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ABSTRACT

Written in 1965, the author describes the initial stages in the development of the elementary level curriculum, Man: A Course of Study. The structure and form of the course and three pedagogical techniques are discussed. The course is organized around the humanizing forces of tool-making, language, social organization, the management of man's prolonged childhood, and man's urge to explain. Plans for the section on language include a consideration about what communication is, the design features of a language, arbitrariness, acquisition, and the role of language in shaping human characteristics. The tool-making section is designed from a philosophical approach; the object is to explore how tools affected man's evolution. The unit on social organization focuses on the nature of structure in a society, roles filled by people, and the world view of a society. The childrearing unit centers around three themes: the extent to which and the manner in which the long human childhood leads to dominance of sentiment in human life, the human tendency toward mastery of skill for its own sake, and the shaping of man by the patterning of childhood. The fifth unit concerns itself with man's drive to explicate and represent his world through symbolic systems. The three pedagogical techniques emphasized to achieve the goals of these units are contrasting, using games, and stimulating self-consciousness about assumptions. The author states his plan to create far more units than could possibly fit into a school year in order to provide the teacher with flexibility in planning. (KC)

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Occasional Paper No. 3

Man: A Course of Study

by Jerome S. Bruner

The Social Studies Curriculum Program

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Introduction

"Man: A Course of Study" by Dr. Jerome S. Bruner is the third in the series of Occasional Papers from the Social Studies Program at Educational Services Incorporated. Like the earlier papers, it was initially written for use within the Program. Dr. Bruner has charge of the Elementary Project of the Social Studies Program; his paper served to clarify the direction of work for this Project. We hope that the article will also be useful to persons not directly connected with the Social Studies Program, in explaining the aims and methods of our current efforts in the elementary grades.

Dr. Bruner, Director of the Center for Cognitive Studies and Professor of Psychology, Harvard University, is currently on leave from Harvard to be one of the co-directors of the Social Studies Program at ESI, together with Professors Elting E. Morison of MIT and Franklin K. Patterson of Tufts. "Man: A Course of Study" has also been incorporated into the ESI Quarterly Report, Summer-Fall 1965.

PETER WOLFF
Editorial Director

Man: A Course of Study

by Jerome S. Bruner

TH**ERE** is a dilemma in describing a course of study. One must begin by setting forth the intellectual substance of what is to be taught, else there can be no sense of what challenges and shapes the curiosity of the student. Yet the moment one succumbs to the temptation to "get across" the subject, at that moment the ingredient of pedagogy is in jeopardy. For it is only in a trivial sense that one gives a course to "get something across," merely to impart information. There are better means to that end than teaching. Unless the learner also masters himself, disciplines his taste, deepens his view of the world, the "something" that is got across is hardly worth the effort of transmission.

The more "elementary" a course and the younger its students, the more serious must be its pedagogical aim of forming the intellectual powers of those whom it serves. It is as important to justify a good mathematics course by the intellectual discipline it provides or the honesty it promotes as by the mathematics it transmits. Indeed, neither can be accomplished without the other.

We begin this article with an account of the substance or structure of a course in "social studies" now in the process of construction. A discussion of pedagogy follows. The aim of the exercise is to write a transitional first draft of the course, a common focus for those of us who have been trying to compose the course, trying to teach parts of it to children in the fifth grade. If the exercise is finally successful, we shall end with a completed course—with the materials, guides, films, and the other things that must be in the student's hands and on the teacher's shelf. There will be drafts in between. The exercise, we hope, will allow us to be clearer about what we are doing. In

the final section we shall consider how we propose to get from a first draft such as this to a course that is ready for teaching.

Structure of the Course

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 discernible continuity between him and his animal forbears. For man represents that crucial point in evolution where adaptation is achieved by the vehicle of culture and only in a minor way by further changes in his morphology. Yet there are chemical tides that run in his blood that are as ancient as the reptiles. We make every effort at the outset to *tell* the children where we hope to travel with them. Yet little of such recounting gets through. It is much more useful, we have found, to pose the three questions directly to the children so that their own views can be brought into the open and so that they can establish some points of view of their own.

In pursuit of our questions we shall explore five matters, each closely associated with the evolution of man as a species, each defining at once the distinctiveness of man and his potentiality for further evolution. The five great humanizing forces are, of course, tool-making, language, social organization, the management of man's prolonged childhood, and man's urge to explain. It has been our first lesson in teaching that no pupil, however eager, can appreciate the relevance of, say, tool-making in human evolution without first grasping the fundamental concept of a tool or what a language is or a myth or social organization. These are not obvious matters. So we are involved in teaching not only the role of tools or language in the emergence of man, but as a necessary precondition for doing so, setting forth the fundamentals of linguistics or the theory of tools. And it is as often the case as not that (as in the case of the "theory of tools") we must solve a formidable intellec-

tual problem ourselves in order to be able to help our pupils do the same.

While one readily singles out these five massive contributors to man's humanization, under no circumstances can they be put into airtight compartments. Human kinship is distinctively different from primate mating patterns precisely because it is classificatory and rests on man's ability to use language. Or, if you will, tool-use enhances the division of labor in a society which in turn affects kinship. And language itself is more clearly appreciated by reference to its acquisition in the uniquely human interaction between child and parent. Obviously, the nature of man's world view, whether formulated in myth or in science, depends upon and is constrained by the nature of human language. So while each domain can be treated as a separate set of ideas, as we shall see, success in teaching depends upon making it possible for children to have a sense of their interaction.

Teaching the essentials of linguistics to children in the elementary grades has limits, but they are wider than we had expected. There are certain pedagogic precautions to be respected if ten-year-olds are to be captivated by the subject. It must not, to begin with, be presented as a normative subject—as an exercise in how things *should* be written or said. It must, moreover, be disassociated from such traditional “grammar” as the child has encountered. There is nothing so deadening as to have a child handle the “type-and order” problem by “recognizing” one category of words as “nouns” and parroting, upon being asked what he means by a noun, that it is a “person, place, or thing.” It is not that he is either “right” or “wrong,” but rather that he is as remote from the issue as he would be if he attempted to account for grief over the assassination of a President by citing the Constitution on the division of powers. And finally, the discussion needs to remain close to the nature of language in use, its likely origin, and the functions to which it is put.

Whether it is true or not that a ten-year-old has a complete grammatical repertory, he is certainly capable of, and delighted in, recognizing all linguistic features

Language

when confronted with instances of them. The chief aid to such recognition is contrast—the opportunity to observe the oppositional features that are so much a feature of human language. What comes hard is to formulate these features conceptually; to go beyond the intuitive grasp of the native speaker to the more self-conscious understanding of the linguist. It is this task—getting children to look at and to ponder the things they can notice in their language long enough to understand them—that is most difficult and it should not be pushed to the point of tedium.

Our section on language includes a consideration of what communication is—by contrasting how humans and animals manage to send and receive messages. The early sessions have proved lively and in the course of them nearly every major issue of linguistics is raised and allowed to go begging. This preliminary exercise has the great virtue that it can be repeated on later occasions, when students have achieved varying levels of sophistication, with the result that they readily recognize how much progress they have made.

The opening session (or sessions, for students often want to continue the arguments over animals and humans) usually indicates which among several openings can be best pursued in later units. The instance which follows is influenced by far too little experience to be considered the general rule, but it is at least one example.

The discussion led naturally to the design features of a language. We designed a language game based on bee language, requiring the children to find hidden objects by using messages in this bee-like language. The children are encouraged to design similar languages and to improve on the design of the language used. They take to this readily and are eager to discuss and make clearer such design features as semanticity, voice-ear link, displacement, and cultural transmission. The game, of course, is a lead into the demonstration of bee language as presented in the von Frisch film (which is not altogether satisfactory). We were struck, however, at how much more interested the children were in talking about their own language than in discussing bee language or von Frisch's analysis of it. It is as

if the bee linguistics were interesting as an introduction into the closer analysis of their own language.

Our next objective is to present the powerful ideas of arbitrariness, of productivity, and of duality of patterning, the latter the exclusive property of human language. We have approached arbitrariness by the conventional route of comparing how pictures, diagrams, charades, and words refer to things. There are nice jokes to be used, as in the example given by Hockett of the tiny word *whale* referring to a big thing, while the large word *microorganism* refers to a tiny one. With respect to productivity, we have had considerable initial success with two exercises. The first is with a language containing four types (how, what, when, where) with a limited number of tokens of each type (e.g., by hand, by weapon, by trap, as tokens of the "how" type) and with a highly constrained set of orders each referring to a different kind of food-related activity. By this means we readily establish the idea of *type* and *order* as two basic ideas. They readily grasp the idea of substitutivity of tokens within a type. (Indeed, given the interest in secret codes based on substitution of words or letters for code breaking, they need little instruction on this score.)

Once the ideas of type and order are established, we begin the following amusing exercises to illustrate the interchangeability of language frames. We present:

1	2	3	4	5
The	man	ate	his	lunch
A	lady	wore	my	hat
This	doctor	broke	a	bottle
My	son	drove	our	car

and the children are now asked to provide "matching" examples. They can do so readily. They soon discover that so long as they pick words in the order 1 2 3 4 5, from any place in each column, something "sensible" can be got—even if it is silly or not true like, "My doctor wore a car," or, "A lady ate a bottle," it is at least not "crazy" like, "Man the lunch his ate."

The students need no urging to construct new frames and to insert additional types into frames already set up (like a new first column the tokens of which include,

did, can, has, etc.). Interesting discoveries are made—such as the relative openness of some positions and the closed nature of others. We hope to devise methods to help the children discover some of the deeper features of grammar, better to grasp what a language is—for example, that one can start with relatively simple sentence frames, “kernel sentences,” and transform them progressively into negatives, queries, and passives or any two or even three of these, and that more complex forms can be returned to simpler forms by applying the transformations in reverse.

Finally, a game has been devised (a game involving signalling at sea) to illustrate duality of patterning, that most difficult feature of human language. It involves developing a language initially with a very limited set of building blocks (as with human languages, each of which combines intrinsically meaningless sound elements, phones, into a unique system that renders them into meaningful phonemes, a change in one of which will alter the meaning of a word so that, in English, *rob* and *lob* are different words, but not so in Japanese where /r/ and /l/ are allophones of the same phoneme just as plosive /p/ (*pin*) and non-plosive /p/ (*spin*) are “the same” for us but not for others). Three kinds of word blocks can be arranged in a frame, making twenty-seven possible “words” or lexemes. But there must be rules as to which combinations mean things and which do not. It is very quickly apparent to the children that the blocks as such “mean” nothing, but the frames do—or some do and some do not. We are in progress of going from this point toward other aspects of duality at this time.

It is a natural transition to go from syntax to the question of how language is acquired by young humans and other primates. We shall use the considerable resources provided by recent studies of language acquisition to show the manner in which syntax emerges from certain very elementary forms such as the pivot-plus-open-class and the head-plus-attribute. The idea of “writing a grammar” for any form of speech encountered will also be presented. In addition, the child-adult “expansion-idealization” cycle will be explored as an example of a powerful form of social grouping that

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is crucial for transmitting the language. For contrast, we hope to examine the problems of language development of Vicki, a chimpanzee raised by a family along with their own child of like age. The subtle problem of "traditional" and "hereditary" transmission is bound to emerge.

Finally, and with the benefit of their newly-gained insight into the nature of language, we shall return to the question of the origins of human language and its role in shaping human characteristics. We hope first to cover the newly available materials on the universal characteristics of all human languages—first getting the children to make some informed guesses on the subject. Then we shall consider the role of language in the organization of the early human group and the effectiveness it might add to such group activities as hunting, given its design features and its universals. To go from this point to a consideration of myth and its nature is not a difficult step.

We have examined these matters in some detail here (though not closely enough). Our hope is to give the reader a concrete sense of how far we wish to go. It is plain that the section on language can take as much of a year as one wishes. We are overproducing materials to give us better some idea of what is possible and how to combine what is possible. Some schools may want to devote much time to language, and we hope to make it possible for them to do so. But above all, we hope to provide enough variety so that a teacher can choose an emphasis of his own, whether it be to increase self-consciousness about language or to impart a livelier sense of some distinctively human aspect of human language. In the first stages of our work, the tendency is to concentrate more on "getting the subject right"—in this case linguistics—than on getting the whole course constructed. And just as there is a tension between the requirement of the subject itself and those imposed by the need to teach it to children, so is there a necessary tension between the parts of our course (the five topics) and the whole (the nature and evolution of man). We shall return to this matter in discussing the summer workshop in a later section.

The section on language has required the collaboration of a variety of linguists of different stripe—pure, anthropological, psychological—and of teachers, psychologists, film-makers, artists, and children. At that, it is hardly a quarter done. Gloria Cooper of Harvard has directed the unit, with the aid of David McNeill of Harvard, Mary Henle of the New School, John Mickey of Colorado State, Betsy Dunkman of the Newton Schools, and Florence Jackson of the New York City Schools.

Tool Making

One starts with several truths about children and "tools." They have usually not used many of them; and in general, tools will not be of much interest. This may derive from the deeper truth that, in general, children (like their urban parents) think of tools as set pieces that are to be bought in hardware stores. And finally, children in our technologically mature society usually have little notion of the relation between tools and our way of life. Production takes place in factories where they have never been, its products are packaged to disguise the production process that brought them into being.

The tool unit is still under discussion. What follows are some of the leading ideas that animate the design of the unit.

We begin with a philosophical approach to the nature of tool-using. What is most characteristic of any kind of tool-using is not the tools themselves, but rather the program that guides their use. It is in this broader sense that tools take on their proper meaning as amplifiers of human capacities and implementers of human activity.

Seen as amplifiers, tools can fall into three general classes—amplifiers of sensory capacities, of motor capacities, and of ratiocinative capacities. Within each type there are many subspecies. There are sensory amplifiers like microscopes and ear horns that are "magnifiers," others, like spirit levels and bobs, that are "reference markers," etc. Some implement systems "stretch out" time (slow motion cinematography) and others condense it (time-lapse registration). In the realm of motor amplifiers, some tools provide a basis for binding, some for penetrating, some even for

steadying—as when one of our pupils described a draughtsman's compass as a “steadying tool.” And, of course, there are the “soft tools” of ratiocination such as mathematics and logic and the “hard tools” they make possible, ranging from the abacus to the high speed digital computer and the automaton.

Once we think of tools as imbedded in a program of use—as implementers of human activity—then it becomes possible to deal with the basic idea of substitutability, an idea as crucial to language as it is to tools. If one cannot find a certain word or phrase, a near-equivalent can be substituted in its place. So too with tools: if a skilled carpenter happens not to have brought his chisel to the job, he can usually substitute something else in its place—the edge of a plane blade, a pocket knife, etc. In short, tools are not fixed, and the “functional fixedness” found by so many psychologists studying problem-solving comes finally because so much thinking about tools fixes them to convention—a hammer is for nails and nothing but nails.

Our ultimate object in teaching about tools is, as noted before, not so much to explicate tools and their significance, but to explore how tools affected man's evolution. The evidence points very strongly to the central part in evolution played by natural selection favoring the user of spontaneous pebble tools over those proto-hominids who depended upon their formidable jaws and dentition. In time, survival depended increasingly on the capacities of the tool-user and tool-maker—not only his opposable forefinger and thumb, but the nervous system to go with them. Within a few hundred thousand years after the first primitive tool-using appears, man's brain size more than doubles. Evolution (or more simply, survival) favored the larger brained creatures capable of adapting by the use of tools, and brain size seems to have been roughly correlated with that capacity. There are many fascinating concomitants to this story. Better weapons meant a shift to carnivorousness. This in turn led to leisure—or at least less food-gathering—which in turn makes possible permanent or semi-permanent settlement. Throughout, the changes produced lead to changes in way of life, changes in culture and social organization, changes in what it is possible to do.

All of these matters are now superbly documented in Leaky's excavations in Olduvai Gorge in East Africa. We have consulted with him and he has expressed eagerness to edit four films for us on tool-making and its subsequent effects on the emergence of a new way of life. These are scheduled for the fall of 1965. If we are successful in getting our pupils to speculate about the changes in a society that accompany changes in technology, we will at least have fulfilled one of the original aims of the Social Studies Program: to get across the idea that a technology requires a counterpart in social organization before it can be used effectively by a society.

There happen also to be new materials available on the burgeoning technology of the Magdalenian period when more decorative features appear and tool-makers begin to specialize. We are exploring this work to see whether it too can be used in the same spirit.

A few of the exercises being planned to the "tool section" give some flavor of the pedagogy. One unit calls for the taking of a "census of skills"—the tasks that children know how to perform, along with some effort to examine how they were learned (including tool skills). Another unit consists of trying to design an "all-purpose" tool so that the children can have some notion of the programmatic questions one asks in designing a tool and why specialized use has a role.

There will also be an opportunity (of which more in a later section) for the children to compare "tool play" of an Eskimo boy and Danai boy of New Guinea with the play of immature free-ranging baboons, macaques, and chimpanzees. We are also in process of obtaining films on the technique of manufacture of flint implements and hope also to obtain inexpensive enough materials to have our pupils try their hand at flint knapping and other modes of instrument making, guided possibly by films on the subject by the distinguished French archeologist, Dr. Bordes.

There will be some treatment of tools to make tools as well as of tools that control various forms of natural power. A possible route into this discussion is an overview of the evolution of tool-making generally—from the first "spontaneous" or picked-up tools, to the shaped ones, to those shaped to a pattern,

to modern conceptions of man-machine relations as in contemporary systems research. Indeed, if we do follow this approach we shall also explore the design of a game of tool design involving variables such as cost, time, gain, specificity of function, and skill required, with the object of making clear the programmatic nature of tools and the manner in which tools represent a selective extension of human powers.

The section on social organization is still in preliminary planning, save in one respect where work is quite well advanced. The unit has as its objective to make children aware that there is a structure in a society and that this structure is not fixed once for all. It is an integrated pattern and you cannot change one part of the pattern without other parts of the society changing with it. The way a society arranges itself for carrying out its affairs depends upon a variety of factors ranging from its ecology at one end to the irreversible course of its history and world-view at the other.

A first task is to lead children to recognize explicitly certain basic patterns in the society around them, patterns they know well in an implicit, intuitive way—the distinction between kin and others, between face-to-face groups and secondary groups, between reference groups and ones that have corporate being. These, we believe, are distinctions that children easily discover. We should also like the children to grasp the rather abstract fact that within most human groups beyond the immediate family, continuity depends not so much upon specific people, but upon "roles" filled by people—again, as with language and tool-use, there are structures with substitutability.

Such social organization is marked by reciprocity and exchange—cooperation is compensated by protection, service by fee, and so on. There is always giving and getting. There are, moreover, forms of legitimacy and sanction that define the limits of possible behavior in any given role. They are the bounds set by a society and do not depend upon the individual's choice. Law is the classic case, but not the only one. One cannot commit theft legally, but then too one cannot ignore

Social Organization

friends with impunity and law has nothing to do with it.

A society, moreover, has a certain world view, a way of defining what is "real," what is "good," what is "possible." To this matter we turn in a later section, mentioning it here only to complete our catalogue of aspirations of ideas we hope to introduce in this part of the course.

We believe that these matters can be presented to children in a fashion that is gripping, close to life, and intellectually honest. The pedagogy is scarcely clear, but we are on the track of some interesting ways of operating. One difficulty with social organization is its ubiquity. Contrast may be our best way of saving social organization from obviousness—by comparing our own forms of social organization with those of baboon troops, of Eskimo, of Bushmen, of prehistoric man as inferred from excavated living floors in Europe and East Africa. But beyond this we are now developing a "family" of games designed to bring social organization into the personal consciousness of the children.

The first of these games, "Hunting," is designed to simulate conditions in an early human group engaged in hunting and is patterned on the life and ecology of the Bushmen of the Kalahari desert. The elements of the game are Hunters, Prey, Weapons, Habitats, Messages, Predators, and Food. Without going into detail, the game simulates (in the manner of so-called Pentagon games used for increasing the sensitivities of generals) the problem of planning how far one wishes to go in search of various kinds of game, how resources need to be shared by a group to go beyond "varmint" hunting to larger game, how differentiation of labor can come about in weapon-making and weapon-using, how one must decide among different odds in hunting in one terrain or another. Given the form of the game (for which we are principally grateful to Dr. Clark Abt), its content can be readily varied to fit the conditions of life of other hunting groups, such as the Eskimo, again with the object of contrast.

What has proved particularly interesting in our early work with the game is that it permits the grouping of a considerable amount of "real" material around it—accounts of the life of the Kalahari Bushmen (of which

there is an extraordinarily rich record on film and in both literary and monographic form), their myths and art, the "forbiddingly" desert ecology that is their environment. And so too with the Eskimo; should we go ahead to construct an analogue game for them, we are in possession of an equally rich documentation on the Netsilik Eskimo of Pelly Bay. Indeed, one of the documentary films made by the ESI Studio in collaboration with the Canadian Film Board and Dr. Asen Balikci of the University of Montreal (one of seven half-hour films to be "cut" from our 100,000 feet of film) has already received international acclaim.

Finally, and again by contrast, there now exists a vast store of material on the social organization of higher primates—a considerable portion of which is also in film shot by a crew under Dr. Irvén DeVore of Harvard for ESI—that serves extremely well to provoke discussion on what is uniquely human about human social organization.

The group now at work on Social Organization consists of Edwin Dethlefsen of Harvard, Richard McCann, on leave from the Newton Schools, and Mrs. Linda Braun of the ESI staff.

This unit has just begun to take shape at the time of writing: It is proceeding on three general themes in the hope of clarifying them by reference to particular materials in the areas of language, of social organization, of tool-making, and of childhood generally. The first general theme is the extent to which and the manner in which the long human childhood (assisted as it is by language) leads to the dominance of sentiment in human life, in contrast to instinctual patterns of gratification and response found to predominate at levels below man. That is to say, affect can now be aroused and controlled by symbols—human beings have an attitude about anger rather than just anger or not anger. The long process of sentiment formation requires both an extended childhood and access to a symbolized culture through language. Without sentiment (or values or the "second signal system" or whatever term one prefers) it is highly unlikely that human society or anything like it would be possible.

Child Rearing

A second theme is organized around the human (perhaps primate) tendency toward mastery of skill for its own sake—the tendency of the human being, in his learning of the environment, to go beyond immediate adaptive necessity toward innovation. Recent work on human development has underlined this “push toward effectance,” as it has been called. It is present in human play, in the increased variability of human behavior when things get under control. Just as William James commented three-quarters of a century ago that habit was the fly-wheel of society, we can now say that the innovative urge is the accelerator.

The third theme concerns the shaping of the man by the patterning of childhood—that while all humans are intrinsically human, the expression of their humanity is affected by what manner of childhood they have experienced.

The working out of these themes has only begun. One exercise now being tried out is to get children to describe differences between infancy, childhood, and adulthood for different species—using live specimens brought to class (in the case of non-human species) or siblings for humans. For later distribution, of course, the live specimens (and siblings) will be rendered on film. Yet the success of a session, say, with a ten-day-old, stud-tailed macaque suggests that the real thing should be used whenever possible.

Dr. Balikci will be cutting a film on Eskimo childhood from the Netsilik footage, and comparable films on baboon and Japanese macaque childhood will also be in preparation. Beyond this there is still little to report. Dr. Richard Jones of Brandeis is in charge of the unit, assisted by Miss Catherine Motz, on leave from Germantown Friends School, and Mrs. Kathy Sylva and Mrs. Phyllis Stein of ESI.

World View

The fifth unit in preparation concerns itself with man's drive to explicate and represent his world. While it concerns itself with myth, with art, with primitive legend, it is only incidentally designed to provide the stories, the images, the religious impulses, and the mythic romance of man's being. It would be more accurate to describe the unit as “beginning philosophy”

in both senses of that expression—philosophy at the beginning and, perhaps, philosophy for young beginners.

Central to the unit is the idea that men everywhere are humans, however advanced or “primitive” their civilization. The difference is not one of more or less than human, but of how particular human societies express their human capacities. A remark by the French anthropologist, Lévi-Strauss, puts it well.

Prevalent attempts to explain alleged differences between the so-called primitive mind and scientific thought have resorted to qualitative differences between the working processes of the mind in both cases, while assuming that the entities which they were studying remained very much the same. If our interpretation is correct, we are led toward a completely different view—namely, that the kind of logic in mythical thought is as rigorous as that of modern science, and that the difference lies, not in the quality of the intellectual process, but in the nature of things to which it is applied. This is well in agreement with the situation known to prevail in the field of technology: What makes a steel ax superior to a stone ax is not that the first one is better made than the second. They are equally well made, but steel is quite different from stone. In the same way we may be able to show that the same logical processes operate in myth as in science, and that man has always been thinking equally well; the improvement lies, not in the alleged progress of man's mind, but in the discovery of new areas to which it may apply its unchanged and unchanging powers.

All cultures are created equal. One society—say, that of Eskimos—may have only a few tools, but they are used in a versatile way. The woman's knife does what our scissors do, but it also serves to scrape hides, and to clean and thin them. The man's knife is used for killing and skinning animals, carving wood and bone, cutting snow for building blocks for the igloo, chopping meat into bites. Such simple weapons are “the mother of tools,” and by specialization a number of tools derive from them. What is “lost” in variety of tools is won

in the versatility of uses; in brief, an Eskimo man and wife have tools for all their tasks and can carry most of these tools about with them at all times.

So too with symbolic systems. The very essence of being human is in the use of symbols. We do not know what the hierarchy of primacy is between speech, song, dance, and drawing; but, whichever came first, as soon as it stood for something else other than the act itself, man was born; as soon as it caught on with another man, culture was born, and as soon as there were two symbols, a system was born. A dance, a song, a painting, and a narrative can all symbolize the same thing. They do so differently. One way of searching for the structure of a world view is to take an important narrative and to see what it ultimately tells. A narrative, or at least a corpus of narratives, may be what philosophy used to be. It may reflect what is believed about the celestial bodies and their relation to man, it may tell how man came into being, how social life was founded, what is believed about death and about life after death, it may codify law and morals. In short, it may give expression to the group's basic tenets on astronomy, theology, sociology, law, education, even esthetics.

In studying symbolic systems, we want the students to understand myths rather than to learn them. We will give them examples from simple cultures for the same reason for which the anthropologist travels into an isolated society. Our hope is to lead the children to understand how man goes about explaining his world, making sense of it and that one kind of explanation is no more human than another.

We have selected for our starting point some hunting societies. An Eskimo society, a Bushman society, an Australian aboriginal society will certainly suffice to show what the life experience of hunting peoples is. From the scrutiny of the myths of these groups, it is immediately clear that you can tell a society by the narratives it keeps. The ecology, the economy, the social structure, the tasks of men and women, and the fears and anxieties are reflected in the stories, and in a way in which the children can handle them. One good example of Eskimo narrative or Eskimo poetry, if skillfully handled in class, can show the child that the prob-

lems of an Eskimo are like our problems: to cope with his environment, to cope with his fellow men, and to cope with himself. We hope to show that wherever man lives, he manages not only to survive and to breed, but also to think and to express his thoughts. But we can also let the children enjoy the particulars of a given culture—the sense of an alien ecology, the bush, or ice and snow, and a participant understanding for alien styles.

We introduce an origin myth, things taking their present order, the sun shining over the paths of the Bushmen, and the Bushmen starting to hunt. But we should equip the children with some possible theories to make the discussion profitable, theories not in words, but in ways of reading and understanding a myth. If the narrative is to be called a myth, it should portray conditions radically different from the way things are now. It is possible to devise ways for children to analyze a plot. If done with one story variant only, such an analysis may yield something akin to a phrase-structure grammar; if done with a group of myths, something comparable to a transformational grammar may result. It is intriguing to see how stories change. Children know such things intuitively and can be helped to appreciate them more powerfully.

One last thing: why should such things be taught so early? Why not postpone them until the student can handle the "theory" itself, not only the examples? There is a reason: if such things are new to a twenty-year-old, there is not only a new view to learn, but an old established view to unlearn. We want the children to recognize that man is constantly seeking to bring reason into his world, that he does so with a variety of symbolic tools, and that he does so with a striking and fully rational humanity. The unit on world view is under the direction of Dr. Elli Maranda, aided by Mr. Pierre Maranda of Harvard and assisted by Miss Bonnie McLane.

The most persistent problem in social studies is to rescue the phenomena of social life from familiarity without, at the same time, making it all seem "primitive" and bizarre. Three techniques are particularly useful to us in achieving this end. The first is contrast,

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of which much has already been said. The second is through the use of "games" that incorporate the formal properties of the phenomena for which the game is an analogue. In this sense, a game is like a mathematical model—an artificialized but often powerful representation of reality. Finally, we use the ancient approach of stimulating self-consciousness about assumptions—going beyond mere admonition to think. We believe there is a learnable strategy for discovering one's unspoken assumptions.

Before considering each of these, a word is in order about a point of view quite different from ours. It holds that one should begin teaching social studies by presenting the familiar world of home, the street, and the neighborhood. It is a thoroughly commendable ideal; its only fault is its failure to recognize how difficult it is for human beings to see generality in what has become familiar. The "friendly postman" is indeed the vicar of federal powers, but to lead the child to the recognition of such powers requires many detours into the realm of what constitutes power, federal or otherwise, and how, for example, constituted power and willfully exercised force differ. We would rather find a way of stirring the curiosity of our children with particulars whose intrinsic drama and human significance are plain—whether close at hand or at a far remove. If we can evoke a feeling for bringing order into what has been studied, the task is well started.

A word first about contrast. We hope to use four principal sources of contrast: man *versus* higher primates, man *versus* prehistoric man, contemporary technological man *versus* "primitive" man, and man *versus* child. We have been gathering materials relevant to each of the contrasts—films, stories, artifacts, readings, pictures, and above all, ideas for pointing up contrasts in the interest of achieving clarity.

Indeed, we often hope to achieve for our pupils a sense of continuity by presenting them first with what seems like contrast and letting them live with it long enough to sense that what before seemed different is, in fact, closely akin to things they understand from their own lives. So it is particularly with our most extensive collection of material, a film record

taken through the full cycle of the year of a family of Netsilik Eskimo. The ecology and the externals are full of contrast to daily life in an American or European setting. But there is enough material available to go into depth, to work into the year's cycle of a single family so that our pupils can get a sense of the integrity not only of a family, but of a culture. It is characteristic of Netsilik Eskimo, for example, that they make a few beautifully specialized tools and weapons, such as their fishing lester or spear. But it is also apparent that each man can make do with the stones he finds around him, that the Eskimo is a superbly gifted *bricoleur*. Whenever he needs to do something, improvised tools come from nowhere. A flat stone, a little fish oil, a touch of arctic cotton and he has a lamp. So while the Eskimo film puts modern technological man in sharp contrast, it also serves perhaps even better, to present the inherent, internal logic of any society. Each society has its own approach to technology, to the use of intelligence.

Games go a long way toward getting children involved in understanding language and social organization; they also introduce, as we have already noted, the idea of a theory of these phenomena. We do not know to what extent these games will be successful, but we shall give them a careful tryout. The alleged success of these rather sophisticated games in business management and military affairs is worth extrapolating!

As for stimulating self-consciousness about thinking, we feel that the best approach is through stimulating the art of getting and using information—what is involved in going beyond the information given and what makes it possible to take such leaps. Crutchfield has produced results in this sphere by using nothing more complicated than a series of comic books in which the adventures of a detective, aided by his nephew and niece, are recounted. The theme is using clues cleverly. As children explore the implications of clues encountered, their general reasoning ability increases, and they formulate more and better hypotheses. We plan to design materials in which children have an opportunity to do this sort of thinking with questions related to the course—possibly in con-

nection with prehistoric materials where it will be most relevant. If it turns out to be the case that the clothing that people wore was made from the skins of the ibex, what can they "postdict" about the size of a hunting party and how would they look for data? Professor Leaky informs us that he has some useful material on this subject.

Children should be at least as self-conscious about their strategies of thought as they are about their attempts to commit things to memory. So too the "tools" of thought—what is explanation and "cause." One of those tools is language—perhaps the principal one. We shall try to encourage children to have a look at language in this light.

The most urgent need of all is to give our pupils the experience of what it is to use a theoretical model, with some sense of what is involved in being aware that one is trying out a theory. We shall be using a fair number of rather sophisticated theoretical notions, in intuitively rather than formally stated form, to be sure, but we should like to give children the experience of using alternative models. This is perhaps easiest to do in the study of language, but it can also be done elsewhere.

We shall, of course, try to encourage students to discover on their own. Children surely need to discover generalizations on their own. Yet we want to give them enough opportunity to do so to develop a decent competence at it and a proper confidence in their ability to operate on their own. There is also some need for the children to pause and review in order to recognize the connections within the structure they have learned—the kind of internal discovery that is probably of highest value. The cultivation of such a sense of connectedness is surely the hub of our curriculum effort.

If we are successful, we would hope to achieve five ideals:

1. To give our pupils respect for and confidence in the powers of their own mind.
2. To give them respect, moreover, for the powers of thought concerning the human condition, man's plight and his social life.

3. To provide them with a set of workable models that make it simpler to analyze the nature of the social world in which they live and the condition in which man finds himself.

4. To impart a sense of respect for the capacities and plight of man as a species, for his origins, for his potential, for his humanity.

5. To leave the student with a sense of the unfinished business of man's evolution.

It is one thing to describe the nature of a course in terms of its underlying discipline and its pedagogical aims, and quite another to render these hopes into a workable form for real teachers in real classes. Teachers are sufficiently constrained by their work loads so that it would be vain to hope they might read generally and widely enough in the field to be able to give form to the course in their own terms. The materials to be covered in this particular course, moreover, are so vast in scope as to be forbidding. The materials, in short, have got to be made usable and attractive not only to the highly gifted teacher, but to teachers in general, and to teachers who live with the ordinary fatigue of coping with younger pupils day by day. They cannot be overburdened with reading, nor can the reading be of such an order as to leave them with a feeling of impotence. At the same time, the material presented should be loosely enough woven to permit the teacher to satisfy his interests in forming a final product to be presented to children.

The Form of the Course

That much said, we can state what we mean by a *unit*, the elements of which the course is made. A unit is a body of materials and exercises that may occupy as much as several days of class time or as little as half a class period. In short, it can be played to the full and consume a considerable amount of the course content, or be taken *en passant*. Indeed, some units will surely be skipped and are intended only for those teachers who have a particular interest in a topic or a particular kind of exercise. There will be more units than can possibly be fitted into a year's course and teachers will be encouraged to put them together in a form that is commodious to their own intent.

In a manner of speaking, a collection of such units constitutes a course of study. But the image is unfortunate, connoting as it does so many beads strung together by some principle of succession. It is our hope that after a certain number of units have been got through, a unit can then be introduced to "recode" what has gone before, to exploit connection. Some units only review and present no new material.

A unit also sits on the teacher's ready shelf, and consists of six constituent elements.

1. *Talks to teachers.* These consist of lively accounts of the nature of the unit—particularly the nature of its mystery, what about it impels curiosity and wonder. Our experience in preparing these indicates the importance of staying close to the great men in the field, if possible to find a great article that can be presented in somewhat abridged form. The design of a language (taken from Hockett) or the nature of kinship (taken from Radcliffe-Brown) or how a thing should be called (Roger Brown)—these are examples. The genre needs further study and we are exploring the kind of writing required—something that is at once science and poetry. If it should turn out that a student finds "talks to teachers" worth reading, so much the better.

2. *Queries and contrasts.* In trying out materials to be taught, we have learned certain ways of getting ideas across or getting the students to think out matters on their own. Often these can be embodied in devices—pictures, reading, and diagrams. But sometimes they are best stated as hints to teachers about questions to use and contrasts to invoke.

"How could you improve the human hand?" turns out to be a useful question. So does the question, "What are the different ways something can 'stand for' something else, like a red light 'standing for' stop?"

We have already spoken of our tactical fondness for contrasts, and we are coming up with useful ones in our designing. One such is to have students contrast a cry of pain with the words, "It hurts." Another is to compare the usual words from which phonemes may be inferred—hit, hat, hate, hut, hot, etc. Or the difference to be found in the two allophones of the phoneme

/p/ in the words *spit* and *pit*—the latter of which will blow out a match held to the lips, the former will not. Yet the two are regarded as the "same letter" or the "same sound" whereas *hoi* and *hut* are "different."

3. *Devices*. This part of the unit contains the "stuff"—the material for students. Principal among the devices is, of course, reading material and we are, like others, struggling to get such material prepared. In good season we hope to understand this obscure matter better. Currently, we are operating, much as others have, to find, or cause to be written, material that is interesting, informative, and in a decent style.

But there are many devices beyond reading that are in need of developing for different units. One is the film loop for use with the Technicolor cartridge projectors that we use increasingly. We are putting together four-minute loops constructed from Eskimo and baboon footage, with the intention of *asking* questions or *posing* riddles. Too often, films have a way of producing passivity. Can we devise ones to do the opposite? Why does *Last Year at Marienbad* abrade the curiosity so well?

We are also exploring what can be done with games, as already noted, and with animation and graphics and maps. We shall get help where we can find it within ESI and outside.

4. *Model exercises*. From time to time in devising a unit it becomes plain that the problem we face is less in the subject matter and more in the intellectual habits of children in ordinary schools. We have commented on some of these problems already—the difficulty many children and not a few adults have in distinguishing necessary from necessary and sufficient conditions, the tendency of children to be lazy in using information, not exploiting its inferential power to nearly the degree warranted.

Model exercises are designed to overcome such intellectual difficulties. We think they are best kept imbedded in the very materials one is teaching. But it is often helpful to provide the teacher with additional special devices. We intend to use puzzles, conundrums, games—a kind of pedagogical first-aid kit.

5. *Documentaries*. These are accounts, or even tape

recordings, of ordinary children at work with the materials in the unit. We would like the documentary to be both exemplary and at the same time typical enough to be within reach of a teacher in his own work.

Along with the documentary goes a more analytic description. The analytic documentary is designed to serve dual purposes. The first is to make it plainer both to ourselves and to teachers what in fact are the psychological problems involved in particular kinds of intellectual mastery that we hope to stimulate in children. In this sense, the analytic documentary is a further clarification of our pedagogical objectives. But in another sense, they represent an attempt on our part to accustom teachers to thinking in more general terms about the intellectual life of children. The second objective—call it educational—is to provide teachers with what might be a more useful educational psychology than the kind that is found conventionally in textbooks dedicated to that obscure subject.

It is our hope that as we proceed in our work there will be spin-offs in the form of general research problems that can be worked on by research centers not directly geared to the daily routines of curriculum building and curriculum testing. The work of such centers, as well as research in the regular literature on intellectual development, will constitute a continuing font from which we can draw material for the analytic documentaries.

6. *Supplementary materials.* The final section of the unit "kit" consists of such supplementary materials as paperbacks (and lists of related paperbacks), additional film and game materials, and such other devices as might attract the attention of either a diligent student or an aspiring teacher. Without question, it will become clearer what is needed by way of supplement once we have gone further into providing what will be our standard fare.

A final word about the unit materials. We hope to issue them in such a form that each year's experience can be added to the previous year's kit. That is to say, we believe that as new experience is gained in teaching the course, new editions of the kits should be made available to all our teachers. We intend to gather the

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wisdom of teachers who try out the course so that it may be made available later to others, to gather in new materials for teaching, new documentaries, new analyses of the scholarly literature, and fresh attempts through our talks to teachers to lend a still more compelling mystery to those topics that deserve to be taught. Indeed, it is probably obvious by now that the six-sectioned unit kit, stretched from one end of the teacher's shelf to the other, is our proposed substitute for that normally most unhelpful genre, the teacher's manual.

No plans for teacher training have yet been established, save that we hope within the next two years to bring together for a summer session a group of master teachers to help advise us about proper steps. Our staff now includes several highly gifted and experienced teachers, all now brooding over this very issue.

The "course," such as it is, will be "taught" to three classes this coming summer (1965) at the Underwood School in Newton. The classes will be fourth, fifth, and sixth grades, with the object of discovering at what level to pitch the material, how to take account of the slow and fast learners, and so on. But teaching is in this case part of a summer workshop effort to get material written, drawn, readied. It will also provide an opportunity to do the kind of intensive interviewing of children to determine what they are making of the material and how their grip may be strengthened.

In short, the summer ahead is a first effort to do an intensive summer workshop on the course.

Teacher Training.

Tryout and Shaping