling and other types of locomotion. They also comprise the movements animals make when feeding, when mating, even when breathing. Nor is this all: slight movements of parts of the body, such as pricking the ears or making a sound, are also parts of behavior. And many animals do something akin to our blushing -- they change color, sometimes as a way of concealing themselves from predators, on other occasions when they are aroused to attack or are courting a female. It is difficult to distinguish this sharply from behavior. And, of course, behavior can also consist of standing still and looking intently or, perhaps, just thinking -- doing something internally that may influence subsequent behavior.

On the whole, however, we tend to call "behavior" movement or a change of movement, including the change from motion to absolute nonmotion, or "freezing" -- in short, what one can directly observe. But even though we may start by studying these observable things, as we observe more closely, and particularly as we apply more analytical methods, we are able to see more and more of the processes that go on inside the animal, and behavior itself becomes an increasingly vague concept as attention focuses increasingly on the machinery behind it. However, for practical purposes, saying that we are concerned with movements will do.

Animals behave in a bewildering variety of ways; in fact, the range of animal behavior patterns is as great as that of their many shapes, sizes and colors, which took generations of zoologists to describe and classify. No two species behave exactly alike. A robin can be recognized by its song and also by the way it feeds on one's lawn, by the nest it builds and by its threat and courtship postures. And there can be surprisingly many different types of behavior in one and the same species of animal too. Gulls may feed by plunge-diving for fish or by killing a sick bird or by foot-paddling to drive worms to the surface of a meadow, or even by hawking insects on the wing. Yet the behavior repertoire of such species is limited -- no gull catches a bird the way a falcon does, nor can a robin build an oven-bird's nest. The enormous variety of behavior repertoires has as yet been described only very sketchily, and the behavior of most animals is very imperfectly known. But enough is already known to set us wondering about what it all means, to ask questions about behavior; and this natural progression from description to inquiry leads us deeper and deeper into the subject.

The next question generally asked by the student of behavior is, Why does an animal behave the way it does? This seems simple and straightforward enough, but it is really two questions in one -- and as we shall see, both are important to the biologist.

Let us say we are watching a dog eat. When we ask ourselves, Why is it eating? we may mean, To what purpose, to what end does it eat; what is the use of eating? One answer, of course, is that it eats in order to survive, or, to put it more specifically, the effect of eating contributes to the dog's survival. This is one aspect of behavior -- and an important one -- which we shall deal with later: much of behavior has survival value. This is of course obvious with eating, but the way other behaviors contribute to survival is not at all obvious and has to be investigated in detail.

However, there is the second question implicit in the one we are pursuing: when we ask why a dog eats, we may also be asking, What makes it eat? In this case we are not inquiring about the effects of its behavior but about its causes. Now it becomes relevant to know whether or not the dog has been starved, whether it is stimulated by the sight and smell of food, and whether, when it was young, it learned where and when to seek food.

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The quest for the causes underlying behavior leads to equally fascinating research, though of quite a different kind. We have, of course, known for a long time that, mechanically speaking, behavior is a consequence of muscle activity, and that muscles on the whole do not contract unless stimulated by nerves. The way muscles work and the way nerves make them contract are the proper study of the physiologist, and a great deal is already known. But rarely is behavior a matter of an isolated contraction of one muscle. On the contrary, even the simpler behavior patterns, such as locomotion, are sequences of contractions and relaxations of very many muscles, all well modulated and well timed. In fact, behavior is almost always a symphony of muscle contractions, with the messages from the central nervous system organized in an orderly manner, and it is this organization we have to understand.

The central nervous system, for its part, does not act entirely on its own accord -- it receives stimulation from other sources. What are these sources? Partly they are the sense organs -- eyes, ears, nose and many others -- which provide the animal with information about the outside world. The sensory processes, therefore, must also enter into our study. But partly, too, behavior is controlled from within: a hungry animal sets out to feed, and when its sex urge awakens it goes in search of a mate. We shall have to find out what it is inside the animal that makes it hungry or stimulates its sex urge. And finally, there is the fact that outside stimuli and internal condition interact -- i.e., a hungry animal reacts to the food stimuli while a satiated

animal does not; outside of the mating season, as in winter, most animals are indifferent to the same sex partners that strongly attracted them in the mating season.

There are two major difficulties in this study of the causes of animal behavior, and unless they are clearly recognized, they can hamper research seriously. The first concerns the subjective experiences of an animal: does it feel anything akin to what we feel when we are, say, angry or sad or amused? The biologist simply does not know and cannot know, and for that reason he does not feel he is entitled to say anything on the subject. Therefore, pursuing a strict and scientifically consistent line of inquiry, he cannot say that an animal attacks "because it is angry" or that it retreats "because it is afraid." He has to express the cause of what we might interpret as anger in terms of processes that can, in principle, be observed and measured just as well as the behavior itself. In short, he is interested in the machinery of behavior.

A second possible source of confusion is our failure to distinguish the two meanings of "why." We are apt to say, for instance, that an animal eats because it needs food, that a bird builds a nest because it requires a receptacle for its eggs. Again, we have to go beyond the superficial meaning of the word, and in order to avoid ambiguity biologists are strict about its use. In their language, "because" refers literally to causes, to events which precede the behavior and which can be shown to control it.

The confusion arises because we ourselves can, in some way still mysterious to the scientist, think ahead: even before we decide whether or not we shall undertake a particular form of behavior, we can imagine what the effect of that behavior will be. Thus we can say, with a certain justification, that the effect of our behavior controls what we shall do before we have done it. But although many animals do things -- such as building a nest, feeding their young, hoarding food -- that

prove to be useful long after they do it, they do not really seem to have these distant aims "in mind" when they are doing them. Certainly they often show surprisingly little adjustment to abnormal conditions that may arise; in such circumstances their behavior frequently "misfires." If a young songbird is accidentally kicked out of the nest and gets chilled, it fails to open its mouth for food when a parent comes and so is neither fed nor brooded -- it perishes, simply because the parents cannot cope with this unexpected development; they brood only young that are in the nest and feed only young that gape. What they react to, much more rigidly than we, is the stimuli of the moment. And while it is true to say that the function of feeding the young is to make them grow up -- a distant aim -- the causes of feeding the young are found in stimuli, external and internal, without which this end would not be reached. We would find out little about such causes if we would content ourselves with assuming that animals, like human beings, plan their behavior with distant aims in mind.

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We are still very far from completely understanding the behavior of animals, but we are beginning to learn how we can arrive at such an understanding. We also feel that our task is urgent. Some animals, such as those we consider pests, are a direct threat to us, to our health and our food supplies; we must know how to keep them in check. Others, such as our cattle and consumable fish, are indispensable to us; they have to be farmed, bred and cropped sensibly. We also have to learn to live and let live -- to share our planet with our fellow creatures, and this task of conservation, too, requires understanding. And, finally, since we are really related to our fellow animals, a closer study of their behavior can help us in learning to understand ourselves.

INNATE AND LEARNED BEHAVIOR

Irven DeVore, with the assistance of R. Trivers and I. Rothman

Helpless, the herring gull emerges from its egg, its feathers soft and downy, its wings ludicrously short. Within a few hours, it manages to peck at its parent's bill. The parent, male or female, responds by regurgitating food for its chick. If danger appears, the chick can only crouch in its nest, small and silent. Two months later the fully grown gull takes to the air. Its first flights may lack the grace of a more practiced bird, but the basic movements are performed with ease. The gull is now independent of its parents, able to fly to food and away from predators.

What happened during those two months? Did the chick await its emancipation, practicing for the moment when, at last, it would fly? Or were its actions unthinking, and unneeding of thought, following the inherited patterns of its species? We do not know what it is like to be a herring gull, but some people do seem to imagine it is much like being human, with feathers: the male and female are husband and wife, together bringing up their young, teaching them how to survive. Others see the bird as a living machine, operated by nature: male and female cooperate to rear young because they have inherited instructions to do so. The bird's life is seen as a program prepared in advance and run off automatically.

People tend to view animal behavior through one or the other of these distorted lenses. But behavior is more profitably analyzed from the point of view of adaptation. How does an animal's behavior enable it to survive in its particular environment -- that is the question.

"Innate" and "learned" are terms that refer to the way behavior develops in an individual. A herring gull chick is born with built-in instructions for carrying out certain behaviors. When it is hungry and without previous experience, it pecks at the red spot on its parent's bill.

A message from inside the animal's body -- hunger -- and the right kind of information from the environment -- a red spot -- produce an automatic, inherited behavior we call "innate." Sometimes innate behaviors emerge at birth; sometimes they develop later, as the animal matures.

The herring gull is born with a set of innate behaviors, but it is also born able to learn some things. It is able to change some of its behavior after experience with the outside world. It learns, for example, where things are in its environment. Changes in behavior due to experience we call "learned." Learning allows the individual to adjust to its environment. An animal also adjusts to its environment through innate behaviors, and does so automatically, but to only one set of environmental possibilities. If the environment changes and the animal cannot because it is built to behave in one way and one way only, the species is on its way to extinction.

The balance between innate and learned behaviors changes with each species: animals differ in the degree to which individual experience fills in the life pattern bequeathed by the species. Some animals are born ready to act adaptively on their own. Innate behaviors determine what they eat, what they avoid, how they live. Such an animal may learn some things, but it will depend on innate behaviors to solve its most important problems. But some animals are born dependent on others: their survival depends on being in a protected environment, cared for by others. The baboon baby clings tenaciously to its mother. The human baby wails to communicate its hunger. And the mother responds, adaptively. Because the infant can depend on her, he has the time to mature slowly and the opportunity to learn many things.

Behavior is seldom either innate or learned, but an integration of the two. And in studying behavior, it is difficult to make any general statements true of all animals -- or, for that matter, true of all fish, or all birds, or all mammals. What is true of all is that each species is superbly adapted to survive in a particular niche in a

particular environment. The following examples illustrate how innate and learned behaviors interact to produce the behavior that adapts different animals to different niches.

THE WORLD OF THE TICK

Among the insects we find the most striking examples of behavior that is clearly instinctive. In the social insects this behavior may be very complex, but the simple, effective behavior of the unsocial tick will serve to illustrate. The cattle tick is a small, flat-bodied, blood-sucking insect found throughout the United States and most of the world. When it first hatches, it possesses neither legs nor sexual organs. In this state, cold-blooded animals such as frogs and lizards serve as its host. After it has shed its skin several times, its missing organs develop, it mates, and it is then prepared to seek a warm-blooded host. The sperm the female tick receives in the act of mating remain bundled into capsules until mammalian blood reaches the tick's stomach. Then the capsules break, the sperm are released and they fertilize the eggs.

Eyeless, the female tick is directed to the tip of a twig on a bush by her photo-sensitive skin. Her metabolism is so sluggish that she is in a state of suspended animation; one scientist, Von Uexkull, kept such ticks waiting on the ends of twigs for 18 years.

The signal for which the tick waits is the scent of butyric acid, a substance present in the sweat of all mammals. For 18 years a tick may sit and wait. But when the animal catches the scent, it reacts quickly. It hurls itself in the direction of the odor. The object on which the tick lands must be warm. A delicate sense of temperature is suddenly mobilized: if the object is not warm, the tick drops right off and climbs back to its perch, perhaps to wait another 18 years for the right smell to come along. If it is the right temperature, the tick burrows its head deeply into its host's skin and slowly pumps itself full of blood. The tick is sensitive to temperature,

but not at all to taste. Once the membrane is perforated, she will drink any warm fluid, whether it is blood or not.

The behavior of the tick is an example of a life pattern inherited and carried out literally "blindly" by predetermined response. The tick's behavior is almost entirely innate: it has no opportunity to learn during its lifetime, nor any need to learn.

SALMON

The Pacific salmon is unusual, even among fish, in that it spawns only once in its life, and then dies. The young grow up without ever witnessing the adult behavior that made possible their birth. Yet when they are five years old, they, like all salmon before them, leave the ocean and swim upstream. Here they mate, lay eggs, cover the eggs, and die. They must do all this without ever seeing a salmon do it before them, and they must do it correctly the first time they try. They will not have another chance.

What does the salmon have the opportunity to learn? Spawning would seem to be innate. What about the journey upstream? If the eggs are removed from the stream where they were laid and placed in another, the salmon return five years later to the new stream. If the salmon's nose is clogged by an experimenter, it is unable to find its way back to where it was born. These and other experiments have taught us that although the urge to swim upstream is innate, the actual route is learned. In the first year of its life, the distinct combination of odors of the homestream is fixed in the salmon's brain. Many other behaviors of the salmon may also be learned. It may learn where to seek food and safety. Its ability to swim may improve with practice. It may come to recognize which animals are dangerous. At present, we simply do not know.

RAT MOTHERS

In many animals it is difficult to decide what opportunities for learning the individual may have had, particularly in species in which the

young grow up in a social group. Experimentation is necessary to tell what behavior the animal will perform if it is deprived of the opportunity to practice or to observe other animals. Once an animal is adult, it is almost impossible to determine how it came to behave in a particular way. So experimenters often rear animals in isolation to discover what behavior patterns they will develop spontaneously. Animals reared in isolation are sometimes called "Kaspar Hausers" after a famous boy who spent his first 18 years alone in a cellar but in later life was a court celebrity because of his intellectual accomplishments.

But interpreting the results of isolation experiments can lead to heated arguments. No animal in the world has been studied more thoroughly than the common white laboratory rat, yet there is disagreement on the extent to which the rat's maternal behavior depends on experience. It was long ago discovered that a female rat reared in isolation behaved toward the young of her first litter in precisely the same way that a rat reared in a colony behaved toward her fourth or fifth. Even a rat with no maternal experience will build nests before her young are born, clean the young, eat the placenta, and retrieve the young that get scattered on the floor of the cage.

Maternal behavior in the rat appears to require no experience. But experiments suggest that, although an integrated pattern of behavior may seem to appear spontaneously at the appropriate time in an animal's life, the component parts of the pattern may require previous practice. Rats raised in isolation with nothing in their cages to manipulate -- deprived of nesting material and fed powdered food instead of pellets -- did build nests. It was observed, however, that these rats manipulated their own tails. So the experiment was repeated, this time with rats whose tails had been amputated. Given nesting material, none of these females built nests. In another experiment female rats were fitted with wide Victorian collars which prevented them from licking and grooming their own bodies. These females, normal in

other aspects of their maternal behavior, failed to clean their young at birth.

Is the maternal behavior of a rat to be considered innate or learned? Clearly, the maternal urge which directs the behavior is innate. Similarly, the motor patterns involved in licking and manipulating need not be learned. But, apparently, they must be practiced. Normally, a pregnant rat who builds a nest and cleans her young has had considerable experience in manipulating objects and cleaning herself. These experiences are necessary if the rat is to perform the complicated behaviors required of a mother.

PIGEON PRACTICE

The maternal behavior of the rat, at first glance innate and automatically released by the hormones of pregnancy and lactation, turns out to require certain sorts of experience. The emergence of flying behavior in pigeons, on the other hand, is a classic example of how processes of growth may look like processes of learning. When we view the clumsy attempts of fledgling birds to fly, we readily come to the conclusion that the difficult coordinated movements of adult flight require weeks of practice. The behavior is not perfect the first time it appears. But does improvement require practice? Not necessarily. Behavior can improve through maturation alone. Pigeons were reared in narrow earthenware tubes in which there was no possibility of practicing the movements of flight. When these tube-reared birds were released with normal birds of the same age who had just begun to fly, they flew just as well as the normal ones. It seems that the urge to fly matures in pigeons before the muscles and wings have developed sufficiently to allow flight. The fledgling pigeon flaps its wings prematurely because an internal urge goads it to do so. Practice of the motor patterns involved is not a prerequisite for flying. They may learn how to fly better, but the first flight itself is not learned.

Similarly, we are accustomed to viewing the scrapes and bruises of the young toddler as a painful but necessary part of learning to walk. Babies in many other cultures are strapped down to cradle boards from the time they are born. Apparently, a child released from his confinement is able to get about just as efficiently, after only a day or two of practice, as a child who has been unrestricted all his life. Experience and practice are not required for the emergence of the walking behavior, though they may be for its perfection.

ANIMAL ADAPTATION AND EXPERIENCE

In thinking about the development of behavior during the lifetime of an animal, it is helpful to begin by assuming that almost all behavior of mammals is in a sense learned behavior. Some behavior is learned very rapidly and easily if the animal is living under conditions that are even approximately normal for the species. A young hooved animal, prodded and licked by its mother, soon staggers to its feet, and guided by her muzzle, it will find her teats and begin to nurse. These behavior patterns develop so quickly in nature that we think of them as "innate," but, to be accomplished successfully, they require the active presence of a normal and undisturbed mother. What we can say is that this crucial walking and nursing behavior must be performed within a few hours after birth, and that under normal circumstances this will occur. We can think of an animal's life pattern as the result of performing behavior which is more or less easily learned. A young deer or antelope must learn to stand and must learn to nurse, and its inheritance insures that normally this will be accomplished quickly and easily. Its inheritance consists of ways of behaving that succeeded for the species in the past. Adaptation is in large part the result of successful past behavior.

PUPPIES AND PEOPLE

Man interferes with this process in his domesticated animals, selecting behavior for his own convenience rather than a dog's survival. Because

the only animals many children will have observed in detail are household pets, it is inevitable that these will be discussed whenever the subject of animal behavior comes up. It brings up an interesting point. Many of the behavior patterns of an adult dog are the results of its master's more or less successful efforts to train it. What a dog can be trained to do easily or only with great difficulty is intimately related to what behavioral predilections it has inherited. Although various types of dogs have been deliberately bred to eliminate some behavior patterns and emphasize others, all dogs still retain much of their wolf ancestry. Wolves live in social groups and a human family is, in effect, the "pack" in the life of a domesticated dog. That is, domestication capitalizes on the same social impulses that make it possible for a wolf to be a member of a pack. Some behavior patterns remain essentially unchanged in captivity; a male dog urinating on a fireplug is the counterpart of a male wolf advertising his territory. We know that predators return repeatedly to a spot where they have found prey in the past, so it is no surprise that a puppy soon learns to return to the kitchen to find its feeding bowl.

These behavior patterns are all easily learned because they are part of the basic behavioral repertoire of wolves and are shared by all dogs. Some of these "wolf patterns" we find undesirable and try to either eliminate them or to modify them for our own purposes. Wolves hunt their prey by running it down, and it is very difficult to train most dogs not to chase moving objects -- whether they are automobiles or scampering children. By careful breeding and special training, this same impulse to hunt can be modified so that the dog "herds" flocking animals rather than killing them -- the herding behavior is much like hunting, but stops short of killing. This behavior can be sadly out of context in the city -- many a collie has died trying to "herd" a disobedient automobile.

In the hands of a patient trainer a dog can be taught to perform amazing circus tricks -- wearing clothes, walking a tightrope, riding

on a horse -- and we all recognize and applaud these behaviors for the difficult tricks they are. As opposed to the things a dog learns easily, these behaviors are learned with great difficulty. This is what we mean when we say that an animal learns to do some things easily and naturally, other things it can be taught to do with painstaking training, other things it can never learn.

BABOON BEHAVIOR

Baboons are more complicated than the other species we have been discussing, yet in their case, too, some elements of behavior are inherited and some modified by experience. Like human infants, a baboon is born incapable of doing anything very difficult. The monkey is born with a tenacious grip and is highly frustrated unless it can cling to some textured, warm, soft surface. In nature this surface is the mother's chest, and, since she has no hand free to help it, an infant must be able to cling by itself throughout the day or it cannot survive. There is no time to learn this behavior; it must be performed at birth. This grasping reflex, along with the ability to nurse and to make soft "licking" sounds when it is disturbed, is about all the behavior the newborn baboon possesses.

Most of what the young baboon must accomplish as it matures is the sort of behavior we have been calling "easily learned." But it does not appear automatically. Behavior for the monkey not only requires learning, but learning in a social context. Mating -- necessary for the survival of the species -- seems so natural that it has long been assumed to be an inherited pattern of behavior, but a monkey reared in isolation is incapable of the reproductive act. It must have had experience with others in a juvenile play group before it becomes capable of adult reproductive behavior. Isolation also interferes with communicative behavior. A monkey inherits the ability to make certain sounds. But, unless it grows up in a group of monkeys, it is incapable of reacting normally to the sounds of others of its species. The sounds are innate, but their context must be learned. Baboons are programmed

to learn from others. The baboon infant seems to have an innate urge to observe, to explore, to manipulate. It is programmed to pay attention to its environment, the ideal condition for learning about it. But the long period of infant dependency seems to work so that the young baboon is particularly attentive to its social environment, particularly motivated to learn from the others on whom it is dependent for survival itself. For example, the baboon infant learns its diet by watching others eat and imitating their actions. (Baboons in one group will readily eat scorpions. In another, in which the adults do not eat scorpions, the young react to the animal with fear.) The infant learns where it is safe to sleep and where to hide from predators. It learns what animals to fear and where they may be found. These are things a young baboon must learn to survive, but they are things it need not learn on its own. It responds to the movements, the gestures, and the warning cries of the older animals in the troop. The shared knowledge of a troop constitutes its social tradition. It is learned, it is essential for survival, and much of it is unique to each troop. In these respects, it resembles human culture.

The implications of social learning for individual survival are very important. The combined experience of the group benefits all the animals, including those that are not yet born. If every baboon had to learn that lions and men with guns are dangerous, baboons would be a rare species. But one unpleasant experience with hunters is sufficient to alarm the group, and for many generations afterward, the group will automatically give alarm calls when a hunter is sighted and flee to safety. It is through the social tradition that baboons and men have compensated for their slow reproductive rate and long period of juvenile dependency. Merely to mature slowly would put the species at a grave biological disadvantage compared to animals that have large litters several times a year. But the ability for the slowly maturing primate to modify behavior in response to changes in the environment, and to pass along this experience, has proved to be a remarkable advantage.

MAN

Man's abilities are unique. Man is unique in his ability to modify his behavior to adjust to changes in the environment. Man is unique, that is, in his ability to adjust, through learning, to new situations; to adjust his environment, through technology, to suit his needs; to use what he has learned in the past to solve problems faced in the present and imagined for the future; to accumulate knowledge and to transmit this accumulation to others -- to teach as well as to learn. Man is equipped to survive through his social relationships and his technology, including the tool of language.

If we look to the great apes, man's next of kin, we can see many rudiments of human learning, thinking, and flexibility. The chimpanzee, for example, shows sound evidence of an embryonic intellect. Chimps make and use tools. In the wild, they crumble leaves to dip for water, using them as a sponge; in the laboratory, they put two short sticks together to make one long enough to reach fruit outside their cage. They prepare for the future. On seeing a visitor enter the laboratory, they slip quietly to the fountain to get a good mouthful of water, return to the front of the cage, and wait in seeming innocence for the visitor to get close enough to be thoroughly drenched.

But what is potential in other primates is realized in man. Between a desire and the attainment of a goal, man is capable of an almost limitless number of intervening steps, plans, and tools. He is loosened from the bonds of the immediate and the concrete by his powers of abstraction. His freedom from the here and now distinguishes him from other animal species and lies behind his ability to produce tools, speech, science, art, all else we call distinctively human.

Man is born almost free of innate responses. The clearest forms of innate behavior in the human are simple responses to dangerous stimuli, reflexes such as blinking when something comes too near the eye, coughing when something becomes caught in the throat, sneezing when

something enters the nose. But blinking, coughing, sneezing, and the like will not alone ensure survival. Other humans must. The human baby is born dependent on others. His dependency ensures that he will be in prolonged contact with other members of his species, and that he will have maximum opportunity and motivation to learn from others of his species. Others protect and care for him so that he may learn to take care of himself.

The infant begins to learn almost immediately. He is born able to suck, but he learns to suck more efficiently. He is born able to inform others of his needs and later learns words to express these needs although, even after learning a particular human language, a child may fall back on the emotional behavior that is part of his primate heritage. (Baboons, like babies, have temper tantrums when they feel rejected.) Smiling appears with age, not learning, but is modified by later experience. When the human infant first begins to smile, he smiles indiscriminately to all faces. Later, he becomes more selective, smiling at stimuli that have proved rewarding, like his mother's face. He learns to sort mother out from other alternatives.

Man learns from experience. He has an innate ability to learn. Of all the animals, his behavior is the least dependent on innate mechanisms, and the most dependent on what he, as an individual, experiences. But, like all other animals, man is bound by his inheritance as a member of a particular species. Man's flexibility is great, but not limitless. In the twentieth century, man's intellect has made him the unquestioned master of the planet. But, from the long range perspective of evolution, much of the smart money is on the instinct-driven insects.

NATURAL SELECTION

Robert Trivers

Charles Darwin is famous for discovering and demonstrating that all creatures evolved from previous creatures and that all creatures are related, in the sense that they have descended from common ancestors. What Darwin also achieved, which in some ways is even more important, is the explanation of how evolution takes place. Some small ape living maybe ten million years ago was ancestor to both man and chimpanzees. But how does a small ape change into a man? And how does a small ape change into a chimpanzee? Why in one part of the forest does this small ape change into a chimpanzee, in the other into man?

Darwin's grandfather and Lamarck before him guessed that creatures evolved from each other through time, but neither was able to supply a convincing hypothesis to explain the process of this evolution. Charles Darwin's explanation was the mechanism of natural selection. Briefly, Darwin built his theory as follows. He pointed out that most creatures die without reproducing. This is true in all species, with the exception of man in certain places in the world. To choose a familiar example or two, if a salmon lays 6000 eggs and if the salmon population is reasonably stable, then about 5998 of the eggs will die before they reproduce. In baboons, a species that reproduces relatively slowly, it can be calculated that approximately two out of every three baboons die before they reproduce.

Once one realizes how many animals are dying, one realizes that if this mortality strikes nonrandomly, there is tremendous potential for change in the species.

To imagine how it is possible to change from a small ape into a chimpanzee on the one hand and into man on the other, we have to imagine that ten million years ago, the species of small apes became separated into

two different populations, perhaps due to some gradual climatic change which separated the original forest into two parts, with a dry area between them. If we assume that death strikes differently in two different environments because the environments themselves differ in characteristics, then it is possible to imagine that the characteristics of this small ape could get pushed into different directions in the two habitats.

To understand the origin of the radical differences that came to characterize chimpanzees and human beings, we have to imagine that the different way death strikes in these two populations of small apes is acting on many different characteristics. We have to imagine, for instance, that there is variation in individuals in how hairy they are: in one population being hairy is advantageous (hair protects against various things, including bad weather); in the other area (for reasons not quite as clear to us), having less hair is advantageous. Perhaps in the second area, where man began to evolve, there were greater opportunities to hunt. Perhaps gradually the animals that hunted more left more surviving offspring than those that tended to rely more on vegetable food, and this in the hominid area, the species gradually pushed toward those characteristics that help in hunting. Conversely, we might suppose that in the area that led to the chimpanzee, there were abundant trees for food and protection, and the creatures that tended to spend an appreciable amount of the day running around in trees left the most surviving offspring. The animals that ran around in trees best might leave the most surviving offspring, whose characteristics might include an opposable big toe which helps in climbing trees, a semi-upright posture which allows individuals to run around easily in the trees, and on the ground.

What I am suggesting, in short, is that two populations became separated and each of them showed variations in a number of characteristics: there was variation in weight at birth, length of pregnancy, hairiness, big

toe opposability, uprightness, size at maturity, tooth structure and size, shape of the hand, size of the kidney, etc., etc., etc. In one population death struck in one way, tending to favor individuals with certain characteristics, whereas in the other population, selection was for slightly different characteristics. When this selection--this differential mortality--operates over long periods of time, it is possible to push two populations that were once identical or very similar along different evolutionary paths.

To understand the operation of natural selection, we have to take into account first the high death rate in all animals species except our own, and we must understand that this death rate strikes nonrandomly. That is, it chooses some individuals rather than others. The second thing we must take into account is the genetic variability within a species upon which natural selection operates. If all members of a species were identical genetically, there would be no change. The death rate might be extremely high, but it would not matter which individuals death took before they reproduced: the genetic pool would remain unchanged. The process of natural selection is able to change the characteristics of a species over time only because individuals within the species are not genetically identical; if death takes some before they reproduce and leaves others to reproduce, the genetic constitution of the population may differ considerably from a previous one.

In every characteristic of every organism, there is genetic variability, and it is this variability that natural selection operates on. There is genetic variability in the size of an orangutan's kidney. There is genetic variability in the color and smell of flowers within a species, and in the shape of oak leaves. There is genetic variability in the tendency of baboons to fear leopards. If you look at a group of fifteen people, you will see striking differences in foot size, hair shape, skin color and types of ears. These are genetic variants. They are not gross and major variants; it is not a matter of having ears or not, but of subtle variations in ear shape. Natural selection in these cases chooses

not between extreme types but between very minor variations. And what is important is whether the variation plays a role in leaving more surviving offspring or not.

Let me give an example of the importance of gradual variation in characteristics. Most mammals tend to eject the placenta within a half-hour to an hour after the birth of the young. There is variation in this trait, however, and some of this variation is genetic. In most cases it is hard to see the advantages or disadvantages in keeping the placenta within the female's body a certain time after birth. But in one species, the wildebeest, we can see how selection has operated on this tendency. Richard Estes, studying the behavior of the wildebeest in Africa, discovered that the female wildebeest tends to retain the placenta within her body longer than most mammals, in fact for about three hours after birth. This is significant because when the placenta is finally ejected, it is noticed by vultures soaring overhead; these vultures then circle around, descend and tear apart the placenta. Hyenas pay careful attention to the behavior of vultures, which they use as a guide to their own food sources. When hyenas see vultures circling and landing, they are apt to converge upon that spot quickly. Wildebeest young are especially vulnerable to hyena predation during the first hour or so after birth. (A calf tries within minutes to stand up, and within an hour it can run at about the speed of its mother.) Estes hypothesized that if the female ejects the placenta soon after birth, the risk of attracting hyenas to the newborn calf are great; if the mother retains the placenta for three hours after birth, the calf has three relatively safe hours in which to mature.

Several million years ago, when selection began on female wildebeests to retain the placenta within their bodies for longer and longer periods of time after birth, there was undoubtedly variation in this characteristic. The individuals that tended to hold the placenta longer had a better chance of having their young survive; mothers of the next generation would tend to be those whose own mothers had retained the placenta within

their bodies for a longer period of time. Thus selection would gradually tend to lengthen the placenta-retention time.

What causes genetic variation? Most of us know the word "mutation." We know that mutations are changes in inherited genes. But most of us think of a mutation as a gross change in an individual's genetic constitution that will lead to some striking abnormality of appearance. There is good historical reason for this notion of what a mutation is; the first mutations, discovered about 70 years ago, did cause gross and strange new structures in the organisms (in this case, plants). In fact, this is how they were discovered. But if all mutations were gross, natural selection would be seen as choosing between grossly different individuals; that is, natural selection would decide, so to speak, whether three legs are more adaptive than two--does the child born with three legs leave more surviving offspring than the one born with two? This idea of a mutation cannot help but give us a false view of how natural selection operates. It makes it seem as if natural selection must wait a long time until a large mutation pops up, and then it must make an all-or-nothing selection.

This old picture of a few gross mutations controlling the direction of change in the natural world has been discarded. Every individual has perhaps 5,000,000 genes, and every 1 in 100,000 tends to mutate. Thus the average person has between 10 and 50 mutations within his genes. Most of these mutations cause extremely slight effects.

The case of skin color in human beings affords a good example of both gross and slight mutations. Albinism is caused by a single mutation that prevents the deposition of pigment in the skin and eyes. This is an extremely serious mutation, and tends to be selected against. People with this gene are extremely sensitive to the sun. On the other hand, it is the vast number of small mutations that lie behind the great variation in human skin color.

The range is from very dark-skinned people to people so light-skinned that they look almost light blue because you can see their blue veins through the skin. And throughout the world there is every conceivable intermediate between the two. In any one area, one will find variation. Of the African people in Kenya, **one will** find that most individuals will tend to be very dark, **but** some will be slightly darker, and some slightly lighter. The same variation is found among people in Sweden--most will be very light-skinned, some will have slightly more pigment. These differences are caused by many small mutations which are cumulative. That is, if one has ten different tiny mutations for whiteness, one can end up quite white, and if one has five for white and five for black, one could end up intermediate. Natural selection operates on the very small mutations in terms of which are most beneficial in a certain environment. Evolutionists have shown that it is these very small mutations with minor effects that are important to evolutionary change.

Ultimately, then genetic change in a species is based upon mutation, that is, random changes in the genetic material. They can range from extremely grotesque mutations (so strong that the individual does not even develop--a certain number of miscarriages are probably a result of this sort of mutation), through mutations that have a large effect but allow the individual to survive, finally to the range of mutations in which the effect is slight. I have emphasized that the small mutations are the important ones to evolutionary change because they are more likely to be beneficial. I have also emphasized that these changes are random but are then acted upon by the environment. Finally, I have tried to emphasize that the best way to think about how natural selection operates on animal species is to recognize and emphasize the variability that can be seen around you in all traits of all species. This variability is based upon the effects

of many, many gene differences or mutations with very, very slight effects.

In conclusion, I should like to point out here an important consequence of viewing evolutionary change as a result of different death rates which are determined by the environment in which the species is living. The consequence, I feel, of this approach to evolution is that one cannot really talk legitimately in terms of higher and lower animals, more evolved and less evolved, better or worse. It is very clear when one views evolution in this manner that in different environments, different characteristics are adaptive. In some environments, it is good to stand on your hind legs and run around like we do and in others it is better to run around half standing up; in others it is better to run on all fours. In a species like the sloth, selection favored running around upside down, hanging from branches. There are no traits in this scheme that have an absolute value, an absolute value irrespective of the environment.

THE CONCEPT OF CULTURE

Hans Guggenheim

Although Man: A Course of Study draws on many disciplines, much of its subject matter, as well as many of its central concepts, comes from the field of anthropology. One of the most important concepts in the science of man, as anthropologists sometimes call their discipline, is that of culture. The concept of culture is never discussed as such with the students in Man: A Course of Study, but it pervades much of the course's thinking. A consideration of the meaning of culture may help those who teach the course to gain a greater understanding and enjoyment from the materials of the course.

What is culture? As social scientists use the term, culture does not mean seats at the opera and visits to museums on Sunday afternoons. Nor is culture a quality that some of us possess and others do not. Culture, as anthropologists use the term, is basic to the human condition, and we will begin by taking a brief look at the history of the concept of culture -- how it was developed and changed to accommodate new theories about man and society. Finally, we will attempt to see how the concept is used by social scientists and how it is related to Man: A Course of Study.

One of the first scientific definitions of culture was attempted by a remarkable Englishman, Edward Tylor, in 1871, in his book Primitive Culture. According to Tylor:

Culture, or civilization...is that complex whole which includes knowledge, belief, art, and any other capabilities and habits acquired by man as member of society.

This definition makes three important points: that culture is acquired, that is to say learned, and thus not a part of nature; that culture is shared, since it is as a member of society or social group that man acquires it; and that it is a complex whole, rather than a single trait.

As anthropologists worked with the concept of culture in investigating human societies, they began to change it. A new and important distinction was made when the concept of culture as a condition basic to all men came to be separated from the idea of a culture, and the differences among cultures came to be the subject of scientific examination. By stressing various cultures anthropologists were developing a comparative method that would permit the classification of societies along an evolutionary scale.

By the late nineteenth century anthropologists were ranking societies from savagery through barbarism to civilization along a scale in which concepts of evolution and progress were often linked and confused. Their ideas were to be challenged during the first half of the twentieth century by scholars whose approach stressed the uniqueness of cultures. These scholars argued that there could be no evolution of culture because the various components of culture were not equally stressed everywhere. One culture, characterized by a complex technology, might have a very poor store of mythology and art, while another, recognizable for its complex kinship system and profusion of religious symbols, might be limited in technology.

By the end of the first World War, culture was seen to play so important a part in human affairs that the American anthropologist A. L. Kroeber defined it as a force that dictated the needs of individuals and their contribution to historical events. For Kroeber, cultural conditions effected changes in religion, fashion and technology, and the individual and his role in the making and shaping of events and conditions were held to be marginal. As Kroeber put it, writing in the American Anthropologist in 1917:

When a tide sets one way for fifty years, men will float with it, or thread their course across it; those who breast the vast stream condemn themselves in advance to futility of accomplishment.

The continued study of cultures led to an increasing number of definitions of culture; by 1952 scholars were able to list 164 different definitions. The criteria that had been advanced for defining culture varied widely; some of the definitions emphasized the ideals and values held by a society, others stressed behavior; some definitions continued to emphasize learning, while others began to view culture as a process. Still others described culture as a functioning system rather than a haphazard collection of different patterns of musts and shoulds, of behaviors and beliefs. But even such an approach as this last created new problems about the concept of culture. If it were a functioning system in an equilibrium, how did change occur? Was it generated from within the system or culture, or must it come from the outside? Such considerations focused attention on the importance of the individual's role in culture, and his place in the process that is culture. Anthropologists have continued to investigate cultures in the field and to develop new theories. The study of the Netsilik is one such attempt in which teachers and students can participate.

Culture is not something that can be observed as a whole, but is rather an abstraction drawn from behavior and patterns of behavior of a population, from their belief systems, from the results of their behavior (their material possessions) and from any other criteria that may be important for the scientist's task.

One way of discovering what culture is may be to look at what it is not. A boy walking along the seashore steps on a shell. Neither his stepping on the shell nor the shell are part of culture. The boy bends down, looks at the shell and puts it to his ear. He hears a sound; the sound is that of nature, not culture. He blows into it, and turning to a friend, says, "This shell will be our symbol of authority. Anyone who speaks must hold this shell." Thus the boy, Ralph, in William Golding's The Lord of the Flies, has incorporated the shell into culture by giving it meaning. Two other men pick up a shell on the shore. One takes it home, puts it on a table and measures it. Then

he gives it a Latin name, photographs it and publishes the picture in a book. The second man also takes it home, but he then makes a gift of it to another person and eventually receives a different shell from a third. We may infer that these two men belong to different cultures. Both have given meaning to the shells: the one by classifying it in terms he calls science, the other by assigning to it a value and converting it into a means of exchange.

MAN AND THE BEGINNINGS OF CULTURE

Homo sapiens (man who thinks) is the result of a long process of evolution in which cultural patterns, brain and body interacted in a complex and continuous system. Among the names for man that sought to bring out his distinctive nature was homo faber: man who makes, or man the toolmaker. But toolmaking as a single trait does not differentiate man from other species. Kenyapithecus, a prehuman who inhabited Africa some twelve or thirteen million years ago, fashioned hammer-like tools. Indeed, small-brained primates capable of tool use and toolmaking have been widely spread throughout the world for millions of years, and even today some primates other than man, such as chimpanzees, make tools.

Seven hundred thousand to half a million years ago, major climatic changes seem to have created the conditions that were to make the difference. One group of animals was caught up in the evolutionary sequence that led to the emergence of the human species, and it displaced all other groups in competition with it. The precise causes, effects and patterns of this evolution are not fully known, but there is good reason to believe that the process involved the following steps:

(1) the development of a larger brain, especially the outer layer (cortex) with its large area linked to the control of thumb and fingers; (2) the development of the opposable thumb that permitted the making and handling of finer tools; (3) the development of an inhibitory mechanism in the brain that permitted the movements of thumb and fingers to be controlled more efficiently. All of these factors

led to a greater reliance on tool use. However, we could not describe the stage of greater tool use as 'culture,' were it not for another factor.

Together with the inhibitory controls over the new and more complex hand, there developed controls over the mechanisms of vocalization. Increased controls over vocalization made possible a clearer differentiation of sounds and permitted early men to code sounds (give them arbitrary meaning) and decode them (extract meanings from them). In socially organized groups, such a system of coding and decoding of sounds developed into a symbolic system of communication -- language -- that allowed the sharing and storage of information.

Other animals, of course, had associated sounds with their own emotions, and were able, through experience, to associate a given sound with a certain event; for example, a breaking stick or a cry of alarm might indicate danger. But only man developed the ability to code sounds to give him information about unassociated events and to combine the sounds into more complex sequences with meaning. We refer to this process as the symbolic process, and this symbolic process became language.

Symbols enable man to accumulate and transmit (learn and teach) information and change what he has learned by relating isolated events. Symbols make it possible to remember the past, interpret the present and project the future. On this basis, the world of man's imagination becomes filled with the possible, the probable, and the impossible. Symbolic thought and behavior gives meaning to man's existence, and that is the foundation of man and his culture.

Language and culture and the new structures in the brain that supported them led to further changes in the biology, especially the brain, and culture of early man. Because of the way in which man has evolved, he cannot exist outside of culture. Man's evolutionary development does

not permit him to exist outside of culture, and it is in and through culture that man partially creates his own biological destiny.

CULTURE AND ADAPTATION

One way of looking at culture is to view it as a strategy for adapting to environmental conditions and to changes in these conditions that may in themselves be the result of man's earlier actions. What is adaptation? Adaptation can be defined as the ability of a population to survive and reproduce. Cultural adaptation is the nonbiological strategy, based on symbols, that assures the continuity of human groups within a given environment. For man, this means deciding how and when to use resources: resources of both power and production. Such decisions are made within certain culturally defined rules, but individuals need not be conscious of making them.

Technology is the primary means by which a group uses the energy potential in its environment to overcome the limitations the environment imposes upon it. Some scholars see technology as the basic strategy of cultural adaptation, and they recognize levels of energy control such as human power, animal power, water power, electricity, atomic energy. The Netsilik's use of cold to freeze food, their use of seal blubber for heat, their use of dogs to pull sleds, are all examples of energy control in a difficult ecological setting.

The environment does not determine the specific technology of a population or how the people give meaning to their technological achievements in their culture. But the environment imposes limits on the kinds of cultural adaptations possible. The arctic environment is not conducive to agriculture or the creation of large food surpluses that could bring about a specialization of labor. As a result, environmental conditions may threaten the existence of a group that grows too large, and so cultural mechanisms that limit its size artificially, such as severe marriage regulations or senilicide, may come into practice.

Other aspects of cultural adaptation may be seen in the way a society allocates its resources. Institutionalized social relations, such as rules for sharing seal meat, may be practiced. Without such institutions and rules, the group might not be able to survive. Where the survival of the group depends on its ability to hunt or forage, a cycle of dispersion into small family units and congregation into larger communal groups at other times seems to be the rule.

Cultural adaptation is largely an unconscious process of an entire society, not an act performed by an individual. Nor should all cultural activities be considered adaptive for the group as a whole or beneficial to the individual. Child sacrifice in ancient Carthage, institutionalized drinking among Mexican Indians and the carrying of firearms in the frontier days in North America may have fulfilled certain needs at specific times in history, but these activities need not be considered adaptive or even beneficial to their societies or individuals forever. It is therefore dangerous to look at a given society, suggest that it needs a given custom in its culture and then declare this custom as adaptive.

LANGUAGE AND CULTURE

As children view the Netsilik films, they hear strange sounds. They recognize these sounds as a human language, but they do not understand what is being said. They read poems and stories about the Netsilik that sound reassuringly familiar in their translation. But would they sound so in Eskimo? The Netsilik seem to live a simple life. Is their language also simple, or "primitive"?

There is no language that can be described as primitive. All languages enable men to analyze experience, to generate new combinations of ideas and to expand their vocabulary. Thoughts and ideas expressed in one language can be translated into any other language, even though it may involve a good deal of labor. In all languages man can talk of the future, refer to the past, talk about things near or remote, speculate about what exists and what might exist, and create for himself a world of fantasies in which to live.

Languages, like culture, are never static. They change constantly as people speak them and bend them to their purpose. Languages have their own histories. Any language may change its form and may be spoken by peoples who live in different cultures, different regions of the world and different historical periods.

We are concerned here with the relationship between languages and cultures. Language functions not only as a device for reporting experience or for the purpose of communication; it also functions as a self-contained, creative symbolic organization that defines experience for its speakers. Languages differ in the ways they categorize experience and also in what segments of experience they set apart. In English we have terms that categorize color. By using colorimetric terms we distinguish blue from green, yellow from red. The Navaho, on the other hand, lump together our blue and green, but distinguish between two kinds of black. This does not mean that we cannot see differences in black or that the Navaho cannot see the difference between blue and green. For the Hanunóo of the Philippines, who live in subtropical forest, color is not a category by itself. The Hanunóo categorize red-green in terms that also specify the dimensions of light-dark and moist-dry. In ordering the universe, the Hanunóo classify what can be named by a series of continuing contrasts. The Netsilik designate their prey a "land" or "sea" animal according to where the people live when they hunt it. They consider fish a land animal, because fishing is an important activity in the summer and autumn while they live on the land. Differences among languages do not mean that people cannot think similar thoughts in them, although it may be easier to express some thoughts in some languages than in others.

All men, whether Hanunóo, American or Netsilik, impose a symbolic order on the universe, an order that is not of nature but of culture and that gives meaning to his existence. They place themselves in this scheme by the use of kinship terms and proper names. The acquisition

of a name for a newborn Netsilik child is necessary for him to be considered human and part of his society. The naming expresses and defines his relationship to society, and he becomes a personality.

It is also important to consider not only the existence of different languages, but differences in the use of language. Some societies rely heavily on language in transmitting knowledge from one generation to another. Other societies, some hunters and gatherers for instance, rely more on example than on verbal instruction. Some cultures or groups stress the use of silence over speech and rely heavily on non-verbal communication, such as the hand signals of hunters or flags of sailors. Members of exclusive clubs in England may not speak to each other for years; there is no need for it. After all,...they have little to say, and their old school ties affirm the solidarity they feel with each other. Similarly, we may find that an Eskimo visiting another's igloo may leave after many hours of silence; again, his presence sufficed to express his good will and feeling of solidarity, and there was no need to talk.

The use of language creates a sense of solidarity within a group, and it also sets apart those who do not share in its conventions. In "My Fair Lady," Henry Higgins made Eliza Doolittle, the flower girl, sing "The rain in Spain falls mainly in the plain" until she "got it" and he could introduce her at court as a mysterious foreign duchess. We are made aware of speech patterns, not only accent, and how some ways of speaking are thought appropriate to certain situations while others are not. Those who cannot make appropriate utterances in the correct manner are excluded from the group. Recent research has given support to this popular feeling and has shown that the manner in which people learn to speak and encode their experience in language may have profound consequences for the psychological make-up of the individual.

THE INDIVIDUAL AND CULTURE

The study of man the species must always involve the study of man the individual. As one writer put it, "Every man is in certain respects like all other men, like some other men, like no other man." Lévi-Strauss, a well-known French anthropologist, goes a step further and claims that in a special sense each man is a species unto himself, a "mono-individual." As he so beautifully states it:

All the members of the species Homo Sapiens are logically comparable to the members of any other animal or plant species. However, social life effects a strange transformation in this system, for it encourages each biological individual to develop a personality; and this is a notion no longer recalling specimens within a variety but rather types of varieties or of species, probably not found in nature...and which could be termed "mono-individual." What disappears with the death of a personality is a synthesis of ideas and modes of behavior as exclusive and irreplaceable as the one a floral species develops out of the simple chemical substances common to all species. When the loss of someone dear to us or of some public personage such as a politician or writer or artist moves us, we suffer much the same sense of irreparable privation that we should experience were Rosa centrifolia to become extinct and its scent to disappear forever.*

In Man: A Course of Study we speak first about Man, then about the Netsilik as a group, and finally about individuals called Itimangnark and Irkowagtok. When we refer to the Netsilik, we speak in terms of their culture and we assume shared patterns of behavior that we can predict on the basis of our understanding of the culture. However, when we speak about the individuals, we refer to personality, and it is not possible to infer an individual personality from social institutions or cultural norms alone. What does personality mean? One way of describing it is to say that it constitutes a lifelong process of interaction between the individual and his society and culture. Another form of viewing personality is as a set of motivations, behaviors and problem-solving techniques.

*Claude Levi-Strauss, The Savage Mind (Chicago: University of Chicago Press, 1966), p. 214.

Individuals who share the same culture may exhibit the same behavior, yet do it with different motivations. Or, they may have the same motivations, yet attempt to reach their goals by different behaviors. One man may paddle his kayak to hunt down enough caribou for himself and his wife; another may be paddling faster to prove that he excels at the art of kayaking; a third may paddle even faster merely to shame the other two. Thus common participation in a socio-cultural institution need not be based on identical participants nor on their uniformity.

How does a personality develop? Man is not born a tabula rasa, an unwritten sheet of paper on which culture leaves its mark; he also carries a genetic endowment. Personality is not created by the environment alone; it also depends heavily on factors of heredity. However, since very little is known about hereditary aspects of personality, social scientists have concentrated their study on the influence of the environment on the formation of the personality. Although there is a relationship between the personality of the individual and his culture, every aspect of the individual cannot be predicted from a knowledge of his culture.

Many studies have attempted to investigate the relationship between child-rearing practices and cultural institutions such as art, magic or religion. For example, they link harsh parental treatment during infancy to the cultural belief that the spirit world is harsh and aggressive, to the occurrence of witchcraft and to the aggressiveness of individuals who practice it.

Other studies have been concerned with the effect of social structure, economic practices or political systems on the child-rearing practices themselves. For example, it has been shown that differences between boys and girls are maximized in cultures where big game is hunted, because of the demands placed on males in these societies. Boys in such societies are trained for achievement and self-reliance, while

the training of girls emphasizes obedience and responsibility. This does not mean that all individuals in these societies conform to the culturally favored type, but merely that many seem to approach it. Cross-cultural studies show how personality or the psychological process may serve to integrate culture.

An individual's personality can be understood in part through his decisions for actions. By observing one individual, the Netsilik hunter Itimangnark in our films, we can note that he will pile up rocks on the beach in a certain way, take a particular stance over a hole in the ice for many hours and beat a special kind of drum in a particular way. If we knew of no other man engaged in these activities, we might think this was merely a personal habit or response to a particular problem he faced. However, when we observe several individuals engaged in similar activity we may begin to classify these actions as culture traits, as when we notice that piling rocks is part of an activity called caribou hunting, that watching over the ice is part of an activity that involves ceremonial sharing of seal meat, and that drumming involves a group of Netsilik who watch and keep rhythm with the drums.

However, we note that when Itimangnark drums the people clap a rhythm, but they do not do so for another Netsilik, Irkowagtok. We discover that Irkowagtok is unpopular, and we begin to realize the reason for this. He has not always conformed to the behavior expected in seal-sharing and in his dealings with relatives. We begin to find out that he is not a good hunter and is considered lazy. We now say that both Itimangnark and Irkowagtok are individuals with different personalities who make different decisions within the institutions of their culture. The personalities of both individuals can be seen as linked to their life histories. They result from, and express, a long sequence of activities in their lives from the time they learned to speak to the time we meet them competing in a performance of the drums.

Cultures, then, present man with opportunities and choices, with problems and solutions, with desires and fulfillments, with patterns of obligations and means of breaking them. But within a range of possibilities, individuals act and interpret the world. For all of man's attachment to his own culture, he is not a slave to it. He may even participate in several cultures in his lifetime, as many immigrants to the United States have done. Even populations can change and modify their culture through innovation and invention or through contact with another group.

In the end, however, important as it may be for ourselves and for the children to understand the concept of culture, it may be more important to acquire respect for the individual human being, and for the integrity of his views and rights as a person even if we do not approve of him. We may not like the cultural values and behaviors of others, but if our world is to survive we may have to learn to follow the command in W. H. Auden's words: "You shall love your crooked neighbor with your crooked love."

CULTURAL VALUES AND VALUE JUDGMENTS

In all cultures some forms of behavior are more highly valued than others, and the individuals who conform to the ideal behavior patterns tend to be rewarded. Societies may show their esteem by positive social sanctions (rewards) or their disapproval by negative sanctions (punishments). Such sanctions may be observed in child-rearing practices of various peoples: the North American Plains Indians in traditional times rewarded bravura, the Japanese reward obedience, and the French reward rationalism and the ability to make fine distinctions between different kinds of food. Values people hold in their own society lead them to judge others by their own standards. An Englishman brought up in a culture that thought attention to food below the dignity of a gentleman would find the personalities of the French peculiar, and would in turn be judged rather uncultured because he could not recognize a good sauce.

Although cultures tend to favor the development of a certain personality type, or types, they usually make provisions for those who do not conform. Such people may find institutionalized outlets in certain roles; among the Eskimos they might become angatoks, or in America, an artist or a college professor. The non-normative personality type varies, of course, according to what norms are favored by the culture. Not only the type of nonconformity but also the toleration for nonconforming behavior varies strongly, some cultures being more tolerant than others. Often, however, it is the non-normative personality type who brings about change and creates innovations in the social and cultural situation.

Parents and educators in America today are not always sure what values to stress in preparing their children for the American society of the future. Which should they reward: competitiveness or cooperation? Do these two values conflict, or can they be combined? Should parents and teachers encourage independence, or conformity and willingness to compromise? Each of these values is sound, but together they may not always be compatible. Any one of these values may or may not be helpful to the individual, depending on the nature of his society. Willingness to run for office defines and demands a personality type different from that of a successful violinist. Parents who want their sons to become President will attempt to inculcate different values in them than those who hold different aspirations.

One aspect of the complex relationship among culture, environment and personality can be seen by a look at the Netsilik. In this hunting society the lack of a food surplus prevents the formation of a centralized, powerful authority structure supported by the rest of the group. This economic condition then mitigates against the development of the personality type associated, let us say, with a dictator. The daily use of hunting weapons, the severe conditions of the arctic environment and the need for self-sufficiency tend to develop fearlessness of physical hardship and a sense of individual power. And finally a cultural pattern of partnerships between men maintains group solidarity and lessens the chance for conflict. However, the

very closeness of these partnerships, in particular the wife-sharing partnerships, often leads to friction. If institutionalized means of resolving the conflicts, such as song contests, fail, such friction may result in homicide. The high rate of homicide in traditional times, the development of a personality type best suited to cope with the harsh environment, and the cultural institutions that maximized the chances for group survival can be seen as a complex, interlocking set of relationships.

We have spoken about rewards and punishments, the social sanctions that exist in societies to help reinforce behavior according to an ideal standard of conduct. These standards of conduct may or may not be realized, but they exist at least in symbolic form in all known societies and are sometimes referred to as moral systems. The existence of moral systems is therefore thought to be found in all human societies. But this idea raises difficult problems.

If cultures contain values or moral principles by which people judge their own actions and those of others, are there also values that permit us to judge the actions of the cultures themselves? People form their identities and self-images in terms of cultural values. Thus, for many small societies, to become human means to become part of that particular culture. For the Japanese, for example, becoming human means to become Japanese and is a continuous process. A child, a socially deviant individual or a Chinese is not fully human in the Japanese view. Members of large, modern nations may also be unwilling to recognize the fact that all men are equally human, irrespective of the culture, society or race they belong to. Slavery, for instance, is one means of attempting to classify people as less than human, or as objects in order to manipulate them. War propaganda is sometimes used to dehumanize the enemy so that he can be killed with no moral scruples in battles or in concentration camps.

The answer to the problem of judging other cultures lies neither in extreme relativism, which maintains that each culture is unique and

therefore its standards are unassailable from outside its own frame of reference, nor in extreme absolutism, which sets one standard for all cultures based on an absolute moral value defined by the observer. The problem posed here is not one of idle speculation, but of deep consequence. In societies made up of many different cultures, the values of the dominant culture may often be established as laws, and conflicts between the cultures may appear as conflicts of law and justice. Colonialism is often characterized by a systematic misunderstanding between two cultures regarding the nature of the values that set the standards of behavior and the laws that enforce them. Justice built on a belief in absolute standards may lead to prejudgments, or prejudice about the values and culturally patterned behavior of others, and should always be open to new thinking. This may be important when differences in values are about preferences for food, fashion or fun, but it is far more important when these values involve the beliefs sacred to a society -- beliefs about self-image, race, language, religion.

If we accept the notion that the possession of values is a universal human characteristic, can we demonstrate some values to be universal? Most societies seem to distinguish justifiable killing in war, execution, religious sacrifice or ritual from the murder of in-group members, and to elevate to an ethical value the preservation of life of in-group members under most circumstances. Some cultures, however, such as the Jains (a religious sect in India), have made the preservation of all life a supreme ethical value. As Clyde Kluckhohn has suggested in Culture and Behavior*, this example can be regarded as an extreme formulation of an ethical universal, or as an absolute by which all other formulations ought to be judged. Criteria for helping us choose between varying forms of moral principles are difficult to define but may be, in the long run, necessary for man's survival.

*Clyde Kluckhohn, Culture and Behavior (New York: Free Press of Glencoe, 1962).

The study of man helps to establish criteria for judging whether one set of standards and values can be considered more viable and defensible as a goal for the survival of man than another. If ethical judgments are basic to the nature of man, man's survival may yet depend on his ability to find values and set standards for behavior that will assure the survival of his species in the atomic and post-atomic age. But however absolute such values may be, the rules by which man will have to govern himself must take into account the inventiveness of man himself, the variability of situations in which he finds himself, and the historic process in which change occurs. It is in the pursuit of knowledge of the human condition that an answer to Jerome Bruner's question and quest as to what makes man more human may yet be found. It is partly in the hope of making children aware of this question -- a question basic to an education directed toward an uncharted future -- that we have worked on this course.

MAN IN THE SOCIAL WORLD

THE SOCIAL WORLD AS A BLUEPRINT IN THE MIND

Men everywhere are born into society and spend their lives in it. A major characteristic of human societies is that people live with other people and recognize ties to individuals and to groups. The mother-child tie, the bond between husband and wife, economic ties between men and political ties between leaders and followers are but a few of the many social relationships which contribute to social life.

Observable behavior is important in describing a social relationship, but equally important is the conception of the relationship that people carry in their minds. Much of a person's social behavior is linked to the values, attitudes and expectations that he and others place on social relationships. Each person has a perception of the responsibilities, obligations and privileges that are part of various ties between him and other individuals or groups. One way to understand human social behavior is to interview people to discover their values and "rules" for social behavior. Other clues to a people's conception of social relationships are found in their legends and beliefs. Lastly, a people's conception of the social universe is embedded in the very language they speak.

Human social relationships are dependent on our ability to group people into categories (mother-in-law, teenager, hippie, Transylvanian), and then attach rules and values to the people in them. Conceptual categories such as mother-in-law or hippie encourage us to think of many different people as members of a category instead of as individuals. The terms themselves create images, which in turn affect how we act and feel toward others. Kinship is one important system that man uses to categorize his social universe. Animals other than man form associations with their parents, siblings, and children, but

only man puts these biological relatives into categories because only man possesses symbolic thought. Only man can remember his ancestors for several generations or conceptualize his "second cousin once removed." Although biological facts ("people are begotten of men and born of women") form a foundation for kinship, kinship systems are not restricted by biological relationships.

In studying other peoples, anthropologists have found that different societies have different systems of classifying relatives. People in some societies think of themselves as belonging to a group that traces its descent from a common ancestor, either real or imagined. The Iroquois, for example, trace their ancestry to a common ancestor on the female side and do not see themselves as significantly related to the male line. Eskimos -- and Americans and Andamanese Pygmies as well -- trace descent through both the father and mother. People who define kin according to this "Eskimo kinship" system consider themselves equally related to people on both the male and female sides, but an Iroquois certainly does not.

Kinship categories and ways of tracing lineage are not just word games played for intellectual excitement; they have important social consequences for behavior. Kinship classification systems provide a mental diagram for the people one jokes with, eats with, even sleeps with.

Kinship and marriage are about the basic facts of life. They are about "birth, and copulation, and death," the eternal round that seemed to depress the poet but which excites, among others, the anthropologist.... And although Man has these facts of life in common with other mammals, he differs in that he can choose between alternative courses that they offer him in the way of group-formation, succession, mating arrangements, etc.*

* Robin Fox, Kinship and Marriage (Baltimore: Penguin Books, 1967), p. 27.

All societies designate how man is related to other men and assign meaning to various relationships in terms of "acceptable" behavior, expectations and values. Such ways of classifying and behaving are blueprints in the sense that they are customarily, although not always, followed. For example, a young Netsilik girl learns that she will be expected to sew clothing and boots for her husband. She dutifully learns to sew. Yet some wives probably make better parkas than others. Indeed, there may be a wife who refuses, for some reason, to sew parkas at all. Just as "wife" specifies a range of acceptable behaviors, so do all social positions. Once you have been placed in the category "teacher," for example, there are certain behaviors that are acceptable and many that are not. Teachers, principals, parents and students all have a conception of what a teacher is and how a teacher should act. Differences in these conceptions occasionally make life interesting and sometimes downright difficult.

NETSILIK SOCIAL ORGANIZATION

Kinship systems are a guide to a people's way of life and how they conceive their social world. Among the Netsilik, as in our own society, kin are traced through both parents. Mother, mother's siblings, mother's parents are kinsmen, as are father, father's siblings, father's parents. Sons and daughters, cousins, brothers and sisters and their children are also kinsmen. Ties of both blood and marriage are included in the concept of kin.

Although each Netsilik chooses to live with only some of his relatives, he relies on all of them for assistance and friendship. One Netsilik defined his kinsmen as "the related people who may go away but come back and then share food, help each other and stay together."*

Although the Netsilik are likely to trust anyone they define as kin, they are suspicious of nonrelated persons. Visiting a distant camp

*A. Balikci, Development of Basic Socio-Economic Units in Two Eskimo Communities, National Museum of Canada, Bulletin 202 (Ottawa, 1964), p. 36.

where one does not have any relatives can be dangerous, but if one has a kinship connection there, no matter how tenuous, he can be assured of hospitality, cooperation and protection. The same distrust of non-kin leads the Netsilik to prefer marriage with relatives. If a girl marries a kinsman, preferably her first cousin, she can continue to live among relatives and does not have to move to a strange camp full of potentially hostile nonrelatives.

The formation of Netsilik groups is based upon the recognition of ties of blood or marriage. The fundamental social unit of the Netsilik is the nuclear, or immediate, family. It consists of husband, wife and children and is the most important social and economic unit. The man and woman share joys and sorrows, cooperate in an economic scheme characterized by division of labor, and bring up the children to learn the skills, values and traditions of the Netsilik way of life.

Immediate families sometimes live alone in summer and autumn, but most often they live with other relatives in an extended family. The Netsilik extended family consists essentially of adult brothers and their wives and children. An unmarried brother may choose to live with his married brother, and elderly parents of either spouse might also be part of this group. Extended families are seldom larger than four brothers and their families: a total of perhaps fifteen people.

Members of the extended family help each other with the economic necessities of life, especially during caribou hunting. The brothers depend on each other to work together in hunting, to share food, and to provide companionship. The extended family, like the immediate family, is more than an economic group; it is a group with many long-lasting bonds of affection.

A typical Netsilik extended family consists of a father and mother and their grown and married sons. It is an evolving group in that

the death of the head of the family may change the membership of the group but does not necessarily destroy it. The head of the extended family is usually the father or oldest brother. He must be strong, assertive and accustomed to making decisions, for extended families often live in isolation. When the father dies and a son assumes leadership, the younger brothers occasionally challenge him. The resulting conflict may split the extended family into smaller extended families or into immediate families.

The third unit of Netsilik social grouping is the winter camp. It is composed of four or five extended families who come together in winter to live and hunt seals on the sea ice. Although almost everyone knows each other, the Netsilik feel that this group is not bound by secure and close kinship ties. Instead, the winter camp is bound by other kinds of ties, the most important being partnerships. Each man has several partners who are not his relatives. With some of them he shares a prescribed part of each seal he kills, with others he shares songs, wives and feasts. Partners, like kinsmen, assist each other in many ways. Partnership ties are the Netsilik way of extending cooperation and trust to the nonrelatives at winter camp.

These three Netsilik social groups allow for great flexibility of residence and cooperation. An immediate family may choose to live alone, to live with close relatives in an extended family or to join nonrelatives in winter camp. Seasonal hunting conditions, quarrels between brothers and personal friendships are but a few of the influences on a Netsilik in choosing where and with whom to hunt and live. For example, an immediate family may live alone in August and September, join with brothers in October, then live with many nonrelatives in a winter camp. The following year this same immediate family might choose to camp with cousins instead of brothers, or perhaps move to a far-off camp with distant kin. The flexibility of each family in moving and forming different kinds of groups is an important means of adapting to the Arctic, just as is the ability of the whole Netsilik

society to combine into large groups when cooperation is necessary, as in the winter, and to divide into smaller groups in other seasons.

Social groups continue through time and are not dependent upon particular individuals. For example, in traditional Netsilik life, the extended family was an important social unit throughout the year. Although with each generation the members of a particular extended family changed, there were continual regroupings along the patterns of the extended family. The duties and obligations of family members remained the same although different people filled these positions.

MORE COMPLEX SOCIAL ORGANIZATION

In many respects, the Netsilik social life is relatively simple. There is no level of organization beyond the winter camp, which consists of fifty to one hundred people. Winter camps do not join together to form a larger group. There is no formal authority. Hunting decisions are made by the best hunter in camp; other decisions are made by older, experienced men. Almost all kinds of interaction are between people in face-to-face relationships. Almost everyone knows each other or can establish some kind of tie.

There are many societies in the world with complex organization. East African kingdoms have hereditary chiefs and princes with great political and economic power. The United States and other developed nations with large, mixed populations and large geographic areas are even more complex.

In the United States, the extended family is not an important social unit. Its members rarely live together or participate as a unit in economic activities. The immediate family exists as a social unit, but it does not function as the minimal economic group. The immediate family depends upon stores and jobs for its food; indeed it requires the services of the community, state and nation for exis-

tence. Schools are important for the caring, teaching and socializing of children.

Each individual in American society belongs to many groups which are not organized by kinship ties. Businesses, schools, clubs and churches are but a few of these groups. Each of these groups has a different function. Many groups have formalized authority structures with jurisdiction over the functioning of the social group.

In addition to the many kinds of social groups and the formal government structure of the United States, the American social system is considered complex because it includes many economic and social groups with different kinds of social organization. The farmer's life is very different from the city-dweller's life. The social life of the poor or the unemployed differs from that of the middle class. Indeed, it can be argued that the United States is not one society but many different societies.

The social organization of a society includes the forms and functions of social groups within it. Just as important is the member's conception of this organization — the picture of social life that he carries in his mind and which enables him to live in that society. One can pursue the study of social organization on various levels. Groups and how they interact can be studied. Or the members of a group and how they behave with other members of that group might be investigated. Or if interested in individuals, one might use a case study approach to look at particular people and how they participate in groups. Yet the foundations of these studies are the same. One must observe and interview and study the values and customs and traditions of the people. And the essential goal of these studies is also the same: to gain insight into man's relationships with other men.

WHY TECHNOLOGY IN A STUDY OF MAN?

A conversation between Peter B. Dow, Director of the Social Studies Program, and Richard S. Rosenbloom, Associate Professor of Business Administration, Harvard Business School, and consultant to the Social Studies Program.

PETER: Let's begin by my asking you two questions that are often put to me by people who are new to this course: "Why should we have so much information on tools in a course that is essentially concerned with the study of man? Why study technology when we are primarily interested in social behavior?" Could you comment?

DICK: Those are sensible questions to ask about the course, questions that reflect a curious fact of our existence. We're surrounded by the tools of our own culture--the artifacts of our society--and yet in many ways they are invisible to us. We're not aware of the extent to which tools and technology shape our lives. Our own notions of time and distance, our patterns of thought, the way we spend our time, the things we like to do, are all vastly different from what our forebears experienced just fifty years ago. They are so different because of changes in communications technology and transportation technology--TV, computers, automobiles, airplanes. Yet, they're all so familiar to us that we overlook them.

Tools are an inseparable part of human behavior and human life and are an important aspect of any attempt to understand man as a social being. Without understanding the interaction between man and what he makes, we can't understand man himself.

PETER: You mean tools have really become an essential part of the environment in which we live.

DICK: Tools are an essential part of the environment of any man. If you took away the artifacts of any culture, the people would perish. They couldn't defend themselves; they couldn't feed themselves. No humans

anywhere could survive without their tools, as simple as they may be. And any group of people would be vastly changed in their everyday behavior if you gave them different tools. Even if they managed to survive, they would survive in a completely different pattern.

PETER: You know, we've spent a lot of time talking about animals so far in this course. Are you suggesting that tools are as important to man as, let's say, water is for the salmon or air is for the herring gull?

DICK: Well, Marshall McLuhan has¹ advocated with some impact the theory that technology is the medium of human life, and that we understand the world through the medium of the technology of the age. He's made a big point of how electronic technology is a new medium for modern life. I think in a real sense tools are to us what the ocean is to the salmon.

PETER: But certainly technology is very different to us than it is for the Netsilik. What you're talking about is a highly sophisticated and complex system. Another question that I'm often asked is "What is the relevance of studying Netsilik technology if you're trying to get across the notion of technology to children who live in this very complex age of ours?" Is there a relevance?

DICK: Yes, I think there is a strong relevance. We have always tried to keep in mind that the aim of the course is not to teach about Netsilik technology but to teach something about life in a technological age, as it will be experienced by the kids in the course.

We look at Netsilik technology because it is simple enough to understand. One of the most important strategies in learning is to find a frame of reference within which you can understand some fundamental principles. The physicist learns about the stars by conducting fairly simple experiments here on earth. There are some fundamental questions about technology that you can explore by looking at as simple a society as the Netsilik.

PETER: Well now, let's get down to the specifics of what we study in the Netsilik course. What is the logic behind the lessons we have designed? How do they begin, and how do they reveal the connections between the Netsilik technology and our own lives?

DICK: We begin by trying to get students to think about what tools really are. The first question posed is, "What are tools?" We think of hammers and screw drivers and saws and monkey wrenches as being tools, but the notion is much broader and more basic. It is useful to think about tools in a general sense as the objects made by man and used by him for practical purposes in interacting with the environment. To alter the physical environment, we have tools like shovels, saws and hammers. But there are other tool needs. A pencil and paper are tools for communicating and storing information. Calendars, automobiles, telephones--these are all tools of one sort or another. The only thing they have in common is that they are made by man, and they help man meet his needs in interacting with a social or physical environment.

PETER: Would it be proper to think about a tool as something that enables a man to do something he can't do solely with his physical body--that is, as a kind of extension of the structure of the body in some way?

DICK: Yes, many tools are just as simple as that. They are extensors--ways of extending a capacity that man has innately. Since man starts out with little ability to survive completely on his own, he needs these extensors for survival. Of course, in our society we have gone way beyond survival in the face of the natural environment and have created a complex man-made environment in which we need tools to adapt to the tools we made to survive--but that's another story.

Other tools make it easier to do something that you could do yourself anyway. There are certain things that you can twist with just the strength of your fingers, but a wrench helps. A wrench also

extends your ability to do things that would be impossible just by natural force.

PETER: Once when we were looking at the Netsilik bow drill, you made a remark that this was a kind of conversion of reciprocal to rotary motion. That made me think in a different way about what the human body can and can't do. It's not possible for us to make a full rotating motion, yet with the help of a device like the bow drill, we can make that motion and hence drill holes or light fires or whatever. Is that a reasonable example to think about now?

DICK: That's a good example. The bow drill translates and amplifies man's natural ability in a way that increases his own power. In simple societies like the Netsilik, most tools are at this level. They are identifiable extensors of a natural ability of the man. In the Netsilik lesson we can see this time and again. As we classify the tools, we can think about the problems they help the Eskimos solve and the natural abilities they extend in solving them.

PETER: I suppose one kind of lesson would be one where you brought in an object that had a curious shape of some kind, presumably a tool, and asked kids to figure out what capacity that particular tool extended or what function it performed.

DICK: You can bring a simple tool into class and ask the children to guess the problem, because in many tools there is such a nice natural relationship between the form of the tool and its function. You can guess the function just from the properties of the tool and the way it's shaped. You can look at something that is used to cut snow for an igloo, and, if you know that you're dealing with Eskimos rather than Bushmen, it's not hard to figure out what the tool is used for.

But form following function is not such a universal rule in an advanced society, because we have the power to go beyond function in the form of things. However, in any technology that presses the limits of what the maker can do, you see this nice fit of form and function. That's why jet airplanes look like paper airplanes. The paper airplane is shaped the way it is because it's at the very limit of what a child can do, and it's also a very efficient form for flight. When the great Theodore van Karman, one of the greatest designers of airplanes, was asked to define an airplane, he said "An airplane is a machine that barely flies." That's true. Airplanes are built to the limit of our capacity to build them, and their form follows their function very closely.

PETER: Could you talk specifically about some of the tools children will actually study in the course and comment on the similarities or the differences they reflect in Netsilik technology as compared with our own?

DICK: Several things that you see in all tools are included in the study of the Netsilik. The Netsilik have very few materials to work with, and they have to be ingenious in how they use them. Probably the best example is the bow. If all you have are animal products, how can you make a bow that is potent enough to kill an animal? The Netsilik do it by ingenious joining techniques, using sinew and antler and the devices they have to shape and to drill holes. They exploit to the maximum the natural properties of the materials they have to work with.

PETER: I suppose that's one of the differences: the Netsilik have few materials and are limited by the properties of the materials they have. On the other hand, we can go so far as to create synthetic materials when we don't have natural ones available. Does that represent a significant difference in what we are able to do compared to the Netsilik?

DICK: It certainly leads to differences in our attitudes towards things. Of course, there are other modern societies in which materials are not as plentifully available. Contrast the European attitude toward paper with the American. We're profligate with paper to the extent that we create a trash problem. The natural abundance of certain kinds of materials have created a set of attitudes and ways of using these materials.

PETER: But that reminds me of a further point--the fact that the Netsilik reuse the same materials in a variety of ways in the course of a year. One example is the skin sled, where they take the skin roof of the karmak and convert it into sled runners. Then in the spring the sled is taken apart again and the skins reused for a tent. That fit between the environment and the available materials and the purpose to which they are put at different times of year seems rather impressive by comparison with our profligacy.

DICK: Well, there are many facets of that. The meat packers now are proud of the fact that they package and sell everything but the squeal, and that a plant that produces ham and bacon also produces glue and resins for plastics, all from the same animal. In some areas we've learned to utilize fully the materials we're working with.

PETER: Obviously the study of technology isn't limited to an examination of tools and materials. In what way does the study of the Netsilik enable us to see what might be called more abstract things about technology--that is, the relationship between technology and human behavior, or the interrelationships between tools? Are there things that we can see and study in Netsilik hunting or other aspects of Netsilik technology which do give us a more conceptual view of the place of technology in our lives?

DICK: Yes, if we focus on the use of tools rather than on where they come from. So far, we've been speaking mostly of the ways in which man exploits the natural environment to create his tools.

PETER: Excuse me for interrupting, but that suggests a kind of contrast that exists in the "Man and Animals" unit, where on the one hand we study the structure of the animal and the fit between the structure of the animal and the environment in which he lives. On the other hand, we look at its behavior and how that relates to survival in the environment. One could say that there's an analogy here.

DICK: Oh yes. The structure-function concept is as applicable to a tool as it is to the animal. In the use of tools, we get into human behavior--cooperation, strategy, planning--almost the moment we begin to talk. When we talked about where the bow came from, we talked about materials, function and fabrication, all inanimate things. But if you ask what the bow means to the Netsilik, then you talk about the needs of the people, about planning, the strategy of the hunt and the relationships between hunters.

All of these considerations enter in in the use of a tool in ways that are very important to the study of man and of society. The strategy used here in these lessons is to look at the process of hunting and see how it is followed using different tools. First we see the bow in use, and then a different system of tools used in hunting at the crossing place.

PETER: Say more about that. What do you mean by a system of tools at the crossing place?

DICK: System is a term that's widely used and seldom defined. To me, the main thing that is implied by the notion system is a lot of things fitting together in interactive ways, ways in which a person can't always anticipate the nature of every interaction. System is what happens when somebody blows a fuse in Buffalo and the lights go out in Boston. System is when it snows in New York and flights are delayed leaving Chicago. And you can see just by my examples that the basic technology of our lives--power, communication, transportation--these are all tied up in systems which defy the imagination in their complexity.

Of course the Netsilik don't have systems as complicated as these. But in its own way, the life of a single group of Netsilik Eskimos constitutes a systematic relation between the behavior that they follow year in, year out, the way they confront particular problems, and the tools they use. Suppose that you could change one element of their lives--you give them rifles, change the migration habits of the animals, or change the climate, or suppose a ship is wrecked on the shore and all of a sudden there's a lot of wood available--it's clear that the effects of the change would show up in ways that you can't anticipate.

But to go back to the system at the crossing place--here the spear kills the caribou, but it takes a lot to get to the point where the spear is used. Inukshuks, which are tools of a specialized sort, are built to deflect the path of the herd. There is the kayak that gets the hunter to the caribou. These things fit together. Without the kayak and the spear, the inukshuk has no meaning. Without the inukshuk and the beater, the man in the kayak would have no caribou to pursue. The several tools fit together; the beaters cooperate with hunters by helping to deliver the caribou to the spot where the hunter can attack them. The hunters lend the final meaning to the work of the beaters.

Furthermore, all of this has to be planned. There is a program of behavior that these men follow in their separate roles as part of the hunting process. In the end, if it is successful, it produces an animal that can be turned into food and clothing and into more weapons to help kill more caribou. Here you have a set of interactions where if you change some of the pieces you change many aspects of the system.

PETER: And so possibly the whole organization of the society would change in some way as a result of this change in technology?

DICK: Oh yes, social behavior changes as the technological systems change. This is a very trite example, but look at what the automobile has done to social behavior in two generations of Americans. Teen-age

dating habits, patterns of residence and air pollution are three quite different effects that stem from the invention of the automobile. They are part of a system of consequences that come from introduction of that one device.

PETER: But why is it important for us, or for our children in school, to perceive the systematic nature of that hunting process? What relevance has it?

DICK: I guess this always comes down to the question of change. The central fact of modern life is change, stimulated in many cases by change in technology. Whether you're talking about the computer or the pill or the bomb, there they are. They're new options for people, and they will affect our lives. As new tools become available, the consequences are diffused throughout the entire society. It's only by understanding the systematic relationships that we can begin to appreciate why this happens, so we're not surprised by it. Sometimes we can't predict what will happen, but we can predict that changes will happen.

PETER: But are our lives really as interconnected as the lives of the Netsilik? Let's say you are talking about a caribou-hunting party of a dozen people or less. It's easy to see that if one hunter doesn't show up or if the new piece of technology enters the system, people will be directly affected.

DICK: We are even more dependent on others than they are. The Netsilik family is much better able to improvise and to survive on its own than we are.

Itimangnark makes his own tools. He has to be able to repair his weapons on the spot if he has a mishap, and he fashions them to his own taste. Each weapon in a society of this sort is individually tailored to the man who made it, who is also the man who will use it. In the same way, the Netsilik family unit generally can get along on its own, whereas in

our lives we're used to being dependent. If all the people who keep gasoline stations went away, what would happen to us? Wouldn't that affect our lives?

PETER: You know, we put so much emphasis on independence in our society. But Itimangnark, by possessing the entire technological knowledge of his society, has a kind of freedom, a kind of independence that we do not have. Is that true or am I...?

DICK: That's a very apt comment, and I think we need to think more deeply about the need for new interpretations of the values that we have always held very firmly in this society. Fundamental changes may have been caused by the last two generations of change in technology. We need to ask, "What does this mean now in this kind of society?" What is the modern equivalent of the Eskimo hunter's independence when he goes out with all of his possessions on one sled and with enough knowledge in his head to make anything he needs? We can't do that. We can't move our household in one vehicle now and strike out on our own and be self-sufficient without, in effect, leaving the society and going back to another era.

PETER: Yes, I suppose one could say that the price we pay for the kind of security we have is a dependence upon each other which is more extensive than the Eskimos have.

Let me ask you another question that relates to the connection between the Netsilik and us. Certainly it was new for you to come from your work at the Harvard Business School and your study of modern technology to consider the organization of the technological life of the Netsilik. What have you learned from your work with the Netsilik that has in any way enlightened you with respect to your understanding of our own society?

DICK: I think I've learned some very fundamental things. I've learned from the children and from the study of the Eskimos (and I can't really

tell from which--I think both in combination) that this is a way of posing the very fundamental and simple questions, such as "What do you mean by system?" or "Why would we want to study this?" These are questions that any person of an inquiring bent should face up to, but they are easy to dodge within your own familiar frame of reference.

I have approached the Eskimos with the conviction that many things that are true about us must be true about them. It has been a challenge to try to understand what those things were. I've been helped by the incentive of trying to respond to the good questions the kids ask and the very good ideas that they have. From both of these I think I've gained a very important perspective on some things.

Your question brings us back where we started--why we have anything about tools in a course about man. And I think we could say quite honestly that the discussion we've been having shows that we are not talking about engineering when we talk about technology and society. We are talking about fundamental questions for any social studies curriculum or any human being who wants to understand himself a little better. And one place we look, and I stress that it is only one place, to help us understand these questions is this matter of technology and its interaction with man.

PETER: Thank you very much.

WORLD VIEW

WHAT IS "WORLD VIEW"?

This course presents three main aspects of human life that are characteristic of men in every culture: technology, social organization and world view, which includes cosmology and religion.

First, in every human society men use tools to exploit the resources of their natural environment. Subsistence and the manufacture of artifacts are carried out according to established technological processes. The sum of these processes is a people's technology.

Second, man is a gregarious being who enters into collaboration with his fellow men to satisfy his basic needs, to insure his security and to improve his well being. Without coherent, meaningful patterns of behavior and expectations, there could be no social life. Social organization is the network of relationships between the people of a given society and the prescribed behavioral patterns within these relationships. It includes how people actually behave and their beliefs about how they and others ought to behave.

Third, all human societies develop distinct notions about supernatural powers, together with sets of beliefs about the origin of the world and its nature. This is the subject of this paper. In order to present an analysis of Netsilik world view, we have analyzed and structured the ethnographic data we had on Netsilik mythology, beliefs and attitudes. But it is doubtful that a Netsilik carries a similar, completed picture in his head. A Netsilik, for example, probably does not separate the social significance of an angatok's seance from its religious significance. The three aspects of human life do not occur in isolation. Netsilik seal hunting depends on the use of tools and strategy (technology), on cooperation with others in accordance with Netsilik social rules (social organization) and on the observance of the rituals and taboos connected with hunting and eating seal meat (world view).

The goal of teaching religion and cosmology is not simply to describe a particular world view, but to teach what it means to have a world view. Having a world view is a uniquely human phenomenon. Only man has the desire and ability to explain his world. However, most individual men are not inventors of explanation, and no man independently creates a whole cosmology. A person's culture provides him with a cosmology; socialization is society's process for teaching its members a particular world view.

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In our analysis we have roughly divided world view into religion and cosmology. Although magic is often distinguished from religion as being concerned with more concrete, specific objectives such as curing an illness or making a person sick, such a distinction is frequently difficult to make. Therefore, we include magical activities under religion.

In many societies, including the Netsilik, religion concerns supernatural forces such as gods, ghosts and spirits. It is essentially a symbolic system in which something stands for something else. Thus, a wooden idol represents a god but is not a god. Religious symbols are charged with emotional associations and tend to summon feelings in connection with the ideas they represent. Rituals are performed as expressions of religious or magical beliefs to reassert the power and validity of these beliefs. Each rite may be both an expression of belief and an attempt to influence the supernatural powers.

Cosmology is the body of myths and beliefs explaining the beginning of the world and its composition. It, too, is symbolic. Origin myths frequently serve as the foundation, the justification or the model of the existing social world. Thus, European kings considered their position in harmony with divine law. As Ruth Benedict puts it:

Cosmology should be studied always in relation to the life of the tribe in question, the behavior of its members, and

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the institutions it exalts. Cosmology is often a commentary upon this life that is not to be excelled, and sets forth the virtues and vices of the culture from the point of view of the native himself.*

A people's cosmology includes their knowledge of their natural environment, which is necessary in order to exploit its resources. To the Netsilik his belief that night and day resulted from an argument between a fox and a hare is just as much a part of his knowledge of the natural environment as his belief that the moon influences the tide.

Westerners generally see a sharp dichotomy between the "scientific" or "natural" world view, in which impersonal forces act in accordance with the laws of nature in isolation from human desires or behavior, and the "supernatural" world view, in which vital creatures inhabit the world and are motivated to make things happen by their feelings about men. But:

Most people do not dichotomize the universe into two distinct and mutually exclusive spheres labelled "natural" and "supernatural," as we Westerners do, although they often dichotomize it in other ways, and they can distinguish different kinds of causal agents in the world they live in....**

A Netsilik knows that the winds, for instance, influence the formation of winter ice, and that if the ice is not right the seals will not come. If he is forced to find an ultimate cause he would probably say that the spirits wanted men to go hungry. He does not hold these explanations in opposition but sees them as a continuum, which does not mean he doesn't distinguish between them. All societies have symbolically ordered their environment. It is the extent and content of these classificatory systems which differ from society to society, not the ability or need to establish order by classifying.

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* Franz Boas, ed., General Anthropology (Boston: D. C. Heath and Co., 1938), p. 661.

**John H. M. Beattie, Other Cultures: Aims, Methods and Achievements in Social Anthropology (London: Cohen and West, 1964), p. 203.

The world view of a society functions in many ways to influence people's lives:

1. It provides the members of the society with a structure for interpreting experience, thereby creating order out of the potential chaos of human responses to the world. Categorization is one of man's tools for organizing his world. Categories enable people to identify things and events, to see distinctions between and similarities among things, to relate new and unfamiliar experiences to old, familiar ones.
2. The structure a society develops provides explanations for events that people would otherwise feel were inexplicable. These explanations, in turn, give people a way of coping, often a way which they feel helps them control nature. And any order and its consequent means for control is better than none.
3. A world view guides people's behavior and their emotions and attitudes about things by including some definition, or model, of a good or admirable person. Such a model tells a person how he should react toward different situations--for example, how he should feel and behave at the death of a relative and how he should greet the birth of a child. Here, as in the next point, social organization and world view clearly overlap.
4. The world view embodied in a culture functions to bind people together, because it is shared by all the members of that culture. People who look at the world in similar ways share similar orientations which contribute to their effectiveness in communicating their experiences to one another, and cooperating with one another in dealing with their environment. Furthermore, the beliefs embedded in a people's world view are often reasserted in culturally institutionalized rituals and ceremonies that strengthen the ties which bind the people of a society together.

To understand what makes man different from other animals, one must understand how the extent of experience and ways of ordering that experience embodied in a culture influence the lives of the individuals in that culture. People's lives are influenced by their beliefs, their world view, as well as by their natural and social environments. To be human, to have a culture, is to live in a world in which one's ways of dealing with the natural environment and with other people have meaning in terms of a set of ideas for ordering the world. In isolated societies, at least, the natural environment provides both the raw materials for living and a set of limitations within which a people fashion their material culture. In a similar way, their world view provides the structure and a set of limitations within which the world can be experienced.

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NETSILIK WORLD VIEW

The Netsilik see the spirits, which are the souls of dead creatures, as the forces that move life. They believe that every living creature has a soul. The soul is the power that gives a creature his characteristic form: a seal soul is what makes a seal a seal, and a human soul is what makes a man or a woman human. Most important, it is the soul which gives the creature life. Because it is the life force, it is also the center of vulnerability. If a man's soul is strong and unharassed, the man will be strong. And if a man sickens or falls into misfortune, it is because his soul is being attacked by hostile spirits.

Another source of power is the name. All creatures with names, that is, people and dogs, derive special qualities and strengths from the power that resides in their names. It is believed that the souls of the dead are anxious to have a newborn child named after them so that their name can be used by a living person. A newborn child is never named after a living person, but after a dead person, so that the spirit of that person will give the child the power of his name and will become the child's guardian spirit. And since the Netsilik have been named for

dead relatives or friends for generations, a person has a host of guardian spirits, the spirits of all the people who once bore his name. Naming is an important part of the birth ritual. As a child is being born, the names of ancestors are called out. The name that is called at the moment of birth is the child's name.

The soul and the name are the sources of an individual's power. The soul gives a person life, vitality and humanness--the qualities he shares with other men. The name gives a person his individuality, his special abilities--the qualities that distinguish him from other men.

Because it is the life force, the soul is imperishable. Since souls cannot die, the world is inhabited by the souls, or spirits, of dead animals and people. The spirits of dead animals often take on new bodies and return to live on the land or in the sea. The spirits of people usually go to the Land of the Dead, where they hunt and play games just as people do on earth, without suffering the hardships that living men must suffer. Spirits do not remain aloof from the living, however. They may hover over the dwelling places of men. Even from a distance, they hold great influence over the lives of people on earth.

When a soul becomes a spirit, it takes on new powers. Spirits can possess a man, driving him mad, or infect him with sickness. They can cause a bank of snow to fall over on a man, make him fall through the ice, or cause him to be clawed to death by a bear. A helping spirit can enable a man to overcome these same perils or can attack a man's personal enemies.

The Netsilik do not divide the spirits into good and evil. Rather, they see them as powerful beings, capable of great vengefulness when they are displeased, and willing to act as the agents of men's hostility toward other men. It is because of their potential for causing suffering that the Netsilik fear the spirits. All spirits are dangerous, but the most

dangerous, because they are the most powerful, are Nuliajuk, Narsuk and Tatkek, the Moon Spirit. Nuliajuk, once an orphan girl, mistreated and cast off by humans, became the most powerful spirit of all. She is the ruler of all beasts, and she has created strict rules that men must follow if they are to be allowed to kill her beasts in the hunt. The Moon Spirit watches over men's actions to see that they break none of the ancient rules. If they do, the Moon Spirit reports their carelessness to Nuliajuk, who punishes them by calling her beasts away from men's hunting places and by ordering Narsuk to create storms. The Netsilik fear Nuliajuk, not only because of her great power, but also because they know she has good cause to feel hostile toward men.

Spirits are the ultimate cause of all hardship--death, sickness, madness, storm and starvation. Through their beliefs about souls and spirits the Netsilik interpret their experience. If a man falls sick, it may be because he is infested by a harmful spirit. If a woman's child is born unhealthy, she may have broken a taboo during her pregnancy. If a man has a hunting accident, perhaps an enemy has used evil magic to send a spirit against him. If the winter is stormy and seals hard to find, Nuliajuk is wreaking her vengeance upon men for breaking the ancient rules.

Spirits are also the agents in the magic and ritual that men practice to control nature. If a person is sick or injured, helping spirits are summoned to combat the spirits that harass him. If a whole camp is suffering from blizzards and hunger, helping spirits can be called upon to help discover who has broken an ancient rule and so angered Nuliajuk. Following the ancient rules demanded by the spirits and using magic to invoke spirits' help are two of the principal ways the Netsilik have to control what happens to them. And for the Netsilik, these means for controlling nature are as potent and necessary as is their use of tools. Thus, the Netsilik use their understanding of the spirits' desires and their ability to use the spirits' power to avert or counteract the hardships which they believe are caused by the spirits.

To the Netsilik the complex set of taboos and rituals which constitute the ancient rules of life are both a burden and a security. He follows these rules to avoid angering the spirits and to protect himself and his camp against the disasters that vengeful spirits cause. He also follows them for the comfort of adhering to tradition in times of stress. The greatest number of taboos and rituals are concerned with birth, death and hunting, the things most significant to the people.

Many Netsilik babies die very young; this is especially true of adopted babies. The Netsilik interpret this fact by believing that the soul of a newborn child is particularly vulnerable. It is weak and it is especially attractive to harmful spirits. Therefore, many rituals and taboos must be observed at the birth of a child to give it the strength of helping spirits and to pacify the spirits that might harm it.

The taboos and rituals that must be performed at a person's death are important because death is the time when a human soul becomes a spirit. The spirits of the dead are anxious to be remembered and respected by those whom they leave behind on earth. When a person dies, his soul hovers about the igloo for four or five days, and does not rest unless the proper rules have been respected. If the ancient rules are not observed, the soul does not go to rest in the Land of the Dead. It remains on earth to harass, perhaps to destroy, the relatives who broke the rules. The spirits of people who die by suicide or accident go to dwell with the Moon Spirit. Thus a person who dies alone will not necessarily become a harmful spirit just because no one could observe the death taboos and rituals around his soul.

The greatest number of rituals and taboos concern the killing and eating of game animals. The Netsilik follow these rules not only to avoid angering Nuliajuk, but also to repay the souls of dead animals for the privilege of hunting them for food. Some of the rules avoid hurting or insulting the soul of a killed animal by making it taboo to do things

like cutting and sewing his skins or breaking his bones at the wrong time of year. Other rules, like those concerned with a boy's first seal, show the pleasure and gratitude men feel for a successful hunt.

The complex system of taboos and rituals that a Netsilik must follow is a burden. At the same time it functions to order his life. On the one hand the system reinforces some of the basic categories or polarities of Netsilik life. For example, many taboos and rituals, especially those involving animals, are observed only at certain seasons of the year. There is one set of taboos for the inland camps, another for life on the sea ice. Because it distinguishes the two phases of the Netsilik year, the taboo orients individuals to these separate phases.

The taboo system also provides a guide for behavior in the most critical situations of life. Birth and death, for instance, are surrounded by taboos and rituals which provide people with a way of expressing their feeling about these events. They feel that by observing these ancient rules they are influencing their fate.

One ritual may perform both these functions. For example: when a Netsilik man is dying, his relatives are expected to stand around him. At the moment of his death they must cry out together, "He has given up the ghost." In doing this, the people are affirming an event, the passing of one more from the category of the living to the category of the dead. At the same time, this ritual expresses their grief. And because the ritual is performed by a group of people, each is supported in his grief and joined in his fear of his dead relative's spirit.

A Netsilik is not always a passive victim of the spirits' aggression. He also uses the power of the spirits to serve his own ends. Personal helping spirits, magic words and amulets are three ways the Netsilik use the power of spirits. When a person uses the power of spirits to assure hunting luck, attack an enemy or cure a sickness, his means of control is

very different from simply following the ancient rules. When a person observes the rules, he controls his fate by keeping peace with the spirits. When a person uses amulets or magic words or calls upon his personal helping spirits to influence fate, he is using the power of spirits aggressively. The Netsilik use magic power not to appease but to challenge the forces in the spirit world that would harm them.

Angatoks are individuals whose contacts with the spirit world are especially strong. They have powerful helping spirits, which empower them to defeat the most formidable hostile spirits and thus to overcome the suffering the hostile spirits are causing men. Through their helping spirits angatoks see and understand things beyond the vision of ordinary men. They can look into the future and into the secrets of others. They know the causes of things through the spirits of animals who have special knowledge.

To be an angatok, one must experience a special vision or enlightenment. It is this special vision that makes a spirit ally himself with a person and become his helping spirit. There are many ways that a Netsilik can become an angatok. He can go to a respected angatok for instruction and guidance. Or he may seek his vision and helping spirits alone. Sometimes a person is visited by helping spirits without seeking them. Then he becomes an angatok only if he wishes to accept the responsibility for these powers. Controlling powerful spirits is a dangerous business with which not all individuals have the courage to live.

An angatok can use his own personal vision and helping spirits to overcome the misfortunes of others. He is a specialist at curing sickness or madness, assisting at difficult births, practicing evil magic against individuals and influencing weather and hunting. Hardships that strike an individual--sickness, accidents or difficulty in giving birth--may be the result of a broken rule, or they may be caused by another's evil magic. The angatok must discover the cause of the

misfortune to know whether to appease the spirits involved or to attack them.

When hunger menaces a camp, the angatok calls the people together into the ceremonial igloo and holds a seance. Here he uses his helping spirits to discover what has angered Nuliajuk. He summons his spirits with magic songs in a special angatok's language. The helping spirits speak through the angatok in two ways. If the angatok sings himself into a trance, his helping spirits will speak through his voice. Or the angatok uses someone else as the medium. He ties one end of a thong onto an arm or a leg of the person, and holds the other end in his hand. He asks his helping spirits a question, and then pulls on the thong; if the arm or leg moves, the spirits are answering no; if it does not move, the spirits are saying yes. This way an angatok can discover if a man has broken the ancient rules.

During a seance, the people are awed at the power of the angatoks and their helping spirits. Many people, even those not being questioned directly, confess their recklessness in having broken ancient rules. After the confession, the angatok uses his power to try to mollify the angry Nuliajuk. The Netsilik believe, however, that the spirits often are appeased when people bring their recklessness into the open. For what angers the spirits most, especially the Moon Spirit who watches people's actions, is secretiveness.

Appeasement is not the angatok's only skill. He may be called upon to attack the hostile spirits that caused a woman to be possessed by madness or a man to fall sick or be clawed by a bear. If the angatok's helping spirits are powerful enough to drive the hostile spirits away, the suffering person will get better. An angatok can also cause other men harm, for he is expert in evil magic. Just as he sends his helping spirits to attack hostile spirits, he can send them to attack a living man's soul. The practice of evil magic is a dangerous test of even an

angatok's strength, however, for spirits sent to destroy a man do not rest until they have done their work. If the one they were sent against has helping spirits strong enough to resist them, they will turn back and attack the maker of the evil magic or one of his relatives.

The powerful angatok embodies the capacity of man to control the supernatural powers that cause human suffering. Because his ability to deal with spirits gives him influence over people's lives, he is a powerful man in a Netsilik community. Not only does he give aid to individuals, but he is a central figure of Netsilik ceremonial life. The seances, in which the angatok seeks the causes for the disasters that strike the community, are an institution of social control among the Netsilik. Through seances the angatok can expose people whose recklessness is dangerous to the security of the group. Furthermore, in a group where people are suspicious of one another, where there is a great social tension, the seance breaks down people's secretiveness and brings a sense of security.

Although an angatok can often help combat a misfortune that strikes an individual, he cannot guide an individual's destiny. Every Netsilik must have his own spiritual resources. He relies on his name to give him strength. And since a Netsilik can acquire many names in his lifetime, he may have many name-souls to support his life. And his ability to use the power of the spirits differs only in degree from that of the angatoks. Every Netsilik seeks personal power in magic words and amulets, which work through the power of spirits.

The Netsilik have great faith in the power of words. Magic words are powerful formulas for calling on spirits for help. Some magic words are fragments of old songs, handed down from earlier generations; other are believed to be sentences that were heard back in the days when animals could talk and have been remembered ever since. Magic words are private property. The owner keeps them secret, for if they

are heard by another person, they lose their force. They can be bought, at a high price, or passed on as a legacy by one who is dying.

Amulets are parts of animals that give the wearer special abilities. A swan's beak assures that a woman will have boy babies; seal teeth give luck in sealing; a spider makes a good craftsman. It is not the amulet itself but the spirit of the animal from which it is taken which has the effective helping power. An amulet works only for the person who wears it, but if it is traded, its magic power is transferred to the new owner.

The spirits which populate the Netsilik world are entities which enable them to explain and to influence their experience. They also fill a Netsilik's life with fear. A Netsilik fears many things: storms, starvation, disease, isolation, and the hostility of men. But most of all, he fears the spirits. He fears them because they are powerful, unpredictable, invisible and ever-present. Fear is a pervasive element of the Netsilik world. This is what a Netsilik means when he says, "We do not believe, we fear."

How do the Netsilik live with this fear? Their world view has built into it a way of coping with the fearful. Part of the Netsilik world view has to do with beliefs about what kind of man is best able to cope successfully with life. For the Netsilik, the ideal man is the aggressive, independent man, the man who is skilled at providing for his family and who is skilled at fighting those who would cause harm. The skillful hunter and the skillful angatok both embody part of the Netsilik ideal personality. Independence and aggressiveness are respected in the Netsilik community and elaborated in Netsilik legend because they are the qualities which best enable a Netsilik to cope with his frightening world.

Kiviok is a legendary Netsilik hero. Because he is a hero, he exemplifies the characteristics of the ideal Netsilik man. But also,

because he is a hero, his adventures are not those that ordinary men experience, and his fate is not one that ordinary men desire.

Kiviok is a man whose experiences extend the boundaries of knowledge for his people. He has explored many unknown realms. To the extent that these experiences lead into the unknown, he brings new knowledge, and therefore new powers, to his people. Because he has lived through the ages of Netsilik history, he has explored the realm of past time. Because he so transgresses the boundary of mortality, he embodies the continuity of the Netsilik people, which extends beyond the experience of any single group of Netsilik individuals.

Kiviok has learned many things about the realms of supernatural creatures, of animals, and of foreigners. He has learned about the ways of animals by taking to wife many animals in human form. He allows himself, just like an ordinary seal, to be dragged home by a bear to be butchered, thus learning what it is to be preyed upon. He sees how salmon are made. He is responsible for the forming of the sea ice. He even visits the land of the white man and becomes a man of great possessions. All this knowledge he brings to the Netsilik people.

In some ways Kiviok is like an ordinary Netsilik man. Although he has many lives, he grows old. Like every Netsilik man, he cannot live long without a wife, and he prefers a young and handsome woman to an old and ugly one. He is hurt by the unfaithfulness of his wives, his human wife and his goose-wife. He loves his wolf-wife and mourns her death; he travels far to recover his fox-wife and his goose-wife and children. He has the same feelings and vulnerabilities as ordinary men.

In other ways Kiviok is different from the ordinary Netsilik--he is the ideal. His individualism enables him to go off alone on great adventures, to provide for himself and his various wives, and to form new ties when old ties have been broken. To those who threaten him or provoke his rage, he can be cruel and murderous. But it is in his use

of supernatural powers that Kiviok most embodies the Netsilik ideal. He is a great angatok; his helping spirits are many and effective. Mountain ranges grow up and rivers flow at his bidding. He battles successfully with the realm of life most dangerous to the Netsilik, and uses the powers of that realm, the realm of the spirits.

In one way Kiviok differs from even the ideal Netsilik man. The independence that makes him a hero destines him to a fate that no Netsilik would want, a life of solitude. He is a man who must keep wandering, a stranger in his own village. He has no home among people. Kiviok becomes almost dangerous to people. When he returns to his village, his parents are "killed with joy." Finally he became "ghastly to look at"; his own people are "scared to death merely by his appearance." The very adventures which make him a culture hero have made him unfit for human society. His fate is to be alone.

The adventures and the fate of Kiviok have a special meaning for the Netsilik. Kiviok is many heroes in one--explorer, conqueror, and teacher. As explorer he visits the strange, unexplored realms which are mysterious and therefore threatening to the Netsilik--the realms of wild beasts, supernatural forces, and foreigners, and the realm of the forgotten past. As conqueror he defeats all. Those who harm him or hurt his pride are defeated by his vengeance. Because Kiviok is a human, his victories in the frightening realms of life show his people a way to conquer their own fears. Kiviok the teacher reaffirms the central place of men in the world. It is said that the wolves could not hunt caribou until Kiviok taught them. But Netsilik men taught themselves how to hunt seals. As a human teacher Kiviok dramatizes the superiority of human intelligence and skill over the physical strength of animals and even over the magical powers of supernatural creatures.

Do the Netsilik believe in Kiviok? We are not sure. Perhaps they do not believe that he actually exists or existed. But they do believe

in the dangers he encounters; that is why they find his adventures so meaningful. In his many roles the legendary Kiviok brings reassurance to the Netsilik people. The real terrors of Netsilik life, subdued in legend by Kiviok, lose their threatening force. And in his fate as a culture hero--the isolation of having no place in human society--Kiviok reaffirms the value of the social group in the lives of ordinary men.

THE NETSILIK ESKIMOS

Knud Rasmussen

Cut off from the surrounding world by ice-filled seas and enormous trackless wastes, a little handful of people calling themselves Netsilingmiut (the Seal Eskimos) have been suffered to live their own life, entirely untrammelled by outside influence, right up to the present time.

According to the census I made of them, there were around Pelly Bay 32 males and 22 females, on Boothia Isthmus 39 males and 27 females, at Murchison River 22 males and 15 females, at Bellot Strait 10 males and 8 females, and finally at Adelaide Peninsula 47 males and 37 females. The marked excess of males over females was not due to any greater mortality among the females, but to infanticide....

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The Netsilingmiut have not received their group name: "the people who live where there are seals" because seals were particularly abundant in their territory; this is by no means the case, unfortunately. They have more probably received it because, after a life in the interior, they have for some reason or other separated from the Caribou Eskimos and moved down to the coast.

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It is astonishing how much the Netsilingmiut know about the land they live in, be it natural conditions and fauna or its early history. Though they had no previous knowledge of paper and pencil, they were remarkably quick in outlining the shape of their great country, and, having done so, could put in all the details with remarkable certainty. Obviously the distances in these hand drawings cannot always be correct; but all islands, peninsulas, bays, and lakes are reproduced so accurately that finding one's way from place to place is an easy matter even to an utter stranger

Excerpted from Knud Rasmussen, The Netsilik Eskimos: Report of the Fifth Thule Expedition, 1921-24, vol. VIII (Copenhagen: Gyldendalske Boghandel, Nordisk Forlag, 1931).

to the country. This geographical knowledge is of course accompanied by a most intimate acquaintance with the animals and their habits--a knowledge on which their whole existence depends.

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The traditions of the Netsilik have it that they are a people that have come into the country from elsewhere and have taken it from the original inhabitants. Where they came from is a question that is rather vague to them. They know merely that when their forefathers came to their present hunting grounds the lands were already populated with Tunrit....

They say that in the earliest times it was the Tunrit that made the country "inhabitable," which means that they did all the work that made it possible to hunt the caribou and catch the salmon with the gear they had invented themselves and the hunting methods that were used. It was the Tunrit that found the places where the caribou crossed the waters, and they built cairns in various parts of the country and thus compelled the animals to follow certain paths so that while on land they could be hunted with the bow and arrow from...[blinds] or pursued in kayaks at... crossing places either over lakes or wide rivers. They it was, too, that found the fishes in the rivers and set up...dams and fish weirs built of stones at the places where the salmon run, so that those that were shut in could be speared with the leister.

The Tunrit are described as big, strong people who were so good natured as to be almost timid and therefore easily took flight.

It was not always an easy matter to obtain people's true meaning as to how they appraised the white man.... Often one had the feeling that they regarded him in quite the same manner as many white men look upon the Eskimo--as being inferior to themselves, as a sort of powerful barbarian to whom particular deference was due, because he was bigger and stronger than themselves and had an outfit and instruments of power far in excess

of their own.... A further fact that increased their respect was that they always believed the white man's resources were inexhaustible.... But above all was their invention of the firearms, which made them both terrible enemies and impossible to compete with in the struggle for food. On the other hand, the Eskimos were always their superiors in their ability to live in their cold land, in building snow huts, in driving dogs and in paddling a kayak. In these very elementary accomplishments the white men were always inferior, and in many ways quite dependent upon the Eskimos themselves while in their country.... All these points of view were explained to me one day by old Kuvdluitsoq, and in conclusion, he, as it were, summarized his views and his appraisal in the following sentence:

" ...It is generally believed that white men have quite the same minds as small children. Therefore one should always give way to them. They are easily angered, and when they cannot get their will they are moody and, like children, have the strangest ideas and fancies."

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There is scarcely any country on earth that presents conditions more severe and inclement for man than the most easterly parts of the Northwest Passage, for it lies waste and bare of all that is otherwise considered necessary to life; and yet there the Netsilingmiut for generations have known how to wage the struggle for existence, in such a manner that strangers coming among them will involuntarily receive the impression that it is a people who desire no better hunting grounds than these, the very ones where their ancestors developed that special culture which they have faithfully handed down from father to son.

Winter takes up most of their lives, a hard, stormy winter, already beginning in September and lasting right into spring--the middle of June. In the winter months proper they have to contend with the severe cold, which constantly fluctuates between -30° and -50° C, and in spring, when

warmer weather really should set in, it is often so raw and stormy that it is a matter of great difficulty to obtain food. In May, June, July, and August they are livened up on exceptional occasions--that are remembered--by a few warm days when nature awakes and everything seems to be growing. Then one is sensible of such mildness around that all adversity is forgotten and it feels wonderful to be alive. But such periods are brief, a few days at the outside, and one is again left at the mercy of a climate in which warm clothing and a healthy, hardened constitution are necessary for survival.

Snow begins to fall in September, sometimes even toward the end of August, and it lies until June. As early as September the fjords are iced over, and in October the sea ice lays a covering that does not disappear until sometime between July and August the next year.

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Qaqortingneq said to me: "You have seen us happy this summer; we have been happy, not only because we have enjoyed living together with entirely new people in our village, who came to us from far away and yet could speak our tongue. You also came to us with ammunition for our guns and with iron for our ice-hunting harpoons.... In times like these we often feel we have so much food that we will not be able to eat it all. But whoever does that forgets the many, many days in winter when we can find no food at all; he forgets that the caribou go away from our country and that even the seals may disappear or snowstorms prevent us from finding their breathing holes. And so the man that is wise never lolls about idle when the weather is good; he can never know what bad days may eat up his meat caches and drive him and his family into starvation.

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"Three winters before your coming (1919), seven people starved to death up there close to Kingaq (Cape Britannia); they had spent the summer in

King William's Land as we had, but their hunting had not been good; there were not caribou enough and scarcely any trout. As soon as the ice would bear they tried sealing, but that failed because the ice was all cut up by the currents owing to the mild weather, and they could catch no cod either.

"...in the dark time, when the sea ice was cut by currents, they starved to death. (He names the seven persons)...

"The year after there were still more who died of hunger... They had spent the summer at Naujatoq on Adelaide Peninsula and perished in the easterly part of Simpson Strait. Constant snowstorms were the cause, and it seems that the men have been ill, too, possibly some sickness contracted through eating year-old, putrid stores."

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In the following I will in Samik's own words give some accounts of famine. He himself was a good hunter and a respected shaman.

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"You know Tuneq, the brother of Itqilik; you have met him and his present wife; you have lived with them and seen that he is a happy man, a man who likes to laugh and a man who is always good to his wife.

"One winter, many years ago, hunting was a failure. Day after day went by and nobody had anything to eat. People died of hunger or froze to death, and the quick lived on the dead. Then Tuneq suddenly became disturbed in his head. He began to consult the spirits, and it was not long before he began to do so through his own wife. He used her as a medium.... He did it in this way: he tied a line to one of her legs and made her lie on the platform; then he tugged at her leg and let the spirits answer through her leg. He did this often, and it was not long before he said he had received the answer that he was to save his own life by eating his

wife. At first he only cut small pieces from her clothing and ate them, drinking water with it to help him to swallow it. People who saw him say that he behaved like a man possessed of a wild and evil spirit. Bigger and bigger were the pieces he cut from her clothing; at last her body was quite exposed in many places. The wife knew that the spirits had said her husband should eat her, but she was so exhausted that it made no impression on her. She did not care. It was only when he began to feel her, when it occurred to him to stick his fingers in her side to feel if there was flesh on her, that she suddenly felt a terrible fear; so she, who had never been afraid of dying, now tried to escape. With her feeble strength she ran for her life, and then it was as if Tuneq saw her only as a quarry that was about to escape him; he ran after her and stabbed her to death.

"After that he lived on her, and he collected her bones in a heap over by the side platform for the purpose of fulfilling the taboo rule required of all who die. He was going to hold death-taboo over her for five days. But people say that the ghost of his wife often walked through her own bones, Tuneq waking up at night as the bones he himself had gnawed began to rattle. Sometimes they moved up and down, and it happened that the man sitting up on the platform would be hauled off during the night by some invisible power. And when he then suddenly awoke there was no one in the snow hut, only the bones lying over by the side platform, rattling.

"In the same famine, Tuneq's brother Itqilik ate his younger brother....

"...his younger brother was frostbitten in both feet so that he was unable to walk. Gangrene set in, and as his feet were quite numb, Itqilik cut them off his living brother and ate them. Later they agreed that Itqilik might just as well try to save his life by eating the whole of his brother, who was doomed anyhow. Then Itqilik killed him with his

knife and lived on his body till he reached a place where men lived...."

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The most glaring consequence of the struggle for existence is manifested in the way in which they try to breed the greatest possible number of boys and the fewest possible girls. For it is solely economy that lies behind the custom that girls are killed at birth, if they have not already been promised to a family where there is a son who some day is to have a wife. These murders of newborn girls are not at all committed as the outcome of crudeness of mind nor because they underrate the importance of the female to the community; they are quite well aware that she is indispensable. When it happens, it is only because the struggle for existence is so hard, because the experience of generations is that the individual provider is unable to feed more than the most necessary members of the family....

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They hold the view that if a woman is to suckle a girl child it will be two or three years before she may expect her next confinement. But if she has not to suckle, she may expect another child comparatively soon after; so they encourage the number of births--when it is a girl that is born--either by killing it or giving it away immediately after birth, and then hope that the next one will be a boy.

A hunter must take into consideration that he can only subject himself and his constitution for comparatively few years to all the strain that hunting demands. Competition is keen, and if he has no very special natural gifts and enjoys no unusually good health, he need not be very old before he can no longer hold his own with the young. Now if he has sons, they will as a rule be able to step in and help just when his own physique is beginning to fail. Thus it is life's own inexorability that has taught them the necessity of having as many sons as possible. Only by that means may they be certain that they will not need to put the rope around their own neck too early; for it is the common custom that old

people, who can no longer keep themselves, prefer to put an end to their life by hanging rather than drag themselves through life in poverty and helpless old age.

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We will now make a closer examination of what life is like in the different seasons, and, as our starting point, take the early winter, when all the new clothing with which they have to withstand the cold is ready. This skin clothing has been made under both taboo and festivity; for from the day that the last caribou left the country all hunting is temporarily suspended while industrious seamstresses in new, warm snow huts are occupied from morn till eve. Evenings and nights are passed in song feasts after joyous banqueting on caribou meat and frozen salmon.

When at last everything is finished--for not another stitch may be put in when out on the ice the sun is again high in the heavens the following spring--they remove the camp from land and start out on their way to where the seals congregate. This breaking up from..."the place where the clothes are made," or "the sewing place," takes place at varying times all according to whether there is meat enough and they can afford to take a holiday close to the winter caches. In some years they have to go out to the breathing holes at the end of November, whilst there are years when they may wait until January or February.

Once out on the ice, this represents the commencement of a life of constant moves and journeys; they remove to a new hunting area as soon as there are no more seals at the camp that was first chosen. These journeys to new grounds may be long or short, all depending upon whether the hunting is good or bad. As a rule the distance is six to ten miles. The appearance of the seal is closely bound up with the manner in which the ice happens to lie. If the winter ice comes over a fjord suddenly and at the same time lies far out to sea, it often happens that only a few seals get into the usual hunting places. But if the ice forms so

that the inner part of the fjord is first covered, while there is open water for some time outside, the animals have more time to come into the open sea, and then hunting is profitable.

In seasons when hunting is bad they have to move incessantly from place to place, and the winter becomes a hard one, not only for the hunters themselves but especially for the old people. The treatment of the aged, of course, varies with the individual. Here, as everywhere, there are helpful and sympathetic, or hard-hearted sons and sons-in-law, and the fate of the old people lies in their hands....

I made exhaustive enquiries as to the treatment of the aged, and the only case of heartlessness that I came across was that of an old woman by name Kigtaq. She was the mother of a woman named Terigssaq, who was married to Arfeq. When they moved from camp to camp she was often left out on the ice in mid-winter, clad only in a thin inner jacket and no thick, warm outer coat. Even in bad weather she often had to sleep out on the ice as she had not caught up with the others....

I took up this case of Kigtaq and asked whether it was not thought wicked that more care was not taken of an old woman. To this Samik answered: "No one here among us wishes harm to old people. We ourselves might be old some day. Perhaps there are those among us who think Arfeq might take better care of his mother-in-law, particularly by giving her better clothes. But others excuse Arfeq, in that he has been so unlucky in his hunting that he has barely been able to procure furs for his wife and his children, and people think he must first and foremost attend to them; for not only are they more closely related to him, but they have their lives before them and they must live long, whereas there is no future for an old worn-out woman. Then again there are others who think that Arfeq should allow his mother-in-law to ride on his sledge, or at any rate go back for her when he has built his snow hut, while others say that he only has two dogs and with his wife has to help to drag his sledge from place to place.

And if he has to be at the breathing holes next morning at the proper time to secure food, he cannot travel backwards and forwards between the old and the new camp to salvage an old woman. He has the choice between helping one who is at death's door anyhow, and allowing his wife and children to starve. This is how it is, and we see no wickedness in it. Perhaps it is more remarkable that old Kigtaq, now that she is no longer able to fend for herself, still hangs on as a burden to her children and grandchildren. For our custom up here is that all old people who can do no more, and whom death will not take, help death to take them. And they do this not merely to be rid of a life that is no longer a pleasure, but also to relieve their nearest relations of the trouble they give them."

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If they only had decent sledges and sufficient dogs, their winter life would be a much easier one...various primitive types of sledges of skin they use, and one can only admire the ingenuity with which they help themselves when no wood is to be had. For it was a long way to where there was wood. And in addition, a journey for the purpose of getting driftwood has as a rule to be paid for by bad summer hunting; for they would have to go right down to Queen Maud's Sea, to the north coast of King William's Land, or the region about Matty Island, and even then there was no saying that they would get anything out of their journey in these regions where wood is almost nonexistent.

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In a snow hut it is always the woman who begins the day. She gets up first in the morning and tends the lamp, which as a rule is all but extinguished in the evening before going to sleep. This is done not only because they do not mind sleeping in a cold room, but because they have to economize with the oil. For the blubber supplies they can put aside for the winter are astonishingly small, even in the spring months when most seals are caught. It is kept in a seal skin that has been removed whole, cuts being made only at the head and hind flippers. A

blubber bag of this kind is reckoned to hold the blubber of five medium sized seals.... On the ice round about King William's Land there are only very few families that had more than three or four...for the winter. These families were in fact looked upon as being very well-to-do....

But to return to the early rising woman. As soon as she has got her big blubber lamp burning at full blaze she removes the block of snow that closes the entrance passage...and this means that the house is open to any one who cares to make a morning call....

The woman's next task is to put food over the lamp for her husband, usually consisting of a strong blood soup with blubber or boiled seal meat in it. This first meal is eaten by him naked, just as he is after his night's rest, and lying on the platform. While breakfast is being prepared, the footwear and what else may have been hung over the drying rack to dry is attended to. This rack is always in the form of a half circle.... The lamp itself is...set on three upright sticks...so that its heat will not melt the snow, or on two pieces of wood laid longitudinally under the lamp.... The Greenland drip-basin for the oil that always oozes out of the lamp...is here substituted by a piece of sewn seal skin that is called..."the kneeling place";... The lamp, and everything belonging to it, is not only the woman's property but as a rule has been hewn out of soapstone by her.

People living together in a hunting camp feel closely attached to one another in many ways. They mostly have a strong feeling that they cannot manage singly but need one another's help in the daily hunting. Therefore the men call their hunting companions (partners)... "those with whom I live on the firm ice," an expression that has come to mean: "the one with whom I have sought refuge." The thought is always this: "If I do not catch anything, I will surely get food for myself and my family from the others in the camp." The moral is of course: "I expect you to do for me what I do for you." These are all views that naturally grow

in places where it is difficult to obtain food. Caches that have been kept from the summer hunting are therefore always considered to be common supplies in a camp on the sea ice; it is expected that the owners will share them when they bring them in, so that all will have a part. If caribou meat or frozen trout is brought home, it would cause a most painful stir if all were not gathered to a festive meal--by invitation, of course. The man who brings a cache in...fulfills his obligations by adding a song feast to the meal, and this sets the donor in still higher relief. Song feasts are always a sign that there is meat and good days at a camp and hunters who can afford to feed others. Consequently the guests manifest their pleasure at the host's being able to "afford to sing" by eating without stint before the singing begins.

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The difficulty of procuring dog feed necessitates the keeping of very few dogs. Many have only one, some two to four, and only very few of the most skilled hunters can permit themselves the luxury of what may be called a real team of seven to eight dogs. The result is that they are not used for traction in the same sense as in other regions, where walrus hunting gives a surplus of meat of quite different dimensions. Among the Netsilingmiut there is never anything to spare, and therefore they have to draw the sledges themselves and be content with a couple of dogs to assist....

As a draught animal it might well be dispensed with. But a breathing-hole hunter without a dog might just as well stay at home and suck his thumb. If he has a dog, a hungry one for preference, it will lead him over the ice with distended nostrils in order to get the scent of something eatable, and it is from wonderfully long distances that it will suddenly prick its ears, lift its tail, and rush away, not stopping until with unfailing certainty and without wavering a moment it has taken its master to a breathing hole.

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The seal is only caught from the ice. Open-water hunting is not known....

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Breathing-hole hunting is a wonderful method and can be developed into a great art through years of practice and experience. Training begins early, at the age of twelve or fourteen, and...the Netsilingmiut are considered to be experts by all other tribes....

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All the men of the settlement go out together, each with his dog. As soon as a breathing hole has been found they all throw their harpoons at it, trying to hit it. The lucky thrower gets the hole, even if it may have been another who first discovered it.

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...quite early in the morning, while it is still half dark outside, Inutuk and I are awakened by a pail of boiling seal blood being put before us. Drowsily we slobber up the hot liquid with its plentiful admixture of train oil, for we know from experience that it is the only meal we may expect to have for the next ten or twelve hours. Then we quickly get into our clothes and tumble out of the snow hut. As usual there is a fresh breeze blowing and it is bitingly cold. Our fellow hunters are there already and, fifteen men strong, we race over the ice.

Finding a breathing hole without the aid of a dog is a matter of pure chance; not only is it difficult to discover, but there are not many of them. But sometimes the foxes form a guide, for they often place their excrement on the ice dome. Today, however, we all have a dog on a leash, and its fine nose is working incessantly up into the wind, sniffing and smelling from the moment we left the camp. We are three hours wandering about before the first hole is found, and we immediately flock round it in order to hit the small opening in the snow with our harpoons; Inutuk is the lucky one, and I remain with him while our comrades go on over the ice; gradually we see that they take up a position at other

holes, some of them so far away that we can just discern them as small dots out on the white snow.

With the certainty of great experience Inutuk now makes his arrangements for the hunt. First he cuts away the whole of the uppermost layer of snow, exposing the little dome down on the firm ice. With his tuk he opens the frozen ice at the place where the seal usually breathes and then scoops out the small lumps of ice that fill up the opening with his ilaut of musk-ox horn. He "feels" his way under the ice until he knows whether the little opening through which the seal is to be harpooned is in the middle or to one side of the dome itself. He knows that this investigation is of vital importance to the direction in which the harpoon has to be thrust. The seal always comes up with its back to the ice and, if the ice is thick, the breathing hole from the surface of the ice down to the water forms a large funnel-shaped basin which the body of the seal by no means fills, so that one might very easily thrust the harpoon past it, even if the upper opening of the hole is hit truly. That is why it is so important and necessary to work out beforehand the position the seal will occupy in the ice funnel. These investigations completed, a small snow dome is again built up over the hole, just as it was before the snow was shoveled away. With the harpoon a hole is then made through the snow so that this and the opening in the ice are in line, thus ensuring that at the critical moment the harpoon meets with no resistance.

Now Inutuk takes out his fine, ingeniously thought-out down indicator (a tiny device that warns the hunter when a seal comes to the hole), places a single piece of swansdown between the "straddle legs" of the caribou sinew, and puts it down through the hole so that it hangs in the upper rim of the hole with the "arms" up, while the "legs" with the swansdown go down into the opening, but no further than that they can easily be seen from above.

Now all preparations have been made, and Inutuk spreads his tutEriAq (fur box) out before the breathing hole and stands on it. Having done so, he stands as motionless as a statue, harpoon in hand and eyes fixed intently on the swansdown, which is just visible through the opening in the snow. Hour after hour goes by, and I realize what a fund of patience and hardiness is required when this hunting has to be pursued in a storm and in a temperature of about -50° C.

Four hours seems to me an eternity, and yet it is nothing; it sometimes happens that a man will stand twelve hours at a stretch when it is necessary to get food for those who are starving up in the icy snow hut; indeed when times are bad, when a quick catch means life or death, particularly to the hunter himself, exposed as he is all the time to wind and weather, it may happen that a man will stand almost without a break day after day at a breathing hole, taking only the shortest possible rests at home in the snow hut. I have heard of a man who spent two and a half days at a breathing hole, sometimes standing, sometimes sitting, but awake all the time.

Inutuk and I had just about decided to abandon the hunt at this hole and to try to find another one, when we caught sight of a man who had got his harpoon firmly into a seal. As soon as the happy hunter had got his catch hauled up on to the ice we ran over to him for the purpose of partaking of the feast, which always assumes the character of a ceremony on account of the gravity with which it is eaten. All knelt down, the man who had made the catch on the right side, the others on the left side of the seal. The hunter cut a tiny hole in the belly, through which he took the liver and a piece of blubber. This done, the hole was closed up again with wound pins so that no blood would run out and go to waste. The liver and blubber were cut up into small squares and eaten in the same kneeling position. Whenever I took part in one of these meals I felt something fine and affecting in the manner in which they knelt to "the daily meat."

Toward the end of May the dome over the breathing hole melts and the opening is fully exposed in the ice. If there is a sufficient number of people in the camp, men, women and half-grown children scatter over the ice, as far as possible all provided with a harpoon and line, and every one takes up a position by a breathing hole.... The seals are gradually compelled to come up to a hole even if there is someone there, for the many fruitless attempts they have made to come up and get air make them bewildered and half mad; their dizziness overcomes their fear and they fall an easy prey. If...there are numbers of seals, and there are people enough, a big kill can be obtained.

...o't'uq is the term for a seal that lies up on the ice to sleep....

Not until well into May and in the beginning of June do they become numerous, but by that time the ice is so watery that it is almost impossible to crawl up to the seals without making a noise...the hunter crawls over the ice, but stops every time the seal he is stalking awakens and looks at him. As long as his prey is observing him he has to roll about in the snow exactly like another wet seal that has just come up out of the water. The o't'uq, which is very suspicious at first, at last believes it is another seal that like itself has come up to bask in the sun, and by and by takes no more notice of the hunter, who at last gets so near that he can jump up and harpoon it....

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There are naturally very definite rules as to the manner in which the booty is shared among the hunters who have been out together. The rules apply especially to breathing-hole hunting, however, as this is pursued at a season when every bite of food procured is of importance. In spring, when everybody has food enough, it is no uncommon occurrence that a man retains the whole of the seal himself....

Apart from the skin, the man that catches a seal only keeps the entrails,

blood, the fat of the back and head, and the hind flippers and tail bone--in other words not a single piece of real meat. So little is his share if there are many men out together and all have to have a part. Thus if there are only two men in a hunting camp, the seal is divided across the middle. A man may have the right to a share even if he has not been out with the party, whether his absence may have been due to sickness or to work that could not be put off; he receives as his rightful share the same piece as he would give of his own kill to the other man.

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In the ordinary breathing-hole hunting the shares play such an important role that at many villages there are most complicated rules for dividing a seal. They have in fact special amulets for luck with hunting shares; and sometimes it happens that, while their boys are still quite small, parents decide which parts of a seal their sons undertake to give each other for the rest of their lives while they live at the same village....

As soon as it is brought into the house the seal must be dealt with exactly in accordance with ancient observance. It must never be laid on the dirty and trampled snow floor. Before being taken in, snow is carried in and trodden out over the floor so that the seal will lie on fresh clean snow. It offends the soul if its body is allowed to lie on a place where a woman has walked....

The careful hunter will always dip a piece of snow into the water-pail and let the water drip down into the seal's mouth. It is said that seals are always thirsty, and that they often let themselves be killed just to get a drink of water. For the thrust of the harpoon that kills it does not hurt and simply feels like a slight smarting. It is the belief that all seals know where killed animals are usually treated well, and therefore they always make their way to such people....

About the beginning of June, after the last seal hunts and the wet removals on melting ice, they (the hunters) lie up on land and dry their clothing; their worn and blubber-smearred garments are seen to and on the whole everything is made ready for the great season, summer and autumn, that is to be spent in fishing for trout and hunting caribou.

The caribou have already begun to make their appearance in April, singly or in small flocks.... And afterwards they come into the country steadily and regularly. They are shy, and in the old days were almost impossible to get with bow and arrow; but now when guns are used, matters are different and, on trips into the interior, individual animals are brought down as early as in the latter part of April. For the sun is high up and it is not so serious a matter to blend the hunting of caribou and seal as in the cold and dark months.

As soon as the snow has melted away they move into the summer districts and settle down for the next four months. This is the time of the tent camps round lakes and rivers, the happiest season of the year, when the summer sports are entered into with zest and nobody ever neglects an opportunity to excel at hunting and fishing. In this period all the old and infirm become rejuvenated and gather strength to bravely withstand the rigors of the darkness and the frost of winter.

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At the first part of the season trout are the principal form of food, but there was some sporadic caribou hunting with bow and arrow; the hunters concealed themselves behind talut, which were built right up to the paths usually followed by the game, and there they could lie for days and wait. ...it has been practically impossible to hunt caribou that remained in the country during the winter when it was cold. The creaking snow made it quite impossible to get within suitable range, and the cold interfered in another manner too, even if the hunter had special fingered mittens designed for handling the bow and arrow, it

was very slow sport in cold weather. The fingers became numb, not to speak of the fact that no hunter could hold out having to lie motionless hour after hour in windy weather on the cold snow. It was reckoned to be quite an achievement, a song was composed about it, if caribou were shot out of season before the great herds gathered. On the mainland this was not until the end of June, when mighty herds slowly made their way northwards--cows with their tiny calves, heifers, and young oxen. But even though hunting them gave a rich yield in numbers of animals killed, their meat did not go far because they were so lean, while their skins were useless for clothing. The great harvest of meat was always reaped in autumn....

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In those days it was a great and constant problem to get skins enough for the winter. For outer and inner coat four skins each were required, two each for inner and outer trousers, and one for footwear. This made seven skins for a grown man, six for a woman, and three or four per child, so that taking a small family of husband, wife, and three half-grown children, twenty-five skins had to be procured from caribou killed in the season when the fur was serviceable, i.e., in August-September, and this without counting an extra suit for the husband, who, always out in every sort of weather, could certainly do with it.

But this was not all. There had to be platform skins too, and with rugs, at least six skins, and sleeping skins, at least three, the total at a modest estimate was twenty-nine to thirty skins without counting those for the tent sheet, eight to sixteen according to size. Before firearms were introduced it had certainly been difficult for most Eskimos to get so many, and in most cases they managed by the help they received from those who were well supplied....

When hunting with the kayak at the crossing places, the usual method was for the kayaks to lie concealed on the opposite side of the water to that

from which the caribou were driven out, although when required by the terrain they might sometimes be on the same side.

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During the whole of the period when caribou were hunted their skins had only to be dried, and had not to be cured or sewn. There was a very strict taboo against making clothes before the great caribou hunt on the migrating animals had been brought to an end and people had moved into ice houses or snow houses. But if there were a case of urgency and a pressing necessity that a man should have a new garment before the sewing season, snow had to be collected from different drifts until they had sufficient for a house just large enough to accommodate the seamstress.

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The Netsilingmiut imagine the "Land of the Blessed" as a place where joy never dies and where every day it must manifest itself in play. It would seem that this ideal existence had already been realized in life at the fishing place, where every single day they played and carelessly noised and laughed for at least five or six hours--people of all ages and of both sexes. Their day formed itself almost as follows: First the labor of procuring the daily food. This was restricted to ten minutes twice, sometimes three times, a day; but even these ten minutes' work was to them a sport, with contests and larks to the accompaniment of cries and deafening laughter.

The fishes were caught down in the little stream that joined the two lakes together. A stone dam had been built in it, blocking it completely. Out in the middle was the [gashge], a round weir of stones forming a separate enclosure, ten meters long, parallel with the flow of the river, four meters wide measured at right angles from the course of the river. This [gashge] had an uk'uAq: a gateway in the end facing the lake from which the river flowed. The trout that followed the

stream and tried to get from the upper lake to the lower one had necessarily to pass through the uk'uAq into the [gashge].

The fish usually approached at midnight or early in the morning before sunrise, and sometimes in the afternoon when the sun was low. Only at these times did the Eskimos catch them and during the rest of the day fishing was strictly forbidden, for then the fish were to be left in peace. Everybody fished at the same time. No one had to approach the [gashge] till the local "superintendent of fisheries" had shouted the signal over the whole settlement: "...Now we'll all go down!"

This cry was always greeted with joyous howls from all the tents, but nobody ever walked down to the river; it was always a wild race of men, women and children, from the most decrepit, hobbling and stumbling old veterans to the youngest fleet runners, some fully dressed, others half naked, most of them bare legged, despite the fact that the water was icy cold and the air more than chilly. They seemed to be oblivious to cold. They stopped a short distance from the river, where the leisters with their long shafts were deposited, and then four or five men stole forward, leister in hand, towards the lake whence the fish usually came. Cautiously they crept up to just outside the brink, careful lest their shadows should fall on the water. Twenty or thirty meters from the [gashge] and the san'Erutit they suddenly rushed out into the river and then walked downstream, waving arms and leisters, wading towards the opening of the [gashge] inside the stone walls of the san'Erutit...then one could see how the many fish that had accumulated shoaled hurriedly towards the [gashge]; only here and there did one leap over the stone dam and continue on toward the other lake. When there were no more fish in the river a man sprang to the uk'uAq and closed it with a large flat stone, and then all the trout were shut up in the weir.

The closing of the uk'uAq was the sign that the fishing could begin and, careless of the cold water or their clothes, which became saturated, the

whole impatient flock of people tumbled into the river and into the [gashge], where they began to spear the fish that had collected in it. The fish dashed wildly about, in between the legs of the Eskimos, who stabbed away with their leisters with no pretense at any system, the sole object being to be the one to catch the most fish, and it was always a riddle to me that in this scuffle, with the leisters incessantly darting in and out of the water, apparently at random, the people preserved their toes unscathed; there was never anyone that got so much as a scratch on leg or foot. Each fisher carried in his hand a qorqaut: a long bone needle on a thong, with a toggle of wood at the other end. When a fish is caught the needle is stuck through it, preferably so as to break the backbone, then he goes on again, often trailing five or six fish behind him at the end of the thong.

Later on in the summer season, or the beginning of autumn, there is often such a wealth of fish at Amitsoq that, in the course of fourteen days, every family can catch so much that they are able to make three or four caches of good, fat trout for the winter. Each cache represents between two and three hundred kilograms....

Some variation in the day's events was caused by many small, affecting customs. For instance it is a very important event, and one to be celebrated, when a small boy catches his first fish. Thus I one day happened to see Pugutaq (the wooden tray) catch his first fish. The boy was no more than six years old, so that it was his mother that had to do most of the catching. He was too small to wade out in the river, so she had to carry him out to the [gashge]. There he had to hold the leister himself, but had to be assisted in spearing the fish, and afterwards in pushing the qorqaut through it. But as soon as this was done she broke out into loud joyous cries and announced to the settlement that her son had made his first catch. Later on the day was celebrated with a great feast, consisting of all the trout possessed by the family. It was arranged in the usual manner, the women eating by themselves and

the men likewise; they never eat together, as the men are afraid of bad hunting if they eat in company with unclean women, which might scare the animals away....

All work has a natural distribution, roughly characterized by the fact that it is the man who procures food while the woman does all the housework. Her contribution to the upkeep of the home is set at a high value, and a clever seamstress enjoys genuine esteem. The woman has not only her special duties but also her rights; in her marriage she has her own property, her particular possessions being recognized as the lamps, pots..., ulo, sewing needles, meat trays of wood..., water containers...and the large horn ladles for boiled meat and soup, almost always of musk-ox horn. She brings all these things into the marriage as her trousseau and retains them in the event of a separation.... Itqilik's wife Unalerssuaq, who had no soapstone cooking pot in her marriage outfit, bought one and paid for it--of course with her husband's approval--with a newly born child. Naturally a soapstone pot is not so high priced if the family is in the vicinity of one of the places where soapstone is to be had, so that this particular bargain may be explained by the fact that the Itqilik family was right up at Arvetoq (Bellot Strait), and there it was impossible to get any of this material.

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Divorce is common as long as there are no children, and there are women who go through seven or eight trial marriages before they finally settle down.

Their pleasure in their offspring is great, and children always unite parents closely. If they cannot beget children a little adoptive child usually has the same effect and influence. Adoptive children are always bought, and the price paid for them varies greatly, although it is always high. Eqatlijoq, for instance, had bought her adoptive son for a soapstone cooking pot and a kayak, both very precious objects. They are usu-

ally bought when newly born, the reason being, of course, that a mother who does not intend to rear her child does not want the trouble of nursing it, especially as this also would mean that her next child would be so much the later in coming. In winter these little adoptive babies are brought up on seal soup, or on caribou soup in the caribou season; the foster mother first takes the soup into her mouth and keeps it until it has come to a suitable temperature, and only then does she gulp it into the infant's mouth. It needs no saying that this feeding gives most children violent diarrhoea, of which many of them die. This happens especially when the foster mother in her eagerness to make the soup more nourishing puts blubber or caribou fat in it. But if the foster child survives the first difficult period it thrives well and begins to eat meat even at the age of twelve months, although the foster mother chews it first and then passes it into its mouth.

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Most young men and women are "engaged" before they are born, which means that the parents agree that their children are to have each other. If the parents of an engaged couple live so far apart that they rarely or never see each other, the natural thing is that when they grow up they enter into a temporary marriage with another. As far as the woman is concerned this happens at a very tender age, thirteen to fifteen. One young man, Angutisugssuk, who lived in King William's Land, called a man right up at Repulse Bay his father-in-law. Angutisugssuk was then twenty years old and unmarried, because his mother-in-law had not yet given birth to his "intended." And so for the time being he was "second husband" in the house of Tarajorqaoq.

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Polygamy is known, but of course it cannot be general owing to the great inferiority of women as to number. If a man has more than one wife it is consequently always a sign of good standing and especial skill as a hunter. Though jealousy is no unknown feeling, concubines usually get on well together. Polyandry is also practised, it being no rare occur-

rence for a woman to have two husbands. A grown man is a helpless being if he has no woman to make his clothes, and so it will happen that a husband will call a good comrade who is alone to share his wife with him. It is seldom, however, that these marriages run smoothly, especially if the men are young, for it very often ends in one of them being killed. Naturally, a wife can never ask a good friend to come in as a partner in her marriage; this is a right that exclusively belongs to the husband.

Wife exchanging for short periods often takes place, especially between men who are usually song-fellows at festivals.... Husbands have almost always a certain man to whom they hand the drum when they have sung their song. This man, who has to sing a song in reply, is called his iglua: his song-comrade or song-fellow.... Two such men who usually follow one another at a song festival are considered to be so closely associated that not only after the ceremony but at all times when they feel inclined, they can exchange wives. Some religious appraisement undoubtedly lies behind this fellowship. It involves both advantages and obligations; for instance, if a man is about to set out on a long journey--perhaps to trade--and his wife is with child, sick or in some other manner unfit to go with him, he can borrow the wife of his iglua to accompany him, giving his own in exchange. This form of wife-exchange is necessary in a community living the nomad life of Eskimos.

Husbands have a very free hand in their married life and it is considered to be quite in order for them to have intercourse with any woman whenever there is an opportunity....

...a woman who has given herself to another man usually gets a thrashing from her husband, even if she herself was not the inciting party. Cases do occur, however, where it is the gallant lover that is called to account, and the difference is then settled by a bout of fisticuffs. All men are clever and trained boxers. A fight of this description is usually fought without spectators. The contestants strip to the waist, face each other

and then pound away at shoulders, arms and head until one of them retires and declares himself beaten. After an encounter of this kind the two are good friends again.

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I said that men fight among themselves for a wife, for a simple consequence of the shortage of women is that young men must take women by force if their parents have not been so prudent as to betroth them to an infant girl. The little settlement up at Bellot Strait was established by men who found their surroundings too hot for them because they had stolen their wives and incidentally, in the heat of strife, had sent the husbands into the great silence. Abduction need not always end in bloodshed, however. Just before I arrived at King William's Land a young man, Inorajuk, had lost his wife under circumstances which he himself described as follows:

"Last winter I visited a snow-hut camp with people from Victoria Land just at the time when the warmth of the sun begins to return and the seals have young. I went there to trade, and my sledge party consisted of Seqineq and his wife, my wife and my little daughter. My trading was soon completed, but I was compelled to stay the day over on account of snowstorm. On that day my wife was invited to a house to eat boiled seal meat; but scarcely had she gone inside when my comrade Seqineq came running up to me and told me that the people at the settlement intended to steal my wife.

"There were fourteen men and their wives in the camp. I hurried to the house where my wife was being kept shut in, and by using my fists I succeeded in getting her out into the open. But then all the men and their wives came out after me with the exception of Seqineq, who was kept shut in because he would help me. After a long fight I had to give in at last, because my opponents had pulled all my clothing off and it was impossible for me to fight out in the snowstorm, which numbed all my

muscles. Then I had to leave the camp alone with my little daughter, and since then it has been impossible for me to get my wife back."

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In the old days a tribe was really at war with all others outside of its own hunting grounds, and many are the tales that have been handed down of strife, murder, in fact massacre. After the entry of the white man into the Hudson Bay district, perfect peace was established between the tribes in the east, but they were still at loggerheads with all tribes to the west, especially the people from Victoria Land.

One would think that in these waste and desolate regions they would feel pleasure when they came across people who could be company for them; far from it. To this day it is customary, when a sledge party approaches a settlement, that it does not drive right up to the door. An informal arrival like that might give rise to fright and misunderstanding, which would quickly lead to hostilities. And the fact must never be lost sight of that human life was never at any time taken too seriously.

It is astonishing how suspicious they were in former times, but an instinct of insecurity like this can only have arisen because experience showed that there was reason for it. As evidence of this an old man told me the following:

When they broke camp in his grandfather's day and moved from one hunting place to another, they drove sledge behind sledge, many in company, in a long line, the first breaking the trail. As there were only few dogs, men and women had to pull too. During such a removal the snow knife was never released from the hand and as a rule a man also had his sealing harpoon with him. A man in the procession could not stop to make water without great risk, for the one who walked in front might easily get the idea that the man for some reason or other would strike him down from behind, and this suspicion alone might be a sufficient cause of bloodshed. They

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did not trust each other; even if they apparently were the best of friends they could never be sure that the one had not evil intentions. So it is no wonder that they were doubly cautious when meeting strangers.

When the sledges had been stopped at a distance of about a mile from the settlement a woman was sent up to tell who they were and that no hostile feelings were entertained. Only when the truce bearer had been well received could the rest drive up without hesitation....

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Angatkut [angatoks], or shamans, are people possessed of special gifts that can bring them in communication with the spirits of the earth, the air and the sea. By means of these preternatural beings they can see "the things that to others are hidden," and they can help their fellow men who have got into danger, either on account of sickness or on account of continuous misfortune on their hunts, or if, attacked by an enemy, they have become possessed of an evil spirit.

Angatkut can get into communication with the supernatural in two ways, either by holding a seance or through qilanEq. These methods of calling up spirits correspond in every way to those that are customary among the Iglulingmiut, and, as among the latter, a special spirit or shaman language is employed.

An ordinary seance is held in a snow hut or a tent, preferably in a subdued light; it is said that the spirits do not care to appear in full daylight. When a shaman is going to summon his helping spirits for some purpose or other the whole village is invited to attend the ceremony. He conjures them by singing special spirit songs; among the Netsilingmiut these spirit songs were not necessarily about anything particular nor set to any special melody. It is simply said that there is a certain song which, when sung, has the effect that the spirits like to come. Every angatkut has his own particular song, and it puts him into a trance.

It is then believed that the spirit summoned takes up its abode in his body and simply speaks through his mouth. And so, as soon as he has fallen into a trance, he always speaks in a voice that is not his own, often a deep, resonant bass, at other times in a shrill falsetto, and if some animal is his helping spirit and it now dwells in him, he imitates the voice of that animal.

A helping spirit is called an apershaq: one that exists to be questioned, and there may be a great difference in these apershat. For instance, a certain Unaraluk, a man who was one of the less prominent angatkut, had such eminent helping spirits as the sun and the souls of his deceased father and mother. Another shaman, Iksivalitaq, had the moon spirit, a sea scorpion and one of his father's dogs--remarkably enough a dog that was alive, a young animal still in use.

An angatkut does not choose his own apershaq. They come to him of their own volition, and then he must not be afraid of them. If he is, he will never secure them as helping spirits. Tiagssaq, the wife of Samik, was a shaman in her younger days but abandoned the cult when she began to have children. Her expressed reason was that she could not sleep at night for fear of her helping spirits.

There is no particular place in hut or tent for an angatkut when summoning his helping spirits. Either he walks about the floor singing, or he sits on the platform uttering the various sounds that are characteristic of the spirit that has possessed him.

The other method of getting into touch with one's apershaq is the so-called qilaneq, which means that "something happens by means of tying something fast." It is just the same as the Iglulingmiut method. The shaman ties a line to one of his own legs or the head or leg of another; then he jerks the line to the continuous accompaniment of a monotonous repetition of: "...where are those [spirits] I must bind fast to me?" After having been

called for some time a spirit takes up its abode in the body that has been tied to the line, and one communicates with it by continually jerking the line. When the part of the body to which it is tied becomes so heavy that one cannot lift it, the spirit is there and ready to answer the questions put to it. Usually the shaman has some idea of the breach of taboo that may have been the cause of the misfortune or sickness that is now to be averted or cured. He addresses a number of questions to the spirits, pulling at the line all the time. When the line cannot raise qilaq (that to which it is tied), i.e. either his own leg or another's head or leg, it means that he has named one of the causes of the sickness or bad hunting. That is how the spirits answer.

The Netsilingmiut themselves are very emphatic in pointing out that they no longer have great shamans among them. The whole art rests upon tradition from olden times, and the respect for shamanizing is really only created by what people know from the old tales a shaman should be able to perform, if only he is sufficiently well up in his art....

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[The only thing I could not get] exact information about was the special training of shamans, so I must presume that preparation is of a rather casual character. Disciples are led out into the bosom of nature by an experienced shaman who is willing to help them, and there in solitude they receive visions, a simple result of the fact that they are firmly convinced that they are there to witness something supernatural. Hallucinations in this nervous state are very common, and the teachers themselves do all they can to surround the disciple with a mysteriousness that increases his agitation.

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Once during a visit I had opportunity of seeing Ugtugpagluk shamanizing. While I was in her tent she suddenly had a violent attack of hysterics, apparently for no reason whatever; she spoke wildly, screamed, sang, and shouted aloud, tumbling to and fro on her platform, until finally she

went into a trance. In that state she put some fur from a hare's foot into her mouth and spit it straight out again, and then it had become caribou fat. Just before the seance we had eaten a very fat caribou tongue, and she had apparently kept some of this in her mouth and later on, by chewing it together with the white hare fur, made it look like a piece of tallow. As soon as the hare fur had been transformed into tallow she came to herself again, resumed her natural voice and explained that it had been a helping spirit that had possessed her and compelled her to make tallow of the hare fur. Her husband and all the audience were very much impressed by this trick.

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These events took place in the month of October, just when the first long and dark evenings had commenced; the darkness had undoubtedly affected their minds. They said then that evil spirits were prevalent in our village and, although we had no fewer than five shamans at the place, they were fully occupied every evening with their invocations. They were two men and three women. Every evening they rushed out into the darkness to fight against the spirits, and they always returned with torn clothing. Sometimes they were also bloody on arms and hands. No one imagined the possibility that they may have torn their garments themselves or taken blood with them and smeared themselves with it. No one ventured out after nightfall at that time....

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One very rarely sees men or women at their work without their humming a song. They have all their songs, both men and women. And sometimes it happens that children, half in play, half in earnest, make up songs and deliver them among playmates when playing song-festivals in a little snow hut that they have built themselves. Great pains are taken to put the words together nicely and skilfully so that there is melody in them, while at the same time they are pertinent in expression. A man who wants to compose a song may long walk to and fro in some solitary place, arranging his words while humming a melody which he also has to make up himself.

With Orpingalik, who of all Netsilingmiut was the most poetically gifted man, I often discussed the significance of song, not merely as a herald of festivity in the qagsge but also as a valve for their sorrows and cares. [To him his songs are] not only...just as necessary...as his breath, but they are his comrades in loneliness.

In the following I have attempted to reproduce Orpingalik's views on how a song is born in the human mind. His poetic narrative of course was not the product of a single question, but the result of a most intimate conversation which I have recorded summarily, but retaining his own expressions and illustrations.

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..."Songs are thoughts, sung out with the breath when people are moved by great forces and ordinary speech no longer suffices.

"Man is moved just like the ice floe sailing here and there out in the current. His thoughts are driven by a flowing force when he feels joy, when he feels fear, when he feels sorrow. Thoughts can wash over him like a flood, making his breath come in gasps and his heart throb. Something, like an abatement in the weather, will keep him thawed up. And then it will happen that we, who always think we are small, will feel still smaller. And we will fear to use words. But it will happen that the words we need will come of themselves. When the words we want to use shoot up of themselves--we get a new song."

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I have previously compared life at a fishing place with that in "the Land of the Blessed." Everybody does just what he pleases and almost invariably that which amuses him or her at the moment. Onerous duties are for the long cold winter. "In summer people must flourish in exactly the same manner as the soil they live on," explained Samik one day. The form of pastime that is most in vogue is games, and...it is impossible to obtain any really vivid impression of life in summer if some of the

favorite variations are not mentioned here....

Naturally enough, the people usually chose the games that provided both warmth and exercise, and hour after hour they would devote themselves to these simple and naive pleasures, oblivious to everything else.

A particular favorite was a cross between hide and catch. All the players stand in a circle, close together, with heads bent, while one conceals himself; when he is found he is pursued, and the first to touch his bare body must then hide, and the game begins all over again. Or they sit down in a long row while one walks along and kicks all the foot-soles of those seated; then he walks over their toes, next over their shins, and every time he has completed the round he butts them in the stomach. Finally he goes around behind them, tickles each one on the body with his foot and runs away, when all the others jump up and pursue him; when he is caught he must tear a tuft of hair from his coat and give it to the one who is now to take his place. Or they play "keeping silent," with firmly closed mouth. The one who laughs first is given a comical name which he must answer to for the rest of the day. Or they play bears and try to attack all the others who jump about, the one who is "on" having to crawl on all fours. There was also a ball game, in which as many as possible had to take part. They split up into twos and these partners try to throw the ball to each other. Every kind of trick is allowed; they fight with their opponents, trip them up, and push from behind, with shrieks of laughter all the time, and once this game is properly started, old and young participating, it might well last the whole day and never seem to weary. Next day they would start again. Man and wife were oftenest partners, and I was forced to admire their pretty treatment of each other. I have rarely been among people where the men praised their women so much, while the women never tired of lauding the splendid qualities of their husbands.

A curious game, a particular favorite among the children, was...[the spirit

game], in which they imitated and parodied shaman seances and the general fear of evil spirits with a capital sense of humor. They held complete and true shaman seances, fought with imaginary enemies just as the grown-ups do; in fact they even used the same formulas that they had heard their parents utter when really in fear and danger. Although this game was absolute blasphemy the grown-up audience writhed with laughter, just as if they took a certain satisfaction in seeing the evil and inexorable gravity of life made the subject of farcical burlesque. Some hours later it might happen that an attack of illness, or perhaps a bad dream, would rally the grown-ups to a seance during which they desperately sought to defend themselves against hidden enemies, with exactly the same means as the children had mocked in play. When I mentioned this remarkable circumstance to my friend Kuvdluitssoq, and enquired of him whether it was really prudent to mock the spirits, he answered with the greatest astonishment pictured in his face that the spirits really understood a joke.

THE CHANGING LIVES OF CANADA'S ESKIMOS

CULTURE CHANGE

All cultures are continually changing. Each generation inherits a way of life from its elders that includes social relationships, values, ideas and a technological system. Yet people in each generation also contribute and introduce new ideas and discoveries and interpretations of traditional culture. Each generation may face new problems and new circumstances. But when there are great and sudden changes in the physical or social environment, the people of a culture may find that the inherited ways are no longer effective or relevant. They must then rely increasingly upon their own resources for adapting and changing.

Although changes in climate and geography have often effected great changes in the lives of groups of people, perhaps the greatest external source of change has been contact between peoples. (The frontier movement in the United States, which radically changed the lives of the American Indians, is one well-known example.) Many situations of conflict occur between small, isolated groups and larger, dominating groups who may possess superior technological skills as well as physical force. Often the people with the simpler technology, the smaller population or the less "modern" approach find that their feelings about themselves and what is good or possible in the world no longer apply in the new and changing environment. They may have to adjust to new forms of economy and technology and also to new standards of values and morals. One aspect of such change is that the goals of a new way of life may be more easily transmitted than the means of obtaining them. People have their hopes raised, but not their chances.

The kind of change which comes into the lives of "contacted" people is not completely predictable. Technological innovation leads to

changes in other aspects of life such as patterns of social life or religious belief, but the direction of change will vary with the circumstances of introduction. The degree and content of change is a combination of the introductions from the other culture and the selective adoption of certain aspects by the contacted group. For example, a Western culture might attempt to introduce Western-style clothing to a group of Pacific islanders and find that the people like cotton cloth but use it for purposes other than clothing. The material is adopted, but the function -- Western-style clothing -- is not. It is also hard to predict what aspects of the traditional culture will be retained when there are new cultural possibilities. Languages are regularly one of the last things to change. They die hard and are still spoken when almost all the old ways are gone.

CANADIAN ESKIMOS

During the nineteenth century, the Canadian Eskimos had occasional contacts with European explorers and whalers. Sometimes they obtained steel traps and other goods, but for the most part, their technology was unchanged. They were also the beneficiaries of shipwrecks, from which they obtained wood and iron. The Eskimos recognized the advantages of iron over stone tools, and there are accounts of men walking several hundred miles for a few nails or for wood.

Toward the end of the century the fur trade brought major changes into the lives of the Eskimos. The trappers and traders brought metal pots and pans, cotton and woolen garments, tents and canvas, boats and guns. The new hunting techniques with the steel trap and the net and the rifle made it no longer necessary for the Eskimos to gather in larger sealing camps or to hunt caribou in groups. Many of them gathered in permanent trapping and hunting camps near the trading post where they could obtain guns, ammunition and cloth in exchange for furs.

These camps were an important step in changing the traditional way of life. There was increased individual autonomy and smaller and fewer cooperating groups. The proceeds from trading were never subject to elaborate sharing rules, but were kept within the immediate or extended family. In many camps, family organization and closely knit kin ties continued to be important, but traders and missionaries and police supervised the economic, religious and legal life.

In the last twenty years, contacts with the outside world have greatly increased and change has correspondingly intensified. Two developments have been important in this. The penetration of the Arctic for military purposes introduced opportunities for employment and illustrated for the Eskimos the power of industrial technology. The Canadian government began developing wide-ranging plans for improvement of the Eskimos' education, health, welfare and economic situation. The Department of Indian Affairs and Northern Development was established in the 1950's. It has greatly supplemented the few missionary schools, which first introduced syllabic reading and writing, and there are now schools in nearly all settled Eskimo communities. The family allowance, started in 1944, pays from \$6 to \$10 for each school child in the family, and support is provided for the old and the indigent.

The most significant development has been the gathering of more and more Eskimos into permanent settlements, the centers of which are schools, medical depots and trading stores sponsored by the government. The opportunities for employment, schools, and government aid have drawn the Eskimos. These communities are often composed of Indians, European Canadians and Eskimos from different areas and different bands, and are not held together by traditional social relationships and rules. The old basis for leadership and cooperation has disappeared. An especially skilled hunter has no authority among wage earners. Seal-sharing partnerships and caribou drives have been abandoned and leave no heritage easily translatable into village self-government.

Decision making has been taken over by white agencies. The European Canadians have chosen the sites for these communities, and often the area does not provide enough food to support the population. The depletion of the caribou herds and the location of the communities increase the Eskimo's reliance upon imported foods. Yet in many cases, the lack of local resources and industry makes it impossible for the Eskimos to gain an income for purchasing the desired and necessary goods. Thus many of the communities lack economic self-sufficiency as well as internal unity.

One attempt to alleviate this situation has been the establishment of cooperatives.* Eskimos are encouraged to learn new skills and set up small industries which utilize the fish and game and human resources that are available. One cooperative in arctic Quebec has a carving industry, a print shop, a fishing operation, a small sewing factory, a store, a bank and a tourist agency. Each operation has its own staff and managers, most of whom are Eskimos. The majority of the cooperatives, however, have only one or two operations under their control and have only a limited impact on the community as a whole. Although there are only some twenty cooperatives in all of arctic Canada, this has been one means by which the Eskimos are becoming economically, socially and psychologically independent again.

NETSILIK ESKIMOS

Of all the Canadian Eskimos the Netsilik have had perhaps the fewest personal contacts with European Canadians. Until recently most of the change they experienced was the result of the introduction of the rifle and net fishing. Immediately after the rifle was introduced in the early 1920's, caribou drives at crossing places, and consequently kayak making, were abandoned. The greater hunting

*One Eskimo cooperative is beautifully portrayed in the film "Eskimo Artist -- Kenojuak," listed in A Guide to the Course.

success brought by the rifle meant that more dogs could be fed, and by 1926 they averaged four per hunter, more than twice as many as three years before. This, plus the more efficient wooden sleds, meant much greater individual and group mobility. The Netsilik did occasional trapping to trade for rifles, wood and steel tools at the new posts at Repulse Bay and King William Island, but they did not do enough to enable them to trade for all their necessities.

A Roman Catholic mission was established at Pelly Bay in 1935. The missionary lived intimately with the people, speaking their language and eating their food, and he converted the group. The old beliefs were not, however, completely forgotten. Many of the people interpreted Christianity according to their inherited beliefs, and saw the missionary as an extremely powerful shaman with God as his helping spirit. Besides acting in his religious capacity, the missionary operated a trading store, taught school and treated the sick.

Two important patterns have emerged among the Netsilik, in common with other Canadian Eskimos: the importance of the immediate family as an economic unit, and the tendency for people to settle in one place for most of the year.

The migratory cycle of the extended families has now ended. The population clusters around the school and mission for most of the year. The only major exception is the October fishing trip to the Kellett River made by everyone. Many hunters take their families on spring sealing trips, and some families still fish in August at the one remaining stone weir. Otherwise almost all hunting trips are made only by men, usually traveling in pairs for safety. Increased mobility has made this possible. (In 1959 hunters owned an average of eight dogs apiece.)

Caribou are no longer found on Simpson Peninsula, and no caribou migrate anywhere in the entire Netsilik region. A few caribou are resident the year around far to the south of Pelly Bay, and are

hunted both in winter and summer. These hunts are demanding and only the young men attempt them, sometimes accompanied in summer by their wives and children. Very few caribou are killed now in spite of great effort, but they are still being hunted because neither seal-skin nor imported clothing is warm enough to substitute well for their fur, especially on winter hunting trips. Musk oxen are nearly extinct, but fortunately the fish and seal populations have continued without reduction.

Sealing techniques have changed drastically. In the fall, hunters make trips to the one area in the Gulf of Boothia that is kept ice-free by currents until December. At this time seals are shot from the edge of the sea ice as they surface in the open water, and are retrieved with rowboats. This method is so efficient that many people do not hunt at all in midwinter. In 1959 a good hunter killed nineteen seals in three days at the Gulf of Boothia. The old breathing hole technique yielded an average of twelve seals per hunter in an entire winter. In summer, seal can be killed from motor canoes or whaleboats. Meat is no longer always shared within the extended family.

A government health team flies in once a year. In 1960, following their visit to Pelly Bay, a flu epidemic killed more than ten people out of a total population of about one hundred. Shocked by this disaster, the Canadian government decided to establish a school at Pelly Bay whose teacher would also act as health and welfare administrator. A one-room school and residences for the teacher and an Eskimo caretaker were built in 1963.

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The school has acted like a magnet, causing the abandonment of all outlying camps and completing the concentration of the Pelly Bay Eskimos around the school and mission. It has also resulted in major changes in local leadership, as all government functions are

now carried out by the teacher. The present missionary serves as both priest and trader.

The mission school had been informal, meeting only twice a week. The government school meets regularly in its well-heated building and serves a hot meal. Supplementary teaching in summer makes up for absences during the October fishing trips.

The teachers face many problems. Many of them are not informed about Eskimo life or Eskimo values and beliefs. They do not know the language or the culture. Isolation and loneliness are intensified by these barriers. Often they fail to understand some of the values which the Netsilik consider important.

The teachers claimed that Eskimo parents spoiled the children by allowing them to do whatever they pleased. In a way, the teachers were right, but they distorted what they saw. Compared to the teachers' own standards, Eskimo parents do permit their children considerable emotional spontaneity. The teachers distorted Eskimo parents' behaviour by judging it too much from their own standards of parental discipline. The teachers had little regard for cultural relativity, and as a result they failed to see how consistently Eskimo life encourages children to grow up into independent and very resourceful adult human beings.*

The curriculum is the one used in the regular Alberta public schools, so that the Eskimo children, living in igloos or canvas tents, learn to read from primers describing life in a modern suburban family, and study how locomotives work. This problem of what to teach is also faced by the mission boarding schools, and now by the modern government boarding school at Inuvik. A girl who has learned to use an electric sewing machine will not be better than her sister

*J. J. Honingmann, "On Understanding Another People," in People of Light and Dark, ed. Maja van Steensel (Ottawa: Department of Indian Affairs and Northern Development, 1966), p. 73.

at sewing sealskin boots by hand, and is likely to be less happy while doing it. The schools cannot teach skills, such as hunting, that were useful in the old ways of life, and there are still only limited opportunities for using the modern skills that are taught.

Contact with the outside world has changed the Netsilik way of life.* It has introduced modern technology, different foods and clothing, opportunities for education and employment, and medical assistance. It has also drastically affected established social values and relationships and has created problems for both the Netsilik and those who seek to change the Eskimo way of life.

The Netsilik can no longer rely on the total fabric of their traditional culture. They have been forced to reexamine their inherited values in the light of other values, attitudes and desires. The difficulty of accepting and adjusting to a new culture is great.

Many of our ways of doing things have evolved in our culture through hundreds of years. They can't be fully adopted by other people until those people have sufficiently changed their system, their religion, their ideas, their social relationships, in order that the new forms may fit. Therefore, if people cannot adopt everything we try to teach them, we mustn't jump to the conclusion that they are ignorant or that they are of inferior intelligence. If you use your eyes

*A recent article in The New York Times (August 9, 1968), briefly describes a new cooperative at Pelly Bay. "The Pelly Bay Co-op is earning money from the construction of an airstrip; erection of pre-fabricated houses supplied by the government; the sale of soap-stone carvings and other handicraft products; fish, fur and seal-skins; providing municipal services, such as delivery of heating oil and garbage disposal; operation of a snack bar and a self-service laundry, and lodging, feeding and guiding well-heeled fishermen who come to the Arctic for the abundant char and 30-pound lake trout."

unbiasedly, you will see that every group of people is intelligent enough to solve their own traditional problems quite efficiently. They have to be, otherwise they wouldn't be here any longer for you to see them.*

In order to help the Netsilik make the transition into a different and difficult world it is necessary to try to understand the meaning of the migratory life for the Eskimo and to understand the reactions of the people to the present. The past and present are not separate but are fused in each individual of the society. What the people think of the changes and what they want for their own lives are important for any planning of change and development. No effective change can take place without the involvement of the Eskimos. They must have the chance to learn the skills, techniques and customs which will enable them to find and make new opportunities in today's world.

*Honingmann, "On Understanding Another People," p. 74.

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