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METHODS OF INVESTIGATING COGNITIVE DEVELOPMENT OF CHILDREN IN RURAL KENYA: SOME KAMBA RESULTS

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STAFF PAPER

Theories of cognitive development have been based almost exclusively on studies conducted among American and European children. Very little research of this kind has been done among African children. Furthermore, most of the studies completed to date have relied primarily on "translated" versions of standard tests. This generally has involved the use of Western materials inappropriate to the African milieu. The paucity of research and the dearth of well-designed studies among African children has had two undesirable consequences. First, it has represented rural African children as being somewhat less advanced mentally than Western children. Secondly, it has kept us from discerning whether the patterns of development discovered among Western children are truly universal or are simply products of Western cultural and educational systems.

The subject of this paper is a description of the methods I have developed for my current study among Kamba children in Kangundo, Machakos. This methodology attempts to overcome some of the shortcomings I have pointed out. The goals of my research are: to describe how children acquire adult semantic categories, and to investigate the child's learning of certain aspects of logical thinking.

The method I used first required the selection of a semantic domain. A semantic domain is the set of terms that people use to label such things as "plants," "animals," "colours," "kinship terms," "disease," and so forth. The domain, however, must be one which the people themselves consider to be a reasonable category. I chose the domain of animals as it was one with which Kamba children had a fair degree of familiarity. The next step was to describe the structure of the domain using Kikamba-speaking adults as informants. To describe the structure, one must know: what the major categories (of animals) are, and how the categories are related to one another. I also was interested in the dimensions, (e.g. big vs. small; walks vs. flies) which were used in categorising animals. In doing a study like this, the investigator must be careful not to impose any of his own ideas. He should, rather, elicit those of the indigenous people. Although there are many methods for discovering these categories, I found the best one to be "free sorting." After eliciting a list of animal names, I made out a set of cards with the Kikamba animal names written on them (with illiterate adults, I used pictures) and asked my informants to put "those which are alike" together. I then asked them to give me their reasons for the groups they formed. The structure of the domain of animals is partially summarised in the taxonomy on the following page. (Note: The taxonomy shown on page 2 is only partial. It excludes snakes, reptiles, and certain odd-ball animals. Further, only the major subdivisions are presented).

Certain problems arose, however, with using this particular structural device (a taxonomy). It definitely does not represent what all Akamba would do, given a sorting test. In practice, there is a high agreement between informants on: what animals go together, and what criteria one uses in sorting. There is considerable divergence, however, as to the order in which the criteria should be applied. An example of this arises within

PARTIAL TAXONOMY OF KIKAMBA ANIMAL TERMINOLOGY

SYUMBE (creatures)

NYAMU (animals) 4 legged

NYAMU SYA KITHEKANI (wild animals)

SYIMAVUNGU (hoofed)

MBAI (fierce)	ITE MBAI (not fierce)
mboo buffalo	ntiwaia gazelle
mbusya rhino	kilong'a antelope
	mbii Dik-Dik
	nthia steenbuk n
	nguuwe wild pig
	ngatata
	nzai zebra
	ndwia giraffe

SYA ITHU (with paws)

MBAI (fierce)		ITE MBAI (not fierce)	
IISAWA NYAMA		MAIMANI	OTHERS*
nzou elephant			
munyambu lion		luma anteater	nzui fox
ngo leopard		mbuko mole	mbiti hyena
ndw'a mutwe tiger		mbia rat	nguli monkey
		nduu squrrel	nzee pocupine
			mbuku hare

NYAMU SYA MUSYI (domestic animals)

IISAWA (edible)	ITAISWA (inedible)
ngombe cow	mbaka cat
ilondu sheep	ngiti dog
mbui goat	ngiti

NYAMU SYA [illegible] (water ani.)

nguu hippo
ikuyu fish
mukunga whale
kingangi crocodile
kyoa frog
nguu tortoise
ndundyo toad

NYUNYI (birds)

NUNYI SYI KITHEKANI (wild birds)

IISAWA (edible)	ITAISAWA (inedible)
ivui dove	kilui kite
mithonzwe weaver-bird	ndiu eagle
nzevele sunbird	mbolosya hawk
kteetee wren	ndei vulture
ngang'a guinea fowl	ngunguu crow
	ndundula owl

NYUNYI SYA MUSYI (domestic birds)

nguku chicken
ivata duck
mavui pigeon
mbata musinaa turkey

KUKAA (flying)

umuu mosquito
mbaa whitefly
ngi fly
ngi locust
kimbalutya butterfly
kitooli grasshopper
nzuki bees

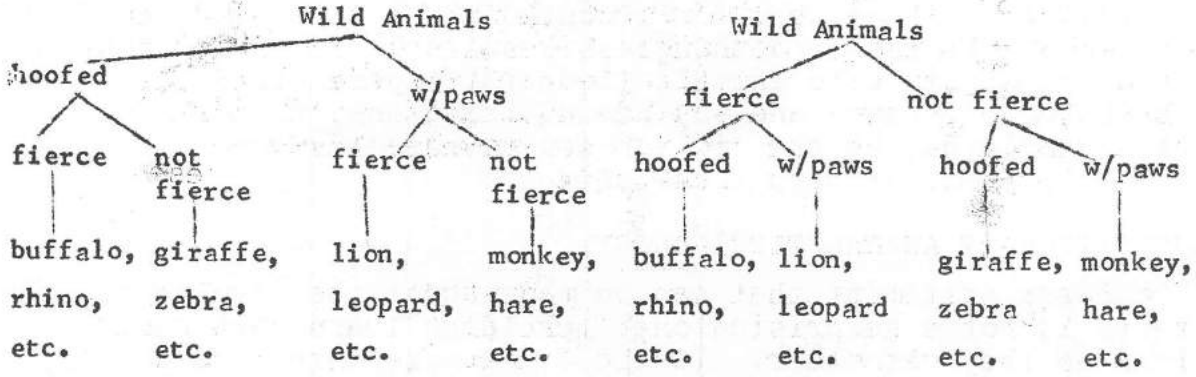
TUSAMUI (insects)

TUTAULUKAA (not flying)

ngunguni bedbug
ndaa lice
ngala flea
mbili tic
nyenze cockroach
muthwa whiteant
nthingii blackant
nguku red ant

the category nyamu sya kithekani (wild animals). Referring to the taxonomy on page 2, one can see that the two major ways of subdividing wild animals are: hoofed vs. has paws, and fierce vs. not fierce. In the taxonomy given here, hoofs vs. paws is shown as the initial subdivision, but some Akamba would proceed in the reverse order (sorting by "fierceness" first, and then by whether they had hoofs or paws). Thus, the two acceptable ways of categorising wild animals are:

FIGURE 2: TREE DIAGRAM OF WILD ANIMALS



Regardless of which alternative is followed, however, the resultant groupings are identical. Thus, a taxonomy is not the best way of describing the system. A tree diagram with optional choices would be a more accurate representation. From this, then, I concluded that, in the domain of Kikamba animal terminology, there is cultural sharing with regard to which animals are more alike and what dimensions are relevant in classification. How one applies these dimensions, however, is a matter of individual preference. It is not a part of shared cultural knowledge. Therefore, in testing children, any of the acceptable adult criteria applied in any order would qualify as "acquisition" of that part of the adult system.

After completing my analysis of the adult responses, I developed a series of sorting tests to be administered to a sample of Akamba children. The purpose of the tests was to discover in what manner children acquire the semantic categories of the chosen domain. In addition, this procedure would allow me to examine the formal characteristics of the children's sorting, given familiar materials.

I gave four sorting tests to a total of thirty children, divided into three groups. The first group consisted of ten six and seven year-olds who had not yet entered school, the second consisted of ten nine year-olds in Standard I, and the third consisted of ten twelve year-olds in Standard III. At the time of the testing, the nine year-olds had had only six months of schooling and were, for all intents and purposes, "illiterate." Further, none of the children had been exposed in school to scientific instruction in the classification of animals.

The first test I used consisted of asking the children to sort pictures of 17 animals which were more or less familiar to them. (Specifically, the animals pictured were: cow, goat, cat, dog, chicken, duck, owl, monkey, hare, elephant, giraffe, leopard, frog, tortoise, fly, butterfly). The second test was designed to

see if the children had mastered the domestic-wild-water distinction among animals. It involved pictures of six animals: cow, dog (for domestic); zebra, elephant (wild); and fish, frog (water). The third test was aimed at discovering the child's acquisition of the categories animals, birds, insects. Birds were represented by a duck and an owl; animals by a rat and a monkey; insects by a fly and a caterpillar. (I found, however, that even the older children saw no similarity between a fly and a caterpillar, and that only the most sophisticated adults could verbalise a shared common attribute. Therefore, I discounted these two items and will not report the rather meaningless results). The final test used was a set of six wild animals (leopard, tiger, giraffe, zebra, buffalo, elephant) and was administered only to the nine and twelve year-olds, as the six and seven year-olds were insufficiently familiar with these animals.

THE ACQUISITION OF ANIMAL TERMINOLOGY

The first statement that can be made about the results of these tests is not a surprising one: children learn more adult dimensions as they get older. (Table I) A more interesting result, however, is that younger children can sort better than they can give reasons, particularly with very familiar animals. This is apparent on all three tests. Looking at the "easiest" items (for a rural Mukamba) on the 17-animal free sorting test - goat cow, chicken, duck, a majority of the younger children paired them correctly (by adult standards). However, only a minority of them were able to give the acceptable Kamba reasons for doing so. (Table II)

The same thing happened in the wild-domestic-water and bird-animal tests. The younger child's sorting ability far exceeded his ability to verbalise the proper dimensions for correct sorts. (Tables III and IV) The one exception is that all the seven year-olds who put the fish and frog together gave the adult reasons for doing so. I shall comment on this particular outcome later.

It should be noted, on Table III, that no other acceptable Kikamba reason was available for the three pairs listed. However, sorting by other dimensions (and thus forming other pairs such as cow-zebra) was indeed possible. Since some of the twelve year-olds did this, they have relatively low percentages in some of the other rows.

The wild animal test showed a similar gap between nine year-olds and twelve year-olds in terms of the disparity between correct sorting and giving adequate reasons. The nine year-olds did even better than the twelve year-olds in proper grouping on two out of three pairs. (Table V)

However, when it comes to naming adult dimensions, the twelve year-olds perform better. (Table VI) There are two possible explanations for this phenomenon. One would be that young children do not know the proper semantic dimensions, but have had sufficient experience with familiar animals to know which ones are (culturally) more alike. The other explanation would be that children, in fact, know the dimensions at a young age but are unable to verbalise them. The argument which could be made for this latter explanation is that children have the concepts, but they are what the Russian psychologist Vigotsky called "non-conscious spontaneous" concepts. As Vigotsky himself explains it, a child will "form and use a concept quite correctly in a concrete situation but will find it strangely difficult to express that concept in words." (Vigotsky,

Thought and Language, page 79)

Whether or not the child "knows" certain dimensions at age seven, he does learn to verbalise them by age nine or twelve. The interesting thing here, though, is that his ability to verbalise dimensions seems to proceed from the least familiar animals to the more familiar, the opposite direction of his sorting ability. In the 17-animal free-sorting test, the seven and nine year-olds' most common correct pairs involved domestic animals. Yet, if we look at the reasons, only one child mentioned the fact that these animals were domestic, whereas three children mentioned the complementary dimension of "wild animals." The difference is even more clearly demonstrated in the second sorting test.(Table III) One hundred per cent of the seven year-olds who put fish and frog together gave "water animals" as a reason, 40 per cent of the seven year-olds who put elephant and zebra together mentioned "forest animals." On the other hand, none of the children who put dog and cow together mentioned domestic as a reason, although 60 per cent of the children did group them together. We should note that there could be no other good reason in Kikamba for putting dog and cow together. They share none of the sub-divisions of domestic animals: edibility, "hoofness," whether milked or not, eats meat vs. eats grass, or guard animals.

This, I feel, demonstrates the way in which "pre-conscious spontaneous concepts" become conscious and thus verbally explicit. Thus, the animals a child first becomes familiar with - the goat, cow, dog, etc. - are not labeled "domestic" in his mind, because he has nothing to contrast them with. Later, when he learns there are also elephants, giraffes, monkeys and that these are called "animals of the forest," he can systematise his knowledge by supplying the complementary label "domestic.' Thus, as shown in Tables II and III, the discrepancy between sorting and giving dimensions for domestic animals gradually decreases until, at age twelve, it disappears. To state the proposition another way, the category "domestic animals" takes on an "unmarked" quality - i.e., it is the norm or baseline and only differences are remarked upon. Later, when the "marked" category - i.e., different-from-domestic (wild, water) is mastered, the child can give the unmarked category a label. This, I think, is one of the ways that "natural" learning takes place.

The same phenomenon occurs with flying and non-flying animals. In this case, "birds" or "flying creatures" is the marked category and and four-legged, walking animals is the unmarked category. The marked quality, flying, is mentioned by even the youngest children, whereas it is not until age twelve that children can verbalise the unmarked "walks" or "four-legged" characteristic of nyamu (animals). The results from the free sorting tests are revealing. (Table VII) This may explain why, in the bird-animal test (Table IV), the rat and the monkey were so seldom grouped together by the younger children (10 per cent of the seven year-olds, 20 per cent of the nine year-olds did so vs. 60 per cent of the twelve year olds). However, it should be noted that only 50 per cent of the twelve year-olds gave the correct reason (four-legged or walks) vs. 100 per cent correct reasons for the bird pairs (flies, has wings). It seems that the unmarked quality of the nyamu is insufficiently formulated for a young child to see any similarities between two such disparate animals as a rat and a monkey.

FORMAL CHARACTERISTICS OF CHILDREN'S SORTING

Almost all psychologists who have investigated cognitive development among rural African children have concluded that they are unable to think abstractly -- that is, they are tied to concrete, perceptible attributes. Jerome Bruner has stated that children in "primitive" rural villages are unable to apply the hierarchical properties inherent in the grammatical structure of their language to the semantic sphere. (Bruner, et al. Studies in Cognitive Growth, 46) In the same book, Patricia Greenfield concluded from her study of the Wolof in Senegal that "Bush children who do not go to school rely on colour attributes at every stage of development." (Greenfield, Ibid., page 315) Witringer, a French psychologist, goes even further saying: "The intellectual inferiority of the African is explained by a mental attitude profoundly conditioned by a concrete, intuitive attitude centered on the syncretic perception of reality." (My translation, Witringer, "Considerations sur l'intelligence du noir africain")

It should be clear from my previous discussion that this is a gross distortion of the situation. The Akamba children I tested were gradually learning to systemise their knowledge about animals. To do so, they were learning both perceptible and non-perceptible attributes as well as a system of hierarchical categories. In giving reasons for their sorting, the children were abstracting attributes common to two or three examplars.

The reason for the difference between my findings and those of Patricia Greenfield is due, I think, to the nature of the materials used for testing. The Wolof children in her sample sorted exclusively by colour probably because many of the objects (clock, bicycle, car helmet) were unfamiliar objects in their rural setting. When I used animals familiar to Akamba children, I had quite different results. Only two out of ten pre-school children sorted exclusively by colour. (A third child sorted by colour originally, but when asked if he could sort another way was unable to do so). Of the nine year-olds (only six months of schooling) only one out of ten children sorted by colour. Nor were these children tied to "perceptible" attributes. As Table VIII shows, more children sorted by non-perceptible attributes than by perceptible ones.

Another measure of ability to abstract is the logical form of the reason. There are two general types of reasons, super-ordinate and complexive. A super-ordinate reason is one that states a common characteristic of the items in the group, such as "they are all animals," or "they both have horns," or even, "this one has horns and that one has horns." A complexive grouping does not single out any one attribute as common to all but makes "local groups" such as "goat is like a cow because they are both milked," or "the cow is like the dog because they are both black." Unlike previous findings (with both American and African children), I found a majority of the youngest group were able to give super-ordinate reasons. The results for all children are presented in Table IX.

The conclusions in this paper all are tentative, as I am still in the process of conducting my research. However, I feel that even these early findings attest to the superiority of using material familiar to the children being tested.

TABLE I

LEARNING ADULT DIMENSIONS

	6 & 7 yrs	9 yrs	12 yrs
Per cent children giving any adult reason	60%	70%	100%
Total number of adult reasons (all children)	10	12	25
Reasons Given			
1. Fly, has wings	40%	70*	38%
2. Hoofs vs. paws	10%	0%	20%
3. Four-legged or walks	0%	0%	50%
4. Habitat: wild, domestic, or water	30%	40%	60%
5. Edibility	0%	0%	20%
6. Eating habits: grass vs. meat	10%	0%	10%
7. Milked vs. not milked	10%	10%	10%

* Percent of children giving these reasons.

TABLE II

COW-GOAT, CHICKEN-DUCK, SORTING VS. REASONS

	6 & 7 yrs	9 yrs	12 yrs
Cow-Goat			
Per cent children grouping them together	60%	60%	90%
Per cent children grouping together with adult reasons	30%	50%	90%
Chicken-Duck			
Per cent children grouping together	60%	70%	80%
Per cent children grouping together with adult reasons	10%	50%	80%

TABLE III

WILD-DOMESTIC-WATER-DIMENSION

Animals Placed Together	7 yrs	9 yrs	12 yrs
Dog-Cow Together	60% *	50%*	30% *
Mentioned "Domestic"	0%	20%	30%
Fish-Frog Together	60%	70%	60%
Mentioned "Water"	60%	20%	50%
Zebra-Elephant Together	50%	30%	20%
Mentioned "Wild"	20%	30%	20%
Alternate sorting by adult dimensions (hoofed vs. paws; edible vs. nonedible)	0%	0%	30%

*Per cent of children

TABLE IV

ANIMALS VS. BIRDS

Animals placed Together	6 & 7 yrs	9 yrs	12 yrs
Duck-Owl Together	40%	50%	60%
Duck-Owl Together and gave reason: fly, has wings	0%	40%	60%
Rat-Monkey Together	10%	20%	60%
Gave Reason: Walk, has 4 legs	0%	0%	30%

TABLE V

WILD ANIMALS: SORTING

Pairs in Final Sort	9 yrs.	12 yrs.
Leopard-Tiger	70%	90%
Giraffe-Zebra	60%	50%
Elephant-Buffalo	60%	40%

TABLE VI

WILD ANIMALS: DIMENSIONS

	9 yrs	12 yrs
Per cent children giving any adult reasons	40%	70%
Total number of adult reasons (all children)	5	13

TABLE VII

FREE SORTING TESTS

	6 & 7 yrs.	9 yrs.	12 yrs.
Fly or Has Wings	40%	70%	80%
Walks or Has Four Legs	0%	0%	50%

TABLE VIII

SEVEN YEAR OLDS: PERCEPTIBLE VS. NON-PERCEPTIBLE REASONS

	% of Children Who Gave Reasons[1]	% Within Each Group Who Gave Particular Reasons[2]
Perceptible Reasons Exclusively	38%	
Colour		67%
Other Aspects of Appearance		33%
Non-Perceptible Reasons Exclusively	63%	
Habitual "actions"		100%
"Flies"		60%
Are "wild animals"		60%
Live in grass		40%
"Stay together"		40%
Eat alike		20%
Are "domestic animals"		20%
Live in trees		20%
Lay eggs		20%
Are milked		20%

Note[1] This table reports only children who were able to give reasons.

Note[2] A child may mention more than one reason.

TABLE IX

LOGICAL FORM OF REASONS[1]

	6&7 yrs.	9 yrs.	12 yrs.
1. Unable to give reason	20%	10%	0%
2. At least 1 super-ordinate reason	80% (100%)[1]	90% (100%)	100%
3. At least 1 complexive or relational reason	30% (38%)	0%	0%
4. All super-ordinate reasons	50% (63%)	90% (100%)	100%

[1]Figures in parentheses indicate the percentage totals of those children who were able to give reasons.

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THE THEORIES OF JEAN PIAGET: CONSERVATION AND VISUAL ACUITY IN KENYAN SUBJECTS

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STAFF PAPER

This paper, based on research done in Kenya between June-August 1969 was written for a course in Social Relations at Harvard University, January 1970.

INTRODUCTION

I studied the development of Piagetian psychology by testing some 53 Kikuyu subjects in Kenya between June and August 1969, working under the auspices of Dr. John Whiting and the Child Development Research Unit in Ngecha, Kiambu, Kenya.

Jean Piaget has developed a psychological theory based on a child's ability to perform certain operations and utilize certain cognitive processes in dealing with the everyday world. Piaget divides mental development into several stages, and in each stage the child theoretically can perform certain tasks concerning the conservation of matter, liquid, and number, along with other instrumental judgemental activities. Piaget's theory is developmental in an innate sense; all human beings theoretically should be able to develop Piaget's delineated abilities at approximately the same age. A certain sequence is followed, but it is not easily observable. He also has specific age groupings; once a child has one ability, no regression should occur. If a child can conserve quantity at age eight, then he should also be able to conserve quantity at age twelve. Piaget offers a stage-by-stage developmental order for the abilities to conserve quantity, mass, and number.

However, Piaget does not allow for cultural and experiential variation. Therefore, it is useful to study whether his theories apply to children who have not grown up in western society with its emphasis on precision and exacting instrumental activity. In addition Piaget uses western artifacts in his tests: balls of clay, tall glasses of water, and marbles (although marbles, I found, were just as African as western).

In my study I was unable to find exacting age boundaries, due to the size of my sample, but I was able to study the phenomena of non-regression to a prior inability to see if abilities were related to educational experience, to find if semantic error might influence results, to see if there are sex differences in any given ability-level, and finally to see if Piaget's developmental abilities were indeed an innately evolving sequence, or whether cultural variation might occur. If cultural variations occur, we might assume that these abilities are not innate but due to some other phenomena not yet distinguishable, some unaccounted-for variable which is disguised within some existing variable.

In one test I dealt with a linear complex which demanded very precise perceptual discrimination; the subjects must establish which of two lines is longer in two different matrices. I felt that this sort of visual problem might be influenced by education. A child used to working with a ruler or geometric shapes under demanding conditions might be able to make finer discriminations than children who, though of the same chronological age, might never need to have made such judgements and would therefore have some difficulty when presented with the task.

Overall, I wanted to see if Piaget's theory and experimental findings would hold up cross-culturally, if his concepts of the conservation of quantity, number, and mass would show innate development in all human beings regardless of cultural differentiation or educational variation. As it turned out, Piaget's work shows remarkable cross-cultural validity; I found very little statistically sound variation in my results when compared to Piaget's.

HYPOTHESES

The results of Tests I, II, and III should indicate that the acquisition of conservation of quantity, mass, and number are dependent on: a) age; b) perhaps on education; c) not on sex (i.e. there should be no sex-differentiation among the answers the subjects give; d) for each ability and hypothetical determinant, Piaget's non-regression phenomena should be Evident, i.e. Piaget's

age groupings of) pre-operational (before-7), concrete operational (ages 8-11), and formal operational (12 through adolescence) should prove to be guides for determining which abilities become operational, and at what times in developmental life.

2. The results of the visual test should show that education influences a child's abilities to discern fine perceptual matrices' differences, and age should also show a high correlation to visual acuity. Piaget found that the confusion regarding any of the illusions would lessen with age, that the first figure provides the most confusion for all ages, and the second, because of stabilizing vertical lines, provides less confusion and is more easily discernable at an earlier age.

SAMPLE

My sample was composed of 53 Kikuyu children, ranging in age from 4 to 22 years, with varying degrees of education and coming from different househod types (polygymous, monogamous). There were 27 males and 26 females in my sample, and they were randomly chosen, there being no criteria for selection other than their willingness to try the tests. The age groupings of my sample ar as follows:

Group I	Group II	Group III
(4-7 yrs.)	(8-11 yrs.)	(12-22 yrs.)
7 males	6 males	14 males
10 females	10 females	6 females

I realize that females dominate the sample in Groups I and II (i.e. the young and medium ages) and that males dominate Group III (i.e. the oldest ages) of the sample. This will not affect overall resulsts, as shall be seen later, because sex differences are negligible in determining what ages will give what responses.

FINDINGS

Experiment 1: Testing Procedure

Experiment 1, Situation 1: The child is presented with several glasses and pitcher of water. Two glasses are identically small and squat, T1 and T2. T1 is filled 7/8th with water, and the child is instructed to fill T2 to same level or until he feels that the two glasses have equal amounts of water. He then is presented with T3, a tall thin glass looking very unlike T1 and T2. He is asked to point to the level he thinks the water will reach when T2 is poured into T3, the tall thin glass. This level will be considerably higher than the level of water in T2; what T3 lacks in width, it gains in height.

Experiment 1, Situation 2: The child is asked to make a judgement: do the two glasses contain equal amounts of water? The height of the liquid in T3 is higher than that in T2, but they both hold identical quantities.

Experiment 1, Situation 3: The child is asked to what level the water will rise in T2 (short, squat glass) when it is poured in from the tall, thin glass, T3. In other words, in Situation 3, the child must again make a judgement and indicate where he thinks the water will rise to. He is presented with conflicting visual stimuli again, the tall versus small glasses, and also has a stabilizing stimuli, the original small glass, T1, to use for comparison.

Experiment 1: Preliminary Results

Regarding my hypothesis that age predicts answers, I found in Situation 1 that the higher the age, the greater chance of incorrect answers. Chi square = .059, D = -.097, mean scores for respective age groupings (young-old): 1.82, 2.00, 1.70 where 1.00 is a correct answer.

In Situation 2, age predicts correct answers for older subjects, confused answers for medium age subjects, and wrong answers for younger subjects. Chi square = .0001**, D = -.608, both very high statistical reports. Mean scores for increasing age are: young - 1.94, medium - 1.50, older - 1.05.

In Situation 3, age does not predict correct answers: all groupings of subjects had significantly more correct versus incorrect answers. Chi square = .063, D = -.212, mean scores for increasing age are: young - 1.47, medium - 1.19, older - 1.15.

By holding age groupings constant, and then comparing sex and answers, I found no relation, La = 0 in 7 of 9 cases, and attaining a value of .250 only once, in the case where age held constant is medium, Group II, and sex predicts answers. Here Chi square is .302, and I therefore feel this is a spurious result statistically, but may have some theoretical significance, to be discussed later.

By holding sex as the constant, dividing variable, and comparing age and answers, the results are as expected:

For males, by Section of Experiment 1, the Chi square, D, and mean scores are as follows:

Situation 1: .209; -.174; (2.00, 2.00, 1.79)
Situation 2: .0001**; -.598; (1.86, 1.33, 1.00)
Situation 3: .176; -.214; (1.57, 1.17, 1.21)

For females, by Section of Experiment 1, the Chi square, D, and mean scores are as follows:

Situation 1: .057; -.055; (1.70, 2.00, 1.50)
Situation 2: .003**; -.527; (2.00, 1.60, 1.17)
Situation 3: .177; -.255; (1.40, 1.20, 1.00)

Testing for education, the following results are found, with Chi square, and D reported as to its influence on the answers:

Situation 1: Chi = Ø, D = -.067
Situation 2: Chi = .0001**, Yates Chi=.001**, and D=-.539
Situation 3: Chi = .020*, Yates Chi=.042*, and D=-.320

Experiment 1: Discussion

Age appears to predict correct answers, the higher the age group, the higher the number of correct answers, regardless of sex, but only in Situation 2, which is the best indicator of the presence of the conservation of quantity in a subject because it is of a solely judgmental nature (Chi = .000**, D = -.608). Nearly all subjects received incorrect answers in the youngest age group (mean = 1.94); the subjects in the medium age group seemed unsure of themselves, with mean scores of 1.50 (as many got it correct as incorrect); and most subjects in the older age group received correct answers (mean = 1.05). The results verify Piaget's belief that, first, the older a child becomes, the greater his chances of being able to conserve quantity, and second no regression occurs: mean scores approach 1.00, or all correct as ages increase.

Sex also predicts answers quite well in Section 2 only, when categories were covered concurrently; in other words, there was no allowance for the male-older and female-younger sex-age clustering. When age categories were examined for each sex, sex-answer correlations dropped appreciably (from Chi = .02* to young = .218, medium = .302, older = .117). Sex, therefore, has negligible predictive value when trying to determine what age groups will give which answers. Age still remains the only valid predicator of answers at this point. The original result, that sex predicts answers at Chi = .020, La = .320, is due to sampling disequilibrium, and clustering of sexes at opposite ends of the age group

polarity (males in the older age group, females in the younger age group, and about equal distribution in the medium age group).

Despite the sampling deficiency, the tendency for sex to predict answers in Situation 2, younger and medium age categories, has theoretical significance. La = .250, with mean scores (1.00 = correct = have ability) for males = 1.33, for females=1.60 in Situation 2 indicates that perhaps boys gain the ability to conserve liquid before girls do. There is one plausible explanation: boys enter school before girls in Kikuyu society since girls' place is in the home, traditionally. Could it be that because boys have more schooling at this time, they can operationalize conservation of quantity before girls do?

In Situation 2, education is highly related to performance on the tests: D = .539, a very strong relationship. It is, however, quite misleading statistically, and only brings about more theoretical confusion.

Acceleration of the conservation-quantity ability may result because of education; in the number test, early repeated contact with objects whose numbers are important causes boys to gain the conservation of number before girls.

The catch is this: education is highly correlated (.744**) with age which makes sound logic, for the older you are, the more education you are likely to have. Therefore, I think that this relationship of sex to education to age is misleading because education is totally intermingled with age, and the sample is not large enough to determine whether sex can indeed assume a strong predictive relationship to answers in all age categories. Further work must be done to isolate these variables, especially age from education.

I had anticipated more incorrect than correct answers over all age groups in Situation 1 due to subjects' unfamiliarity with the apparatus, and their seeming interest in the white man giving the test rather than with the test itself. The results indicate a total lack of ability in Situation 1, not entirely due to the absence of the ability to conserve quantity, but more dependent on the conditions under which the test was conducted.

In the third situation, I thought that the two similar glasses would exert a stabilizing effect on the judgments, that more correct answers would result, and in this belief I was correct. T1 and T2 are identical; the child may well be able to conserve liquid regardless of age, or he just may have remembered that in Situation 1 he began with the same two glasses he is to work with now, and they were filled equally then. Using visual cues, the child may be able to give the correct answer without understanding that there is the same amount of water in both the tall (T3) and small (T1) glasses. Only Situation 2 isolated the judgment: the child must have the ability to conserve quantity in order to receive a correct answer in Situation 2.

Experiment 2: Testing Procedure

The child is given two quantities of clay: one is already in the form of a ball; the other is to be fashioned into another ball, equal in size, shape, and weight, by the subject. When he has created his ball, the experimenter takes it and rolls it into a cigar-shaped object. The subject then is given both quantities of clay and asked, "Do they both weigh the same? Do they both have the same amount of clay in them?" The answers to both questions ideally are "yes" since the cigar is fashioned from one of the identical balls.

There is some semantic difficulty here as I merely asked "Are they the same?" and did not ask the subjects to differentiate between weight and volume. The results then give limited indication to whether a child totally had or did not have the ability to conserve matter.

Experiment 2: Preliminary Results

Age predicts correct answers and conservation for the older (age 12 and over) subjects only; all others did poorly and did not show the ability to conserve matter. Chi square = .006**, D = -.264, mean scores, with increasing age: 1.76, 1.88, 1.40.

Sex does not predict answers in any way. Male mean scores were 1.63, females were 1.69, with Chi square = Ø, La = Ø.

With age the dividing factor, sex is a poor predictor of ability, the males do well with age as a predictor. Chi square = .008**, D = .491, mean scores 2.00, 1.83, 1.36 with increasing age groups. For females, the results are less significant. Chi square = .177, D = Ø, mean scores = 1.60, 1.90, 1.50 with increasing age groupings.

Education yields slight predictive power with questionable statistical significance due to sampling distributions. Chi square = .101, Yates chi = .189, D = -.235, with mean scores 1.80 for insignificant education, 1.52 for significant education, with 1.00 being correct answer mean score.

No other variables showed any statistical or theoretical significance.

Experiment 2: Discussion

According to Piagetian theory, Groups I and II, or everyone below age 12, should have difficulty with the concept of mass conservation. Therefore, only Group III should show any significant ratio of correct to incorrect answers with the mean score approaching 1.00.

Age predicts answers quite well considering the fact that there was some semantic confusion in gaining the sample data, in this particular case. With Chi square = .006** and D = .264 (not as significant a result for age as in the quantity case of Experiment 1, Situation 2) age seems to predict that Groups I and II will have more incorrect than correct answers. They, in fact, do, with mean scores of 1.78 and 1.83 respectively, far above the 1.00, all correct level, and quite above the 1.50 confusion point found in the quantity case. There should, in fact, be such a "confused" case, but I fear that the semantic, questioning error which plagues these results has eliminated it. I would have expected a 1.50 mean for Group II subjects, but it obviously had either been obliterated by testing error or perhaps it is an invalid theoretical construct; one cannot determine this from the data.

Piaget is correct in his research findings, cross-culturally speaking. Age seems to be the sole determinant of the appearance of the ability to conserve mass.

Although sex, over all categories (answer by sex comparison), showed little predictive power in relation to answers, when the sexes were isolated, and then compared (answer vs age) males had better test scores, upholding Piaget's theory regarding age. Chi square = .008**, D = .491. Females, on the other hand, did not fare as well. Chi square = .177, D = Ø. Does this mean that sex is indeed some sort of relevant independent variable to this ability? Not at all. There are 14 males and only 6 females in the Group II age bracket. The results, therefore, favour males because of sampling clustering, and sex really has little statistical significance, although it does present an interesting theoretical possibility, the fact that sex does influence when a given individual may develop a certain conservation ability.

Education has but a minor effect on ability as shown in the subjects' answers, with mean scores of 1.80 for insignificant education, 1.57 for significant education, Chi square = .10, Yates Chi = .189, and D = -.235. Again, overall, education is highly correlated with age, and the two variables are intertwined in the

data; therefore, I once more feel that age is the only significant variable which allows one to predict when a child will develop the ability to conserve mass.

Experiment 3: Testing Procedure

The third test measures the child's understanding of the concept of number conservation. Each subject is presented with six marbles in a row, each equi-distant from the next one, and told to place each of six thimbles in a one-to-one correspondence with each marble. Each subject then is told to count the number of marbles and thimbles until he is certain that they are equal. All subjects, regardless of age, had to determine that the lines were not only the same in length, but in number also.

When I was satisfied that each child knew that the numbers of objects were equal, I spread the line of thimbles to one twice as long as in the original matrix, destroying the one-to-one subjects' correspondence, and then again asked the subjects if there were the same number of objects in each line.

In Situation 1, I used thimbles and small marbles; in Situation 2, I substituted large marbles for the small ones; and in Situation 3, I mixed the small and large marbles together.

Marbles have much value to Kikuyu male children; the objects are used to play games, and whoever has the greatest number of marbles has a great deal of status in the children's peer groups, at least for males. Marbles would be a familiar object to both males and females alike, although of greater worth to the former.

Thimbles are recognized by males and females alike also, and therefore were familiar enough to be used in the test. They have no exacting value for girls as marbles do for boys, but they are known objects. Therefore, I had tried to eliminate any distracting stimuli which might draw the attention of the subject from the test to the objects used in the test, and I believe these results are the most valid for all tests considered in this overall design.

Experiment 3 - Preliminary Results

Number-ability is well predicted by age overall:

Situation 1: Chi square = .014, D = -.245

Situation 2: Chi square = .197, D = -.132

Situation 3: Chi square = .041, D = -.206

In each case, there were more correct answers with increasing age, but there were more correct answers in each age-grouping additionally, although Group I showed confusion. Mean scores for each test situation were as follows; the scores read left to right with increasing are:

Situation 1 = 1.47, 1.13, 1.10

Situation 2 = 1.35, 1.13, 1.10

Situation 3 = 1.41, 1.13, 1.10

As for sex predicting answers, the results are indefinite:

Situation 1: Chi square =.007, Yates Chi =.018, La = Ø

Situation 2: Chi square =.078, Yates Chi =.154, La = Ø

Situation 3: Chi square =.227, Yates Chi = Ø, La = Ø

The males outperformed the girls in each case. It must be noted that mean scores (1 = correct) dropped and came closer to the females' scores with trepeated testing:

Situation 1 M = 1.07, F = 1.38

Situation 2 M = 1.11, F = 1.31

Situation 3 M = 1.15, F = 1.27

When age is the dividing factor, and sex again is plotted by answer, only young males do significantly better than young females (Group I). This occurs only in Situation 1, La = .250, and everywhere else the sexes do equally well; all Chi square values are high and statistically insignificant, and of the 9 La figures obtained, 8 were Ø with only one of any significance, statistically speaking.

When sex is the dividing factor, with answers plotted against age divisions, males seem to do better overall:

Males		Females	
Situation 1:	Chi=-.046*, D=-.179	Situation 1:	Chi= .177, D=-.218
Situation 2:	Chi= .209, D=-.121	Situation 2:	Chi= .Ø, D=-.124
Situation 3:	Chi= .049*, D=-.210	Situation 3:	Chi= .Ø, D=-.164

Plotting answers against education, the following results were obtained.

Situation 1: Chi =.099, Yates Chi = .191, D = -.226

Situation 2: Chi =.187, Yates Chi = Ø, D = -.176

Situation 3: Chi =.043*, Yates Chi = .093, D = .270

Education seems to be a relevant variable statistically.

No other variables were in any way related to the answers given in these three tests.

Experiment 3: Discussion

Age predicts correct answer increments with reasonable theoretical validity, showing some confusion in the youngest children, and little or no confusion among the older groups, II and III. With all three tests measuring the same ability, the consistency in answers is truly astounding, as seen in the mean scores (1.00 = all correct) for each test:

Situation 1:	1.35,	1.13,	1.15
Situation 2:	1.47,	1.13,	1.10
Situation 3:	1.41,	1.13,	1.10

There seems to be a negation of the non-regression phenomena here: all subjects who showed the ability to conserve number in Group II show an increase in incorrect scores in Group III, Situation 1. Note however that one must account for individual variation, that this is not a longitudinal study testing the same subjects at different times in their life span. It also only occurs in the first testing situation, and thereafter there is no sign of any such regression.

The concept of number conservation seems operational by age eight, or the concrete operational developmental period of Piaget. Actually this coincides exactly with Piaget's finding that in his stage 2, (concrete operational) number conservation stabilizes, but before this age of eight, number is a confused concept. My data indicates just this as seen in the comparison of mean scores above.

There is one issue here: Kikuyu peer groups stress the ability to count, to keep track of how many marbles one has. Even a Group I child (four to seven years old) plays and counts with marbles. Could it not be possible that the early contact, not the innate ability, accounts for the child's mastery of number slightly before Piaget predicted its occurrence? This cannot be deciphered from the data.

As for sex, boys do considerably better than girls do in all age categories. Here is a comparison of mean scores, by age, in each testing situation:

	Males			Females		
Situation 1:	1.29,	1.00,	1.00	1.60,	1.20,	1.33
Situation 2:	1.29,	1.00,	1.07	1.40,	1.20,	1.33
Situation 3:	1.43,	1.00,	1.07	1.40,	1.20,	1.17

Males seem to do better in each age category, but then marble play- is a boys' game, and this may in some way account for the differences at the younger age levels. In the medium and upper age categories, the sample size and distribution may be influencing the results. Overall, sex is not a statistically significant predictor of answers.

Education seems to have a significant relationship with the number of correct answers given, but again, education and age are positively correlated and, therefore, inseparable: older children have more education and more correct answers.

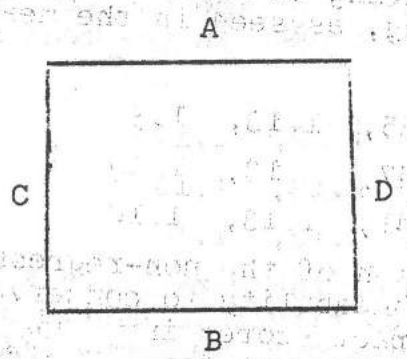
Experiment 4: Procedure

Each child is presented with the following visual stimuli:

A

B

He asked which line, A or B is longer, or if they are of equal length. The lines are equal. In Situation 2, the above configuration is modified by adding 2 vertical lines to form a square, and the question is repeated:



Experiment 4: Preliminary Results

Age statistically is only a fair indicator of response in Situation 1. Chi square = .156, D = -.136. Mean scores are more indicative of the subjects' response pattern, and its theoretical significance: 1.94, 1.93 for age groupings I and II, but a drop to 1.75 in Group III.

Sex has no predictive value and is unrelated to responses in Situation 1: Chi square = .223, La = Ø.

Education has little predictive value either. Mean scores were as follows (1.00 = correct answer): with insignificant education, 2.00; with significant education, 1.83, a drop, but again education is highly intercorrelated with age, the latter being the best predictor of answers. Education was statistically significant: Chi square = .056, Yates Chi = .167, D = -.174.

In Situation 2, with the vertically stabilized matrix, age was again a good predictor of answers, the higher the age, the more correct answers recorded: Chi square = .022*, D = -.311. There was a balancing of correct/incorrect answers in this situation in the Group II subjects. Means were as follows, for increasing age: 1.65, 1.47, 1.20.

Sex is a poor predictor of answers: Chi = Ø, La = Ø.

Holding age as the dividing, controlling factor, some sex differences did emerge from the analysis: these two are insignificant statistically since the females compose 60 per cent of the subjects in Group II and the males compose 70 per cent of Group III. Sex again is negligible factor in answering the question posed correctly or incorrectly.

When sex is the controlling factor, and answers and age are compared, males do statistically better than females. Males: Chi = .022*, D = -.453; Females: Chi = Ø, D = -.182. However, when mean scores are compared, the differences between sexes seem negligible and only age remains as the relevant variable. Males: 1.71, 1.60, 1.14; Females: 1.60, 1.40, 1.33.

Education is highly significant statistically. Chi square = .002**, Yates Chi = .006**, D = -.467. The mean score for insignificant amount of education subjects was 1.88; for significant amount, 1.22.

No other variables showed any theoretical or statistical significance.

Experiment 4: Discussion

In Situation 1, the illusion began to show in signs of clearing only in the older age group, just as Piaget showed. In Situation 2, the vertical lines stabilized the matrix, and clearing of the illusion occured in the medium-aged Group II. Piaget's theory is upheld.

I thought education might aid in making fine discriminations in a society where such visual activities are not stressed. Theoretically I think education might influence such judgments. Statistically I seem to be supported, as education in Situation 2 had a Sommer's D value of -.311, quite high considering the sample size. Again, I must point out that education is so highly related to age that the two variables are not independent of one another, and therefore I can only mention the theoretical possibly but can give concrete evidence to back it up.

CONCLUSIONS

Age is the only predictor of when a certain conservation ability will become operationalized by a subject. These abilities seem innate and defy cultural differentiation. Piaget's theory effectively predicted the results I obtained in the four tests.

Education showed high statistical significance when held as the independent variable upon which answers were dependent. Education also showed a strong relationship to age, and therefore the two variables remain inseparable within the present sample results. I would have to say that age is the primary determinant of ability presence/absence despite the educational significance statistically.

Further work needs to be done in separating the influences of age and education on the ability to conserve materials. I still believe that education could accelerate the operationalizing of the conservation abilities, but thus far this hypothesis has no validity in research findings, statistically, and is still only a theoretical concept.

Sex tended to display a strong relationship with certain answer-age gropings, but the relationship broke down when sex was isolated and used to control for the other variables. I feel any sex significance is due to the sample size, the uneven proportions of males to females in the young and older age categories. Sex was not anticipated as a significant variable able to predict answers, and I feel that this actually is the case.

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ON EDUCATIONAL ANTHROPOLOGY AND THE DEVELOPMENT OF SCHOOLING IN KENYA

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STAFF PAPER
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The field of "educational anthropology" is neither systematic nor well-developed. Some distinguished names are associated with it - George Spindler, Jules Henry, Margaret Mead, Margaret Read, John Whiting, for example - but it is still an emerging specialization and a confused one at that. Therefore, I cannot pretend in this paper to provide a comprehensive summary of an established body of research findings and theory.

What I shall do is play with a few ideas from the fields of anthropology and psychology, and with their possible applications to education. I have two goals in mind. First, I will try to enlarge the vision of the educationists who encounter this paper of the means available to them for influencing young people's development - their scholastic development, of course, but also their moral sensitivities, their economic capacities, their civic sense, and so on. School people in all countries, I am afraid, usually are quite conservative about employing other than obvious techniques, such as lecturers, textbooks, and examinations, for attaining educational goals. This is true in both the "developed" and the "developing" nations. As a sad result - speaking as a former high school teacher - most of the truly revolutionary events in education take place outside of the formal structure of the schools, and are masterminded by persons who are neither teachers nor school administrators. At best, there then results a wasteful lack of coordination among agencies, new and old, that are attempting to serve youth.

Second, I hope (perhaps immodestly) to contribute in a minor way to the dramatic educational pioneering now going on in Kenya, and in East Africa generally. Youth service, harambee schools, community development, training courses for farmers, Africanization of curriculum: these are all heady adventures to the sympathetic outside observer, especially one (such as myself) who is persuaded that the educational system of his own country requires similar fresh thinking and experimentation. I am convinced that a profound educational revolution is taking place in East Africa, one which I hope to learn more of, and to contribute to in a small way, if possible.

Some readers may notice that I will be using the words "schoolman" and "educationist" rather carefully in this paper. This is no accident. My usage exemplifies one of the basic perspectives of educational anthropology, a point of view which I want to examine now.

The notion is a very simple one. It is that schooling is really only one form of education, and that education, in turn, is really only a portion of the process of socialization through which each child progresses from birth to maturity. Although most schoolmen really know better, many talk and act as though school were the only important formative influence in the lives of children, and as though they (the schoolmen) were the only true "educationists" in the community. This thinking often results in the isolation and the irrelevance of the school from much that is truly exciting and effective in education more generally.

We all know, of course, that this "pedagogico-centric" view of children is false. The subtlest experiences of a child's life may, and do, affect his development, whether or not his parents and caretakers will it. For example, many studies show that the number of adults in a young child's household, and the frequency and quality of their conversations with that child, greatly influence the youngster's linguistic development and his subsequent readiness for school. Thus, a child who grows up in a large household with many co-resident adults is more likely, other things being equal, to develop adequate verbal skills than a child in a broken home with only other children to talk to during most of the day. Similarly, when a mother, from economic necessity or custom, suddenly begins to leave her young baby at home while she returns to work in the fields or factory, she unavoidably changes the substance, frequency,

and perhaps sufficiency of the infant's feeding. This shift may plant in the child the seed of an idea that will mature years later: the notion that people, including one's mother, are unreliable and not to be trusted. We can all think of individuals whose life-styles exemplify this philosophy.

Anthropologists and psychologists refer to the almost limitless number of experiences which influence the growth of children as the socialization process. Although the numbers of possible experiences are virtually infinite, their patterning is not random. Each culture provides a relatively consistent and integrated set of experiences for its children; and for all children, irrespective of culture, various types of experiences are maximally formative at certain ages and under specific circumstances. (For example, breast and bottle weaning between the ages of eighteen and thirty months creates the greatest disturbance for children; earlier or later transfer to adult food is accepted much less stormily). The fact that both cultures and children's growth patterns are patterned makes it possible to study the process of socialization scientifically.

But a further distinction is necessary. The adults of a society generally classify as trivial many experiences of childhood which are, from the anthropologist's standpoint, absolutely crucial. In some cases, the adults may not be aware that their traditional practices have especially positive or negative effects on their children (i.e., the language-learning example just cited). In other instances, however, adults may take great pains to ensure that children of certain ages undergo specific experiences deemed by the culture to be beneficial to the children: initiation ceremonies are prominent examples, as are schools, and day care centers, or creches in nations such as Russia. It is convenient to refer to these examples of deliberate instruction by a common term, to distinguish them from the unplanned and unplotted "natural" experiences. For this planned sphere, the term <u>education</u> seems appropriate.

And from this vantage point it can be seen that schools and schooling are but one type of education that children may or may not experience. The conscious choice of an appropriate type or types of education, for a specific purpose, is a complicated one that both societies and individuals evade successfully; they persist in doing what seems "obvious" or "natural." Throughout much of Africa and other parts of the world, the initiation ceremony was until recently an admirably effective means of educating adolescent boys and girls. But as a corollary to the process of modernization, it has been abandoned or suppressed in many parts of the continent. Now, ironically, many essential elements of the initiation ceremony are appearing or re-appearing in American and European cultures, as people in these nations search for new ways to give meaning and vitality to their faltering educational systems. Programs and experiments such as T- or training-groups, Outward Bound, the Job Corps, National Youth Service, and others, share with the initiation ceremony an emphasis on <u>intensive</u> experience - climbing a mountain, learning complex skills under pressure, undergoing emotional catharsis. This is a technique of education not usually exploited by schools. Unfortunately, I do not have space or time to explore the parallels further.

To summarize, then, the three terms - <u>socialization</u>, <u>education</u>, and <u>schooling</u> - can be arrayed in a brief hierarchy of inclusiveness. Socialization includes, but is more than education; education includes, but is more than, schooling.

There is one further complication. Educational anthropologists, by studying schools first-hand and intensively, have observed that these institutions invariably communicate unintended as well as intended "subjects." They share this characteristic of course, with all institutions of deliberate instruction, (including

initiations). For example, through the actions of teachers and administrators, who discriminate and show favouritism towards various children, students learn the fine points of the social class structure and the ethnic prejudices of the larger society, and of their own prospects as a result of these conditions. Similarly, some schools manage to transmit suggestions of the value and excitement of the intellectual enterprise, while others (through the mechanism of peer pressures, frequently) teach even the brightest youngster that books are boring and that one should be ashamed of "too-good" examination results. This phenomenon is overwhelmingly documented in James S. Coleman's book The Adolescent Society, a study of ten high schools near Chicago, Illinois, U.S.A. I wonder if students in East Africa experience similar pressures from their classmates.

What this boils down to is that within schools, and within other educational institutions, a great deal of unintended and often unrecognized socialization also takes place. Sometimes the socialization that occurs is more effective than the education. This is the case with prisons in the United States, and perhaps here, too, which are officially institutions of "re-education" and training. Unfortunately, in all but a few prisons, the inmates' pressures on each other are such that most first-offenders emerge as hardened criminals, fully socialized to the life of the underworld, rather than educated as productive citizens. Our hierarchy of inclusiveness is hopefully a useful mnemonic device, but it should not blind us to the complexity of the processes of education and socialization in schools and other educational institutions.

The above are not very complicated ideas, but they have important implications for the work of schoolmen and educationists. The schoolman's task in this developing country (as in others) is not to fill, uncritically, an existing post in an unchanged and unchanging institution, but to participate creatively in helping the youth of Kenya develop their capabilities to the fullest, in short, to become an educationist in the full sense of the word. He must seek not only to impart the facts and ideas of a special field, but also to shape his students' conceptions of nationhood; to equip them to deal realistically with economic and domestic challenges; to encourage in them workable ideals of civic responsibility and rights; to help them reject the narrow side of tribalism, but to retain a healthy respect for and involvement in the ideas of their ancestors; and so on. In these endeavours, the educationist must realize that his influence and the influence of the school in which he teaches are probably never exactly what they seem to be or what he would like them to be. On the one hand, some of the objectives that he and his colleagues have implicitly or explicitly chosen for their school may be quite inappropriate or even ludicrous for such an institution. Many of a society's educational goals can best be achieved through the family, the mass media, community development programmes, on-the-job training, and so on. Conversely, some tasks which the school might very efficiently discharge are rarely deliberately assigned to it. Below, I shall present to you possible examples of both these situations.

There is yet another wrinkle, previously mentioned. The teacher's routine work, the pattern of organization of the school, the ways in which the children regulate their own school lives, and so on, may be producing quite important although unintended socialization effects. By his teaching style, homework assignments, and manner of dealing with students, what does the educationist communicate about the characteristics of an "educated man"? Is such a person mainly a good memorizer, a biscuit-tin of facts? An extemporizer or practical problem-solver? Something of both? The schoolman communicates "lessons" of this sort hourly, daily, and over the whole year, without realizing it; the educationist is aware of the phenomenon and constructs his messages sensitively, to be in accord, so far as possible, with his and his nation's highest ideals.

Let me close by giving a few examples of the kind of thinking I hope that schoolmen-turned-educationists increasingly will do. I am going to suggest notions which even I regard as somewhat outrageous, even preposterous, yet not wholly so. They deserve to be investigated, honestly costed, tested experimentally. They should not be rejected out-of-hand, because "Kenya is a poor country" (when we don't know the relative costs of the status quo or of the species of madness I dare to suggest); or because students would object (when we have not asked them); and so on.

One of the universal concerns of both the developing and the developed nations is their stock of scientific and engineering manpower. No country possesses a superfluity of able people in these fields. Most national policies stress scholarships, more laboratories, and better-trained teachers at the higher reaches of education, Fifth and Sixth Form and beyond. But most countries that have followed aggressive policies of recruitment during the later stages of studenthood have discovered that the pool of genuinely promising prospective engineers and scientists runs dry pretty quickly. In each nation, there is a clear shortage of persons with appropriate aptitudes and interests for a productive career in these technical fields.

During the last decade, social scientists - anthropologists such as Margaret Mead among them - have undertaken studies of the origins of scientific talent. Some findings are beginning to come clear. One is that "scientific" adults have had generous opportunities, during early and middle childhood, to manipulate simple objects: blocks, puzzles, nuts and bolts, containers of water, etc. Apparently during these childhood years, children build a self-confidence toward mechanical operations; they learn to enjoy this sort of problem-solving; and (to oversimplify greatly) certain regions of the brain are enhanced, such that the later movement to more sophisticated subject-matter is facilitated. The result is a statistically significant increase in the incidence of scientifically-talented adolescents and adults.

The policy implications of this are radical. Perhaps the best way to increase the stock of scientific talent is not to try to teach these subjects better at the upper levels, but to establish a system of voluntary "pre-science" nurseries and kindergartens throughout the country. In them, children between the ages of three and six would encounter a variety of what (to them) were fascinating toys and puzzles. These "toys," of course, would be ingeniously designed and selected, and the teachers in charge would be specially trained to be appropriate custodians of budding scientific minds. Yet the cost need not be high. The "toys" I have in mind are largely available already, in hardware and toy stores throughout the world. For that matter, the intense improvisation of elaborate wire vehicles, done by little boys all over Kenya, is an excellent example of an activity that could be exploited in these nurseries. Teachers need not be high school graduates; qualities other than scholastic brilliance seem more important. In ten or twelve years, I predict, the vacant seats in the science faculties - which exist even in this country, I believe - would begin to fill up.

This is only one line of thinking. During my brief tenure in Kenya I have noticed a frequent theme in the press, in speeches by Government ministers, and in various reports. This is the notion that if Kenya is to develop economically and socially, the people must be willing to work hard, forego small pleasures in the present in exchange for a better future, and try to attain ever-increasing standards of excellence in productivity. As President Kenyatta says in his Introduction to the Development Plan 1966-1970: "This Plan which the Government has prepared will remain a dead document if the people do not participate in making it a living reality. The spirit of Harambee must pervade in all our activities." (p.iv)

It is certainly no coincidence that these recommendations are in strong agreement with those economists and psychologists who have studied economic development in other parts of the world. Educationists seldom realize, however, that they have a potentially powerful role to play in spreading the required attitudes toward work and the future among the people. Vigorous exhortation alone is not sufficient, although it has its place. In recent years, psychologists such as David McClelland (see his book The Achieving Society) have developed promising techniques for raising the level of "motivation to achieve" in children, adolescents, and adults. The methods are now in use, although not universally, in American business, government and education.

Typically, "achievement training" is provided in specially organized training sessions, led by specially prepared teachers. Even in America, where these techniques were invented, it is generally overlooked that the basic emotional "climate" of the classroom also has its pervasive effects on the achievement strivings of the pupils. Does this climate provide the pupils with opportunities to make choices? To strive to attain challenging but realistic goals? To obtain continuous "feedback" on their individual progress toward their individual goals? Or is it structured to encourage (mainly) compliance by the pupils to the teacher's power-assertive directives as to who should learn what, when and how?

The topic of achievement training is a complex one, although the steps educationists might take to increase such motivation in their pupils are not necessarily difficult. I believe that increasing pupils' desires to "achieve" is as an important a goal for a school (in any country) as teaching the traditional subjects "up to standard." The techniques for increasing achievement strivings are increasingly available; responsible educationists cannot afford to overlook them.

Let me mention one more example briefly. Universal literacy is a shared goal of all developing nations. (It is an objective that self-satisfied "developed" nations as well might also formulate more explicitly for neglected portions of their own populations). But the effort that is required to attain this goal is enormous; and in many instances around the world, the newly literate person discovers that there is little or nothing to read, once he can do so. Yet the poor man's determination to come into contact with the wider world cannot be ignored or despised. The question really is: what is the best method of establishing this contact?

I want to propose that adult literacy may be less effective for this purpose than a comprehensive distribution throughout the population of cheap, battery-operated FM or even TV sets. (This idea was originally John W.M. Whiting's). On a mass basis, FM sets with one or two receiving stations could be purchased for Kshs. 35/- or 40/- each; sets like this are not available to you and me at the local music shop, for obvious commercial reasons, but a government could arrange such a deal. The government would also have to develop a fairly sophisticated series of programmmes to which people would want to listen - no mean challenge by current standards of educational broadcasting as I know them in the U.S. - but this could be done for a fraction of the price planned for the future in adult literacy programmes. I am not suggesting that schools be curtailed, or that anyone who wishes to learn to read be denied that opportunity. I suggest, merely, that we begin to exploit imaginatively the circumstances that we live in a technological age.

This paper has been, in effect, a lengthy attempt to encourage educationists to question everything that exists, or is proposed, in the name of education. In case it is not clear, I am urging Kenyan schoolpeople to scrutinize both the old - the traditional, the "colonial", etc. - and the new - the revolutionary, the latest

computer technology, etc. - with equal care. Their task is to come to a clear, yet flexible, understanding of the nation's and their own goals for Kenya's youth, and then to choose the most effective means for achieveing them that human experience and scientific research have discovered. Educational anthropology suggests, I think, that these means are more varied and perhaps more effective than educationists commonly realize.

Initiation and Self-Image among Kikuyu Adolescents

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This research was conducted while the author was a senior staff member of the Child Development Research Unit, University of Nairobi (Kenya). Thanks for assistance in designing and administering the questionnaire is extened to Wilfred B. Mbugua, Hunter Eliud, Charles Githuka and Esther Waruiru. Data analysis was facilitated by Esther Waruiru, Priscilla Kariuki, and Dorothy S. Herzog. Summarization and interpretation of the data are the responsibility of the present author.

Identification and explication of functional alternatives and supplements to formal schooling are among the major goals of educational anthropology. For several decades, anthropologists have pointed to adolescent initiation ceremonies of non-western peoples as examples of such alternatives(Wilkins 1943; Kenyatta 1938). Curiously, there have been very few attempts to evaluate objectively what is learned by initiates in particular ceremonies. Most accounts focus on details of the rituals themselves; outcomes for individuals are reported (if at all) in terms of cultural stereotypes.

Although verification of expected results of initiation has been ignored, the antecedents of the institution have commanded much attention since the appearance in 1958 of Whiting, Kluckhohn and Anthony's cross-cultural analysis, and its subsequent revision (Burton and Whiting 1961). The Whiting view is that in societies characterized by patrilineality and early and exclusive mother-son social relationships, initiation of males by males serves to break the boys' inappropriate identification with their mothers and female ways. This "psychogenic" interpretation was challenged most notably by Young (1962 and 1965). Young shows strong relationships between the articulation level of the local community with the nation-state, and the extent of male group solidarity present in the local community; and between extent of male group solidarity and the maintenance by such groups of ceremonies of "sex-role dramatization" (initiation), which he interprets as crucial to the groups' continuing stability. Cohen (1964) and Schwartz and Merten (1968) have also commented upon antecedents and hypothetical psychological effects of initiation.

The present study began as an attempt to verify what all these analysts seem to take for granted: that participation in the ceremonies enhances the self-concepts of the young men or boys who pass through them. On this topic, the "Whiting" and the "Young" theories are in apparent agreement. Burton and Whiting suggest that "initiation rites serve psychologically to brain-wash the initial feminine identity and to establish firmly the secondary male identity." (1961:90) Young says: "The function of initiation for the individual, then, is to reinforce a boy's ability to perform his sex role in that type of society that presents him with definite and institutionalized male status." (1965:30)

Note, however, that Whiting seems to posit an immediate effect on the boy ("brainwash") from participating in the ceremonies; Young elsewhere suggests a more gradual acquisition of appropriate sex-role behavior, as a result of the initiate's increased interaction with mature males after the formal ceremony. The present research provides data that can be used to

test the comparative validity of these predictions, and thus indirect evidence in support of one or the other of the general positons.

In addition, evidence that initiation does have measurable psychological effects on initiates should be of interest, and perhaps use, to educational effectiveness of currently employed techniques of socialization and efucation. Perhaps varieties of "intensive experience" (other than circumcision, dissocialization.

Traditionally, the Kikuyu of Kenya practiced eleborate yearly initiation ceremonies, for both boys (between the ages of 15 and 18) and girls (clitoridectomy, between 10 and 15 years). The following remarks deal only with male initiation. These rites included adoption by ritual parents, annointment with white earth, much singing and dancing, eating of special foods, and a symbolic race to the sacred fig tree. Each initiate chose one or several sponsors, slightly older than himself, to support him during the physical operation and to care for and advise him during the subsequent period of seclusion.

Early in the morning of the day of the operation, the boys bathed in the chilly waters of a nearby river, then returned to a special house where they were quickly circumcized by the local operator. Complete self-control during the cutting was mandatory. Eight days of seclusion followed, after which the boys emerged wearing long white cloths until their wounds healed completely. Afterwards, they served with their age-mates and near seniors as a kind of local militia, until marriage some years later. (These ceremonies and status changes are described more fully by Middleton and Kershaw (1965:56-57), and in the several sources cited therein.)

Modern practice, as observed by the author in a "peri-urban" village approximately 18 miles north of Nairobi, is considerably simpler. Most often the boy himself decides when he will be initiated, although the modal age is still about 17, and the father has at least a residual veto if he is expected to pay the operator's fee, as he usually is. Initiation very frequently occurs just after the boy completes primary school (Standard 7), in December of the year: this timing is both a recognition of the boy's achievement, and insurance that the wound will heal before he resumes his studies. The circumcision operation is done in the early morning hours by a medical assistant at the local Government dispensary, for a standard fee of shs. 15/- (about $2.10). Preventitive antibiotics, local anesthetic, and sterile surgical instruments and supplies are used. The operation itself lasts three to five minutes; outcry by the boy on the operating table is very rare. The atmosphere at the hospital is one of sober anticipation and industriousness; more than thirth or forty young men may be processed in the space of two or three hours.

After the operation, the boy, his co-initiates, and their sponsor (s) walk the five miles back to the village, and the traditional eight days of seclusion are observed. During this period, the sponsor gives the boy "good advice" (often of a sexual nature), and tends the boy's would, taking him back to the hospital if complications occur. After eight days, and occasionally sooner, the boy emerges to "roam" with his new age-mates. This period may last only a few weeks if the boy enters or returns to high school. It may also continue for several years if secondary education is unavailable and if (as is usual) the boy cannot obtain a job. Circumcized boys do not like to work on their fathers' farms, and indeed their labor is not needed in the typical homestead.

I suspect that the practices summarized above are more or less characteristic of the Kikuyu of Central Province, Nairobi, and the Rift Valley, but have no objective verification. Those of my research assistants who came from other areas of Kikuyuland did not regard the initiation procedures of the study village as out of the ordinary. In more remote districts, traditional circumcision specialists are probably employed to perform the operation.

It should be noted that these initiation procedures, however attenuated in modern form, are regarded as absolutely indispensible by the eligible boys and their families. I know of no young man in the village, over twenty years old, who has not been circumcized. The boys say that initiation gains them increased respect from others, both younger and older, as well as privileges such as staying out at night and sexual intercourse with initiated girls. They feel that their general behavior improves after initiation, and that they leave off cursing, fighting, and childish games. A smaller number claims to experience an increase in self-confidence. An older boy (nineteen or twenty) who remains uncircumcised runs the risk of being thought unnatural or cowardly, unless he and/or his father are known to be delaying the operation until the boy's completion of Standard 7.

This research was designed to test the hypothesis that initiated boys "grow" in self-esteem as a result of their initiation experiences. The strategy was to administer identical pre- and post-initiation questionnaires to a group of boys circumcized in December, 1969, and also to two control groups: one composed of boys who had been circumcized in 1968 or earlier, and one composed of youths who were postponing initiation to 1970 or later. The final sizes of the three samples are 42,44, and 41; their mean ages are 16. 9, 17.8, and 15.6, respectively. Each of the 127 boys was interviewed twice: in late November and early December, 1969, before the 1969 initiation season began, and then again four or five months later. The three interviewers

were male, indigenous to the community, and had themselves been initiated five or more years earlier.

Sixteen questions were framed to sample the boy's conception of himself. These items inquired into his estimates of his physical characteristics, stamina, economic value, peer relationships, and social maturity. All were products of a series of staff conferences; each possessed face validity to my (local Kikuyu) assistants as tapping dimensions along which boys might change as a result of initiation. An early version of the form was pre-tested briefly and a few changes made, but the imminence of the circumcision season made extensive adaptation impracticable.

Specifically, we asked each boy to estimate his current weight and height, and the number of years he thought it would take for his beard to appear; we sought his opinion as to how many days he could go without food, how many miles he could run without stopping, how many pounds he could lift, and how many feet he could high jump; we inquired as to what he regarded to be a fair wage for himself, and how much pocket money he liked to carry about with him; we requested him to guess th e average age of the boys he roamed about with, and the average age of the boys whom he thought he could beat up; finally, we asked him to tell us how many more years of school he wanted, what hour he thought it was right for him to come home at night, how many children he wanted, how much beer he could drink at a sitting, and the farthest distance from his parents' home he would consider settling after his marrige. The answers to all these questions are susceptible to rough and quick quantification.

For fourteen of the items, we expected initiation to <u>increase</u> the boy's estimates, from the first to the second interview. In two instances, we expected decreases: number of years to beard, and number of years additional schooling wanted. In analyzing each boy's responses, we counted the number of questions on which he changed in the predicted direction, thus deriving a total "gain score" for each boy. We hypothesized that the group of 1969 initiates would have a higher mean gain score than the two control groups.

Preliminary analysis indicates that this expectation is <u>not</u> confirmed in the data. The 1969 initiates have a mean gain score of 7.0, the previously initiated boys a score of 6.7, and the uninitiated boys a score of 6.0. These differences are trivial and show only a weak tendency in the predicted direction. Further, on only one of the sixteen questions (beer capacity) do the 1969 initiates increase their self-ratings significantly (.05 level) more often than the boys in the control groups. I want to carry out some more sophisticated analyses of the gain scores, but am not optimistic about pay-off.

Thu, the "brainwashing" or immediate impact interpretation of initiation experience does not receive support in this Kikuyu data; three to four months after circumcision, the new initiates did not evidence an especially enhanced self-image, at least as measured through the sixteen questions. However, the design of the study permits the making of other comparisons. It is possible to examine the answers given by the previously initiated boys to discover if their self-rating are more expansive than the estimates given by the uninitiated youths. ("Uninitiated youths" hereafter refers to the 1969 boys responding to their first interview, before their initiation, combined with the boys who were postponing initiation to 1970 or later.) According to the "social interaction" or slow growth interpretation of initiation, the previously initiated group is the one that should feel tougher and more competent.

To make such comparisons, gain scores are not relevant; the responses of the boys on either of the two interviews are, and I arbitrarily chose the answers from the first to analyze. The means of the answers to several of the questions are skewed, due to extreme (i.e., "foolish") replies by a few of the boys, so that I chose to make comparisons of placements above and below the medians. The mediars were calculated separately for each yearly age cohort, across the three initiation groups, to control for the previously mentioned age differences among the groups. This procedure resulted in the elimination from the sample of the very youngest and the very oldest boys, whose numbers were too few and also concentrated in one or another initiation group to permit meaningful breaks along the medians. As a result, the N of the 1969 initiates becomes 40, that of previously initiated boys becomes 36, and that of the uninitiated boys becomes 32, for a reduced total of 108.

The boys' answers, analyzed in this manner, provide relatively strong support for the "social interaction" position. For four questions, the differences between the initiated and uninitiated groups in the predicted directions are significant below the .01 level, as assessed by the Chi Square statistic for a 2 X 2 table; for another two, the differences are significant at or below the .025 level; for another question, the contrast is likely to occur by chance only 5% of the time. In four more cases, there are tendencies in the expected directions below the .10 and .02 levels. In only five cases among the sixteen questions is no directionality discernible.

More precisely, the initiated boys (N = 36), compared to the unitiated boys (N = 72), are frequently:

above the median in estimated weight ($p < .025$)
above the median in estimated height ($p < .01$)
below the median in estimated years to board ($p < .01$)
above the median in pounds they can lift ($p < .01$)
above the median in fair daily wages ($p < .01$)
above the median in age of boys roomed with ($p < .025$)
above the median in distance to live after marriage ($p = .05$)

There are tendencies ($p < .10$ and $.20$) for them to think that they can go longer without food, beat up an older age group of boys, come home at a later hour, and drink more beer, all in the predicted directions, but not at commonly accepted levels of statistical significance.

One reasonable interpretation of these results is that the boys who present themselves for initiation already conceive of themselves as more powerful and competent than the boys who do not come forward; the circumcision merely ratifies their pre-existing beliefs. Comparison of the first interview responses of the initiates - to-be of 1969 ($N = 40$) and the boys who were postponing to 1970 or later ($N = 32$) provides no support for this idea, however. One none of the sixteen questions are the 1969 initiates significantly ahead of the boys who chose to postpone. The 1969 group tends (p is slightly larger than .10) to expect to come home later at night, and these are less pronounced tendencies for the 1969 boys to want more pocket money and to be willing to settle further away after marriage. These are not the questions from which the social interaction interpretation received its strongest support, however.

It is also possible that the initiated boys are actually taller, heavier, stronger, etc. than the other two groups. Physical measurements of the two groups are not currently available. This interpretation is cast in doubt by the results of the comparison of the answers of the 1969 initiates and the boys who were postponing (above). Actual physical differences (if they existed) should have been reflected in the two sets of answers, and they were not. Replications of this study should include basic anthropometric measures, however.

Thus, it seems that initiation does have measurable impact on Kikuyu boys' self-image, which takes some time to appear (it is evident in twelve months, according to the above results) after initiation. The social interaction hypothesis apparently receives a high degree of support from this data.

I wish the conclusion were this simple, but it is not. In addition to the sixteen questions, we also collected a limited amount of socio-economic-demographic data from the boys at the time of the first interview. Two or three questions about educational attainments were included.

It turns out that educational achievement is very highly correlated with initiation status, which is not surprising in that completion of Standard 7 is the most common time for boys to be circumcized. To summarize crudely, 61.8% of the previously initiated boys have one or more years of high school; 64.3% of the 1969 age grade finished Standard 7 a week or two or three before they were initiated; 56.1% of the uninitiated group had completed only Standard 6 or lower at the time of the first interview.

Across the board, high school boys report stronger and more mature self-images than primary boys. High school boys are more often:

above the median in estimated weight ($p < .001$)
above the median in estimated height ($p < .001$)
below the median in estimated years to board ($p < .01$)
above the median is pounds they can lift ($p < .001$)
above the median in fair daily wages ($p < .01$)
above the median in distance to live after marriage ($p < .025$)
above the media in feet can high jump ($p < .05$)

For five more questions, there are tendencies in the expected directions below the .10 or .20 levels; for only three (number of miles can run, age of boys can beat up, and years more schooling wanted) is no association of any sort observable. Overall, this record of prediction is slightly better than that of initiation status, with which education is closely associated. This raises a delicate question: what is effecting self-image, initiation or education?

Unfortunately, it is not easy to disentangle the two, at least in the present data. Of the 83 uninitiated boys, only 3 had been in high school; of the 44 initiated youths only 17 had no high school experience. However, these 17 initiated primary schoolers can be roughly compared with the 27 initiated high school students, and when this is done, the greater power of education as a predictor emerges clearly. On the weight question, 52.9% of the primary boys but 74.1% of the secondary boys are above the median for all boys in their yearly age cohort; for height, the proportions are 41.2% and 77.8%, respectively; for daily wages, 47.1% vs. 74.1%; for pounds can lift, 47.1% vs. 77.8% for years to beard, 64.7% vs. 70.4% are (in this case) below median.

There are five questions for which highly significant statistical relationships were found for both initiation status and education. On each of them education predicts potency of self-concept with greater precision than initiation status. The effects of initiation seem to disappear almost completely.

I suggest four tentative conclusions from this analysis:

1) The sixteen questions - with four or five exceptions-are relatively sensitive indices of Kikuyu boys' estimates of themselves, at least as these self-images vary in association with background variables such as initiation and education.

2) Contrary to orthodox anthropological and psychological assumptions of the very recent past, education (perhaps through the mechanism of social interation) has a very strong impact on individuals' sense of selfhood.

3) In combining traditional initiation and modern schooling, the Kikuyu of Kenya (and perhaps other non-western peoples) have fashioned a very powerful sequence of socialization experiences.

4) The hypothesized psychological impact of the experience of initiation is unconfirmed by the present study.

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SERVICES FOR PRE-SCHOOL AGE CHILDREN IN KENYA

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STAFF PAPER

1969

This paper originally was presented at the Annual General Meeting of the Family Service Council of Kenya, Nairobi, 21st March, 1969.

I was very much pleased and honoured by the unexpected invitation from your officers to address this important group. I was pleased, first of all, for personal reasons, because the invitation gave me an excuse for organising recent thoughts on a topic of increasing national concern: the provision of services for pre-school age children in Kenya.

As I went about the task of putting my ideas together, I rembered a story, supposedly true, that I want to tell you now because it rather neatly sums up my position on the subject in question. You may recall that during the thirties, forties, and early fifties of this century, certain American primary schools, never as many as commonly believed, were the scene of a confused revolution in teaching called "progressive education". One of the main goals of progressive education was to teach children how to cooperate with each other, and with adults, in an effective fashion. Authoritarian teacher-pupil relationships were to be avoided, and the proper atmosphere in the classroom was a "democratic" one.

Progressive education had its violent critics, of couse. One of the most widely-read was a free-lance writer named John Keats. (Not the John Keats whose works you know) Keats tells of visiting a vigorously progressive classroom, in which the full arsenal of "advanced" techniques was in use. These third grade children were voting on what to study, i.e., Mexico or sanitation; deciding for themselves how to study it, i.e., "library research" or an excursion; and above all, engaging in a great deal of committee work, with each child supposedly responsible for making his own contribution to the report of the whole committee to the class. Keats became especially interested in one eight-year-old, who seemed both highly intelligent and a born leader. Repeatedly, the class accepted his suggestions; he was regularly chairman of his committee; and his group's report always showed unmistakable signs of his contributions and influence. After one particularly committee-filled, cooperative day, Keats approached his precocious friend. "Well," he said, "did you learn anything today?"

The boy's reply would not have pleased his progressive teacher. "I certainly did," he said. "I learned that if you really want to get anything done, you've to do it yourself!"

And this is the gist of my meassage to you tonight, too: if you wish to have a truly effective programme of services for the pre-school children of Kenya, you will have to design it yourselves. I am not discussing financial assistance at the moment; I am referring to the realm of ideas, of imagination. Imported ideas are under close scrutiny in Kenya at the present time, for good and proper reasons. Imported ideas about nursery schools should be particularly well-scrutinised, for reasons I shall make clear, shortly.

I mentioned that I was personally pleased to be invited to speak to you, because it gives me an opportunity to organize my ideas. There is a second reason why a talk on this topic is particularly appropriate at this moment. There are definite signs that Kenya is entering a period of growth and change in the pre-school field. This will be a period of both promise and danger. So it makes sense to discuss the possibilities with a group such as yours. For example, I understand that the Ministry of Education is currently re-assessing its present policy - which is essentially one of noninvolvement - toward nursery schools. If true, this is welcome news.

Further, a "task force" called together by the Ministry of Social Services, is currently compiling a set of suggested policies and procedures for the nursery schools of Kenya. The Committee includes representatives of other ministries, local government, and a wide spectrum of private agencies. The Committee's report will be a valuable aid and inspiration to

isolated nursery school teachers throughout Kenya. But it will represent only the smallest beginning of the work that needs to be done. I am not criticizing the members of the task force; after all, I am one of them! But we have neither been given, nor have we requested, the mandate and resources required for the larger job.

Third, and certainly of most significance, is the tremendous post-uhuru surge of enthusiasm for nursery schools. Within Nairobi alone, there are 165 officially registered nursery schools and day care centres. This total does not include an almost equally large number of unregistered Harambee nurseries, and small-scale private enterprises. No government can ignore indefinitely a mass movement of such proportions.

I said earlier that this period of change and expansion, which I believe to be imminent, contains elements of both promise and danger. The "promise" must be fairly clear to all of you. Crudely phrased, it is the establishement of a nation-wide network of publically-supported nursery centers. This appears to be a reasonably clear goal, but in reality it is not. I shall return to this problem at the end of my talk.

First, however, I want to discuss what I regard to be the gravest danger to the successful development of a distinctly Kenyan programme of services for pre-schoolers. It is not, as you might predict, the prevalence of so-called untrained teachers, the possible shortage of funds for an expanded programme, or the supposed inadequacy of the present stock of nursery school buildings. Before such judgements are made, a set of standards must be formulated - a set of standards appropriate to Kenya and its own aspirations, not a set appropriate to some foreign country. These worries are, I think, premature until the standards are set.

The danger that concerns me most is that Kenya will adopt a superficially-altered brand of nursery school practice prevalent in another country, without carefully examining the amazingly varied range of nursery school practice that prevails around the world; or analysing carefully the traditional child-rearing practices of the Kenyan people, and the problems these people now face, to discover truly indigenous problems and solutions which can be blended into the national programme. Of these two possible omissions, the second would be much more serious, I believe.

Kenya already is faced with the enormous task of "Africanising" its primary and secondary schools. There is no need to repeat this history with the nursery schools, if the Kenya Government picks its advisers from a variety of sources, and if Kenyan professionals preserve and use their critical judgement and knowledge of their own people.

The present state of pre-school education overseas is curious. First, the field is booming: more and more countries are establishing as national policy the support of schools and centres for two year olds, three year olds, and up; in some, the attendance of such toddlers is virtually compulsory. At the same time, in the democratic states, there is in reality no single canon of "established practice", although many pre-school experts would have you believe otherwise. Rather, there are many vigorously competing ways of running centres for pre-schoolers none of which is obviously the "best" for Kenya as she enters the 1970's.

Perhaps the best analogy for the present situation in pre-school education, for this audience, is to compare it with the period of missionary activity in East Africa, thirty or forty years ago. At that time, numerous Christian sects were competing for the adherence of the African peoples, and each presented its view of the new faith as the only pure and correct version. Nor was it at all easy for a prospective converts to learn from a missionary of Church A that there indeed existed missionaries of Churches B, C, and D, whose opinions on matters of faith and history differed considerably from Missionary A's. If the existence of these competitors was admitted at all, it was to describe them as the purveyors of a perverted doctrine. With only a little exaggeration, this is the state of pre-school education today. Rub a nursery school expert, and you

will discover a sectarian. Not a religious sectarian, of course, but a zealot, who knows exactly how a pre-school teacher should be trained; which materials are "best" for the three-old; what are the universally significant influences on a child's intellectual and emotional development.

The trouble is that if you consult a genuinely varied group of experts (and you must not allow one expert to refer you to another because the second surely will be an ally of the first), you will obtain a generally mutually contradictory array of advice about so-called "established practice". If you are honest in evaluating the answers you receive, you will be right back where you started: faced with the task of designing a genuinely Kenyan solution to Kenyan problems.

Let me emphasise that I am not impugning the motives or abilities of the experts. They certainly do know something about how to work with specific groups of children in their own countries, children who share certain formative influences and who thus exhibit certain common characteristics. Some, also, are intuitive geniuses in understanding and managing children. I am only saying that the experience gained from their work with children may have little relevance for Kenya, or even for a majority of the children in their own country, and that they may not be aware of this limitation.

I think that I ought to try to document my claim that pre-school practice is asvaried as I have made out. There is a very strong tendency in this country, as well as my own, to assume that the term "nursery school" means the same thing to all people. Actually, this is quite far from the case. In the typical Israeli Kibbutz, or communal agricultural settlement, for example, the nursery is an institution in which all infants and children live, sleep, and eat from a time very close to their birth. In these common quarters, they are visited by their parents for an hour or so a day when the latter's work is finished. Over weekends, the children may visit and eat in their parents' home, which is not far away in the settlement. The children are cared for by specially trained nurses, who in some settlements are rotated reguarly to avoid the stabilisation of close attachments. This type of nursery school was expressly designed to break down family ties and individualistic behaviours, which the pioneers thought to be excessive in traditional Jewish life, and to encourage young people to look for personal fulfillment within their peer group, and later in the communal settlement of which they are members. I would remind you that only a small number of Israelis live in Kibbutzim, of course.

The American middle-class mother and father would be aganst this ideology and behaviour. They send their child to nursery school, at age four or five, and for half a day only, mainly to temper the effects of a totally different early childhood environment: the intense isolation of the typical suburban home. In truth, many middle class American children do not have conveniently located playmates of approximately their own age. Thus, the mother thinks of nursery school as a good thing because her child will learn "how to get along with others". Alternately, she may say that her child is learning "how to play with other children", a task which seems highly gratuitous to most foreigners who have not resided in an American suburb. She may also add, if she is honest enough, that she values the nursery school for the daily babysitting service it provides, allowing her also to escape from the isolation of her sparsely-populated home.

But this is not the only kind of nursery school in existence in the United States at the present time. Social workers and other psychologically-oriented professionals have developed another type which I shall label loosely the "therapeutic". In these schools, emphasis is on helping the individual child to understand and resolve his particular emotional problems. The nursery school group is more important as a setting within which events promoting insight can occur, not as a small

society in which Johnny may "learn how to play". The therapeutic school serves two types of children: the emotionally-disturbed, and the offspring of the lower classes, whom many professionals tend to group with the emotionally disturbed. More than other types, these schools emphasise highly trained teachers, psychological sophistication, and a rich array of play materials which aid teacher and child to understand the latter's disturbance. And it is this type of school that is most commonly promoted overseas by American advisers.

Especially with respect to the so-called underprivileged population, this approach has been challenged in recent years by a new hard-nosed breed. These people reject the complicated psychological interpretations of the social workers, claiming that the overwhelming need of underprivileged children is intelligent tutoring in the rudiments of academic subjects. Success in school will solve most of the children's other problems, it is asserted. This approach, developed most systematically by Drs. Bereiter and Engelmann of the University of Illinois subjects the child to a demanding series of intellectual and academic exercises, bearing little resemblance to the "play materials" of the middle class and therapeutic schools. Note, however, that these exercises are not the alphabet, the "two's tables", or handwriting exercises, but logically and psychologically derived preparations for these subjects. The Bereiter and Engelmann "cramming" is similar in spirit, although not in practice, to nursery schools in Japan, which are run largely on a private basis. Entrance to most Japanese schools, even at the primary level, is highly competitive, with the schools ranked hierarchically and selection (as with the CPE, School Certificate, and Higher Certificate in Kenya) increasingly rigorous as the children ascend the educational ladder. Nursery schools in Japan are very narrowly academic; their main purpose is to prepare children for the primary school selection exams. These nursery schools seem most similar to those I have observed in Kenya, although I realize that the schools in this country are not all cut from one cloth.

To return nearly full circle, the best-developed Russian nurseries, or creches, are similar in many respects to the Israeli Kibbutz schools, although with important differences. The two share a preoccupation with decreasing the dependence of the child on his family of procreation, and to this end are full-day or even residential in nature. The Russian schools stress competition, but competition among small groups of children rather than among individuals. The individual child is urged to be proud of his group's collective record, or ashamed of its failings, rather than his own. This learning, the Russians believe, is the first step of a long series aimed at assuring the adult's wholehearted participation in the socialist state of which he is a citizen.

Lastly, I would mention the concept of the day-care centre, found in many countries around the world, including Kenya. Some of the pre-schools I have described are also in fact day care centres, but their major goals for the children are psychological, academic, and moral-civic. To these, the orthodox care centre adds a vigorous concern for the health and nutrition of the child; makes it possible for mothers and guardians to join the full-time labour force; serves as focal point from which other welfare agencies can offer assistance to families in distress. These are additional examples of the kinds of services which Kenya one day may elect to offer to its pre-school age children.

With these seven examples, which are a bare sampling of the possibilities, I trust that I have made my main point: that the variety of pre-school practice around the world is emormous. I would like to stress three other conclusions from the examples, which may be less obvious.

First, each of these sets of pre-school philosophies and practices dovetails, to some extent, with the larger society in which it is found. Thus, the Russians, with admirable logic, strive during the child's earliest years to plant the seeds of socialistic cooperation and citizenship. Bereiter and Engelmann, recognizing the fundamental role of school

achievement in modern American life, take strenuous steps to prepare underprivileged children for the formal instruction they will later experience. And so on. If Kenya develops its own version or versions of pre-school education, it will only be doing what other nations, or groups within nations, have done.

Second, I would point out that the countries to which Kenya currently looks for training and examples in pre-school affairs are the U.K. and the U.S. I am not sure that these traditional exemplars are the most appropriate ones, for the purposes under discussion. If Kenya wishes to preserve and refine the admirable spirit of Harambee, for example, the United States has very little to show her. We don't do things that way. Better try Israel, or Russia, or perhaps Sweden.

Finally, I suggest that the task of finding out about these various styles of nursery school practice is a complicated one, because the "sectarian" devotee of one kind of school is not likely to tell you about his competitors. Actually, he may know very little about them, given his own narrow training. In addition, he may find his rival's creed exeedingly repulsive. Proponents of "therepeutic" schools often feel this way about Bereiter and Engelmann's methods, for example. Nor is a Russian expert likely to tell you much about an American middle class school.

I have spent most of my time talking about the variety of practice in other countries because it is a subject of which I know a little. Further, it is a topic on which people in most countries are uninformed. But I have not spoken much about indigenous Kenyan child-care practices, even though I earlier asserted that these will be more important to examine than foreign nursery schools. I have hesitated to speak because under the circumstances that currently prevail in Kenya and most of Africa, you know much more about these topics than I do. You know how you bring up your own children; you know how your parents and grandparents brought up their children (if you don't, you ought to find out); and you know the strains and difficulties your parents faced, as conditions changed over the past fifty years or so. Systematic social science research on these topics hardly exists.

Further, you know the kinds of young adults you hope to rear, and the techniques and child-care arrangements that seem to produce them. It is from this body of wisdom, much of it quite traditional, that a Kenyan programme of pre-school services must take its inspiration. Any expatriate who tells you that a particular child-training custom is either good or bad is behaving in a professionally irresponsible manner, for he cannot possibly know enough about the context and meaning of the custom in question. I would exclude from this condemnation only certain matters of health and hygiene. I do not mean to suggest that greater insight into the nature and effects of Kenyan parents' child-training techniques is not ultimately obtainable. This, fundamentally, is the assignment of the Child Development Research Unit, of which I am currently Field Director. Some day we hope to be able to present you with a series of systematic accounts of child-training and its effects, in a variety of settings within Kenya. Other people are working on the same task, apart from CDRU. But except for a few bits and patches, the results are not in, and will not be for some years. We look for the moral support of groups such as this one, for our work, and for the later work of our Kenyan colleagues whom we are training both here and in the United States. In the meantime, the task of drawing from Kenya's conventional wisdom to form a sensible, indigenous pre-school programme must be yours, and your Government's.

Some of you may wonder what I mean by "traditional" or "conventional wisdom" from which elements of a Kenyan pre-school programme might be pieced together. Although it violates my just-announced principles, I shall give you one example - provided you do not take it too seriously, and realize it is offered quite irresponsibly. I refer to the Kenya-wide (I think) institution of the ayah. Not the adult maid-servant of the middle class family, but the six-, eight-, or ten-year-old girl who looks after the

youngest toto in all but the poorest households. These girls are often cheerful, patient, and quite reliable caretakers. Why could not a thoroughly Kenyan nursery school employ the services of some of them, as apprentice teachers? Always under the supervision of trained, more mature teachers, of couse. Using these "super-ayahs", something might be done to reduce the prevailingly high teacher-pupil ratios in the nursery schools. And do not forget that these girls will themselves become mothers in five or ten years. What they would learn as apprentice teachers, in the way of sanitation, nutrition, techniques of discipline, teaching, would be readily applicable in their own homes. I suspect that a year or two of such service would be much more valuable than the equivalent time spent in the upper primary standards.

I said early in my talk that the "promise" of the present period is often construed as the possibility of the establishment of a nation-wide network of pre-school centres. I said that this version of the "promise" is vague and premature, for reasons which I have tried to make clear. It is putting the cart well before the horse.

Let me, in closing, outline to you what I regard as a more adequate and (if you will pardon the enthusiasm) more glorious expression of the "promise". For if Kenya can accomplish what I now suggest, it will not only have benefitted itself, but also have set an example for the rest of the world.

First, the people of Kenya, through the leadership of the Government and private agencies such as this one, must decide on the kind of society they wish to build. As the Israelis and Russians have done, quite explicitly; and as Americans do less obviously, through their choices of nursery schools, living arrangements, etc. Do you wish a highly cooperative society, like the Kibbutz? Or a competitive one, as in the United States and Japan? How important to you is the physical health of your children? What emphasis do you wish to place on the academic achievement of the population as a whole? These questions, and similar ones, can only be answered by the Kenyan people themselves, and are being answered, but the debate must continue, and intensify.

Second, a careful assessment must be made of the nation's relative attainment of its own goals. This is a task in which the Government and the citizens may be appropriately assisted by professionals of various sorts, for accurate answers to such questions require a degree of technical knowlege. Let us assume that a highly educated citizenry is one of your goals. What, then, are the attainments of representative children at various levels in the educational system? What factors impede or assist their educational progress? When are most strategic times for intervening to remove the impediments, or for reinforcing the factors that make for rapid learning? Assessments such as this are essential before the task of pre-school programme-building is begun.

Third, given the existence of certain shortfalls - educational retardation, common physical afflictions, psychological disturbances affecting significant numbers of youngsters, and so on - the design of a truly Kenyan pre-school programme could go forward. Note that it might be concluded that the most serious problems can not be effectively combatted in the context of a pre-school effort: health issues, perhaps, can be dealt with most effectively in the pre-and ante-natal clinics; educational retardation in the early primary grades. I do not think that conclusions of this sort are likely, but we must be ready to entertain the notion that pre-schools are not the most effective means of attacking specific problems.

Given the decision that a series of pre-school services will be of assistance, planning should go forward. The design of the programme will be much informed by objective study of a wide range of overseas solutions, sympathetic analysis of indigenous techniques, and the application of considerable imagination toward the invention of new services seen nowhere else previously.

Finally, and only finally, the "institution of a nation-wide system of pre-school centers", whose structure and very placing is based on the preceding three stages, may go forward.

I have spoken to you this evening about certain of the problems you will face in organising pre-school programmes for the children of Kenya. My most frequently reiterated point has been to advise you to rely on your own traditions and imagination in designing your programme and not to listen too respectfully to the advice of outside experts such as myself. I think it is fitting to end this talk with a word that is used to close many talks and speeches in this country, and which is a very apt summary of my main point. I shall not be able to pronounce it with quite the vigoar and enthusiasm with which it is usually utterd. And I shall say it only once, rather than three times.

And that word is - Harambee!

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INFLUENCE OF FAMILY BACKGROUND AND MATERNAL CONTACT ON INFANT PHYSICAL AND PSYCHOLOGICAL DEVELOPMENT IN AN EAST AFRICAN COMMUNITY

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BACKGROUND

Since the work of Geber reported in 1958 and Ainsworth reported in 1959, it has been a widely held belief that sub-Saharan African infants are precocious in their psychological development. While these studies and others (Warren, 1970), leave much to be desired methodologically, the overwhelming evidence suggest that African infants during their first year of life are precocious in their motor development, and questionably so in their perceptual development based on standard U.S., French, and British Infant Testing Norms. Further, ignoring the critique which might be made of the methodologies employed in those studies, there was a strong hint in several studies that this precocity held for those infants raised under rural and/or traditional circumstances and was not evident for those infants who were of more urbanized and/or middle-class family background. The issue raised here, of course, is whether the precocity in these infants, which might be assumed to have a genetic basis, is influenced in some way by sociological and/or cultural factors which might modify the rate of development, assuming that nutritional factors do not play a major role in this largely breast-fed population.

The purpose of the present study was to ascertain:

1) Psychological developmental norms in Kenyan infants utilising a standard testing instrument (the Bayley Scale) in a longitudinal study during the first year of life;

2) To determine whether or not there is psychological precocity in a Sub-Saharan African infant population using more rigorous methodology;

3) To determine whether precocity, social and psychological, is related to the selected demographic variables such as family structure, economic status, place of residence, etc.;

4) To determine whether maternal variables such as education, social attitude, maternal caretaking might account for this presumed precocity.

DESCRIPTION OF PROJECT

These data were collected over a one-year period of time during the author's residence in a periurban community near Nairobi, Kenya, during his sabbatical leave, August 1969-August 1970. The author lived with his family two miles from a Kikuyu village and served as Director of a Child Development Research Unit affiliated with University College, Nairobi and Harvard University. This research project had been operating in the village for the previous two years and is due to continue for an additional three years. Because of the ongoing relationship with the village, rapport established by previous investigators was excellent and continued with a high degree of success throughout the year's stay in Kenya.

Location of the Village

Ngeca village is a Kikuyu community located near the "white highlands" of Kenya approximately 25 miles from downtown Nairobi. The community lies at an elevation of 7500 feet and is now primarily agricultural with some remnants of previous herding activities in the form of cows, goats, and sheep. Approximately 4500 individuals live in the community in an approximate area of 9 square miles. The community has been stable since the time of the Mau Mau uprising in 1958 when people were allowed to

return to their lands or resettle in the present area. The periurban nature of the community provided us an opportunity to study a sample in which there are wide variations in education, income, job opportunities, as well as adherence to traditional practices.

The community consists of three sections: 1) an inner-community in which individuals owned very small amounts of land, barely sufficient to sustain them unless they had outside remuneration; 2) a more favorable agricultural section in which stable, extended family homesteads provided sufficient opportunity for cash crops and more modern version of extended family arrangements; 3) a third portion of the village which was most traditional consisted of relatively large farms with polygamous family households with more than sufficient land to maintain themselves agriculturally.

Sample

The primary sample consisted of 72 mothers and infants. All of these infants were born between July 1, 1969 and December 31, 1969. Most of the mothers in the study were contacted during their pregnancy through a village informant. They agreed to participate in the study and in return they received medical attention for themselves and their children on a once-a-week basis in a clinic set-up by the author. Five mothers and infants were dropped from the study for various reasons, leaving a total of 67 mothers and infants in the final analysis. All mothers were Kikuyu in ethnic background and all were practicing or nominal Christians. Education of the mothers varied from none (approximately half the sample) to as high as Standard 8. Father's and/or income of the family varied from marginal subsistence to a relarively high affluence for this community.

Family Structure

The final sample consisted of 13 polygamous families, 26 nuclear families with the father present at home, 18 nuclear families with the father absent for varying periods of time, and 10 families with either no husband and/or husband dead.

PROCEDURE

August through December 1969 was spent in training African research assistants, all of whom had reached at least the Form 4 educational level. Data was collected by research assistants on a daily basis, generally six days a week and supervised directly by the author.

DATA COLLECTED

Demographic Data

These data were collected by research assistants using the mothers as informants:

1) Household composition
2) Maternal lineage
3) Paternal lineage
4) Economic status
5) Educational level

All of these variables have been coded on IBM sheets preparatory to being put on punchcards.

Psychological Growth and Development

These data were collected by a British-trained, Kikuyu midwife-nurse who was trained to do infant-testing by the Principal Investigator. The infants were tested at two-month intervals during their first year of life. Twenty-two of the infants were tested from age 6 to 14 months beginning in January 1970; 45 infants were tested from age 2 to 12 months beginnings in January 1970. There were four to six tests for each infant.

The data analysis has proceeded to the point of being completely coded and recorded on cards. Preliminary analysis indicates that the programme for the curve fitting in analysis of individual items is successful.

Physical Growth

These data were collected by the midwife-nurse and by a Kenyan physician who worked with the Principal Investigator. Heights and weights were obtained for each infant several times during the course of the year and, as well, two complete physical examinations were done by the physician in March 1970 and again in September 1970.

The data analysis has not been started. The data are ready to be coded and placed on punchcards.

Attachment Behaviour

Assessment of social behaviour was made through a special behavioural test developed, following some of the observations by Bowlby, Schaffer and Emerson. The behavioral test consisted of assessment of infant's ability to recognize strangers and their response to separation from their mother. At two-month intervals, during the course of the first year of life, a research assistant assessed the behavior and response to mother; infant's caretaker, if any; and response to a stranger in the form of an African research assistant.

The data analysis has not yet started.

Home Observations

Attempt was made to assess the infant's relationship to his mother with periodic home observations. This was accomplished by means of "spot obvervations" made at home by a research assistant which consisted of a five-minute period of assessing mother's relationships to the infant's social environment, and infant's activity. Some 15 to 20 observations of the home were made in the course of six months, spaced periodically during the day and of sufficient number for statistical analysis during various phases of the infant's growth and development during the first year of life.

The data has all been coded and placed on cards, ready for statistical analysis.

Modernisation Attitudes

A modernisation test, developed by A. Inkeles, has been used in six cultures throughout the world generally with males to assess attitudes towards "modernization". This test was translated and pretested and utilized for both the mothers and fathers in this sample to assess possible relationship of modern attitudes, rather than formal education, to the infant's psychological development during the first year of life.

The data have been placed on cards and are ready for data analysis.

PRELIMINARY RESULTS

Analysis of the Bayley psychological development data clearly indicates and confirms the early reports of motoric precocity in Kikuyu infants during their first year of life. As others have found, this precocity is most marked in the first seven months of life, falling off in comparison to U.S. norms after the seventh month of life.

Unlike other findings on African infants, the results of testing for the perceptual sensory (mental portion of the test) also indicates precocity for these infants. Though this precocity is less marked than for motoric development, it is statistically significant and is sustained throughout the entire period of testing through the 13th month of life. Analysis of individual items is proceeding but suggests, as others have found and/or have suggested in their work, that those items in the test which are more culture-bound (i.e., very fine motor coordination involved in picking up small pellets, manipulation of cubes, etc) are below U.S. norms.

In order to ascertain the effects of selected demographic variables which might be associated with these results, all of the data for both mental and motor development was statistically analysed to establish Kikuyu infant norms. Deviation scores from this Kikuyu infant curve were then established for each infant and these scores were subject to analysis for the presumed relationships. Multiple regression techniques were used in order to assess the proportion of contributions of various demographic variables to the deviation scores.

CORRELATION WITH MENTAL SCORES

Economic Factors	.37
Modern Amenities	.36
Density of Individuals in the Household Aged 20-40	-.22
Density of Individuals Aged 13-20	+.20

Multiple correlations of these factors combined was .51, accounting for 25% of the variance. All of the above were significant at $<.01$ level.

CORRELATIONS WITH MOTOR SCORES

Density of Individuals Over Age 40	.30
Economic Factors	.26
Density of Individual Age 40	-.23
Sex	+.17

Multiple correlations of all of these was .45. All of the above were significant at $<.01$ level.

Looking at the individual responses on the demographic variable, the mental score was related to $<$ .05 level. Father's occupation, cash income of the family, father's church membership, modern amenities in the household and sources of water. For the motor score, $<$ .05 level was the cash income of the family.

Futher analysis of these data is in process along with maternal behaviour data which will help elucidate the relative importance of maternal factors in infant precocity.

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FORMAL EDUCATION AND RURAL DEVELOPMENT

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This paper originally was presented at the study seminar on "Strategies For Increasing Productive Employment in African Countries," held at Limuru Conference Centre, 21 October - 2 December, 1973.

Education should be a process which prepares an individual for the opportunities and the challenges of his society. Ideally, his education shapes an individual so that his skills, abilities, interests and concerns---in short, the kind of person he becomes--utilize his potentialities and simultaneously afford him a place in his society. Ideally, education develops a person in such a way that his maximum growth makes maximum contribution to the needs of others and the general welfare. The question we will examine during this session is: how adequately does our formal educational system prepare our students for our country's needs?

Because the basic features of our educational system are well known, we will mention them only briefly. The system consists of four levels: primary, Forms I-IV, Forms V-VI, and University. The CPE, EACE, and EAACE examination which determine entry to the next level eliminate 80 per cent of the candidates at each level, so that approximately less than five per cent of those who enter primary school continue to University.

Quality of student and school are measured by performance in these examinations; hence, energies of students and teachers are directed toward and circumscribed by examination preparation. At the same time, examinations are designed and used primarily as instruments to identify those who will perform well at the next academic level. The criterion for selection has come to stress coverage of materials; those who know more facts and more rules are those who are likely to make scores which will earn them a place at the next level. Thus, at each stage of the formal educational system, students' education is geared to the needs of the next level.

Our educational system is essentially an inward-looking one, selecting and training for its ever-diminishing opportunities and casting off those who fail as beyond its concern. Selection and training are based on the ability to absorb and reproduce information and knowledge, primarily the knowledge needed for specialization or expected of experts in these areas.

The system also seems to perpetuate existing inequalities within our society. We have the 40 per cent of school age children who cannot afford primary school fees, and remain outside the system altogether. We have the A, B, and C schools in Nairobi; the elite, government-aided, and Harambee secondary schools; and variations of expenditures, facilities, and resources by Province and District. The quality of a child's primary school will be determined by the affluence of his area and his family. This, in turn, largely will determine his chances of continuing within the formal educational system. The longer he continues, the greater will be his chances for well-rewarded and satisfying employment. Thus, a system ostensibly for the country as a whole, a system which consumes 33 per cent of the national budget, is a system which seems designed for those few whose backgrounds mark them as potentially high-level manpower even before school entry.

Our educational system seems built on contradictions. First, each level is designed primarily to be a foundation for the next, despite the fact that a majority of students will not continue to that next level. Therefore a majority of students terminate their formal education knowing bits pieces of the requirements for futures schooling instead of having a basis for understanding their lives and taking advantage of the opportunities afforded them. This criticism applies with special force to the rural areas where the vast majority terminate their education at the primary school level and where the gap is greatest between the conditions of life and the items to be learned in the syllabus.

Second, our students' training has developed primarily their abilities to absorb and reproduce, despite the fact that we are a rapidly-changing society in a rapidly-changing world. Therefore, a majority of students terminate their formal education without the ability to innovate, to develop solutions to problems, and hence to create new options and opportunities for themselves. We see in our country, especially in the rural areas, increasing demand for the expert, for the specialist, for additional government workers to assist the people to handle the opportunities and challenges of their lives and the development of their communities.

Thus, the ultimate contradiction of our educational system is that its outcomes seem almost to defeat its purposes. It does little to reduce the dependency of the majority on the minority, although it is supposed to make real the promise of independence for all our people. It does little to reduce the advantages of the minority over the majority, although it is supposed to be one of the major equalizing forces within our society.

What would have to change so that our educational system develops the majority rather than the minority, and reverses the cycle of increasing dependence of the many and the in-built advantage of the few? We have chosen to sum-up the interlocking and interrelating set of changes we envision by suggesting that at each level the terminal student must become as important as the continuing student. We now will spell out what we see as major components of this change.

First, this reorientation would lead to a re-examination of the curriculum. Items to be learned, especially at the primary level, would have to meet the double criteria of providing a basis for further study and increasing the student's understanding of himself and his physical and social environment. This kind of re-examination might lead us to eliminate some items taught in the present curriculum, for example the climatic conditions in the different regions of India, or the crops grown in Australia. It certainly would lead us to include items which help students understand the connection between the curriculum and the concerns of their daily lives. For example, learning the functions and operations of parts of the body could be applied to simple first aid, recognition of common diseases and simple health and nutrition. It could be made relevant to the workings of a helath clinic and hospital, and the functions of related extension workers. At the same time, it could lead to an exploration of prevailing fears of modern medicine and to the underscoring of customary beliefs and practices which promote health and welfare. Even this single example raises questions about the strict subject-matter divisions within our

curriculum, and our assumptions about the material appropriate for different age levels.

Second, this reorientation would lead us to develop a range of habits, skills, and awarenesses which are ignored through our narrow conception of learning as the process of absorbing and reproducing certain quantities of information and knowledge. These are the habits, skills, and awarenesses needed to create competence to handle local problems among those who operate at local levels. This competence is especially important for those who live in our rural areas because changing conditions have created new problems for which there are no ready-made solutions, and the solutions which are developed need to take into account the unique configuration of factors operating in each situation. Thus, development of our rural areas requires people who are capable of seeing the questions raised by their experience and who are capable of envisioning and creating change.

One way of developing this capability is to give students practice in identifying and solving problems, in making new combinations of ideas and knowledge. Assignments and examination questions must give students a chance not only to repeat what they have been told but also to deal with what they have <u>not</u> been told giving them practice in independent thought and analysis, and discovery and innovation. Students need to be encouraged to raise questions, and shown how to use questions to clarify their thinking. They need to be asked to examine and compare different ideas, interpretations, approaches, and points of view to break their reliance on a single solution and to develop the mental flexibility to perceive options, alternatives and new possibilities. They need to be guided to relate, connect, order and synthesize so that they can anticipate consequences and relationships. They need to be required to test generalizations and conclusions by accurate perceptions and fine distinctions so that they become realistic planners and organizers. In short they need opportunities to develop the skills and habits of testing theory in application, and sharpening perception and understanding by use of theory.

Another aspect of developing the capability of the majority is stimulation of students' confidence in their abilities to meet new challenges and problems. This confidence is developed through a recognition that one's own experience is valuable and important and that one's insights and ideas are listened to and used by others. So, our students need to be encouraged to make use of their own experiences during instruction. They need opportunities to learn from and listen to each other. Equally important, they need to be rescued from the orientation which views "I don't know" as a sign of inadequacy, and mistakes as something to be ashamed of. People who are trained to look "right" at all costs are unlikely to be self-starters and innovators. They remain followers, avoiding the risks of leadership and initiative.

It seems to us ironic that students at whatever level actually experience fewer responsibilities, have less practice managing their own lives than their non-school counterparts. At home, a young rural girl will be left in charge of the home and younger children, while at school she may only ask permission and follow directions. A woman student at the University must sign in and out and abide by curfews, while her peer who did not obtain University entrance plans and accepts the consequences of her own comings and goings. We see opportunities for undertaking responsibilities as important for developing the problem-solving approaches and the self-confident attitudes we have been discussing.

We would like to explain what we mean by undertaking responsibilities. We do not mean enforcing decisions or rules, or implementing projects set by the staff; students who simply carry out the thinking of others are denied the experience of weighing arguments, questioning and defending, and choosing between alternatives. At the same time, we do not mean making decisions or rules or initiating projects when the burden of enforcement and implementation falls primarily on the faculty. That is irresponsible independence and denies students experience in anticipating difficulties and consequences and learning from mistakes. We mean

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RESEARCH IN TEACHER EDUCATION

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RESEARCH IN TEACHER EDUCATION

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RESEARCH IN TEACHER EDUCATION

The topic of this session is "Research in Teacher Education." We will deal with this topic in three ways, examining the place of research in the training of teachers, research concerned with teacher education, and research which might be undertaken to provide teachers with information they need.

Research As Part of Teacher Training

Let us begin by thinking together what an individual learns as a result of research training and experience.

We all perform research continually as we go about our daily lives. Something arouses our interest, and we try to find out more about it: what it is made of, how it fits together, how it works, what it can do. Something happens and we try to find out why. Something breaks down, and we eliminate one possibility after another, until we have identified the source of the difficulty. Something has to be planned or decided, and we try to find out about alternative solutions so that we can predict which ones will lead to the results we desire. Something has been started, and we decide to check up to see if it is going according to plan. We have problems and ask for advice. We have hunches but postpone action until they are supported or refuted. We test unfamiliar possibilities before committing ourselves to full-scale implementation. In one way or another, we always are raising questions and collecting information to answer them.

The difference between ourselves and the researcher is that the researcher pays considerable attention to the process of raising questions and gathering information. Let us examine a few of the ways the researcher's approach differs from ours.

In the first place, the researcher raises questions about his questions. One of his concerns is that he will be led to complete, not partial, answers. Therefore, he asks whether he has raised enough questions about all the factors which may be contributing to a situation or problem.[1] He also asks whether his questions contain

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[1]One of the examples frequently cited in warning against ignoring factors in a situation is the famous Hawthorne study of ways to increase worker productivity. A group of women was placed in a special room, and during the period of a year, the physical working conditions of these women were varied systematically in order to determine the conditions which would result in improved productivity. No matter what changes were made, the production of these women rose steadily, even when their conditions were returned to the normal working conditions at the plant (i.e. no rest pauses, no special lunches, and a full-length working week). Therefore, the researchers were led to raise questions about factors like the opportunity to talk freely, a feeling of importance, and the absence of strict supervision which they had not thought of in their original consideration of the effect of physical conditions on productivity.

assumptions which will influence or affect what he will find.[1]

A second concern of the researcher is that his questions be answerable. Therefore, he asks whether his questions are sufficiently specific, if they have been formulated in terms that indicate the type of information needed for an answer. A question that is too general raises more questions. Reformulating questions to make them specific is the link between a question and its answer. A specific question guides one where to look, what to look at, how to go about getting an answer. For example, "Do children of important people receive a better education in Kenya than children of unimportant people?" may be a significant concern; it is not yet a question that satisfies a researcher. He would point out that "important," "unimportant," and "better education" all raise questions of interpretation. Because they are too vague, they are not yet useful guides for information-gathering.

A researcher also asks whether his questions are sufficiently limited, if they have broken down his original problem or concern into manageable units. To continue with our example, a researcher might also point out that it probably is easier to operationalize, or make specific, the ideas of "important/unimportant people" than the idea of "better education." For example it would be possible to find a set of jobs which are considered important by most people and another set of jobs most people consider unimportant and to compare the education received by children of these two groups of job-holders. However, it would be more difficult to select a single factor which makes specific the idea "better education." Some would consider it length of schooling; others consider it related to teacher qualification; others assert that it is shown in examination results; and still others argue that it has something to do with the ability to meet successfully certain out-of-school situations and problems. The idea of "good education" is complex and depends upon the occurrance and interaction of a combination of factors. In cases like these, the component factors must be identified and measured separately and then combined into some sort of scale.

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[1]This point is related to the previous one. Assumptions often prevent full examination of all factors. A misleading type of assumption frequently is made in studies of the causes of certain conditions. Recently, a student who was planning research on underachievement among secondary school students suggested that a cause of underachievement among secondary school students might be a dislike for the subject teacher. She had decided to question students who were not doing as well as they were capable of about their attitudes toward their teachers. She assumed that if many of these underachievers did in fact dislike their teachers, her question about what causes underachievement would be answered. She had made the incorrect assumption that if two factors are related, one must be causing the other. Therefore, she had failed to raise questions about additional factors which might be causing BOTH Underachievement and a dislike for teachers. Further, she made the incorrect assumption that gathering information only from underachievers would answer her question. In fact, without also checking on attitudes of students whose achievement is satisfactory, she even would be unable to decide whether any relationship exists between underachievement and dislike for teachers. A study on the basis of her original plan would have produced partial, and possibly misleading, information.

To ensure that his questions are answerable, a researcher also asks if information to answer his questions is available or can be obtained; questions for which no answers are possible are no help in solving problems. For example, we might be interested in factors which cause students to perform badly on exams and suspect that the amount of anxiety a student feels before an examination will affect his performance. If there is no way of objectively measuring amount of anxiety and if subjective reports of amount of anxiety are unreliable, the researcher might shift his attention to the problem of finding ways to measure anxiety, or he might turn his attention to the relationship between examination-weighting or examination-timing and examination performance. He would redefine his problem to be able to collect information.

A third concern of the researcher is that his questions be relevant to his concern, problem, or purpose. We all have had the experience of raising a question, becoming absorbed in some new topic, and at the end of the conversation or meeting being "back where we started" still needing an answer to our original question. Serendipidious findings are often important, both to the layman and the researcher, and a good researcher is alert to the possibility of finding something he was not looking for. However, he also tries to ensure that his questions and resultant information will clarify, not obscure, his problem. Therefore, he asks whether answers to the specific questions he develops also are part of an answer to his major question or concern. For example, a researcher might be planning to study why people decide to train as teachers. He has to decide which factors in a person's background seem to be important in determining career choice. He considers whether or not to include a question on interest in children, and decides to include it because it is an intrinsic motivation which expresses a central value of the personality. For the people who have a strong interest in children, teaching becomes what Carl Rogers calls "self-actualization." He considers whether or not to include a question on parents' occupation, and decides to omit it because there is no research evidence to show that children automatically enter the careers of their parents, especially in Africa where children have a wider choice of careers than their parents had. A researcher also asks how he will use the information he obtains from each question to be sure it is necessary. To continue with our example, the researcher is debating whether or not to include a question on hobbies, how people spend their leisure time. He first thinks that this question is not important because there is no evidence that hobbies influence career choice except in some specialized fields like athletics and the arts. Then he decides to include the question on use of leisure time because he will use it to check on how genuine, deep-seated, and long-standing the person's reported interest in children is.

The researcher also raises questions about his ways of gathering information. He wants to be sure that the way he obtains his information does not make it distorted, incorrect, or invalid. Therefore, he asks whether his way of collecting information will make it more likely to get some

types of information than others. Will his selection of information sources be representative of the group or situation he is studying? A young schoolboy while waiting for his parents decided to survey the vehicles parked at Embakasi airport. On the basis of his spot-check, he concluded that the Mercedes-Benz is the most common car in Kenya. American opinion surveys have begun to reject their former practice of drawing their samples from telephone directories, recognizing that by excluding people without telephones they had been excluding groups whose opinions might differ from those with telephones. Here in Kenya, we are familiar with the extension agent who sticks to the main road and the homes where he is welcomed warmly. He therefore lacks knowledge about the welfare and problems of the most needy families in his community.

In thinking about his method, he also asks whether his presence, observing, will influence people to change their behaviours. For example, it often is difficult to obtain an accurate picture of what really goes on in classrooms. The presence of the researcher leads teachers (and possibly students) to put forth extra effort and follow recommended procedures. A school we know of invites parents to visit on specailly designated days to observe children's classroom activities. Leaving with his mother after one of these "parents' days," a boy was overheard to remark: "Miss _____ must have thought this was a party; she was using her 'company' voice." If the researcher is planning to gather his information using a questionnaire instead of direct observation he asks himself if his questions will lead people to give the answers they feel they are supposed to give, instead of truthful ones, and if his way of asking the questions will make one response more likely than others. It is obvious that it is easier to get accurate answers to some questions than to others like income, morality, and personal relationships. What is perhaps not so obvious is that even the wording of the question itself will affect respondents' answers. For example, even such a seemingly small point as the order of choices will affect a respondent's response; when given a choice between three items, respondents tend to select the last-mentioned more frequently than the other two.

Research training and experience develop certain attitudes and skills. They develop a respect for questioning as a way to examine and systematize existing knowledge and experience and as a way to increase knowledge and understanding. They devdop the ability to formulate and use questions so that they become tools of analysis, planning, and learning. They develop a dissatisfaction with incomplete, partial, and haphazard analyses and the ability to be thorough and methodical. They make people accustomed to discovering that their assumptions are incorrect, their habitual views partial and misleading, and their opinions not shared by others. Consequently, they begin to free people from the limitations of their accustomed and familiar conclusions and explanations. They develop the desire and ability to look ahead, to anticipate problems and

difficulties, and the equally-important mental flexibility to recognize new possibilities and relationships.

In short, research training and experience develop a self-consciousness about one's ways of looking at situations and events, finding out more about them, and dealing with them. They give the habits and skills of independent learning.

Research training and experience develop attitudes and skills which seem especially important for people who will be teaching in our schools. Teachers essentially work on their own; compared to most jobs, teachers have little supervision and guidance and little opportunity to learn by watching each other. Therefore, a teacher must have the ability to examine his own performance, assess his own strengths and weaknesses, recognize and solve his own problems. Our Kenyan teachers share this responsibility for independent growth and development with teachers everywhere.

However, our Kenyan teachers face conditions which make the ability to examine present experience and problems in order to deal more skillfully with the future especially important. Because we are a rapidly-changing society in a rapidly changing world, no system of teacher training, despite its excellence, can provide adequate preparation for the conditions and demands a teacher will experience for the duration of his professional life. It is entirely likely that he will be asked to teach types of courses which were not even part of the syallabus when he received his training for teaching. It is even more likely that he will be expected to incorporate new information and interpretations into the material he learned when he received his training. It is absolutely certain that the community in which he teaches will be changing; students in the future will be growing up and shaped by conditions which will make them different from today's. They will know more and different kinds of things; they will have different interests, concerns, and aspirations; they will have somewhat different training and standards of behaviour and discipline. Therefore, the Kenyan teacher needs to be especially skillful at questioning his own effectiveness and devsing new approaches and methods in order to adapt to changing conditions. The 1970-74 Development Plan emphasises this need for adaptation of educational practices and thus registers an increased commitment of policy makers to innovation.

Therefore, we feel that research training and experience are important components of the training given to prospective teachers. In the next section of this paper, we will suggest ways in which practicing teachers can provide information which will improve the training of future teachers. Here, we suggest that a focus on research during training will improve teacher performance. We wish to stress that we are not thinking about post-graduate students whose studies already include research opportunities. We are recommending the introduction of research activities into the curricula of undergraduate and non-graduate level training.

There are several possibilities for introducing this type of experience. One is a special course in which students undertake research on problems they have identified. Courses of this type can be organized so that each student develops a small research project on a topic of special importance to himself. In this case, members of the course meet as a group to discuss common problems of design and implementation. Equally successfully, courses can be organized so that the students operate as a group, selecting a more complex topic and jointly formulating the research questions, research design, research method and instruments. In this case, each student selects some portion of the commonly-acquired data for analysis.

It also is possible to add a research project to many if not all of the courses already offered in the teacher training curriculum. First-year education students taking Child Development use their two-week vacation between first and second terms to collect information about child-rearing practices in their home communities. There is no reason why students could not use their period of teaching practice not only to gain teaching experience but also to investigate the advantages and disadvantages of a particular teaching method or organization of material, or type of examination question. Topics for research abound in all courses in the education curriculum which would give students opportunities and experience in investigating students' backgrounds and communities and in examining and assessing what goes on in the classroom and school community.

From their research, students would learn content and information they could use as teachers. Even more important, these students would learn a process of continued learning and problem-solving. They would have acquired a method to channel their natural curiosity into a systematic and well-ordered series of steps leading from the recognition of a question to its answer. They would have acquired a set of skills they could use again and again throughout their professional lives to assess, improve performance, and in turn raise new questions. They would have the tools to generate individual solutions to classroom problems and locally-relevant adaptations to changing conditions.

Research Concerned with Teacher Education

What we have said about our students applies equally well to those of us who are in the business of educating teachers. We too should be raising questions and finding answers--about the effectiveness of our policies and practices, about the needs and concerns of our students, and about the conditions and problems our students experience upon completion of their training. Equally important, we should be communicating our information and ideas so that we all can benefit from each other's work.

In preparing for this paper, we have had difficulty finding much reported material concerning research dealing specifically with teacher

education. At the University, a study has been completed which compares reasons for training as teachers of P.G.D.E. and first-year B.Ed. students. This study appears in the new Kenya Education Review. A paper by Dr. A.J. Maleche, "Why Join Teaching?" published in the East Africa Journal reports the reasons Kenyan primary school teachers join, and stay in or leave teaching. The Ministry of Education publishes an Annual Report which summarizes activities of institutions connected with education in Kenya, including teacher training institutions. This report also contains statistics useful for analysing the supply of available teachers. A recently-completed Master's thesis in the Department of Educational Foundations at the University contains information which is useful for considering improvements in the training teachers receive. It is a study of the Impact of the "New Primary Approach on the Quality of Teaching in Primary Schools in Kenya by Mr. D. Sifuna. Several other research reports of interest to those concerned with improving the training of teachers are "CONFIDENTIAL."

There are omissions from this brief list. Even so, it shows clearly that we have not yet taken seriously our responsibility to examine our present practices and policies critically and questioningly and to collect and communicate information about them which could guide and improve future practice and policy. We wish to stress a point which was implicit in our previous section: good and useful research does not require large budgets, teams of "consultants," or "experts," or a knowledge of advanced statistics. We suspect that much useful information is being lost for two reasons. First, because individuals and institutions see research as requiring these resources. Second, because individuals and institutions do not have a clearly-defined avenue for communicating the results of any research they might undertake. Lack of answers to the questions "who will find out about this" and "who will make use of this" probably kill as many ideas for research as lack of money or lack of time.

There are many activities going on which ought to be analysed and reported. We have learned, for example, of an experiment with reading at the Standard III level going on at Meru Teacher Training College, and of innovations in the use of models to teach science at Thogoto Teacher Training College. We at the University have used micro-teaching in the training of our students for two years; by now we should have told you what we are doing and what preliminary indications we have as to the strengths and weaknesses of this method. We all send our students out for teaching practice; do we collect information from them about their problems and difficulties, or analyse the evaluations they receive to find ways to improve their training? The Department of Educational Research of the Kenya Institute of Education has been undertaking a Combined Research Project to teach tutors the methods of research. These tutors then train and supervise their students who conduct research on educational topics. Not only would the research findings be useful for wide distribution but also a report of the project itself, describing the training given to tutors and to students, and analysing the difficulties encountered and

suggested improvements.

There are other investigations which individuals and institutions concerned with teacher education usefully might undertake. Follow-up studies of graduates would provide guidance for improving training and material to use in the training courses themselves. Information from teachers in a particular area, identifying the types of problems they encounter among people with specific cultural traditions and the adaptations they make to accommodate these traditions also would be a worthwhile input into our training courses.

We mentioned that lack of communication channels may contribute to the lack of research being undertaken concerning teacher education. We would like to mention two newly-available sources for dissemination. The first is the Kenya Education Review recently started by the Faculty of Education of the University of Nairobi. We see this as an important way to exchange ideas and information either in full-length articles or in brief reports. The journal also contains a "Research Registry" which will supply lists of on-going or completed research to facilitate contact between people interested in similar problems and make others aware of available sources of information. Secondly, the Bureau of Educational Research is willing to assist with dissemination, not only of the research performed by its own staff but also by anyone else involved in research relevant to education in Kenya. In addition to its published reports, the Bureau offers a Research Seminar every Wednesday at 12:30-2:00 p.m. in the Kenya Education Centre. At these seminars, people involved in research relevant to education give informal reports of their research projects. These seminars are open to all who are interested. Requests for announcements of future seminars or notes of talks which have been given can be obtained from the Secretary of the Bureau. Arrangements to lead a seminar can be made with the Acting Director of the Bureau.

Research to Provide Teachers with Needed Information

Since our teachers, be they in training or in the field, will be teaching Kenyan children about Kenya, they need information about their students and their own communities. It seems imparative that teachers and students training to be teachers become actively involved in producing the information they will teach. They can conduct small-scale community studies, survey pupil attitudes to subjects taught in formal and in informal settings, discover pupils' career choices, record community participation in education.

Over the last seven years, the Child Development Research Unit (now the Bureau of Educational Research) of the Faculty of Education at the University of Nairobi has accumulated a lot of information on the Kenyan child. (See Appendix) This is one type of research and information which our teachers need. It is scholarly research carried out by highly trained researchers. For this kind of information to be valuable, it needs to be made available to teacher educators in a way that indicates

its relevance and utility. One of the objectives of the Bureau is to collaborate with teacher educators to adapt and introduce this material into courses in Child Development and Child Psychology at teacher training colleges. Part of this collaboration would involve enrichment of this material by studies carried out at the training colleges by teacher educators and students.

In this paper we have presented some ideas concerning research in teacher education. We have suggested that research is an activity that sould be carried out by students training to be teachers, practicing teachers and teacher educators. We have argued that such research would fulfill several important functions. It would provide information needed by teachers about the Kenyan child and the Kenyan community. It would assist teachers and teacher educators to improve their effectiveness. It would develop skills and attitudes needed by teachers and teacher educators to adapt the education they offer to our changing conditions. Finally, it would develop a tradition of research as a generally worthwile activity, not as something esoteric and removed from the problems and concerns of practicing teachers.

Activities of the Child Development Research Unit

1966 - 1973

During the past six and one-half years, the Child Development Research Unit, now part of the Bureau of Educational Research, has engaged in the following types of activities:

- Establishing panel communities,
- Conducting research on special aspects of child development,
- Training East Africans in the behavioural sciences.

I. Establishing Panel Communities

The research strategy adopted by the Child Development Research Unit has been to conduct all research studies within small communities consisting of between 25 and 50 families and 100 or more preadolescent children. Members of these communities live in the same area, speak the same dialect, share oral traditions, and form a social network. They often attend the same ceremonies and participate in common activities. Most of them know one another's children. These panel communities, called P.S.U.'s (Primary Social Units), represent different degrees of modernization and urbanization and different ethnic groups throughout Kenya.

In each community, basic data has been collected prior to undertaking any specialized study. This basic data provide comprehensive background information and sets of variables to be used in the analysis of specific studies undertaken in these communities. The types of basic data collected about these panel communities include: for every member of the community - age, sex, birth order, position in the network of kinsmen, age-set status, educational achievement, religious affailiation, marital history, occupational history, residential shifts, economic status, and position on various dimensions of modernization and urbanization; for every household in the community - the floor plan, yard plan, farm acreage and crops, and the number of domestic animals; for the community as a whole - descriptions of the cultural values, beliefs and rituals which characterize community life.

Besides providing a general foundation for interpreting the findings of specific studies, the panel communities provide a base for longitudinal studies. In Kenya, longitudinal studies of individuals have been limited in size and frequency because of the difficulty of following-up individuals drawn by random sampling procedures. In the panel communities, careful collection of demographic information about all members of the community and the possibility of continual contact with the community minimize this difficulty. It is possible for the same researcher or for subsequent researchers to follow the physical, cognitive and/or emotional development of individual children over time. It also is possibly to identify changes in the family and the community and to trace their effects on children's development. Use of the same communities for a number of different studies also gives each researcher access to an increasing range of information about the individuals in his sample.

The collection of this basic family and community data is useful, not only for research but also for teaching. Descriptions of the variety of cultural contexts in which children are growing up, the ways parents provide for their children's physical and mental welfare, and their use of public services can be valuable in training future teachers and field workers who service families and communities.

This basic data has been collected by research teams which have included at least one member of the culture being studied. These teams have lived in or near the panel community for at least a year in order to establish personal relationships with members of the community.

To date, basic data has been collected on approximately 600 households (over 3,500 individuals) in the following communities: Ngecha, Kiambu; Kagongo, Nyeri; Kariobangi, Nairobi; Kangundo, Machakos; Itembe, Kericho; Kaplelji, Kericho; Leldayet, Kericho; Loita, Narok; Nyansongo, Kisii; Oyugis, South Nyanza; Kisumu, Central Nyanza; Vihiga, Kakamega; Kisa, Bungoma; Maralal, Samburu. These represent eight different language groups spread over five different provinces in Kenya. The basic data about these communities has been kept up-to-date by an annual check on births, marriages, deaths, movement in and out of the community, and changes in occupational and educational status, whenever possible.

The basic data are now being transferred to computer cards and to tapes and will be kept permanently by the Bureau of Educational Research to use planning and analyzing future studies. Statistical analyses will provide demographic profiles of the panel communities and will be published as research reports. A Series of monographs describing family life in several of the panel communities is in process of preparation. These monographs are being prepared for use as supplementary materials in the teaching of Child Develpment to students of education, sociology, pediatrics and nursing at the University and at teacher training colleges.

II. Conducting Research on Special Aspects of Child Development

Each research team collecting basic data also has undertaken one or more specialized research projects. These projects have covered aspects of children's physical growth and health, the development of cognitive abilities, motivation, social behaviour, social institutions, and moral development. (See attached listing of Studies in Progress and Completed, 1966-1973). The data collected and the instruments used in these studies are on file in the Bureau of Educational Research. The findings of many studies have been reported both in Kenya and abroad. (See attached Bibliography). Copies of all reports are on file in the Bureau of Educational Research

III. Training in the Behavioural Sciences

Training a group of research scholars qualified to carry out studies of child development has been a third aspect of the work of the Child Development Research Unit. During the past six and one-half years, about 95 . students from the Universities of Nairobi, Dar-es-Salaam, and Makerere have participated in planning research studies, developing research instruments, pretesting, collecting and analyzing data. Some students have undertaken their own research projects, sponsored by the Child Development Research Unit.

As part of the programme to train professional behavioural scientists, fellowships for post-graduate training in the United States have been made available to: hea Sigei Kipkorir (1968-69), Sarah Sieley (1969-70; 1971-72), Serah Lukalo (1970-71), Achola Pala (1970-72), Jane Geteria (1971-72), Samuel Ngugi Njoroge (1971-72), Mary Mungai (1972-73), Bernadette Shiakamiri (1972-73), Ezra Maritim, Esther Keino (1973-74).

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STUDENTS' LEARNING DIFFICULTIES IN A CHANGING SOCIETY

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This paper originally was presented at the Educational and Vocational Guidance Seminar for Secondary School Headmasters, held at Kenya Science Teachers College, Nairobi, 24-26 April, 1973, and subsequently published as "Students in a Changing Society," Kenya Education Review, 1, No. 1, 29-39, November, 1973.

INTRODUCTION

In this paper, we will examine the topic "Students in a Changing Society." We will deal with students between 13 and 20, the ages of secondary school students. The main task these students face is to make a successful transition between the world of the child and the world of the adult, to move from membership in the family to membership in the community and the society. Our students share this task with youth of all societies at any period. However, our students face conditions in our society in Kenya which make this transition especially difficult for them.

We will look briefly at three aspects of this transition and the learning difficulties they create: the conditions, the task, and the available ways of learning. Then we will look at the school, and think about ways in which our schools might better help our students deal with these difficulties.

STUDENTS' TRANSITION TO ADULTHOOD

Conditions

Our students make their transition from childhood to adulthood in a society undergoing rapid change. In traditional days, the rate of change was slow. Those who approached adulthood could see clearly the conditions they would meet and what they had to know to cope with them. Preparing for adulthood meant learning the knowledge and skills other adults already possessed and practiced. Youth had definite goals to achieve and definite standards against which to measure themselves. What would be expected of them was clearly known. It had been set by tradition and experience and generally was accepted and adhered to.

For us, the rate of change is fast and will continue to increase. With change comes unpredictability and uncertainty. The knowledge, skills, and understandings needed to be an adequate citizen, parent, and job-holder will change for each generation. This means that our students cannot simply look at us and find out, by our example, what they will need to know and be like. Not only that, the knowledge, skills, and understandings they will need will keep changing and expanding <u>throughout</u> the course of their adulthood. This means that as they look ahead, our students can see no stopping-place, no point to reach which will be sufficient preparation for the demands of the world. Being an adult, in the sense of being adequately prepared, is moving ever out of grasp as it is approached.

What now symbolizes for a youth that he has reached adulthood, that he is prepared for and capable of meeting the demands of his society? Is it completion of secondary school, when so many others who have completed are unemployed? Is it University entrance, when University students make fewer decisions regarding their own lives than those who remain outside? Is it possession of a degree or a diploma, when even these graduates find employment difficult? Is it earning a particular income, when some make do with less, and others do not manage with even more? Is it having a job and paying taxes, or must it be a particular kind of job? Is it getting married, or will it come to be <u>staying</u> married, if trial marriages, separation, and divorce become common? Is it any one of these, or is it a combination of several? If so, which one or which few tell a youth that he now can count himself an adult, that the period of preparation is over?

Therefore, looking ahead now raises questions instead of providing answers. Our students no longer prepare for predictable conditions, therefore no longer have a clear sense of what will be required or expected of them. This lack of clear goals and standards means that our students have no clear sense of what is worth knowing and needs to be learned. If one is not sure what one is aiming for, how does he decide how to prepare for it? It also means that our students find it difficult to develop confidence in themselves. If one is not sure what will be demanded of him, how does he decide that he is ready for it? Indeed, even knowledge of our success cannot give our students assurance of their competence, because they know that the conditions of their futures will differ from ours.

The Task

The major task for our students in their transition from childhood to adulthood is choosing between the opportunities which are available to them. Traditionally, a youth moved with others of his age through a series of steps; they worked and learned together, moving as a unit toward the clear set of

achievements which defined adulthood. All were included. The range of common activities was great and only a few prepared themselves for additional specialized tasks. The possibility of dispute about social values was slight. Each youth could anticipate with certainty his identity, position, and authority by membership in the community of adults.

Today, countless tasks must be performed, each requiring a different combination of knowledge and skills. There is competition for some of these tasks; only a few of the students who talk of law or medicine will become lawyers or doctors. Today also, our society is divided into sub-groups which are set apart from each other by different points of view, opinions, and values. Think of the groups an individual can join, and the choices he must make as he joins each of them. He now can join a church, choosing either the church of his parents' or any one of a multitude of denominations. He can be active in a political party, choosing either to agree or to disagree with the policies of his government. We could give more examples, all making the point that a youth no longer becomes an adult, he becomes a particular kind of adult.

This means that the students in our schools must choose on the basis of their own experience how to fit into, connect with, or relate to the world. There is no predetermined place waiting for them. This process of search and choice is more far-reaching than the selection of a career, or line of work, although that choice is a significant part of the more inclusive set of choices we are describing. We use the term "vocation" which combines the ideas of "devotion" and "work" to describe what each youth must find before he can feel himself and be acknowledged an adult. Choosing his vocation means choosing what to offer others and where to place his loyalties, abilities, and energies. To choose his vocation, each youth must discover two things. He must discover his own potentialities, what he can offer others, through their response to what he does. He also must discover what is valuable to him, what seems worth doing, standing for, and affirming. So each youth needs to be able to try himself out, and, through the consequences and our responses, develop a sense of himself, his possibilities and limitations. At the same time, he needs to be able to test us, to find our possibilities and limitations.

Ways of Learning

Our students must undertake this task of choosing the kind of adults they will become while isolated from participation in daily life. The traditional method of preparation for adulthood was through a system of apprenticeship, performing a task or undertaking a responsibility under the supervision of those who already performed the task or responsibility as part of their daily lives. This type of learning was concrete and specific; the skills and knowledges to be acquired were directly connected with their use and application. The items to be learned were valued because of their demonstrated utility and application. Those who guided were respected because of their proven competence in the tasks they simultaneously performed and taught.

Our method of preparation is through formal instruction, undertaken as a separate activity in isolation from participation in daily life. We extend the period of formal instruction longer and longer as the knowledges and skills required by our society become increasingly extensive and diffuse. We no longer can replicate a situation where individuals acquire abilities they already understand and have seen used. Our society is coming to depend upon knowledges and skills so specialized that the learner must be made aware of their existence and importance while being educated. We therefore are forced to separate the process of acquiring knowledge from the process of using and applying it. This separation makes difficult for students to feel involvement in and commitment to their learning.

This lack of involvement is accentuated by students' awareness of change. Think for a moment of the value which an item to be learned has for someone who knows that this same item was learned by his father, grandfather, the father of his grandfather, and also will be learned by his children. Now, think of the difference in value which an item to be learned might have for someone whose parents already have confessed that they can't make any sense of the "new math," or someone else who has spent time laboriously learning the names and capitals of countries only to find them changed before many months have passed. In one form form or another, our youth have experiences which lead to their awareness that there is uncertainty about what lies ahead, what they will become, and what they are being asked to learn.

OUR SCHOOLS

Let us now look at the world of the school to see whether or not there are ways that our students can be helped to deal with the difficulties created by rapid change, the need for many choices, and isolation from the world.

Rapid Change

It no longer is possible to prepare students with the information and knowledge they will need throughout their adult lives. The amount grows daily. Changing conditions will make many items obsolete or useless. The student who has learned to add accurately will enter a job where he will be expected to operate a calculator proficiently. We always will find out too late that we need people who understand Chinese instead of English, the working of a bureaucracy instead of 16th Century England, or ecology instead of physics. No matter how up-to-date the curricula, we always will pass on or transmit irrelevant knowledge and train for useless skills, while omitting knowledge and skills that come to be important and useful. Therefore, we would ask, to what extent do our students develop awarenesses and habits that make possible continued learning and adaption to changing conditions?

Let us break this question into three parts. First, what is done to connect our students with the world of expanding and changing knowledge and ideas? What is done to activate their curiosity? What exposures are provided to make them aware of and comfortable with the broad scope of understandings they will be expected to possess?

- For example, are newspapers and magazines part of the reading required of our students?
- What is done to encourage wide reading in a variety of areas in addition to the more thorough analyses of the classroom?
- What is done to encourage students to go beyond the learnings required in common and to share their findings with each other?
- What is done to bring knowledge of the world to our students by making use of Kenyans who have studied abroad, and adults and young people from other countries who live in Kenya? What encouragement is given to students from abroad to share their experiences and perceptions with our Kenyan students?
- What is done to give students awareness of the range of ideas, problems, and controversies which grow out of contemporary conditions by asking alumni and the available wealth of Kenyan and foreign experts to speak about their fields of study and activities?

Now, we would ask, to what extent are students given the habits and skills which make possible continued adjustment to changing conditions? If students leave school only able to absorb and reproduce, they are poorly equipped to deal with change. Changing conditions create new problems, and call for people capable of independent analysis and innovation. Are students given practice in solving problems, in making new combination of ideas and knowledge? Do their assignments and examination questions give them a chance not only to repeat what they have been told but also to deal with what they have <u>not</u> been told, giving them practice in independent thought and discovery?

- Are they asked to raise questions and use these questions to clarify their thinking?
- Are they asked to examine and compare different ideas, interpretations, approaches and points of view?
- Are they asked to relate, connect, order, and synthesize?
- Are they asked to predict consequences?
- Are they asked to test generalizations and conclusions by accurate perceptions and fine distinctions?
- Are they asked to apply their learning, testing theory in application and sharpening perception and understanding by use of theory?
- Are they asked to develop their interpretations, to suggest alternative procedures?

Finally, we would ask, what is done to help students develop confidence in themselves so that they feel capable of meeting new challenges and problems?

- Are their own experiences made use of during instructions?
- Are they asked to learn from and listen to each other?
- Does their training develop the attitude that being aware of gaps in their understanding, what they <u>need</u> to know, is as valuable as having an answer?
- Are they taught to see mistakes as opportunities for learning, or as signs of inadequacy?

Need for Choice

Our students no longer have a blueprint for their lives. They are faced with the need to choose both their careers and their commitments. To make realistic choices, they need knowledge and experience. They need knowledge of the conditions and problems which await them, because these conditions and problems will determine their options and opportunities. At the same time, they need to discover their own potentialities and limitations by beginning to experience the management of their own lives. They need to learn what they can offer their community and society through their participation in the life of the school community. They need opportunity to learn responsible decision-making so they feel capable of meeting the challenges and solving the problems they will face. Therefore, we would ask, to what extent do students have chances to learn about the conditions of adulthood and the meaning of adult behaviour?

Let us also divide this question into parts. First, what is done to give students information and understandings about the choices they will have to make?

- Do they have chances to learn about various lines of work from people in these jobs?
- How are students helped to find out about opportunities for employment and further training? Does assistance include systematic coverage of possibilities, their requirements, chances of acceptance, and how to apply?
- Does counselling emphasize University entrance, thus favouring students with ability to manipulate verbal (English) and mathematical symbols, or are other options treated as equally important?
- Are students exposed to a variety of viewpoints regarding the needs and future of our country?
- Do they have a chance to study and analyze the documents which shape policy, and therefore the opportunities which will be available to them, including the Development Plans?
- Do students have a chance to pose questions which are important to them to each other, their faculty, and invited speakers?
- Are students' interests, concerns, questions about themselves and their world valued and explored?
- Are students helped to achieve perspective on their situation by reading books that deal with the period of adolescence, and novels and biographies that show others confronted by the same choices and decisions they are?

Now, we would ask, what opportunities do our students have to begin to experience responsibilities involved in undertaking the management of their own lives? Before we list the committees, clubs, and activities students sometimes undertake, we would like to explain what we mean. We do not mean enforcing decisions or rules, or implementing projects set by the staff; students who simply carry out the thinking of others are denied experience weighing arguments, questioning and defending, and choosing between alternatives At the same time, we do not mean making decisions or rules or initiating projects when the burden of enforcement and implementation falls primarily on the faculty. That is irresponsible independence and denies students experience in anticipating difficulties and consequences and taking responsibility for unwise choices. Now we ask for a look at the life of the school community. In what areas are students given responsible independence? In some schools, they organize and run a student government, often referred to as a guild, union, council, club, or simply government. They organize and run clubs, societies, and associations centered around social, academic, professional, and ethnic interest. They plan a series of speakers. They write and produce newspapers and journals. They write and produce plays and music. However, even more important than our list might be student-faculty dialogue in our schools to determine the existing activities our students could manage and other activities they would like to initiate and be responsible for.

Isolation from the World

We already have examined the extent to which our students' learning experiences stimulate their awareness of the scope of knowledge, problems, and conditions in the world they will enter. We also have explored the extent to which what is expected of them in class and in the school community helps them prepare for independent responsibility in a changing world. So we already have looked at the extent to which training and experience in schools lead our students to wish to benefit their communities and our country. Are schools producing people who see as the aim of education the satisfaction of feeling

superior to others, because of an emphasis on competition for marks, a failure to ask students to engage in physical work, the custom of younger students waiting on older students, and lack of involvement in the problems of the communities in which the schools are located? Or, is part of our students' training, a training in service to others, not only within the school but in the communities in which they are living? Are schools, with their resources of energy, talent, and learning, parts of their surrounding communities, or are they simply located in them?

- Do our students know the problems of the areas which surround their schools?
- Do they attend community meetings?
- Do they support self-help projects?
- Do they help improve educational opportunities for others by tutoring, assisting at day-care centres, organizing sports and recreation?
- Do students arrange ways to make the facilities of schools available to members of the surrounding communities?
- Do students help the extension agents in the area by providing information and teaching materials?
- Do students receive assistance and support in their classrooms analyzing the difficulties they encounter in these activities and learning to devise improved procedures?

These questions do not grow out of our imaginations. We have seen young people of the same ages as our students combine study and service. Students elsewhere have:

- Helped communities collect information about their problems and needs.
- Helped members of local communities plan and organize action programmes.
- Built buildings in local communities.
- Organized tutoring programmes for primary school and helped implement adult literacy programmes.
- Served as volunteers in hospitals and clinics.
- Helped produce material used in educational campaigns.

SUMMARY

We have looked at the difficulties faced by our students in their preparation for adulthood. We have questioned whether the experiences provided in their schools help them meet these dificulties. We have examined whether the demands on our students' intelligence, capacities, and talents are limited to a narrow definition of learning, that is, simply absorbing and reproducing certain quantities of information and knowledge. We have suggested ways in which broadening the experiences and activities of our students might help them better understand and better fit into the world they will enter.

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THE EFFECT OF URBANIZATION ON THE BEHAVIOUR OF CHILDREN

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STAFF PAPER

The paper originally was presented at the University of East Africa. Social Services Council Conference, at the University College, Nairobi, 8-12 December, 1969.

In our research on children we have found that settings influence children's behaviour. There are three relevant aspects of a setting, the space and contents of the space, as in the set of a play, the cast of characters who are present on the set, and the activities which occur on the set involving the cast of characters. In the six populations[1] we have studied, which include children in Okinawa, the Phillipines, Northern India, Kenya, Mexico and the United States, children spent varying amounts of time in a variety of settings. Associated with these settings were particular types of behaviour. Our findings indicate that the characteristics of the settings evoke and reinforce habits of social interaction which become the core of a child's behavioural profile.

To date we have not explored in detail the behaviour of Kenyan urban children in the settings which a city offers to a young child. Since, however, the problems of city life are of concern both to countries which have long been urbanized and to developing countries, the Child Development Research Unit is embarking on an analysis of the effects of urbanization on Kenyan children. From the work of Thomas Weisner and his assistants[2] and some preliminary observation of Kenyan urban children[3] and interviews with urban mothers,[4] we have an estimate of the time young children spend on various sets, the people with whom they interact, and the activities they perform. On the basis of our findings from the Six Culture Study, we can make some preliminary guesses as to the effects of such variables on children's behaviour.

Let us consider the three relevant aspects of setting in turn and examine the components which have been found to affect behaviour. The first two, space and activity, are closely related. The type of activities which occur in the areas frequented by a young child are determined by the nature of the space, and these activities in turn afford practice in and reinforce certain types of behaviour. Let us take examples from different living arrangements found in Kenya. If children live in a homestead surrounded by two or more acres of land, part of which is under cultivation or in pasture, they can observe or actively participate in gardening or animal husbandry. If on the other hand they live in the centre of a periurban town on a small plot and the family gardens or pastures are removed from the dwellings, their mothers prefer to leave them at home and hence they may have less frequent chance as young children to observe or participate in subsistence activities. If they live in a housing project with only a few feet of packed clay in front and in back of their housing unit, they will have no contact whatsoever with such activities until they return to or visit the country.

In our research we have found that the opportunity and requirement that a child participate in the subsistence economy prescribes certain types of behaviour. In the study of children three to ten years of age in families from six cultures, we found that children who participated in the family economic pursuits were more altruistic than children who had only household chores to perform.[5]

Altruism here is used to refer to three types of observable behaviour: the offering of help and support to others and responsible behaviour as measured by the attempt of children to see that their brothers and sisters and friends obey the rules of the homestead and society. In societies where the only tasks that a parent could assign were housecleaning chores, the children showed proportionately less altruistic behaviour. It is our hypothesis that the belief that one is an essential contributor to the economic welfare of the family as well as a participator in activities requiring their performance reinforces helpful and responsible behaviour.

It is conceivable that the same training may occur in urban families where the mother works and the older children are responsible for tending their young brothers and sisters as well as keeping house, cooking, and even buying the food in the market

Since the societies which value and use children as helpers are those where the women have the heaviest workload,[6] working mothers in the city may instill the same values and train for the same behaviour in their children. On the other hand, they may find it more difficult to do so, and their children may find it more difficult to live up to expectations because other children in the neighbourhood are not given so much responsibility since their mothers are not away during the day. For example, an urban boy left in charge of an infant brother seemed to suffer more in his job and be more tempted by unoccupied neighbours than his counterpart in a country homestead. The latter was able to play around the homestead while the city boy was restricted to the house and small yard. Although the urban mothers who stay home may demand help, they are not really delegating responsibility since they are on hand to supervise and instruct. Our theory would say that for effective responsibility-training to take place, the child must be entrusted to perform tasks in the absence of adults.

In sum, at the present stage in our research, we would predict that children who do not participate in the subsistence economy will be less responsible and helpful than children who are expected to perform tasks which are related clearly to the economic well-being of the family. Although parents may arrive in the city with values about helpful and responsible behaviour they will find it difficult to train their children in these behaviours. Perhaps the mothers themselves were reflecting this problem when they commented that the ideal situation was to keep children in the country until they had learned right from wrong.[7]

The participation of children in important tasks also affects their obedience.[8] Here our findings from previous studies are less clear but there is some indication that, when children are required to be responsible, mothers put more pressure on children to be obedient. If this finding holds up, we would expect to find less compliant children among an urban sample. Our observations in such homes suggest that mothers who are home all day are more likely to issue commands prohibiting action than to command positive actions. Since the content of their restrictions may appear more arbitrary than positive commands related to task activity, they may find it more difficult to motivate their children to be obedient. For example, the urban mothers we observed struggled to keep their children from playing on the beds. Few similar problems or prohibitions occurred in the country. Furthermore, since the urban mothers' commands are less relevant to the welfare of the family as a whole and more motivated by personal feelings, these urban mothers may be less consistent in the following-through if the child fails to comply.

A second finding from the Six Culture Study relating behaviour to the activities which children perform is the association of their behaviour with the economic and social structure of the environment. Children growing up where there is specialization of occupation and social control administered by institutions whose power structure is outside the immediate community tend to be more egoistic than children who grow up where every man has the skills and materials to meet his own and his family's needs and does not require services from others, and where social control is still primarily in the hands of the elders of the town or community. Egoism here includes behaviour in which a child is observed to attempt to dominate others, or to seek help, attention or praise from others. In the rural areas of Kenya and less so in the periurban areas, most individuals can, if necessary, build their own houses, make their household equipment, and produce their own food. Cooking utensils, cloth, tea, sugar and salt are probably the most notable exceptions. These communities also attempt to settle disputes between their citizens in informal ways. Even in the periurban areas, there is local control of most of the issues which concern the education and training of children. Here too, in times of emergency, kin or local neighbourhood groups can be counted on to help. Once a family moves into the city, however, it becomes

dependent on specialists. The material to repair one's house is not available. One is dependent on the markets for food, on the housing authorities for water. If one trusts and uses the city social-control system it is necessary to seek help from strangers. Mothers report that children become more covetous, tempted by the goods they see displayed by neighbours and markets. These are the circumstances we have found to be associated with the increase in egoistic behaviour. The children in these settings are more apt to seek material goods and to seek help as they observe the dependence of their parents on outsiders. Many of the mothers commented that they did not know city ways and had to depend on their husbands and their school age children.[9] They lack the security of country women who know and feel competent in their roles.

Associated with the loss of self sufficiency is the loss of the belief that one is competent to shape the character and behaviour of one's children. Nancy Graves made a comparative study of urban and country mothers and children in Uganda[10] and reports that country mothers in Uganda believe that they have greater control over the shaping of their children than city mothers who are less sure of their efficacy.

The second aspect of setting which affects children's behaviour is the cast of characters who customarily perform the daily activities which take place on the set. The important attributes of casts are age, sex, kinship and number. The composition and size of the groups with whom a child interacts varies in country, periurban areas, and city. In any one of these locations, the child may have more or less contact with brothers, sisters, cousins, grandparents, and other kin. The extended homestead will have a larger cast of characters than the isolated nuclear homestead. A family in the centre of town may have many or few relatives close by; in the city, probably even fewer. In areas with a higher density of population, a child is a member of larger play groups unless his mother can restrict him successfully to his own house and yard (from my observation highly unlikely, for even the most conscientious of mothers). Our research indicates that these variations in size and composition affect two types of behaviour, namely seeking attention, one of the components of egoistic behaviour, and aggression.

We found in the Six Culture Study that in extended family households or homesteads when the grandparents lived in the compound, children sought attention less than in households where grandparents were not present. It is not clear whether this results from consistently more or less attention on the part of adults. Both ignorance and reward could account for the decrease. Since previous cross-cultural studies and a study by the Child Development Research Unit under the direction of Lee and Ruth Munroe[11] have reported that in extended families where there are more than two adults, infants are held more frequently and attended to more rapidly when they cry, I would favour the hypothesis that they a seek less attention because their needs are more consistently met and they have less expectation of deprivation.

The number of children with whom a child interacts also affects his behaviour. In our previous research, we have found that when more than six children get together in one place, the rate of assault and other aggressive behaviour increases. The increase in this type of behaviour is the result of the attempt of a child to influence others. Their refusal to comply to his wishes instigates the frustrated child to employ a series of techniques of persuasion to achieve his ends. These styles of persuasion become increasingly more aggressive if he continues to be thwarted. This theory would predict that the probability of being able to organize and manipulate the behaviour of others would decrease with the number of discreet individuals all of whom have their own motives and aims. A notable exception to this would be an aggregate of children who engage in a game with agreed-upon rules. With the exception of pitching stones and bottle cap games and such, the space offered by

urban environments makes such games impossible especially for young urban children who are not supposed to leave the immediate vicinity of the house.

Another consequence of frequent contact with large unstructured play groups is the increase in the likelihood of constant social interaction cutting down proportionately on individual behaviour requiring prolonged attention span. There is evidence both from our research in a periurban area of Nairobi and from other studies of children from crowded urban areas that constant interaction with large groups of children leads to distractibility. Cohn,[12] in a study sponsored by the Child Development Research Unit, found that children who came from the crowded part of a periurban town were less apt to pay attention to the planned activities in the Nursery School and engaged in more social interchange than children who came from surrounding homesteads. In sum, our research indicates that interaction with large numbers of other children leads to an increase in both aggressive behaviour and distractibility.

Finally, the continual presence of the mother in the cast of characters on the set or close by has the effect of restricting a child. As noted above, urban mothers frequently commanded their children to stop some type of behaviour which they found either irritating in the cramped environment or dangerous because of strange surroundings. Nancy Graves corroborates these findings, reporting that Ugandan urban mothers are more restrictive than their country cousins. Furthermore, the mother who has no work or activities away from the house and whose entire work consists of housecleaning, cooking, and child care probably has habits bred from boredom which affect her children. Urban mothers who did not have jobs outside the home spoke nostalgically of the country and expressed the desire to return to work on their shambas. I have the impression that they are less satisfied in their city role.

In sum, we would expect urban living to affect the behaviour of children because it confines them to sets where it is impossible for them to participate in subsistence activities but brings them rather in contact with specialists who furnish the goods and services ordinarily acquired self-reliantly by each family in country settings. The urban sets with their associated activities decrease a child's contact with altruistic and self-reliant models and reduce his opportunity to learn and to practice responsible and helpful behaviour. They increase his egoistic behaviour and covetousness. In addition, he is more apt to use aggressive techniques for persuading other children.

Assuming that further research will corroborate these findings, one may ask what are the consequences of the increase in egoistic behaviour. It would seem that the shift toward greater concern with one's own personal welfare is consonant with the educational system, since schools as well as the city breed the behaviour we have classified in this category. School settings encourage children who are ambitious and concerned with personal success. Seeking attention and praise are more acceptable in this environment, and the seeker is less apt to be ignored. Those mothers who reported prefering the city, stressed the fact that the urban schools were better than country ones and more accessible. They also commented that children were stimulated by the city environment itself, and since their mothers were ignorant of city ways, learned to cope by themselves or turned to their fathers for guidance. These same mothers stressed the importance of the father's contact with the children.

It seems inevitable that the behaviour profile of children reared in the city and of eventually urban adults will change in the predicted direction. If one wishes to counteract such a trend, our theory would say that innovations must be made both in the design of cities and in the curriculum and activities planned for children both during and after school.

FOOTNOTES

[1] Six Cultures: Studies of Child Rearing, B. Whiting (ed), John Wiley and Sons, Inc., 1963

[2] Thomas Weisner, Research Associate of the Child Development Research Unit, University College, Nairobi, 1968-70, has been studying a network of families in Kariobangi and their relatives and friends in the rural area where they were born.

[3] Observations of children in Kariobangi housing estate, made during December 1968 and the Spring of 1969 by R Ogodo Ogana under the supervision of Thomas and Susan Weisner.

[4] Interviews of preliminary sample of urban mothers in Nairobi conducted by M. Pala and R. Ogodo Ogana under the direction of B. Whiting.

[5] Children's Behaviour in Six Cultures, John Whiting, B. Whiting, et al, (in progress).

[6] "Space and Numbers; Some Ecological Factors in Culture and Behaviour," Robert L. Munroe and Ruth H. Munroe. Paper presented at Meetings on Social Psychological Research in Africa, Dec. 1968.

[7] Personal communication from Ying Ying Yuan, Research Assistant, Child Development Research Unit, University College, Nairobi, Summer 1969, based on interviews with city mothers about image and knowledge of the city.

[8] See Children's Behaviour in Six Cultures.

[9] See Ying Ying Yuan's interviews.

[10] Nancy B. Graves, "Preliminary Report of Country and City Mothers" presented at International Congress of Anthropological and Ethnological Sciences in Tokyo, 1968.

[11] See Munroe and Munroe, "Space and Numbers."

[12] Cohn, Andrew H. "Behaviour Observations of Kikuyu Nursery School Children in Kenya." Mimeographed report, Jan. 1968.