

CASE STUDIES IN
EDUCATION AND CULTURE

General Editors

GEORGE *and* LOUISE SPINDLER
Stanford University

THE NEW MATHEMATICS
AND AN OLD CULTURE

The NEW MATHEMATICS and AN OLD CULTURE

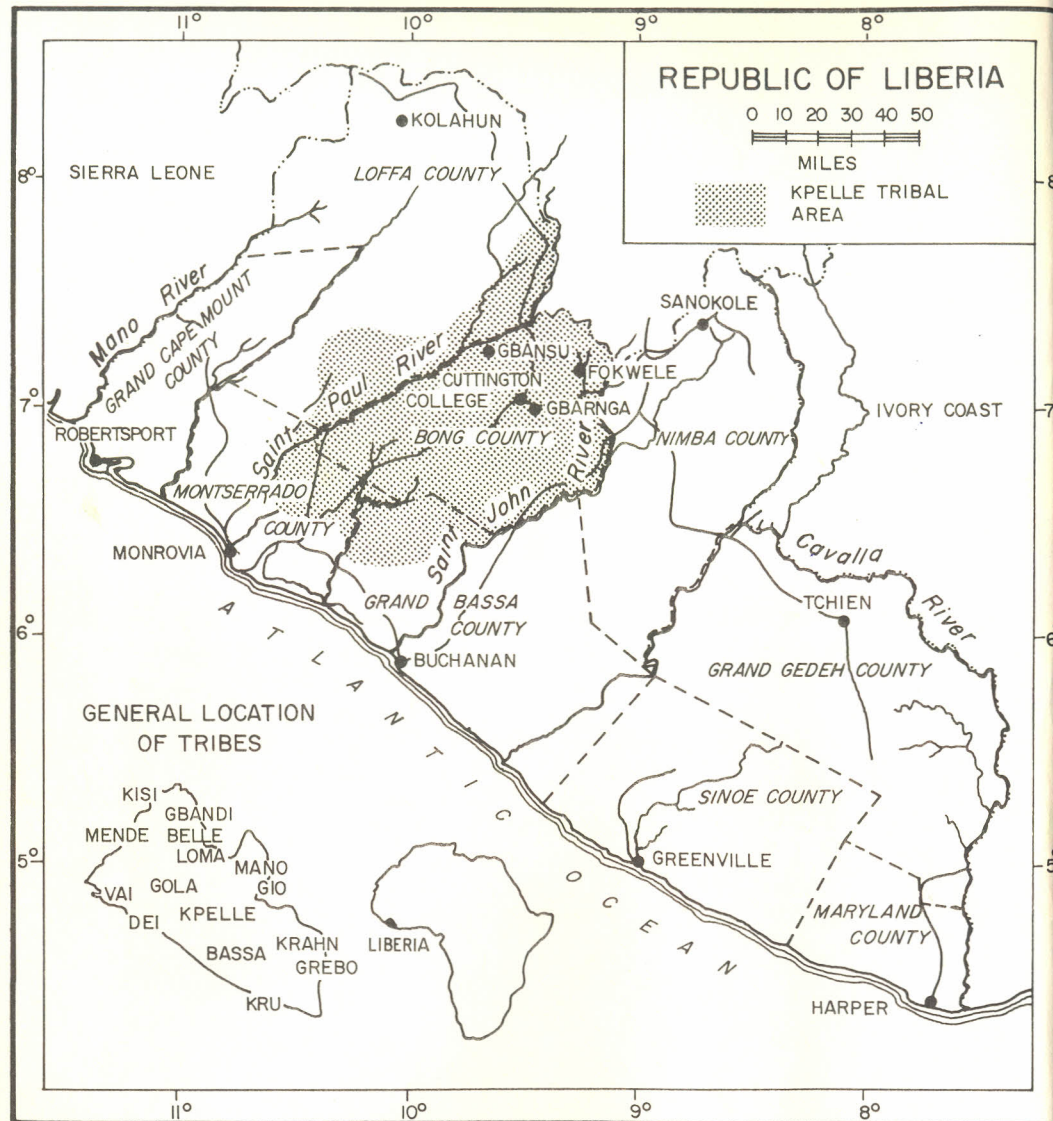
*A Study of Learning
among the Kpelle of Liberia*

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HOLT, RINEHART AND WINSTON
New York Chicago San Francisco Toronto London



*"The less intelligent the white man is,
the more stupid he thinks the black."*

—André Gide, *Travels in the Congo*

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Foreword

About the Series

This series of case studies in education and culture is designed to bring to students in professional education and in the social sciences the results of direct observation and participation in educational process in a variety of cultural settings. Individual studies will include some devoted to single classrooms, others will focus on single schools, some on large communities and their schools; still others will report on indigenous cultural transmission where there are no schools at all in the western sense. Every attempt will be made to move beyond the formalistic treatments of educational process to the interaction between the people engaged in educative events, their thinking and feeling, and the content of the educational process in which they are engaged. Each study will be basically descriptive in character but since all of them are about education they are also problem-oriented. Interpretive generalizations are produced inductively. Some are stated explicitly by the authors of the studies. Others are generated in the reader's mind as hypotheses about education and its environmental relationships.

The cross-cultural emphasis of the series is particularly significant. Education is a cultural process. Each new member of a society or a group must learn to act appropriately as a member and contribute to its maintenance and, occasionally, to its improvement. Education, in every cultural setting, is an instrument for survival. It is also an instrument for adaptation and change. To understand education we must study it as it is—imbedded in the culture of which it is an integral part and which it serves.

When education is studied this way, the generalizations about the relationship between schools and communities, educational and social systems, education and cultural setting that are current in modern educational discussions, become meaningful. This series is, therefore, intended for use in courses in comparative and overseas education, social foundations and the sociology of education, international educational development, culture and personality, social psychology, cultural dynamics and cultural transmission, comparative sociology—wherever the interdependency of education and culture, and education and society, is particularly relevant.

We hope these studies will be useful as resources for comparative analyses, and for stimulating thinking and discussion about education that is not confined by one's own cultural experience. Without this exercise of a comparative, transcultural

perspective it seems unlikely that we can acquire a clear view of our own educational experience, or view education in other cultural settings without ethnocentric bias.

About the Authors

John Gay, born near Chicago, studied at Cornell, Princeton, and Union Theological Seminary, and received his Ph.D. from Columbia University. He has taught at Cuttington College in Liberia as a missionary for the Episcopal Church since 1958. In recent years he has shared in the effort of Educational Services, Inc., to improve African mathematics instruction.

Michael Cole, a Californian, studied at the University of California at Los Angeles and received his Ph.D. from Indiana University. He was an exchange scholar in the Soviet Union in 1963, and a member of the psychology department at Yale University from 1964 to 1966. He is presently a member of the psychology department at the University of California at Irvine, where he is engaged in research in animal and human learning. He made two visits to Liberia in connection with the present case study.

About the Book

This remarkable study does what is so often recommended but so rarely accomplished. It demonstrates specifically how a traditional culture affects the learning readiness, indeed the very thinking, of children who are being taught concepts for which there are no exact antecedents in that culture. It documents the points of conflict between the methods and intent of Western schools and indigenous belief and practice. It shows the way to an understanding of those beliefs and practices as they affect the learning of mathematics. And it makes specific recommendations for ameliorative procedure.

Though the study is about teaching mathematics to Kpelle children, its implications are much broader. What is applicable in mathematics instruction is also applicable in many other areas of learning and teaching. Children are decisively influenced by the culture of their home and nonschool community. The teacher must identify this culture and understand how it has molded the child's thinking and affected his (or her) ability to learn, then devise effective strategies of instruction in the light of this understanding. Although the problem is most dramatic in situations like that of the Kpelle, the same conditions influence learning and teaching in every place where the culture of the teacher and the school is different from the culture of the student. Given the purpose of schools and schooling in this changing world, the implications of this study are applicable virtually everywhere.

George and Louise Spindler
General Editors
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Acknowledgments

The impetus for this book was provided by Educational Services, Inc. of Watertown, Massachusetts, whose African Education Program is a pioneer in developing new curricula and texts for use in English-speaking African schools. One of the authors was privileged to participate in the planning and execution of ESI's mathematics program for Africa. It was this project that convinced him of the need to know more about African children in their own setting. ESI very kindly made available funds through a grant to their Language Committee by the Ford Foundation, under the administration of Stanley D. Weinstein.

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Pronunciation Guide

Because it has often been necessary in this book to cite relevant statements in the Kpelle language, the following guide will be of help. In all cases these statements have been translated into the nearest English equivalent. Such translations are indicated by double quotes, whether or not they accompany the Kpelle original.

The transcriptions of Kpelle words make use of italics for those letters whose sounds closely approximate the normal English use of the letters. There are five sounds that are not normally written in English. These are indicated in the Kpelle words by standard print and are approximately as in the following:

- g, as in *gala*, like an incompletely closed k
- n, as in *nwan*, like the ng in hang
- o, as in *no*, like the o in cot
- e, as in *pére*, like the e in net
- b, as in *boro*, like an English b (except that the air is forced inwards)

Accents are also indicated in the transcription of Kpelle words. These accents show tone marks, and nasalization, as in the following:

- ´, as in *pére*, indicating high tone
- ^, as in *kâlon*, indicating high and then low tone
- ` , as in *tòno*, indicating low tone
- ^, as in *pâi*, indicating nasalization

Where there is no tone mark, the tone is middle.

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1 / Introduction

A BOWL OF UNCOOKED RICE is being passed around the room. "How many measuring cups of rice do you think are in it?" This question was asked of a group of 60 Peace Corps volunteers in training for service as teachers in Liberia. Each volunteer made his own estimate and the results were tabulated. The estimates ranged from 6 to 20 cups and averaged slightly over 12. In fact, there were exactly 9 cups of rice in the bowl, so an average overestimate of about 35 percent was made. This result is in striking contrast to that achieved by a group of 20 illiterate adult members of the Kpelle tribe of central Liberia. When asked the same question the Kpelle adults estimated the number of cups of rice in the bowl to be slightly under 9, an underestimate of only 8 percent.

Then, to the same group of 60 Peace Corps trainees another problem was given that gave them no difficulty. Eight cards were put faceup on the table. Pasted on the cards were 2 or 5 red or green squares or triangles. The task was to sort the cards into two piles; then, after sorting them once, to sort them again in a different way; and finally, to sort them a third way. The Peace Corps volunteers scarcely hesitated in performing this task. Yet a group of 30 illiterate Kpelle adults found great difficulty in sorting the cards even once. One was unable to sort them at all, and the remainder took an average of more than 1 minute for the first sort. Ten were unable to complete a second sort, and 21 failed to make the third sort. These later sorts, if completed, frequently took as long as 2 minutes.

To the casual American observer, the inability of the Kpelle subjects to sort the cards perhaps seems incredible. In fact, it is just this kind of observation that has led men to say "Africans think like children," or to speak of the "primitive mentality." But what about the Peace Corps volunteers' performance when asked to make a simple numerical estimate? Would this not appear an inept performance to any normal Kpelle adult?

These questions and the experiments from which they sprang are the result of a two-year-long investigation aimed at improving the teaching of mathematics in tropical Africa. After a few years experience in teaching mathematics in Liberia, we became convinced that in order to teach mathematics effectively, we must know more about our students. In particular, we must know more about the indigenous mathematics so that we can build effective bridges to the new mathematics we are trying to introduce.

This case study is the story of the Kpelle people of Liberia and their mathemat-

ics. We hope it suggests a larger story, that of many peoples and their contacts with Western education. The Kpelle are in schools we have chosen, Western-style schools, where the culture bears little resemblance to the culture of their homes. Many of the children are in formal classrooms, but many more are part of the wider classroom of a changing way of life. They are all being forced to adjust themselves to a Western, technological world which is absorbing them whether they wish it or not. In school they are being confronted with new and difficult problems. This is also the story of what they bring to this confrontation, of their chances of success, and of what their teachers can do to make success possible. Although limited for the most part to mathematics and related topics, perhaps the reader can use this material to gain an understanding transcending mathematics, and perhaps an approach to action as well.

2 / What is the problem?

WHY DISTURB THE TRADITION?

THE KPELLE are a reasonably well-integrated group of people. The old way of life works well in its accustomed setting. The life of the town on the night of the full moon, when the children are to enter the Bush school the next morning, is a corporate work of art of the kind we no longer know in the Western world. The entire community shares in familiar, accustomed activities. The men and women dance, the "forest thing" comes to the village, sending the women running into their houses, the children prepare, the musicians drum and sing, the young men wear green leaves around their waists and in their hair.

Yeats's poem, "A Prayer for My Daughter," speaks of "A house where all's accustomed, ceremonious," and asks, "How but in custom and in ceremony are innocence and beauty born?" The same easy elegance that characterized the feudal aristocracy of rural Ireland is present here in this Liberian village.

Why is it necessary or advisable to interfere with this culture, to try to understand it and to recommend action? Why is there a problem? Perhaps the best thing is to refrain from disturbing what we find, to ignore the problem of man-in-nature. Our Western way of life is far from perfect, and brings with it much of which we cannot be proud. Why impose it on others who have worked out a different adjustment to their world?

THE NATION OF LIBERIA

The answer is not an easy one. The Western world has already had a tremendous effect on the Kpelle people. They are under the political control of a Western-style government. Liberia was founded in 1821, with the help of the American Colonization Society as a haven for freed American slaves, and to its shores, in the years between 1821 and 1867, came roughly fifteen thousand ex-slaves. The leadership of this group had been substantially Westernized during its years in the United States. The country declared its independence in 1847, and then managed to survive. In many ways this survival is one of the most remarkable achievements of the nineteenth and early twentieth centuries in tropical Africa. At a time when the British and the French were pouring men, money, and effort into their colonies, Liberia was left to herself, to survive or die. This lonely course of independence found help, however, in a newly interested American government and business

world when it was found that high-quality Liberian rubber was easy to produce and that Liberian iron ore was equally profitable. Moreover, Liberia's contact with other nations was greatly expanded when she served as an important link in the Allies' air network in World War II. Liberia's development as a nation since 1945 has been rapid and consistent.

THE LIBERIAN GOVERNMENT AND THE KPELLE

We cannot in this brief case study give a detailed account of the nation of Liberia, its history and its civilization. This has been done well by others, in books listed in the References in the back of the book.

We must, however, look closely at the impact of the Liberian government on the Kpelle people. The first carefully documented explorations by Liberians of Kpelle country were those of Seymour and Ash in 1858, and Benjamin Anderson in 1869 and 1871. Anderson made two journeys to the Mandingo trading center of Masardu in Guinea; he passed through Kpelle land, and was the guest of several of their chiefs. Americo-Liberian settlements touched the western fringe of Kpelle country in the latter part of the nineteenth century, but it was not until the present century that extensive integration of Kpelle land with the coastal counties began. Units of the Liberian army were posted to interior points, district commissioners were settled in principal towns, and in 1923 President C. D. B. King held the first conference of tribal chiefs, including the Kpelle, to discuss grievances. Since that time the Kpelle have accepted and operated within the framework provided by Liberian rule.

THE MISSIONARIES AND THE KPELLE

It was not only the Liberian government that brought alien influence to bear upon the Kpelle. Missionaries came from the United States and from the Americo-Liberians themselves. The first missionary group to work with the Kpelle was the Lutheran Church of America, which established a school and hospital at the border between Americo-Liberian and Kpelle territory toward the end of the nineteenth century. The Lutherans moved into the interior at approximately the same rate as the government and eventually established a network of schools, clinics, and literacy stations in Kpelle land. In the late 1940s William E. Welmers analyzed the Kpelle language for the Lutheran Church; since then, an increasing number of pamphlets, manuals, portions of the Bible, and even a monthly newspaper, have been available to Kpelle who are literate in their language.

The Lutherans were not the only mission group to work among the Kpelle. They were followed by Presbyterians (under Americo-Liberian leadership), Baptists, and Seventh-Day Adventists, as well as smaller groups, some of them African in origin.

The early missionary work of the Muslim Mandingo tribes must not be forgotten. Several hundred years ago they came as traders, and brought their religion with them. Not many Liberian Kpelle have been converted to Islam, but many traces of that religion are found among the people—notably, *gala*, which has become the Kpelle word for God.

THE BUSINESSMAN AND THE KPELLE

The third outside influence on the Kpelle has been economic. For several centuries the Mandingo Muslims have traded with the forest tribes in kola nuts and salt. At present there are Mandingo traders in all but the smallest villages, and there are even Mandingo towns scattered through the interior of Liberia. Americo-Liberians from the coast made contact with the Mandingo traders in the early nineteenth century. They also made bargains with tribal chiefs for the export of palm nuts, coffee, and other products. There had been trade in these items before, but it had reached Kpelle land only indirectly. European traders, from the beginnings of Portuguese contact in the mid-fifteenth century, had sought gold, ivory, pepper, and slaves. They had bargained with coastal chiefs, who had in turn bought the desired items from interior tribes. Doubtless, the Kpelle were affected by this. But in the early nineteenth century traders came among the Kpelle, and bargained directly. Western money entered the land, as well as Western trade goods: cotton cloth to supplant the homespun and home-woven country cloth, iron pots to replace their traditional clay pots, lanterns and kerosene, zinc for roofs, shotguns and shells (with which the village hunters were to make animal life nearly extinct), and stills with which to brew raw rum.

For all of this the Kpelle had little to offer but palm nuts, coffee, rice, and themselves. During the late nineteenth and early twentieth centuries, labor was provided by interior tribes for wealthy coastal homes and farms.

The foreign influence on the Kpelle became more pronounced when the Firestone Plantations Co. opened its first big plantation in Liberia in the 1920s. It was on the southwest edge of Kpelle country, and drew thousands of men away from their villages for a period ranging from six months to several years. Those who stayed longer would often send for their families, where they would live in Firestone-built brick houses and buy company supplies out of their 35 cents a day wages. After leaving the Firestone Plantation, the Kpelle would sometimes go on to the capital of Monrovia to join a growing urban proletariat. Occasionally they would enlarge the population of one of the rural towns. Many, however, returned to their own villages, bringing a new set of values and ideas, as well as money.

The main road from Monrovia to the interior reached the fringes of Kpelle land in the 1920s, and was pushed all the way through to the Guinea border in 1946. It brought change deep into the heartland of Kpelle culture. Towns which had enjoyed their isolation from the coast, because a Liberian official, foreign missionary, or trader could reach them only after a five or six-day walk through difficult, steamy forest, now were exposed to the outside world. Many, but not all, could be traded with, ruled over, converted, or simply gaped at after a half-day drive from Monrovia.

The traders no longer relied on a network of head-borne convoys through the forest. They drove their own trucks to the interior and bought directly from the people. Lebanese merchants were among the first to take advantage of the opportunity. They came to Kpelle land, as to so many other parts of West Africa, with capital, business acumen, and stores full of cheap trade goods. Some of these traders settled down and formed unions with local women, although many more

brought their families with them from Lebanon. All made money, and all had far-reaching effects on Kpelle life.

EDUCATION AND THE KPELLE

All these modes of change—governmental, religious, and economic—have been casual and desultory in their effects on the Kpelle, in comparison to schools, which have done more than any other force to create citizens, secularists (if not believers), and customers. Individual Muslims have at times tried to give Koranic instruction in Kpelle villages, but with little success. It is the Western-oriented schools, primarily of American inspiration and curriculum, that have had the greatest influence.

The first of these schools were those of the Lutheran mission on the western edge of Kpelle territory. Lutheran education has spread so that today there is a substantial network of small elementary schools in villages both on and off the road. A few of these Lutheran schools offer junior high school work, and there is one full high school.

Next came the government schools which were established along the main road. These were first staffed by townspeople who had had a few years of education, and later by graduates of teacher-training programs. These early programs were comparable in intention to some of the early American normal schools, and the methods used were primarily rote memory and harsh discipline. Other missions added schools, in compliance with a government ruling that no missionary activity could be conducted apart from education. Major business concerns were affected by a similar ruling, so that now enterprises such as the Firestone Plantations Co., the German-Liberian Mining Company, and the Salala Rubber Corporation have made schools available to their employees. All education, in all grades, must be conducted in English, by government ruling. At present, education is being extended and modernized through a massive program under the auspices of the Liberian government, USAID, and the Peace Corps.

We cannot trace all the effects of government, mission, and economic influence, both in and out of the classroom. They are too many and too diverse. As we mentioned earlier, perhaps the wisest thing might be to leave the Kpelle to themselves, to their integrated, internally consistent way of life. Yet governmental agents, missionaries, and businessmen have not done so and will not do so. The Kpelle are subject to constant influence from the outside world, despite our qualms of conscience.

The problem becomes clear. People who can estimate accurately the number of cups of rice in a bowl, but who cannot sort patterned cards, are being forcibly inducted into Western culture in a haphazard, disorganized, and insensitive fashion. These adjectives may seem harsh to the government officer, the missionary, or the businessman, but from the Kpelle point of view (and this is the point of view we must adopt) they are accurate.

These activities are haphazard because they impinge at points where the Kpelle

least expect action. Why should the government ask a Kpelle to pay money simply because he lives in a house? They are disorganized because they confuse the Kpelle man by not fitting the pattern he expects: The Lutheran Church requires a church leader to have only one wife; the Kpelle tradition requires that the chief have many wives, by virtue of his office and status. They are insensitive, because they do not take into account local ways of life. The trader arrives and immediately negotiates for the purchases of palm nuts, neglecting to prepare the way with an informal social conversation.

All these difficulties have a focal point in the Western-oriented schools. The schools could ease this period of culture conflict by giving it some focus and order. But the schools, whether government, mission, or business, and their professional personnel, often seem to be doing just the opposite, despite the good intentions and earnest efforts of supervisors and visiting experts. Children are taught things that have no point or meaning within their culture. There is no framework within which comprehension might be possible. What might be valuable and useful in tribal life is bypassed, and meaningful points of contact with the people ignored.

How can we teach effectively, respecting the old while bringing in the new, in as humane and efficient a way possible? We must acquire understanding and propose a course of action. This case study will focus on mathematics, but will be relevant to other areas as well. We will look closely at the behavior of Kpelle children in school mathematics, at the difficulties they encounter, and the context of those difficulties in the broader area of Kpelle mathematical behavior. Finally, we will make recommendations for the improvement of mathematics teaching in this situation.

SETTING OF THE PROJECT

We carried out our work primarily among the Kpelle of the Zota and Zokwele chiefdoms. One phase was conducted in the small, isolated village of Gbansu, near the St. Paul River—a four-hour walk from the nearest road. The reader will find Gbansu and other villages mentioned here located on the frontispiece map. A second phase was conducted in Sinyee, a large village near Cuttington College. A third group of subjects was drawn from a leper colony near the college, and a fourth from small villages south of the county capital of Gbarnga. Within each of these groups we worked with three subgroups: illiterate children, schoolchildren, and illiterate adults. We tried to ensure that our illiterate subjects were non-English speaking, but we found that there is a minimal knowledge of Liberian-English among almost all the Kpelle.

At various points in the discussion, reference is made to groups of American subjects. Unfortunately, circumstances forced us to be more haphazard in our selection of these groups. The great heterogeneity of American society makes it impossible to choose comparison groups that are appropriate in every way, so we had to rely on what fortune and common sense provided. The American schoolchildren were from lower middle-class neighborhoods unless specified otherwise. The

adults were selected from two relatively distinct American subcultures—a New Haven redevelopment area, and Yale college students. Cavalier though this selection may seem, it is probably no more so than a Kpelle ethnographer might have produced during a stay in New Haven.

We obtained experimental data as well as extended commentary on mathematical questions from our subjects. We made every effort to analyze these data in an appropriate way. In the present study, because of limitations of space and the requirements of this series, we are not able to report the full results of our experiments and interviews. However, in the near future we will publish two monographs: one on the psychological experiments we conducted, and one on the relevant aspects of the Kpelle language. These monographs, along with those mentioned in the recommended reading, should give a full statement of what is reported here in a more informal way.

3 / The Kpelle of Liberia

THE AFRICAN CONTEXT

BEFORE WE CONSIDER the problem in detail, it is necessary to find out who the Kpelle are. Not only is it necessary for our purposes, but from the Kpelle point of view, it is good etiquette. To begin a conversation in a Kpelle village by moving directly to the issue is not considered proper. He who does so is selfish; he does not care for the other person, only for the business at hand.

We cannot give a full introduction to the Kpelle people here. This has already been done capably by other authors. We can simply set the Kpelle in their West African context and give a brief sketch of their daily life, so that our discussion of mathematics education can be properly understood.

The Kpelle are a Negroid people in Liberia and Guinea, about 150,000 in number, who speak a language related to many other languages found in the area from the Sahara to South Africa, and from Senegal to Zanzibar. This, the Niger-Congo language family, comprises several subfamilies, three of which meet in Liberia, namely, the West Atlantic, Mande, and Kwa groups. Kpelle is a Mande language, as are many languages in Mali, Guinea, and Sierra Leone. The Mande group is subdivided into smaller subgroups: one includes Kpelle and others, among which are Mende in Sierra Leone and Liberia, and Loma in Liberia and Guinea.

Culturally, the Kpelle are part of a large group of peoples who live in Portuguese Guinea, Mali, Guinea, Sierra Leone, Liberia, and Ivory Coast. Their lives are built around secret societies. Among the tribes adjacent to the Kpelle, these secret societies are known by the general terms Poro, for men, and Sande, for women. The actual Kpelle terms differ only slightly, so we shall use the generic words.

The tribes dominated by the Poro and Sande societies live in two geographical settings—the dense, tropical rain forest which covers all of Liberia and part of Guinea, Sierra Leone, and Ivory Coast; and the damp savanna (tree-dotted grasslands), which covers the rest of these countries. The Poro and Sande are strongest in the forest, where life has been tightly confined to the isolated villages and farms cut from the always-encroaching bush. In the savanna area, where open country makes trade and travel easier, other influences have tended to weaken the tribal secret societies. A notable influence is Islam, the religion of the most developed savanna tribes. We will consider only the rain forest area, since the Kpelle live there.

LIFE IN THE FOREST

Life for the Kpelle is a continual struggle to survive under relatively harsh conditions. Rice, without which a Kpelle man says he has not eaten, is grown on upland farms of about an acre. The ground is lateritic—in fact, all of Liberia can be considered one large iron deposit. The little topsoil that is found after the forest has been cut is washed away by the torrential rains which fall between March and October. The production per acre, even before the weaver birds and small forest animals take their share, is only one fourth or one fifth of what can be produced in a carefully cultivated swamp rice farm. In the annual harvest, in November or December, a family will have produced barely enough rice to survive for the next twelve months. They supplement their rice with cassava, palm oil, okra, eggplant, onions, peppers, cassava leaves, and other greens gathered in the forest, as well as occasional meat and fish from the forest. The Kpelle who have come under Western influence also grow other garden vegetables and fruit, but these are not popular with the more conservative members of the tribe. The basic meal is stew made with palm oil, greens, and hot pepper poured over rice.

THE VILLAGE

A typical Kpelle village is located on high ground, but not too far from a river which is water supply, washing place, and latrine. The village may have between ten and a hundred huts, closely packed together in no apparent order, except that of family groups. Normally about five persons live in a hut. There are some large towns with more than a hundred huts, but these are not common. There are also small hamlets, with from one to ten huts, offshoots of the villages which are generally within an hour's walk of their parent villages. The main villages are usually about ten miles apart, so formerly, intervillage contact was minimal.

The houses are constructed with a framework of light poles, interwoven with thin branches. The framework of the walls is then filled with mud, and plastered with a fine clay obtained from termite hills. The framework of the roof is covered with piassava or palm thatch. The traditional house is circular, consisting of one large room, in which the family cooks, eats, and sleeps. Huts belonging to more Westernized persons may be rectangular, with several rooms, a porch and, in some cases, a zinc roof. Kpelle houses are comfortable, cool, and fairly free from insect life. The smoke from cooking fires filters through the thatch, driving out many of the insects that would otherwise live there.

AGRICULTURE

The life of the Kpelle people is centered around the rice-growing cycle. The clearing of land for farms, burning the dry brush, planting the seed, weeding the farm, driving away rice-eating birds and small animals, harvesting the rice, and storing the crop are set in a context of communal ritual—ritual in which the whole village society participates.

The farming cycle is determined by the weather. Toward the end of the dry season, in February or March, the men select farm sites. The selection process is supervised by the chief and the elders in a man's quarter of town. A man chooses a place within the proper area, either in the virgin forest or in secondary growth. If he chooses the latter, he makes sure that the bush has been uncut for a long enough period to ensure that some topsoil has built up and some nutrients returned to the soil. Outside experts estimate this to be at least a seven year interval.

In many Kpelle areas, the man then gathers a *kunu* or "work group" of men and women from his quarter of the village. These persons are, in some remote way, related to him. He secures the services of a musician, who drums and sings as the men cut the bush. Women come to the site to sing and dance, as well as to cook a hearty meal for all the workers. The men clear away the undergrowth, and allow it to dry for several weeks. At this point, the *kunu* returns and cuts the larger trees; palm and other productive trees are left standing. The women then help the men burn the dried brush, leaving a clearing for the farm. There are stumps throughout the farm, as well as some living trees, but this does not seriously bother this nonmechanized culture.

At the beginning of the rainy season, the women plant the seed rice they have saved from the previous harvest. The men build a thatch lean-to on each farm, where they spend much time during the growing season. They will return to the village frequently, but the whole family will sleep on the farm many nights. They remain there to watch the young shoots, as well as the ripening grain, lest the weaver birds and small animals eat them. The rice matures as the rains slacken, and this is the time of greatest vigilance. Young boys and girls spend their days driving away predators from their parents' farms, in the hope of preserving the harvest.

In November and December, the rice is harvested by the women, with some help from the men. A *kunu* is again gathered for the work, and a feast is given by the owner of the farm when all the rice is gathered in. The rice is cut, dried, and tied into bundles, which are stored in small thatch huts on the farm. As the rice is needed it is brought into the village and beaten, either to be consumed or sold. A small quantity is saved for the next season, when the cycle will begin again.

The more Westernized of the Kpelle grow other crops, such as sugar cane, citrus fruits, pineapple, or rubber. These crops are not part of the Kpelle traditional way of life, however, and are strictly private enterprises. A man gets others to help him with these crops either by paying them or by having them join him as partners. There is no traditional cycle for growing these crops, nor are there traditional practices.

Some tree crops are part of the customary way of life. Palm nuts are needed for the stew they eat with the rice. The oil palm tree is not cultivated, but grows wild in the forest. The only tree crop cultivated is the kola nut, which is sold to the Muslim traders from the north. Kola nuts are planted on grave sites, and bring some income to the family of the deceased.

The town seems to the casual visitor to be overrun with chickens and goats. Yet these do not form a significant part of the diet of the people. A chicken is a favorite present, or "dash," to a visitor, and is also an important part of tribal sacrifices. Goats are killed and eaten on only the most important ceremonial occasions. Other

animals including pigs, sheep, Guinea fowl, and ducks are occasionally found. Cattle are rare, and bring high prestige to their owner, usually a chief.

SPECIALISTS

Every member of the tribe contributes in some way to rice farming and to the maintenance of his household. But there are also specialized occupations, practiced by only a few. Chief among the specialists is the *zoo* or medicine man, who is a leader of the secret society. He dispenses medicines and controls the spirit-filled aspects of community life. The blacksmith is another important figure; he is often a *zoo* as well. There are blacksmiths who remember the days when they smelted their own iron from the ore so common in Liberia. Now scrap iron provides the raw material, which is forged into the tools needed for the basic tasks of society, such as machetes (called cutlasses), hoes, and knives.

Other specialists are the bonesetter (who has a deservedly high reputation), the weaver, the carver, the tailor, and the hunter. Of these specialties, only that of bone-setting is restricted to certain families. The other occupations are open to anyone who can learn. It is quite possible that the genuine skills possessed by the bonesetter may be lost because of his insistence that only his son may learn his craft from him.

POLITICS

The political life of the community depends on the chief, whose main tasks are to mediate between the central government and the people, and to settle disputes that arise in the village. The chief is elected by popular vote of the adults in the village, although at present government-sponsored candidates are normally chosen. He is a figure of moderate importance in the village, and is usually found in his "palaver house" entertaining visitors or discussing village problems. He is one of the few persons almost totally exempt from farm labor, although chiefs at times show that they, too, can wield a cutlass. The chief is subordinate to the secret society elders and leaders. Really important matters are discussed in the society, not openly in the village.

The clan and paramount chiefs, to be described in more detail later, play an important role in village life. When there is an important issue to be discussed or court case to be decided, they may come to the local village and back up, or sometimes supplant, the town chief. They have the right to dismiss the town chief for poor performance of his duties, or for dealing wrongly with an individual who has appealed over his head.

THE SECRET SOCIETIES

The secret societies, the Poro and the Sande, are the center and focus of Kpelle communal life. The entire life of a Kpelle is punctuated by the activities of these societies. The Poro is present when a boy is born, as he grows up, when he is ini-

tiated, when he joins adult society, when he marries, when he is involved in disputes, when his children grow up and marry, and when he dies. In some cases, the Poro may be further in the background, in others more dominant, but it is always there, confirming and authenticating his actions. The same is true of the women's Sande society.

The point in the Kpelle man or woman's life when the secret society is most active is the time of initiation. Every adult member of the tribe has at some time entered the Bush school, gone "behind the fence" into an enclosed area in a restricted part of the forest, for a period of between one month and four years. There he experiences symbolic death and rebirth. At entrance, he is "eaten" by the "forest thing," the embodiment of the tribal spirit. It is possible that, on occasions, this "spirit" appears, masked and robed in raffia. Called the "country devil" by many English-speaking persons, it is the concentrated symbol of all the authority of the past. It "eats" the new initiate, and the scars that are cut into the child's body are its "teeth marks." At the end of the Bush school, it spews out the child, symbolizing rebirth as a full adult. The person receives a new name, and reenters the world he has not seen for months or perhaps years. The boys' school is forbidden to women and uninitiates, and vice versa, so this reentry into normal society means resumption of normal life.

MARRIAGE AND DIVORCE

If the child has reached puberty before or during Bush school, he is usually married shortly after reentering the village as a new person with a new name. Marriage may take many forms, and its gradations range from full payment of a brideprice to the woman's parents, to simply sleeping together on a trial basis (Gibbs, 1963a). However, when the woman has not been turned over to her husband in the prescribed way, the union, while referred to as a marriage, does not carry all the legal rights of a fully formalized union. Therefore there are marriages intermediate between the extremes. The man may pay part of the customary 40-dollar brideprice. He may pay nothing, but agree to work for the girl's father. Or he may take as his wife one of the surplus wives of an important man, in return for which he does farm labor and gives political support. There are no strong feelings in Kpelle society that one particular form of marriage is more moral than any other, although a man usually wishes full possession of rights over his wife. One of these rights, by government law, is the privilege of collecting 10 dollars from any man with whom his wife has committed adultery. This is occasionally a major source of income.

In such a situation, a high divorce rate is not surprising. A woman who is dissatisfied with her marriage may leave her husband and return to her family. The family must pay back any brideprice received, however, and must also pay court costs. The man is almost never wrong in such cases.

Marriage is a casual affair, initiated and formalized with a minimum of fuss, but divorce is an occasion of more significance. Because of this many young persons do not avail themselves of the more formal sanctions of marriage, but simply live together in a trial marriage with the approval of the girl's parents. No one is sure

that the union will survive, and there is no desire to take a chance. Often when a couple is having marital problems, they are settled by an informal meeting of elders in their families, and the couple resumes their life together. If reconciliation fails, divorce by the chief's court is the next step.

HEALTH

Ill health and early death are endemic among the Kpelle. Almost everyone has malaria, always latent in the blood and occasionally flaring up in a serious attack. Almost everyone has intestinal parasites, caused by unsanitary conditions in the village, and particularly by impure drinking water. A high proportion have schistosomiasis (known in other parts of the tropical world as bilharzia), a disease contracted when a snail-borne parasite enters the feet from stagnant water. The parasite travels through the body and eventually settles in the urinary or intestinal tract, where it works slow destruction. More than half of the children die in infancy, and few persons live to old age. Illness and death are an ever-present part of daily life. It is possible that one of the main functions of magic in the Poro and Sande societies is to rationalize this suffering.

TRIBAL ORGANIZATION

Villages form larger communities in two ways. The first is political: Towns and villages are brought together into districts, which the people call clans, ruled by clan chiefs. At present the clans are joined into larger units, which are under paramount chiefs. The chiefs at all levels are elected, although government opinion often is the deciding factor. The chiefs at higher levels handle more serious law cases, and have wider authority to make decisions.

The other unifying factor is the Poro itself. This cuts across even tribal lines, and unifies all tribes within this cultural complex. For instance, Poro within certain Kpelle areas depends on Gola or Loma elders to begin ceremonies. In the Gbande tribe, the officials of Poro speak Kpelle instead of their own language. Poro at this high level is a potential unifying force, and is treated as such by the government. Moreover, many government officials of non-tribal origin have sought and received initiation into the Poro.

This unity was much less keenly felt before the Liberian government gained effective control of the interior. In fact, prior to this, persons from one village often feared to travel to the next village, much less the next chiefdom or tribe. Death or slavery was often the penalty for appearance in a foreign area in those days. This has radically changed. At present, the government has sought to use the Poro as a means of increasing national unity by proclaiming the President chief *zoo*.

This brief summary of Kpelle life provides a necessary framework for our study of mathematics and learning. Now we must look more closely at those aspects of life which relate particularly to learning and problem-solving. In this way, we can understand the context of Kpelle mathematical behavior, and how this, as well as any other aspect of behavior, is learned and applied.

4 / Education

RESPECT FOR TRADITION

AN EXAMINATION of Kpelle culture reveals the tremendous respect paid to tradition. The primary shapers of thought and action in a village are the elders, including the heads of the secret societies, the village chiefs, and the *zoo*. These men are not distinguished primarily for their cleverness, their wealth, or their family. Their primary claim to respect is their solid grasp of Kpelle ways, something extremely difficult for a young or even a middle-aged man to acquire. They are still too open to new ideas and ways, too pragmatic to command this sort of respect.

It is our impression that the town and village chiefs, secret-society heads, medicine men, and other village elders are the least openminded and the least flexible; possession of village authority precludes these traits. It is apparently not necessary for village elders to be able to learn anything new, since, by their standards, they already know everything worth knowing. They know Kpelle ways, and are thoroughly at home with the accustomed. What need is there for more? This is not the case with clan chiefs and paramount chiefs, who have to move freely in higher government circles.

AIMS OF EDUCATION

This command of Kpelle ways is the goal to which every new generation has aspired in the past. The aim of education is threefold—to conserve the past, to conform to community norms, and to be a good provider. The dominant value is maintenance of the Kpelle way of life, although this is coupled with a strong element of individualism. These two determine the type of conformity required. And they in turn determine the ways in which food, clothing, and shelter are provided. It is true that some also learn special trades and skills—blacksmithing, medicine, carving, weaving, drumming, divining, or tailoring, but these skills are firmly within the framework of Kpelle tradition.

THE LIFE OF THE CHILD

Kpelle values are learned at every stage of life in the village. The very young child is kept with his mother at all times. She carries him on her back, secured by a length of cloth wrapped around her body. She nurses him as he needs it until he is

weaned at perhaps two or three years of age. He is bathed frequently, even though in the next minute he may roll in the dust. Symbolic of his entire education is his first contact with food other than his mother's milk. His mother locks him between her legs, pinioning his arms and legs, closes his nostrils with thumb and finger and pours the water in which rice has been cooked down his throat. He can do nothing in its reception; he must swallow it or choke. So with the way of life—he must accept it or suffer.

As the child grows, he plays with other children in the village, goes with his mother to the farm, eats what he is told to eat, sleeps when he is told to sleep, and watches those older than himself. Only in certain areas is he free to do as he wishes; he may play with other children in an almost totally unstructured way, as long as he does not stray too far from the village. He knows, however, not to interfere with the business and materials of adult life, unless he is given specific orders.

The child must never question those older than himself. If he is told to do a chore in a certain way, he must do it in that way, and no other. If he asks, "Why?" or acts in a manner unsanctioned by tradition, he is likely to be beaten. Moreover, he must know what is expected of him without explicit instruction. A violation of unstated rules is as bad as a violation of explicit commands. He learns the proper way to behave by observation.

As he grows older, he is given more and more chores to do for the family. He is asked to get water from the river, to bring wood, to feed the fire, to sweep out the hut, to hoe grass from around the hut, and to help on the farm. The first task of a young boy or girl on the farm is to chase away rice birds, the small weaver birds who eat so much of the crop. At a later age, he is required to help weed the rice, and then to help harvest it. As he grows, he is called on to share in more of the tasks of adult life—house-building, cutting bush, and clearing a trail, if he is a boy; or beating rice, planting a farm, and cooking food, in the case of a girl.

Gradually the child is inducted into the full life of an adult. He is almost never told what to do in an explicit, verbal, or abstract manner. He is expected to watch, learning by imitation and repetition. Education is concrete and nonverbal, concerned with practical activity, not abstract generalization. There are never lectures on farming, housebuilding, or weaving. The child spends all his days watching until at some point he is told to join in the activity. If he makes a mistake, he is simply told to try again. He is not punished for mistakes, unless he willfully rebels against the traditional procedure, or if the error is very costly. The worst deed of all the Kpelle is to make light of tradition in the presence of the elders of the community.

BUSH SCHOOL

At some point in his growth, the child enters Bush school. He may enter at age five, when he has barely begun to grow into the tradition. Or he may enter at any age up to about fifteen, when he would have been exposed to almost the entirety of the traditional way of life. His education in Bush school is not in any sense a radical break in his pattern of growth; it simply intensifies and deepens what is already happening in all aspects of his life.

The life of the child "behind the fence" is largely a replica of his life in the village, except that he sees no members of the opposite sex. The adults and the children build a village in the forest, make farms, hunt, and engage in all the daily activities of village life. Nothing special except some sex education is taught until the very end of the school, when the secrets are revealed. The secrets are apparently few: the nature of the "forest thing" or masked spirit, the type of music that accompanies the appearance of the "forest thing," the ritual behavior by which members identify each other, the threat of death if the secrets are revealed, the techniques of scarification, and the knowledge of special medicines and charms.

The main points of ceremonial in the Poro teach respect for the Kpelle way of life. When the time comes to join the society, either he will be seized by the "forest thing" or, if his family is important, be brought to join by his father. He is taken to the fence at the edge of town. There he hears the frightful cry of the "forest thing," talking incomprehensibly. The adult who has brought the child to the fence tells the "forest thing" that the child is here to be eaten. The response is a frightful roar. The child holds in his hand a stick which represents his life. He carries that stick with him as he is pushed through a hole in the fence. Immediately there is another frightful roar, a loud noise, and the stick is broken and thrown back over the fence. The implication is that the "forest thing" has eaten the child alive, and that his old life has ceased.

The first main ceremony in the school is scarification and, if it has not already been done, circumcision for boys and clitoridectomy for girls. The scars are made by cutting the skin in a traditional pattern. Special herbs are used to make sure the scars remain visible, as the teeth marks of the "forest thing." There are medicines available in case infection or blood poisoning sets in after circumcision or scarification, but at times these fail, and the child dies. The parents of a child who dies are notified by a secret society elder, either at the time of death or at the conclusion of the school. They are not supposed to mourn such a death, since ritually, the child was dead at the time, although mourning does take place after Bush school is completed.

During the school there is little ceremony, although every effort is made to ensure the obedience of the child to authority. He is toughened through rigorous forest living, devoid of all aspects of alien Western culture. A few children may be trained in more advanced aspects of tradition and ceremony. They may learn from a *zoo* the arts of medicines, both beneficial and harmful. They may learn to carve masks needed by the "forest thing." They may learn some of the advanced arts of blacksmithing, or, in the old days, of iron-smelting.

Toward the end of Bush school there are further ceremonials. The child is fattened for the last month or so, so he may reappear in the village looking his best. During this time, the "forest thing" and his helpers go through the village seeking rice and other food for the children. The adults are usually glad to give it, although they often make a show of resistance.

Shortly before the school is to close, the older child is brought to a fearful ceremony. (The younger children must wait until a later ceremony.) The "forest thing" unmasks, and the child is explained all the mysteries of Poro. He is impressed with the great seriousness of what he has learned, and told in no uncertain terms

that he will die if he reveals any secret to an uninitiated person. This is no idle threat, and is therefore taken quite seriously by all concerned. Following this there is a feast within the school, after which the children are taken out of the bush to a small thatch lean-to near the edge of town.

The child is painted with white clay and remains in the thatch shelter until the "moon shines." He may be visited by close relatives, but must not talk unnecessarily. He is still under discipline, and, is actually receiving his last lesson in obedience to authority. He must sit and wait. When finally his clay has worn off and traditionally when the new moon waxes until it casts noticeable light, the children are brought back into the bush, where they are washed in the river.

At this point, they are dressed in new clothes, given new names, and brought back to the town for a grand celebration. They wear the finest clothes their relatives can provide, as well as a white cloth draped around the head and body, to show they are "new-born" to the tribe. In effect, the "forest thing" has been persuaded to give them back to their people, to disgorge them after this period in his stomach, to give them new birth. There is a great dance and feast in the village, lasting throughout the night. Guns are shot, goats and sheep are killed, the old women shed their dignity and dance, girls look at boys and boys at girls for the first time in months or years, and the town welcomes back those who were "dead." During all these activities, the children maintain unusual sobriety and restraint.

Following this ceremony, the adult women or men who have conducted the separate Bush schools, Poro or Sande, turn over the forest to another group for the next period of time. In the past the men have held control of secret society activity and Bush school training for eight years, and then the women for six years. The group spends half of this time preparing for the new Bush school, and the other half conducting the school. At present, the government has shortened the length of the Bush school, and altered this pattern.

EDUCATIONAL VALUES

We must look more closely at several features of this pattern of education. First, if possible, the pragmatic is subordinated to the traditional. A man must know how to cut the bush, how to burn and clear the field, how to cut sticks for a house, and how to build his house, if he is to maintain life. But he does all these things in such a way as to preserve his tribe as he found it. For this reason, the innovator, the man who might be able to do a particular task better than his predecessors, is frowned upon; independence is stifled, particularly within those areas where the tradition is strong. That an individual or family be kept alive and healthy is not as important as maintaining the complex of customs that is the Kpelle way of life.

Moreover, the two goals—individual self-preservation and corporate preservation—are at variance in specific cases. Changes in the Kpelle way of life are necessary if the high death rate of children is to be lowered. For example, the practice of clitoridectomy is maintained under generally unsanitary conditions. Tetanus is occasionally the result, and death usually follows tetanus. Yet this is a tradition deeply embedded in the folkways of growing up. Changes in customs of this type would tend to break down the life of the body politic, and are thus not acceptable.

It is true that in areas confined to specialists, pragmatic use of intelligence is ac-



Chief Benjamin Mulbah and his sons shortly before the conclusion of Bush school.

ceptable. For instance, innovation is allowed in carving and weaving; the blacksmith can vary his designs; doctors may find new medicinal secrets. But the ordinary unskilled man is expected to follow the traditional path, thus obeying the elders and, through them, continuing the history of tribe. It should be noted that the variations permitted these specialists in no way affect the traditional rhythm of life. We will discuss this point in more detail when we consider problem-solving.

The second principal feature of the Kpelle pattern of education is that reasons need not be given for what is learned. The fact that the activity performed and the secrets described are traditional is reason enough. The culture is self-maintaining, since the primary goal is to preserve what has been. At times it may be necessary for a person to justify his actions, but ultimately such justification is subordinated to the maintenance of tradition. Reasons are primarily dictated by the culture, not by the practical necessities of the immediate situation.

Thirdly, education is largely nonverbal. The child learns by observation and imitation. There is no intermediate verbal stage, linking the actions of the teacher and the actions of the child, which characterizes our culture. The Kpelle are trained to relate directly: concrete, adult physical activity becomes concrete, child physical activity. What is learned in this way is, of course, highly relevant to the child's life.

As a consequence of the lack of explicit instruction, children are sometimes left to figure something out for themselves. It might be, for example, how to make a rat trap. We do not know the details, but probably the child experiments with various approaches until he finds one that works. In the process, he may arrive at some general conclusions which would be more widely applicable. Further study is necessary on this question.

To summarize, we can say that Kpelle education is based on the traditions of the tribe. The primary goals of education are maintenance of the past, conformity, and provision of the necessities of life, in descending order. The child learns by imitation and repetition, primarily from his elders, who are obeyed with great respect. At times he may use experimentation to solve a problem. Children must not venture to tell their elders anything, but must accept what they are told and shown. Peers are not sources of knowledge, since they know no more about the culture than oneself. Aliens are also not sources of knowledge of Kpelle culture, but only of their own tribal culture. Learning is largely concrete and nonverbal; therefore knowledge is practical and nonabstract.

The chapter can best be concluded by telling a story. We asked a young man about the report we had received that an old woman lived in the big "spirit" tree at the edge of his village, and that this old woman could bring babies to girls who brought sacrifices and performed the necessary rites. His only answer was "So they say." "They" are the tribal elders who have passed on this piece of information to the younger generation. This young man did not know by evidence, reasoning, or persuasion if there was a woman in the tree. He accepted it on authority. He may have had doubts, but he did not express them. He may have believed the story, but did not wish to take too positive a stand. Or he may have been afraid to reveal the source of his information. Whatever the reason, he took refuge in appeal to authority, and in so doing declared himself as being within the Kpelle tradition.

5 / Problems and decisions

RESISTANCE TO CHANGE

BECAUSE OF THE OVERWHELMING IMPORTANCE attached to tradition and their nontechnological culture, we might expect the range of decisions and problems facing the Kpelle to be more restricted than that of Western culture. Many of the problems worth solving have been solved, in effect, by the tradition, but problems inevitably do arise even within the customary framework. Change is little needed or encouraged and problems do not commonly arise which require the application of critical intelligence to the system itself. The changes which occur and the problems solved are those sanctioned by and contained within the accepted pattern of life. The doctor, the blacksmith, or the carver may vary his products—but they are powerful individuals. Western improvements are introduced, such as zinc roofs or enamel buckets, but they do not affect the basic way of life. In general, the unknown remains unknown and the known is known; there does not seem to be a method by which the unknown can become known. Few are convinced that things can be done better or that the mind can be broadened. Life is lived within the traditional rhythm, and such variations as the new designs of the blacksmith, or the use of kerosene lanterns, in no real sense alter the central core of tradition.

The idea that it is possible to grow rice (the staple of the diet and focus of the material culture) more abundantly is a strange and alien doctrine. The American or the Chinese expert who comes to Liberia on a technical cooperation project may be able to prove that they have methods which can produce five or ten times as much rice per acre as the typical Kpelle family. But his ideas are unacceptable, and his procedures go unused. Rice-growing is not an analyzed, isolated, technical activity in the Kpelle way of life. What Western cultures would compartmentalize into technical science, the Kpelle culture weaves into the whole fabric of existence. The relevant question is not "How do you grow rice?" but "How do you live?"

PROBLEM AREAS

Yet there do arise many situations within the broad outlines of traditional Kpelle culture when a problem must be solved, a procedure must be worked out, a decision must be reached. A man must decide whether to help another person, how to cure a disease, where to locate his rice farm, whom to marry, whether to work for

money, whether to be divorced, who should be the new chief, or when to fight his neighbor.

In the case of marriage for instance, a young man's choice of a girl is not dictated by either family, nor is he restricted to a small group of girls because of a complex kinship system. The families involved may have strong opinions on the matter, but they do not decide it. He can choose the type of marriage he wishes—pay full dowry, pay only a token brideprice, work for the girl's parents or original husband, sleep with the girl on a trial basis, or run away with her to another town. He decides the issue on the basis of his own best interests, and in terms of his own financial resources. He is not bound by the elders, but can use intelligence to balance the factors involved. Some of the factors are prestige, money, family connections, the possibility of children, help in farm labor, beauty, maintenance of family unity, and good health. These factors are influenced by the totality of Kpelle culture, but the individual is allowed to make his own decision.

In this chapter we shall examine various factors which influence the way in which people approach and solve problems or reach decisions, keeping in mind the central role of tradition in this entire sphere of life.

MYTHS

In many areas, myths, dreams, witchcraft, and divination are factors leading to decisions. These myths and magical devices have an inner logic of their own, worked out in a rational way, once the underlying assumptions are accepted. There is a common belief, for instance, that "water-people" dwell in sections of certain rivers. They are generally malevolent, and like nothing better than to pull unwary travelers down to their watery home and eat them. Many stories are told and accepted on the basis of tribal authority: of individuals who have been lost this way, or who have been able to escape by some special trickery, plea, or bargain. Decisions concerning the direction of travel are strongly influenced by such myths. But these decisions are made in a quite rational way, granted the belief in "water-people."

The story of the "spirit" tree which harbored an old woman who could give women babies is an example of how myth is used to solve the problem of sterility. When a woman wants a child, she must go to this tree at dawn to plead for a baby. After beseeching the old woman to give her a baby, she must pick a small branch from the tree, tie it to her back for a whole day, and then put it under her mat at night. Through this use of imitative magic, derived from a legend, she hopes to become pregnant. The underlying assumption, from which the woman's actions follow logically, is the congruence between ritual actions and pragmatic results.

DREAMS

Dreams also function to help a person plot a new course of action. A *zoo* may dream that a certain tree or leaf can be effective in a particular situation. He will go to the forest the next day to pick this leaf and use it, confident of its power. At

times, however, the *zoo* will first find the leaf effective, and then justify its use by some previous dream.

WITCHCRAFT

Dreams are important in witchcraft. If a person dreams he is flying, he knows himself to be a witch. If he dreams he is eating meat, he knows he is engaged in bewitching someone's child. And if a child dies in the village, he accuses himself of having "eaten" that child. He may even confess his guilt publicly, both to relieve his conscience and to prevent evil from coming to the whole community because of his witchcraft. If someone dies, there has to be a reason, and for the good of all, he must confess the reason. Again, the actions of the accused person make sense in terms of his underlying assumptions, supplied by tradition.

A person may dream that he belongs to a group of witches in his village. If he wishes to exercise the power of witchcraft, he will remain silent about his dreams, and continue to associate with the other witches through these dreams. He may know his fellow witches in real life, but he will not acknowledge them directly. If, on the other hand, he has no desire to be a witch, he will go out publicly the morning after his dream and abuse those who appeared in his dream. In this way it is believed that the other witches will reject him, and the dream will not take effect.

Witches are said to be known by the fact that they are loud and unfriendly. A person makes known his desire to be a witch by abusing some other known witch. The other witch seeks to kill him, but if he fails, he is forced to give the secrets of witchcraft in a dream. Such a contest between witches is often a serious and intense matter, and may end in the death by poisoning of one of them.

The Kpelle are convinced of the power of witchcraft. They believe witches can leave their bodies and fly about doing harm, or turn into animals to do their mischief. They also believe that witches can cause lightning to strike their enemies. Recently, there was a terrible thunderstorm at the closing of the boys' Bush school, on the night when the secrets were revealed. One boy, who had the reputation of being "frisky" and insolent to his elders, was hit by lightning that night and killed. One of the authors remembers that storm vividly, and even the particular lightning flash, which was of unusual intensity. The tribal people are convinced that the lightning stroke had been sent by members of the lightning society to kill this insolent boy, who would thus be an example to the others.

It is said that only members of the same family will attempt to bewitch each other, whether in an unconscious or a conscious way. One does not fear witchcraft from a person from another village, or from another quarter of the same village. But one fears being poisoned or hurt by members of his own family. If a person enters a relative's house to eat, he expects the other person to eat first, lest the food be poisoned. Witchcraft within the family may be of the involuntary type. For instance, it is said that an old person may attempt to bewitch and "eat" his children or grandchildren, without being aware of the deed at the time.

However, there is one important feature of witchcraft which keeps many people from dabbling in it. It is believed that eventually every witch will die from witch-

craft himself. Often when a person is ill, he is urged to confess witchcraft, so that the *zoo* in town can rid him of his evil deed. If he does not confess, he will die of the disease.

DIVINATION

Divination is an important aid in decision-making. We have already seen how a question may be answered by using two split kola nuts. They are thrown on the ground, and their position, facing up or facing down, determines the answer. All the while the diviner talks to the kola nuts, and consults his medicine, which may be an herb or some other charm wrapped in a leaf.

Another technique is to take a collection of small sacred objects, such as animal horns, teeth, seeds, shells, and kola nuts. These are spread on the floor and talked to by the diviner. He will turn them and move them about, until they assume a pattern that gives him the required answer.

A very common method for divination is to draw in sand or ashes on the ground. The "sandplayer," as he is called, will write, erase, write, erase and write again, until he has the answer to the problem. He will then recommend some medicine or procedure to follow to gain good results in the matter.

Divination is occasionally used in court cases. A "sandplayer" may be consulted privately by the chief in particularly difficult cases to determine the nature of a person's guilt, and to recommend a proper course of action. More common, however, is the use of ordeals. In these, the accused person is required to undergo an ordeal in order to establish his guilt or innocence. He may be required to drink a liquid containing a poisonous substance. If he vomits it, and thus lives, he is innocent. He may be required to put his hand in a pot of boiling liquid. If it does not burn him, he is innocent. He may be required to have a red-hot cutlass laid against his skin. If he is not burned, he is innocent. A rather minor ordeal is to drink water in which medicines have been washed or water containing the ashes of Koranic verses, before testifying in court.

COURTS

There are, of course, other ways of arriving at decisions in court cases. It is here that Kpelle argumentation is most complex. Courtroom procedure allows each side to make its points in sufficient detail so that an argument of some complexity and depth can be developed. The chief convenes the court, using a council of elders to help him decide. After the arguments have been heard, the chief and his elders make their decision, and implement it by demanding restitution and court costs from the guilty party. Most cases reaching the courts are marriage cases, which usually result in divorce, with the decision going against the woman. There are other cases involving, for example, stealing or defamation of character, but these are fewer in number.

The primary technique for winning a court case seems to be to produce an argument demonstrating conformity to tradition that the other party cannot answer. A

person is admired for his ability to outsmart the other fellow in such an argument. It is not necessary that the point be supported by evidence or that it be logically sound. The important thing is that the statement be one that the other party can reply with, at best, a lame and unsatisfactory answer. It is more nearly a test of wits and understanding of the Kpelle tradition than it is a test of truth or justice. The winning party must be able to convince the majority that he is wiser than those who oppose him.

A series of court cases which Gibbs (1962) collected in the paramount chief's court seem to us to show several steps in procedure. In the first place, the paramount chief listens to each party make the cleverest speech he can, putting himself in the right and the other in the wrong. The main purpose of these speeches is to make one's own actions reasonable and plausible within the framework of Kpelle culture, and to show how the other party's actions are alien to "good ways."

The chief then asks questions of the two parties, or allows them to ask questions of each other. Often if the answer to the question will weaken or embarrass a person's case, he tries to change the subject, or else tries to interpret what he must say in a favorable light. In one case a man was unwilling to list what he had paid as dowry for his wife. When first asked what his payments were, he asked, "Am I guilty?" When asked again, he said, "I am not satisfied. I want to carry the case to Gbarnga. You are trying to keep the woman because she is your stepdaughter." He was threatened by the chief at this point, whereupon he asked for a witness. He kept trying to avoid the subject, but finally had to list his payments in as favorable a way as possible.

The chief then makes his decision on the basis of the answer which most appeals to him as being in accord with Kpelle tradition. In one case, there were two contrary allegations made concerning a woman's behavior toward a man. He listened to both, listened to witnesses make irrelevant statements, and then decided against the woman, calling her a liar. He did so not on the basis of the evidence, for none was given, but primarily on the basis of the view that the man is always right, and secondarily on his assessment of the cleverness of statements made.

It should be noted that usually neither party denies his actions, but tries to put the best face on the matter. Each cites some, but not all, of the related circumstances, and tries to make his behavior seem customary. In the case of a woman who had separated from her husband, the woman's story was that her husband had driven her out, and the husband's story that the woman had slept with another man. Neither denied the other's story, but both tried to show that their action was the usual and obvious thing to do, given the other's behavior. This is, of course, a common phenomenon in law courts throughout the world.

FOLK PROBLEMS

This same pattern emerges in discussions of traditional folk-problems. A group of men gather together and tell the story among themselves. They then pose a problem and argue over its solution. The one who gives the most convincing, most unanswerable statement, wins the discussion.

One problem involved three men in the forest, a trap maker, a palm-wine producer, and a weaver. The trap maker saw a chip of wood floating down a river and realized that there must be someone up the river. He hunted for the person, and found the palm-wine maker, who soon became his close friend. They were joined next by the weaver. The three men showed samples of what they could produce, and found that they could live very well together, and so established a village in the forest.

They were unhappy without female company, however, so they attempted to capture a woman whose footprints the trapper had spotted. They tried to take her by force, but could not. So the trap maker offered her meat, which she refused. But when the weaver offered her cloth, she accepted and went with the men. The question is—to which man did she belong?

The answer might seem clear to an American—she belonged to the man whose gift she had accepted. But the discussion waxed furious, with the debate shifting back and forth between advocates of the trap maker and the weaver. They chose sides, apparently for the sheer joy of the debate. Basically, the argument in favor of the trap maker was that he had been first in the forest, had brought the other two men to the site for the village, and thus had primary rights over the produce of the area, including the woman. As evidence in his favor it was claimed that the first hunter to see an animal owns it, even though another hunter may actually kill it. It was pointed out by trap maker's advocates that he had first found the woman's footprint, and had tracked her down.

Those who supported the weaver gave the argument Americans might prefer, yet couched it as an alternative expression of traditional values. Someone suggested the analogy of a rice farm. The supporters of the trap maker said that the man who cleared the farm should claim the rice. Supporters of the weaver said that the man who harvests the rice owns it. At this point the argument began to center on one of the possible traditional values, and several persons were of the opinion that even if the palm-wine producer alone had captured the woman, he should give her to the weaver, who had customary rights. It was at approximately this point that the discussion ended, with the decisions of the group given by a village elder in favor of the trap maker, on the basis of traditional privilege.

The basic techniques of the argument are the same as in the court case. Each person tries to put his side in the best possible light. There is no argument over the facts of the case, but over the interpretation. Traditional values are stressed, and the decision is a kind of corporate process. The man who makes the last statement is an influential town elder, acting in the place of the chief at a court case. His pronouncement expresses the consensus of the group, to the satisfaction of everyone.

A similar problem concerned three men named Intelligence, Fighter, and Adulterer. They visited a town, where Adulterer immediately set about demonstrating the accuracy of his name. He was caught and was about to be beaten by the townspeople, when it was heard that in order to help Adulterer escape trouble, Fighter had killed a wicked spirit that had been hurting the townspeople. Intelligence brought the news to town, and argued that the net effect of their visit had been most helpful to the people, since now they did not have to worry about the wicked spirit. The townspeople were very grateful, and offered to give a cow to the

three as well as a wife to each. The three men went off with their wives and their cow and settled in a village. They raised children, and then all three died. Their sons wanted to have a great funeral feast for their fathers, so they killed the cow. Then the argument arose as to which son should have the cow's tail, symbolizing authority in the village.

Once again the discussion was hot. Some defended Adulterer because he began the affair in the village, and because Fighter and Intelligence were merely helping him by killing the spirit and reconciling the villagers. Moreover, one man argued that adultery is the reason for every man's existence, since without sexual relations there would be no children. Others defended Fighter because they said it is only through fighting that we are even able to commit adultery. But the argument was won when one of the town elders presented the case of Intelligence. He said that God gave us reason so we would not seek foolishness. He said we need knowledge both to seek a wife and to win victories. He concluded that the cow's tail belonged to Intelligence, and the rest of the assembled group shouted their agreement.

FOLKTALES

Folktales also stress cleverness and wit. Often the hero of the folktale is the spider, the rabbit, the deer, or some other small, relatively weak animal. He manages to outsmart the larger, fiercer animal through the use of his intelligence, and in so doing, flouts the authority who falls from his authoritative position. The culture may be dominated by the authority of the past, but at such points as this a certain rebelliousness is allowed, because it is harmless.

One story concerns Rabbit, Elephant, and Bush-cow. Rabbit was challenged to a tug-of-war by both Elephant and Bush-cow. He accepted the challenges, and without Elephant's and Bush-cow's knowledge, arranged things so that the two games were to take place at the same time and same place in the forest. Rabbit tied one rope to Elephant and another to Bush-cow. He told each that he would hold the other end of his rope, but, in fact, he tied the two ropes together. Then Elephant and Bush-cow began to pull, and neither could defeat the other. In this way Rabbit proved his "strength" to the rest of the animals.

In another story, Leopard wished to enter animal town to eat all the animals. So he pretended to be dead, and lay where the other animals could find him. They carried him inside the walls of the town, whereupon he came to life and began to eat the animals. Rabbit conceived a plan. He announced that they were glad Leopard had come to visit them, and invited him to a feast, giving him the seat of honor at the feast. However, the chair given to Leopard was really a branch of a tree that had been bent down and tied by a rope. When Leopard was comfortably seated in the chair, the rope was cut. The effect was to straighten the tree, whereupon Leopard was flung through the air, over the town walls and back into the forest. Rabbit had saved the town!

The pattern shown by these folktales is the same as that of the court cases and the problem stories. The ability to outtalk and outwit others is the key to success. This ability is demonstrated by reducing others to speechlessness or to unwitting

acceptance of an outcome against their best interests. Kpelle proverbs make this point better than we can:

Two pointed objects cannot prick each other.
 The needle is small, but the clothes it sews are greater than it.
 One's hand is greater than his stomach.
 The word that holds the world is *ei-wala* (a term which indicates the reason for doing a thing).
 A man's tongue is greater than his teeth.

Kpelle wit can properly be understood within the context of traditional wisdom. The clever man is the man who uses techniques and insights provided by tradition. The son of Intelligence won the cow's tail in the story not so much because of raw intellect, but because his father could best interpret the customs of the Kpelle. The trap maker won the woman because customary right gave the booty to the one first seeing it. Small, clever animals use traditional wit, known to the wise elders, but not necessarily known to those who try to rely on brute strength.

GAMES

This principle is illustrated by two games which the Kpelle play. The first is a verbal puzzle, similar to some in Western countries. It is the story of a man with a leopard, a goat, and a bunch of cassava leaves, which he has to take across a river. Only two things can cross at the same time. How then is the man to get them across the river, without the leopard eating the goat while he is not watched, or the goat eating the cassava leaves? It is possible to use reason to solve this, but the Kpelle have memorized a traditional answer. The prize in a discussion goes to the man who can give the answer—but he does not figure it out—he remembers it.

A second game uses two rows of eight stones each. One person is sent away, while the others choose a stone. The person returns and has to find which stone the others selected. He is allowed to ask four times which of two rows contains the stone. He asks once, shifts the stones into new rows, asks again, shifts the stones again, asks and shifts again, and asks a fourth time. He is then able to identify the correct stone.

The authors were in a village when this game was played. After observing others we announced that we could name the stone. We were sent away and returned. We had worked out a combinatorial technique so that the correct stone would come to the head of one of the lines after three shifts. We made our plays, and noticed that the group was laughing at us, sure we could not possibly get the answer. They were then utterly amazed when we pointed to the correct stone. As it turned out, they were amazed because we made the moves in a way different from their traditional procedure. They had memorized a set procedure for moving the stones. The principle was the same as the one we used, but the application was slightly different. They did not, however, use the principle—they had merely learned the pattern of moves. It is Intelligence who wins the battle, but Intelligence representing the traditional wisdom.

LACK OF COOPERATION

There is one final thing to be learned from these stories, puzzles, and court cases. Rarely do the characters cooperate. Although cooperation might be believed to be a basic technique for joint solution of problems, it is always the clever, lone figure who wins the battle. It is true that Intelligence, Fighter, and Adulterer worked together to escape the wrath of the villagers, but they were forced to cooperate in order to survive. Moreover, it was one son who triumphed at the end. The trap maker, palm-wine producer, and weaver cooperated at first, but in the end only one could get the woman. Rabbit saved the people in his village, but he did so primarily to save himself.

This feature of Kpelle stories is confirmed by direct observation of village life. We were told by many persons: "We Kpelle people fear each other. We do not work well together, it is each man for himself." People fear being poisoned by their closest relatives. Distrust seems to be widespread in Kpelle society. We once visited a village on the edge of a large river. There was a canoe tied at the shore for the use of the people. However, there was no paddle; each person had his own. We asked why they did not leave a common paddle in the canoe. We were told it would be stolen. We then asked why they did not attach the paddle to the canoe with a light, long rope, so it could be used when needed, but would not be taken. The man told us that someone would cut it or break it, just to spoil the cooperative effort. He said, "We Kpelle people can't like each other."

Cooperation seems restricted to certain well-defined traditional areas. People work together for those things needed to maintain the equilibrium of village life. The men of the village will unite to clear and burn a rice farm, to build a house in town, to manage the Bush school, to discuss disputes, and to celebrate great occasions. In matters externally imposed on traditional Kpelle culture, such cooperation does not seem to exist. Life, and the learning that prepares a child for life, seem atomistic at the same time that they seem conformist. The ties that bind man to man exist only to the extent necessary to ensure the stable continuation of the traditional way of life, not to enter upon long-range, creative, cooperative bettering of that life. A man does not want his neighbor to go higher than he himself has gone, even if in preventing his neighbor from rising it means that he too must remain in a low state.

We have considered the question of problem-solving among the Kpelle. We have seen that in certain areas innovation is not permitted, and that these areas are those most controlled by tradition. In other areas, change is allowed, but such change is either peripheral to the tradition, or tightly circumscribed by it. Argumentation exists, and a high position is given to the clever man who can outwit his opponents. But his wit is exercised in certain defined and predictable patterns. Men learn from dreams, witchcraft, divination, and myths and use their knowledge to support their claim to be part of the main stream of Kpelle customs and manners. It is each man for himself, except where tradition itself dictates cooperation.