

# Some Principles of Cultural Change

A Report to the  
Office of Technical Cooperation and Research  
U. S. Agency for International Development

by

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Comparative Studies of Cultural Change  
DEPARTMENT OF ANTHROPOLOGY  
CORNELL UNIVERSITY  
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I. Background

The literature of development indicates a growing awareness of the importance of the non-economic factors that influence development. These factors are related to a wide variety of institutional, social and cultural forces that are constantly at work in changing social systems, in ways that are difficult to define, and hard to measure. Personnel engaged in development work at many levels are aware of these forces and, at least intuitively, are constantly shaping their programs to meet the impact these factors have on operations. Because of the press and urgency of action requirements, all too frequently, the field practitioner has limited opportunity to consider these forces in a systematic and comprehensive way.

As one contribution to more effective development operations, AID has attempted to bring together information which would assist individuals and groups in getting a better understanding of these non-economic factors and how they operate.

As one phase of this effort, a research contract, AID/csd-296, was negotiated with the Department of Anthropology of Cornell University, to conduct a program of Comparative Studies of Social and Cultural Change. From this study have flowed a series of more than 30 reports on specific problems studied in Peru, Thailand and India. They add considerable information to what we know through the work of anthropologists that bears on the problem of change. In an effort to make this information more usable by operational personnel in the field, the research staff at Cornell are in the process of writing a series of five summary reports. These summaries seek to gather together into compact and useful form information available from the separate

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studies, and from the anthropological literature that has bearing on AID's operating programs. These summary reports will be entitled:

- a. "Some Principles of Social and Cultural Change." VII 8
- b. "A Handbook of the Practical Applications for AID of the Principles of Social and Cultural Change"
- c. "Factors in Strategic Intervention in Community Life" VII-11
- d. "Methods of Analyzing Change" VII-12
- e. "Recommendations for Future Research on the Processes of Cultural Change" VII 7

While it would have been preferable had the reports been received and distributed in the order listed, the first one made available by the contractor is the one pertaining to research. Copies of each of these other reports will be forwarded to the USAIDs as they become available.

## II. "Recommendations for Future Research on the Processes of Cultural Change" VII 7

This is the first of the five summary documents which has been completed. A single copy of this report is forwarded with this airmail.

The report provides an easily read catalogue of the kinds of problems that anthropologists perceive as being significant for development and that have had or could have research conducted upon them. This material is based specifically on the expertise of the Cornell group with respect to the three geographical areas studied, namely, India, Thailand and Latin America; but is couched in such terms that the generalizations may be applicable elsewhere. The authors are: Dr. Morris E. Opler, specializing on India; Dr. Lauriston Sharp on Thailand; and Dr. Henry F. Dobyns and the late Dr. Allan R. Holmberg on Latin America. In addition to chapters that deal with studies in each of these areas, Chapter 2 summarizes the limitations of community studies with particular reference to the Latin American case, while Chapter 6 discusses suggestions for comparative studies which would reach across more than one region.

There is an excellent bibliography encompassing more than 400 references.

This document will certainly be of interest to Missions that are directly related to the three specialized areas discussed. They are also being sent to other selected countries because the overall principles and general notions illustrated by the materials discussed here, may well be suggestive to people who are concerned with similar problems in other localities.

Additional copies of the document will be supplied upon request. There is nothing classified nor "sensitive" in this report and copies may be provided to indigenous scholars if you desire.

To assist us in evaluating our research products, we would appreciate a message indicating how you may have used this document together with any other comments you may care to make.

Attachment:

Recommendations for Future Research  
on the Processes of Cultural Change

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Comparative Studies of Cultural Change  
Department of Anthropology  
Cornell University  
Ithaca, New York

1967

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### DEDICATION

This volume is dedicated to the memory of Allan R. Holmberg who died on October 13, 1966. He was unable to participate in the preparation of the final draft of this report, which is so deeply influenced by his ideas and work.

## FOREWORD

This report has been prepared and written under Contract AID-csd-296 between Cornell University and the Office of Technical Cooperation and Research of the Agency for International Development.

The original draft of this report has been greatly improved through the careful editing of Gerald F. Winfield, Institutional Development Advisor in the Agency for International Development, whose services the authors wish to acknowledge with grateful appreciation.

Other reports in this series include:

a. Recommendations for future research on the processes of cultural change

This report will set forth recommendations for future social research made by the Comparative Studies of Cultural Change staff. It will include general recommendations for types of social science investigation, and specific suggestions for further lines of research in the world areas most familiar to Comparative Studies of Cultural Change personnel. Both basic research and applied social science projects will be analyzed. Special emphasis will be given to those projects thought most likely to increase the efficiency of allocation of United States foreign aid.

b. Handbook of the practical applications for AID of the principles of social and cultural change

This report, written for the non-professional reader, will give special emphasis to the applications of the research findings to the problems confronting AID personnel at many levels. Using the framework of the principles of social and cultural change, specific examples will be given concerning foreign assistance and the outcomes of attempts to bring about change.

c. Report on factors in strategic intervention in community life

This report will deal with the problems relative to planned change. Examples will be given of programs in which innovations were attempted in formal educational systems, in the health and medical field, in agriculture projects, in local civic mechanisms, and in small industrial complexes, as these have an impact on the developmental process. Cross-cultural comparisons will be drawn to the extent available data permit.

d. Report on methods of analyzing change

This report will deal primarily with methodological problems in studying the process of change, and techniques for promoting it. A brief exposition of the variety of approaches used in this and other studies will be given. Focus will be given to the particular methods of analysis found most successful in analyzing change. The questions raised in analysis of change according to value systems, and the kind of problems met in dealing with comparative rates of change will also be discussed.

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Human thought plays an important role in the spread of culture traits. An innovation is rejected or accepted for many complex reasons.

One common occurrence is rejection of a new element by those individuals who have a vested interest in maintaining the current cultural situation. Factionalism is another frequent phenomenon: one side may reject change precisely because the other accepts it. Acceptance of innovation may be facilitated by the recipient's identification with the donor group and his subsequent imitation of traits he believes characteristic of this group. Substitution may occur, in which one cultural complex is completely replaced by another. Adaptation is also possible: in this case, a new set of traits does not replace an older one, but both are retained, each performing the same function in a different context.

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Man, like all other organisms, must carry on certain basic animal physiological processes in order to survive and to perpetuate his species. He is different from the other animals in that he meets many of his animal needs by cultural techniques instead of by instinct; but since these techniques serve the same human physiological processes, they are often similar cross-culturally. The basic biological process is metabolism; its fundamental components are breathing, thirst, hunger, sleep, elimination, and sex appetite. All of these drives can be temporarily culturally inhibited to allow the fulfillment of other biological or cultural needs. With the exception of breathing, there is considerable cultural latitude regarding the "proper" frequency with which these drives should be satisfied. Hunger, thirst, and sex and elimination drives as culturally experienced by different societies may operate to cause or to prevent change, depending upon the severity of the need and whether other conditions permit such change. Sexual desire

particularly may be a powerful force for cultural change, since new intermediate populations are created with propensities for acceptance and rejection which differ from those shown by the parent groups. Other important drives are the drive to avoid external and internal pain, the drive to avoid fright, restlessness and fatigue, and territoriality. All of these except for the territorial urge may be culturally conditioned.

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The process of cultural change typically occurs in a set order, each stage of the sequence dependent upon the success of its predecessor. All stages occur in the context of the existing recipient culture. Sequential change is not simultaneously experienced by the whole society, but rather each member undergoes the process as a separate individual. In the first stage, the element or idea to be diffused must be truly available to members of the recipient system or subsystem. Second, it must be perceived as potentially relevant to that system by a member of it. Third, the innovation must be congruent with that member's interests. At the fourth stage, which is often a crucial one, the

innovation is tested for its suitability and effectiveness. This trial may be carried out by the potential recipient himself, or take the form of demonstration by an outsider. The interested individual must then evaluate the innovation on the basis of the trial or demonstration, either overtly or symbolically. Finally, the innovation will be routinized and integrated into his total cultural system, and, if necessary, new mental or muscular habits or skills will be established.

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Innovations are accepted or rejected by social groups over time. When opportunities for transfer occur repeatedly, a society may either eventually accept a trait it initially rejected or erect boundary-maintaining mechanisms permanently to block its adoption. If the innovation is accepted, it must then diffuse from the usually relatively small segment of society in contact with the donor group to the society as a whole. The rate of diffusion of a trait depends upon its nature and various socio-cultural factors. An innovation will spread faster if it can be directly imitated by the accepting culture; some modification usually occurs, slowing the trait's diffusion while it is reinterpreted in terms of the existing value systems, levels of social organization, and personal habits. The accepting culture may also change as a result of adopting the innovation, since incorporation of the latter often disrupts the previous pattern. Even if an innovation is integrated without intermediate disorganization, a change in one part of the system tends to produce change in other sectors. The rate, pervasiveness, and disruptive effects of this change may be related to such factors as the internal integration of the system and social scale.

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The process of change for the society as a whole is closely parallel to that described for the individual. An innovation must first be effectively available to and be perceived by all those sectors of the system which it is intended to affect. If the element is one of several functionally linked parts, the whole complex must be available for acceptance. This complex will be more easily adopted if it in turn can be functionally related to other sets of traits in the recipient culture. Suitability and effectiveness also determine whether an innovation will pass through its trial stage to acceptance and further dissemination. This process is encouraged or inhibited by social organization, among other socio-cultural factors. Differences in social class, age, extent of kinship obligations, and proximity to urban cultural centers regulate diffusion possibilities. Competition at group and individual levels may also occasionally serve to foster dissemination.

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The transfer of cultural materials from one social system to another may be facilitated or inhibited by the character of the materials themselves; by the character of the social systems involved, and by the nature of the social situation in which the transaction occurs.

The form of cultural elements may be crucial in determining their transfer. When the form is such that individuals can decide whether or not to accept the innovation, as with an individually owned or operated implement, transfer is more rapid and effective than when a majority or especially a unanimous group decision is required, as with a community irrigation system. Simple innovations can be adopted on sight; more complex materials may require verbal or even more elaborate forms of explanation or the development of cultural capital to effect and support transfer. The form of an element can often be modified to fit a new cultural setting without seriously affecting its understood meanings and functions; such modifiable innovations are more readily acceptable than those which must rigidly retain their original form. Perception of the utility of new goods or practices may be influenced by their form, which thus affects their adoption or rejection.

Cultural systems vary in a number of dimensions which influence their capacity for accepting innovations. Of great importance is the extent to which a system has accumulated capital resources of all kinds, including knowledge, and the way such resources are concentrated for effective employment. Poor and diffuse resources hardly provide a favorable cultural setting for extensive or rapid change. Societies with cultural interests in a future expected to be different are prone to change, while others are tradition-oriented, conservative, and resistant to change; nor is it always

clear just what the basis for such divergent attitudes may be, nor how they themselves may be altered. Depending on forms of social structure and related values, cultural systems may be characterized at one extreme as being open with permeable boundaries receptive to external influences, and at the other extreme as being closed, able to employ some of a number of mechanisms which effectively maintain cultural boundaries to repel influences from outside. Strong boundary maintaining mechanisms may defend rigid social structures while open systems tend to be found with more flexible and adaptable forms of social organization. Also, the more social divisions a system supports, the more it is likely to be flexible and open, receptive to a greater variety and quantity of cultural elements from other systems. Cultural systems vary not only in the character of their organization but also in content. Innovations compatible with the particular beliefs, sentiments, and values, and meeting the specific felt wants of the personnel of a cultural system are most likely to be accepted easily and promptly following appropriate presentation.

The character of the cross-cultural social situations in which cultural materials may be transferred from one system to another strongly influences the extent and kind of transfer that actually occurs. Frequent and intense interaction between personnel of two or more systems is a prerequisite for transfer in quantity, presupposing a situation of some duration and one in which easy verbal communication can take place. Control of what is transferred in a cross-cultural contact situation will depend not only on the inventory of cultural materials available and the character of the systems in contact, but also on the quality of the interactions taking place. Persons who perceive their own status and that of their cultural system as subordinate will more readily accept approved innovations from superordinates of another system, those who are considered "better"; and will more readily drop artifacts and behavior disapproved by the superior others who serve as a meaningful reference group, with whom identification can be established. Much cross-cultural interaction has taken place in situations in which one party could use power sanctions to try to

control the transfer or non-transfer of cultural materials. Here the risk that the other party will react in a negative way with physical or symbolic rebellion is very great but difficult to predict or to control, especially if a competitive situation develops. Today, modern communications media play an increasing role in cultural transfer between different cultural systems.

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When trying to transfer knowledge or an understanding of new techniques it is a temptation to lean heavily on impersonal mass media, to use the radio or widely distributed printed matter to make the desired points. In employing mass media care must be taken to use a local dialect and idiom, so as not to alienate by pretense those whose attention is sought. In depending on the written word, the percentage of people who are literate must be kept in mind, and also any differential in literacy among sections of the population. Certain economic or social groups (e.g., certain Indian castes) may have had little opportunity for schooling, or it may be believed that it is inappropriate for women to be educated. Yet these may be among the groups that a planner or agency is decidedly eager to reach.

One of the important reasons why impersonal mass media have their limitations in this context is that face to face communication is prized in peasant, folk, and tribal societies. The "remoteness" of officials, both in regard to their residence and their manner, is frequently a barrier in establishing sufficient rapport to transfer knowledge and elicit actions based on it. Where verbal persuasion is utilized, individual discussion rather than the calling of mass meetings has proved to be most effective. Orders and general explanations can be given in mass exhortations, but enlistment and comprehension are more likely to flow from direct face to face contact. One of the merits of individual discussion is that it not only communicates information but also indicates a feeling of personal concern and interest which is ordinarily much appreciated and which inspires cooperation and response. Also, indivi-

dual discussion is a two-way street. It gives the member of the recipient group an opportunity to voice his feelings and even his grievances and consequently points to centers of doubt and resistance. . . It may yield suggestions for correcting or strengthening plans, for the local people know the limitations of their natural setting and the human problems, too, and often have ideas of value for the attainment of objectives.

Demonstrations are obviously very useful in culture transfer and are constantly used in development plans. Unconscious demonstrations sometimes play a part, too. One who is attempting to inform members of another group may not realize how closely he is watched and what deductions are made from his possessions, attitudes, and behavior. Rewards and evidences of appreciation and recognition are useful in stimulating and consolidating cultural transfer. Economic rewards, when they can be offered, may spur interest and participation. The reverse of this, negative economic sanctions, have a place as a deterrent to obstructionism, although these cannot be too readily used except by a powerful government or organization. In any case, such negative sanctions should be used sparingly and only for very good cause because of the resentment they arouse and the confrontation they are likely to provoke.

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Planners and administrators of change programs are constantly being called upon to make predictions, and often fairly specific predictions, about the time necessary for the execution of a plan. Such inquiries are natural, for costs, allocation of personnel, and consideration of other tasks depend on the answer. The answer, in turn, is very much conditioned by the rate of change that can be anticipated.

Those who intend to make a strong effort, and who are convinced of the importance of certain changes, tend to overestimate the rate of change that can be expected. Normally the groups whose behavior and prospects are the targets of change programs are people who have been isolated geographically, economically, racially, religiously, linguistically, or socially. Often they have been at a disadvantage in regard to several or all of these factors at once. Their resources, educational level, and identification with other groups of the nation are likely to leave much to be desired; their suspicion of outsiders is usually acute. Experiences in Mexico and the American Southwest suggest that unless a massive, well-designed plan is launched, assimilation and amalgamation into the national body may take two and a half centuries. Inter-marriage into surrounding groups and the pressure of a common danger from the outside may hasten the process.

Even when a carefully planned effort is possible, a reasonable amount of time must be allowed for any transformation. Enthusiasm for formal education may be generated and a school for combating illiteracy may be built within a year or two. Yet though students can be recruited and kept in school for the requisite number of years, it will be some time before this group will be able to assume positions of influence and authority in their community or culture or demonstrate the usefulness of the education they have received. The experiment at Vicos in Peru indicated that modern agricultural practices can be taught in five years or so. Yet new practices are on probation for a longer period. The mechanics of local self-government can be est-

abished rather quickly, but other decision-making methods will probably coexist for some time, and democratic discussion and representation may not play a crucial role for a good many years in spite of the formal apparatus. Unless there are very ample resources, a large staff, and much time, the best alternative guarantee of a healthy rate of change in the desired direction is to seek structural modifications which place representatives of those for whom the plan is designed at strategic positions in respect to the new models and new goals of behavior which are being introduced.

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## INTRODUCTION

The process of cultural change goes on day and night, in every country in the world. Cultural change is the business of international organizations, of national states, of giant business corporations and tiny business enterprises alike, of missionaries and ministers of all faiths, of university professors and kindergarten teachers, of any human being who seeks to alter the behavior of other human beings.

The cultural change process is nothing more nor less than an influencing process between human individuals. Whenever two people are in a situation in which one is influencing the other, a social process is operating. The advertiser who tries to influence you to change your brand of toothpaste, or the parent who tries to influence a son to change his girl friend or to choose medicine as a career, is engaged in this social process. It is a social process whether one is consciously aware of it or not.

The social process works on the human infant almost from the moment it is born, and in truth even before, in the prenatal medical care the pregnant mother receives, the special diet she is prescribed, the protective social regulations of her sexual activity, and so on. An individual's behavior is constantly affected by the social process, and by environmental and biological factors, with the mutual influencing of human beings accounting for individual behaviors and the cultural change phenomenon.

Everyone, as an individual, may ultimately be motivated by biological drives. Since all human beings live in groups of one kind or another, however, we change in terms of social situations and the influencing process.

There are, of course, limits to the influence that one human individual can have upon another under any given social conditions. There is a limit to the ability of the professor in the university classroom to stop a thirsty student from leaving in order to drink water, for example. The great degree of variation in the measures for satisfying basic biological drives from society to society bears witness both to the universality of the drives and to the equal universality of the cultural change process in human groups. Social or cultural motivation far outweighs the biological motivation in people living in all societies.

In using the term "culture", we mean simply those conventional understandings that are manifested in human actions

and the artifacts produced by human beings. (Redfield 1941: 132). Thus, culture is in itself invisible, ideas in the minds of people, and can be described by the social scientist only on the basis of inference from observed artifacts, human behaviors, or what people say (which is, after all, simply a form of behavior). Also, cultural traits are themselves established by the social process of human influence.

This is to say quite simply that the mechanisms involved in enculturation - that process by which the adult participants in any society indoctrinate their young in its cultural patterns - are precisely the same as the mechanisms involved in cultural change. This basic fact of identity of pedagogical process is what makes cultural change possible in the first place. Were human behavior entirely instinctual, it could be modified and changed only by modifying the genetic mechanisms of inheritance. It is precisely the human culture-learning propensity that permits some human beings to undertake to change the behavior of other human beings by altering their culture - the invisible mental patterns for behavior already accumulated in their minds.

The fact that human behavior can be altered by changing human culture constitutes the basis for the existence of all the human institutions devoted to cultural change: UNESCO, the American Civil Liberties Union, the U.S. Peace Corps, the National Association for the Advancement of Colored People, the Agency for International Development, and myriads of other like organizations devoted to changing what other people do.

While thousands of organizations are devoted to attempts to change the culture of one group or another of fellow human beings, these efforts go on with greatly varying degrees of understanding of the nature of the influencing process itself. The present report attempts to set forth with such clarity as we are capable of achieving what we think to be the more significant dimensions of the influencing process. This is not to claim that social science has discovered all that there is to know about the influencing process. Far from it. Social science has barely begun to understand the influencing process. Nor do we claim that all social scientists will necessarily agree with our characterization of the cultural change process. What we are attempting is to communicate to policy makers and professional advocates of cultural change at least some of the more important dimensions of the influencing process in hopes that they may apply these findings of social science wisely in their efforts to better the human condition.

## I. INDIVIDUAL PHYSIOLOGICAL PROCESSES OF CULTURAL TRANSFER

Any social process common to all human beings cannot be very esoteric or mysterious. So it is with the basic processes of cultural change. These are the physiological mechanisms by which human beings learn from one another and from the natural world. The two most general processes of cultural learning and therefore of cultural change are vision and audition.

### A. General Processes

#### 1. Visual observation of behavior and artifacts.

Vision provides the basis for a very great deal of learning. In attempting to study culture, the social scientist cannot see it. He must infer it in part from what he sees people doing. People who are not social scientists learn a great deal of their culture in exactly the same way, although usually at a more unconscious imitative and less conscious analytical level.

The superiority of steel cutting blades over stone is immediately visible to anyone with sight to see the efficiency with which a steel machete cuts a trail through thick forest growth, or a steel knife skins an animal or guts a fish. A steel axe is seen to fell trees far faster than stone axes or ringing with fire (Métraux 1960; Sharp 1952; Holmberg 1954).

The degree of visibility of a behavior has a good deal to do with its adoption. That is, the more visible a behavior, the greater its chances for adoption, other conditions being equal. Thus, a steel axe requires no explanation of its use and utility, once a person accustomed to using stone axes sees one in use. To see a steel axe is to want one, among stone age peoples in general.

At the other extreme of visibility, the Christian concept of Divinity is as invisible as a cultural trait can be, and generations of Christian missionaries have wrestled with the problem of instilling in non-Christians belief in something that cannot be seen.

2. Auditory perception of behaviors. That as many converts have been made as there have been reflects the efficiency of auditory communication in the influencing process. Human languages consist of sound systems that stimulate extremely complex patterns of mental symbols and images, so that a concept as complex and difficult as "divinity" can be passed from one individual to another if they can speak to one another.

The various languages are differentially developed, however, and one problem faced repeatedly by Christian missionaries attempting to win converts speaking New World tribal languages was the absence of any terminology for a monotheistic supreme being. Missionaries have found that it is easier to persuade people to worship one monotheistic god instead of another, than it is to communicate the monotheistic principle to peoples whose languages lack this concept.

This kind of communications problem crops up constantly in the influencing process when it crosses a language barrier. It occurs even between Englishmen and Americans, both of whom speak what is in general a single language (Gorer 1948:12).

Before taking up this problem, however, let us consider another aspect of audition. Auditory perception frequently reinforces visual perception.

The visual perception of the efficacy of a steel axe can operate all alone. A tribesman several hundred yards away from a European chopping down forest trees with an axe might well be able to observe the motions of chopping and later observe from near at hand the cut surfaces after the woodsman quit work, without hearing the sound of axe against wood. Once that tribesman gained the opportunity to test a steel axe himself, his visual perception of its cutting efficiency would be reinforced by hearing the sound of axe against whatever material he sought to cut. The deep-cutting bite of a steel axe in a green tree sounds quite different than the pecking impact of a stone axe.

Thus, vision and hearing are mutually reinforcing. They are not usually separated in the influencing process. The saw "Do not do as I do, do as I say" reflects common-sense recognition that one's acts are often at variance with one's pronouncements, and implies that the observer takes both acts and pronouncements into account. Thus: "Actions speak louder than words."

This combination of vision and audition may be illustrated in the wide diffusion of a single term for the domestic cat in American Indian languages, some variation of mis-mis. This word is the Spanish catcall, corresponding to the English "kitty, kitty" used to call cats rather than name them. It is found in Indian languages throughout the area of former Spanish colonial empire. It reflects the union of vision and audition in the influencing process. The domestic cat was brought to the New World from the Old. The Spanish language term for cats is gato. As Indians, learning the Spanish language as social subordinates not often allowed in Spanish parlors to listen to household conversation, heard domestic cats called "mis-mis, mis-mis", they also saw cats

respond to that call. They perceived clearly the association between animal and call, and adopted the catcall as the name for the animal.

This brings us back to the discussion of problems in linguistic communication. The influencing process that led Indians to label the domestic cat with the Spanish catcall was a casual, non-directed process of inter-societal interaction. The multitude of organizations engaged in fostering cultural change in the contemporary world are not satisfied with casual, non-directed efforts toward influencing other people. If we regard the outcome of domestic cat labeling by American Indians by the standards of these cultural change promoting organizations, we would immediately label it as faulty communication across a linguistic barrier. The proper Spanish label for the domestic cat, gato, failed to diffuse to the Indians, or did so at a much later date. This failure or delay illustrates the need for the advocate of cultural change to speak the language of those people whom he would change very well indeed if his goal is to communicate to them the complete range and meaning of any foreign cultural trait that he seeks to have them adopt.

Auditory perception has another extremely important aspect in the influencing process. In many cases of cultural change, spoken (or its written equivalent) explanation of an innovation may be absolutely necessary for the successful transfer of the innovation from one social system to another.

Like the steel axe, the internal combustion engine appears to be an item of modern industrial technology whose utility is readily grasped by visual observation. While the method of using an axe can be readily perceived, the mode of using an internal combustion engine cannot be readily perceived by a person who has never before used one. The functions of fuel, starting attachments, ignition systems, and exhaust mechanisms all must be explained verbally or in writing before the neophyte will be able to use an internal combustion engine. This factor of innovation complexity is one to whose discussion we shall return later.

We have already mentioned writing several times, and it is time to note that systems of symbols representing human speech carry us back to the importance of vision in the influencing process. Writing must be read, not heard. The problems of communication across language barriers are just as difficult in written as in spoken form.

For the reality to be faced by those engaged in the influencing process is that they deal not with blank minds on which nothing has been recorded, but with already enculturated individuals whose families, friends, neighbors, fellow citizens

have been conditioning for years. Thus, to send 1,000 packages of U.S. surplus foods marked clearly "Donated by the people of the United States - Not for Sale" to 1,000 residents of Hindi-speaking areas of India or Spanish-speaking areas of Peru is not to communicate either that the people of the United States are helping citizens of the country receiving the aid, or that the help is not supposed to enter into commercial channels. People who speak Hindi or Spanish learn to read their own languages, not English, and a great many of them do not learn to read any language.

This widespread dependence upon the spoken word for the social process renders meaningless the written word for millions of people who are prime objects of cultural change programs. This situation makes key items of physical technology the economical transistorized radio and television receiver, and key items of social technology the content of the broadcasts beamed to millions of radio and television receivers in those areas of the world where literacy is still the privilege of small portions of the total population.

#### B. Limited Processes

Besides sight and hearing, the other human senses enter into the influencing process, but in somewhat more limited ways. Man's eyes and ears have developed during his hundreds of thousands of years of evolution as his main sensory systems for protection from predators and perception of the functions of the natural and social environments. Tasting, feeling, and smelling play a part, nonetheless, in the social process, and one that can never be forgotten by the advocate of cultural change. For while these senses are limited in the messages they convey to the human brain compared with sight and hearing, available data suggest that their messages are more likely to trigger limiting reactions than are those of sight and hearing.

1. Taste perception. The sense of taste focuses, of course, upon a relatively narrow range of objects - those that enter the mouth or against which the mouth is placed, so that the taste buds of the tongue can be brought into play. This means that the sense of taste is important principally in terms of food habits. There are known to be significant individual differences in the quality of taste perceptions that are inherited. It is reasonable to expect, therefore, that there are relative differences between populations in taste perceptions. At the same time, the most significant differences in the acceptability of new foods the advocate of cultural change may wish a population to adopt seems to

depend far less upon innate taste than upon the cumulative cultural interpretations of tastes that become conventions in people's minds. We expect to return to a discussion of these cultural interpretations of taste.

For the present, we wish to suggest only that human tasting is uniform enough to produce some common responses to certain flavors among populations with different cultures. Under conditions of free choice, we predict, for example, that tropical citrus fruits and bananas which taste "sweet" to most people will be accepted as food by people who have not previously tasted them, while carrots (which taste of carotene) will often be rejected.

In 1952, the director of the Cornell Peru Project set up a free food choice in a hot school lunch served free to children attending public school at Vicos, the traditional Andean manor the Project was set up to attempt to modernize while improving the standard of living of the Indian serfs more or less bound to its lands. One goal of the pupil feeding program was to introduce into the monotonous Indian diet new foods to provide more vitamins, minerals, and animal proteins. The Project planted a number of truck crops in the manor garden that were not included in the local Indian diet, and promoted the consumption of these foods. Other foods that could not be grown successfully at that high elevation were purchased and imported.

The core of the school lunch diet was a thick soup designed to provide each pupil with approximately 1,200 calories when combined with milk and dessert. Carrots from the garden were included in the soup to hold down the cost of the meal, and to introduce the pupils to their taste. Bananas and navel oranges were served as dessert from time to time.

Although the carrots were cooked in the soup along with potatoes, cabbage; ollucos; beets, various greens, beans, meat; and so on; the Indian pupils initially rejected carrots out of hand. The lure of this free meal may be gauged from the increase in average daily attendance from 15 to 60 pupils before new school buildings were erected or new teachers added, simply in response to the noon meal. Yet hungry as the pupils were, they carefully picked the carrots out of their plates, and left them on the table uneaten. This pattern has continued at Vicos for many years. Year after year the staff members tried to persuade the pupils to eat carrots by including these roots in the soup. Year after year the pupils picked the carrot slices out of the soup and discarded them. Only after a decade of trying has the staff achieved any degree of success.

The reaction to the taste of navel oranges and bananas was quite opposite. Acceptance of these strange foods was immediate and unequivocal. The introduction of these tropical fruits into the school lunch diet quickly produced demand among the children. Very soon thereafter their parents began buying these fruits in the markets in the area which they visit from time to time.

Children in the United States also often reject carrots (if their parents allow it), so there appears to be some cross-cultural distaste for carotene. Navaho Indians have, on the other hand, learned to eat carrots in their mutton stews.

2. Feeling or touch perception. The sense of feeling focuses upon a wider range of phenomena than that of taste, since it involves both the sense of touch by which the skin surface perceives objects or other phenomena (air currents, solar radiation) with which the human body comes into contact, and the perception of internal states within the body. At the same time, the sense of touch perceives a relatively more narrow range of phenomena than that of hearing or sight.

The messages conveyed by touching things often reinforce those transmitted from the eyes. We may cite the steel axe. The stone age tribesman who sees a stranger cutting trees with a steel axe can verify with his touch the sharpness of the blade once he manages to lay hands on one. If he cuts himself in the process, the message is the more clearly perceived. If he tests the axe by striking it against a tree himself, his internal sense of touch will again reinforce what his visual observations have told him about the efficiency of the steel blade. Thus, vision, hearing, and touch all reinforce one another in informing a person as to the efficacy of a steel axe as compared to a stone axe.

The limiting function of the sense of touch seems to occur primarily, again, when previous conditioning and experience have established cultural conventions as to desirable consistencies.

One of the more significant areas of limitation occurs in diet. As people grow up consuming a particular diet, they become accustomed to characteristic food consistencies.

The preparation of specialized foods may in fact be feasible only when certain consistencies can be achieved. This factor has become a key consideration in the success or failure of a number of agricultural extension agents to promote cultivation of hybrid maize varieties. In a well-known instance in New Mexico, a county extension agent demonstrated that a certain hybrid variety was well adapted to local condi-

tions by having 40 of 84 maize-growers in one village plant it. It yielded much more than the traditional "Indian" maize grown by Spanish-speaking farmers. Seeing the utility of increasing their maize yields, the farmers in the county switched enthusiastically to the hybrid maize, 60 planting it the second season. In the third year, however, only 30 planted hybrid maize, and the fourth year only three (Apodaca 1965:35-36). It turned out that the higher-yielding hybrid maize did not taste like the varieties formerly grown, and few of the people liked the taste. Desirous of enjoying the higher yields, however, they thought they might become accustomed to the taste in time. The farmers' wives who had to prepare one of the staple foods in the area were up in arms. The hybrid maize meal simply did not possess the proper texture to hold together for the wives to shape it into round, large tortillas, (Apodaca 1965:38) which are formed to near-paper thinness by patting a ball of dough between the hands and then further thinned by the stress-producing process of tossing the sheet of dough lightly from one hand and forearm to the other. In more urban areas, maize tortillas are manufactured in standard diameters and thickness on machines, but the cornmeal must be very cohesive in any tortilla-making operation. Thus, an initially successful change in agricultural practice was discarded within a few years because both the flavor of the new crop was not well liked and its texture, perceived by touch and vision when tortillas fell apart, failed to permit successful employment of traditional food preparation techniques.

We cite this case as an illustration of the limiting function of touch and established conventions of consistency even though this interpretation has been questioned in the case of farmers growing crops for sale. Also, the question has been raised whether the critical factor was not the fact that the extension agent furnished each farmer hybrid seed the first time he planted it in exchange for his old seed, whereas thereafter farmers had to pay for hybrid seed (Erasmus 1961:62). This case is supported by additional evidence. The author just cited as objecting to the taste-and-texture interpretation described as successful a Point Four agricultural program for introducing "Cuban Yellow Corn" to Bolivian farmers in the Santa Cruz area beginning in 1951. This variety had the advantage of coming up earlier than traditional varieties, growing ahead of the weeds, and possessing a hard kernel that could be stored with less weevil damage than varieties formerly grown in the area. A third of the farmers in the area were planting "Cuban Yellow Corn" by 1953, and demand for seed exceeded the local supply (Erasmus 1961:23-24).

The "Cuban Yellow Corn" was another hybrid maize variety. It possessed all of the desirable qualities indicated, but it also possessed the undesirable qualities of the hybrid

maize discussed in the New Mexican village case! It did not taste like the varieties formerly grown by illiterate commercial farmers. Nor did it have the same consistency. The hardness of the kernel that gave weevil resistance also constituted a handicap in one of the major uses of maize in Bolivia - manufacture of maize beer or chicha. To make an alcoholic beverage from maize, the kernels are dampened and kept in a dark place until they sprout, in order to form sugar. Then the sprouted kernels are ground, and the cornmeal mixed with water (and sometimes sugar) to ferment into chicha. The hard kernels did not sprout easily. The result of these negative characteristics of "Cuban Yellow Corn" was that the hybrid variety planted by commercial farmers piled up in the warehouses for lack of a market. This led to a falling price for "Cuban Yellow Corn".

The farmers brought political pressure on a responsive revolutionary national government, which established policies that led the large alcohol distilling industry in the Santa Cruz area to employ the accumulating surpluses of "Cuban Yellow Corn" to manufacture alcohol, to the detriment of the sugar cane producers in the same area.

Thus, the taste or touch limitation does not affect the commercial farmer as quickly or directly as it does the subsistence farmer encouraged to try an improved maize (or other plant) that yields more heavily or has other desirable characteristics who finds that the taste or texture of the improved variety fails to meet established cultural standards or requirements. Yet it does seem to catch up with even the commercial farmer eventually, by limiting the salability of his commodity in the marketing situation that permits him to grow the new variety for a while.

3: Odor perception. One more human sense is often involved in the social influencing process: the sense of smell.

Odors have historically played a significant role in intergroup relations. The culturally patterned behaviors of each society tend to produce characteristic personal and especially household odors. Where bathing is infrequent, individuals may carry the odor of their own perspiration and body oils. Yet this class of odor seems to occur more often in industrialized society than in non-industrialized societies. Environmental odors tend to override personal odors in the latter. Nearly all Navaho Indians living the traditional camp life herding sheep, raising crops, or carrying on other open-air activities smell of juniper smoke. The wood of the tree that contributes its berries to gin burns pungently, and permeates Navaho clothing and households.

The Spanish mountain village where aromatic rosemary and lavender are burned as firewood (Brenan 1957:88) certainly must exude a spicy aroma.

Sometimes members of organizations promoting cultural change consciously perceive social differences in odors and draw invidious comparisons.

Often such odor perceptions go unnoticed at the conscious level, yet play a significant role in intergroup relations at the unconscious level.

Culturally interpreted odors play a significant limiting role in changes in diet, along with factors of taste and texture. In prehistoric times, Indians in the Andean area who domesticated the potato and cultivated hundreds of varieties of potatoes, faced the same problems of storage that potato growers and consumers face today. They worked out techniques for freeze-drying that produce an end product called chuño. Chuño varies in odor depending upon the precise techniques of production. Those potatoes that are submerged in running water for a period, and then exposed to alternate night-time freezing and day-time thawing and sun-drying smell most strongly, during processing, preparation, and consumption. The odor of chuño is such that, by European standards of acceptable food odors, it has generally been rejected by non-Indian immigrants to the Andean region.

### C. Extra-Sensory Processes

Besides the influencing processes discussed above, there looms importantly as a mode of innovation in human cultural traits, what we may call extra-sensory processes. By this we do not mean extra-sensory communication or predictions of future events, or anything of this sort. What we mean by extra-sensory processes are those non-sensory physiological mechanisms that produce innovations in established cultural patterns.

1. Dreaming. The physiological body state known as "dreaming" serves as a source for innovations in the traits of many cultural systems. Among the Northern Piman-speaking Indians, for example, innovations in the dance and in music are "dreamed". (Underhill 1946). The innovative patterns must be communicated by the innovator to other members of the society through speech and gesture, but the new patterns arise from individual physiological states that do not involve the "five senses."

2. Prophetic revelation. Another extra-sensory process of great significance in changing cultural behaviors is

revelation. We do not argue that revelation is either real or unreal in physiological terms. We assert simply that what men define as real has real consequences (Merton 1957:421 ff), and that many societies define revelation as real. When revelation is prophetic, and tied closely to religious doctrines, it can become a prime mover of men and an extremely powerful force in fostering cultural change. Wherever revelation is defined as real, millenary movements are possible, and these bring important developmental consequences in their wake.

The cargo cult that has often arisen in Pacific Island populations recently exposed to selections of industrial goods typically takes the form of endeavoring, by magical means, to insure that the "ship will come in" loaded with the manufactured items for which the people yearn. Each specific cargo cult arises from the prophetic preaching of some individual who validates the message as a revealed one.

Nativistic movements against political overlords commonly arise from prophetic revelations to members of the subject group (Mair 1959:113). The Ghost Dance movement among North American Indian tribes from the late 1880's to the early 1890's stemmed from the preaching of a Paiute whose messages were regarded by believers as revelations in the doctrine that proper dancing would restore the dead Indians and wild game to life, and do away with the white conquerors (Kroeber et al 1935:198; Lienhardt 1964:160).

Contemporary nationalism sometimes partakes of some of the elements of nativistic movements, and its mystique cannot be underestimated as a dynamic of cultural change.

## II. INDIVIDUAL PROCESSES OF CULTURAL CHANGE

In the previous chapter, we outlined the sensory processes that enable cultural change to occur, ending with some discussion of extra-sensory processes of innovation. In this chapter we take up the individual processes of cultural change. These are the mechanisms of human thought that appear to be most frequently involved in the cultural change process.

### A. Rejection

The first mechanism that bears discussion is rejection. Rejection normally does not lead to change, but to cultural stability. Rejection occurs as a result of myriads of combinations of experiences, and the advocate of cultural change can never afford to forget it for a moment.

The Amish sect in the United States, for example, lives in a highly mechanized society, yet rejects the use of the automobile. This means that the Amish reject with the automobile a wide range of institutional changes in United States life that have occurred in response to the technological shift from horse-drawn to internal combustion powered vehicles. The city-edge shopping center, the drive-in bank, drive-in moving picture establishment, the food-dispensing drive-in, the filling station, and a host of other commercial institutions are useless to the carriage driver.

The Amish sect leaders have a vested interest in cultural stability that motivates them to reject cultural change, and to seek to persuade their followers to reject change also. For Amish leaders who failed to convince their fellow-believers to reject modern technologies would very soon find themselves without followers. They have correctly diagnosed the basic conflict between the leadership status of engineer and technicians in the industrial world and the leadership status of priests in the religious sect. (Hostetler 1964:187-88).

This kind of vested interest is one of the most common components of the rejection of innovations in cultural patterns. The rural political boss in Latin America who is the only well-read man in his jurisdiction can develop quite a vested interest in discouraging his followers from building farm-market access roads that would enable marketing farm surpluses more profitably but would also open the population to influences from other well-read men. Such a politician can also hold a vested interest counter to the wide acquisition of a formal education of more than a few primary grades.

The money-lender who advances school-teachers cash against their next monthly paychecks, who advances farmers seed, fertilizer, etc., against their next crops, and so on develops a vested interest in maintaining the existing credit structure. To such a person, the organization of a credit union poses a threat to livelihood, a danger to be met by concrete actions threatening the teachers and other clients with loss of credit and demands for payment of outstanding loans (Dobyns, Doughty and Holmberg 1965:79). To the money-lender, organizing a credit union is not bringing about beneficial change, but a threat to his profits.

Another commonly encountered component of outright rejection is factionalism. Rivalry, competition, bitterness between entrenched factions within a population lead to situations in which whatever innovation one faction accepts its opposition can be expected to reject on that basis alone.

In some of the squatters' settlements in the Peruvian metropolis of Lima, factionalism has developed between the older leaders who were in charge of organizing the land invasion which founded the settlement, and younger leaders eager to assume control of the settlement under changing post-invasion conditions. The social scientist doing a study involving interviewing all couples in the settlement found that obtaining formal approval and cooperation from the leaders of the "progressive" faction shut him off from interviewing people aligned with the "conservative" faction of the ousted leaders. The latter reject any measure or innovation approved by the former.

## B: Acceptance

The individual process that leads to cultural change, acceptance, is no less complex a phenomenon than the rejection of change. It is, if anything, even more complex.

1. Identification. When squatters' settlement leaders in metropolitan Lima agree to cooperate in a social science study, they are identifying themselves with those elements generally labeled as progressive. Their acceptance of the inconveniences and possible embarrassments of being intensively interviewed reflects a personal identification with science and social progress.

This identification process so favors cultural change, that some social scientists work hard at research designed to permit the identification of those individuals who already exhibit it. These are villagers who turn restless with yearning for better things, often of quite a material nature (Lerner 1958:23). In a world being rapidly shrunk by

mechanized transportation systems, the European business suit becomes ever more standard attire for men, and these "progressive" individuals are often the only ones in their villages who wear neckties (Lerner 1958:22, 40).

These are individuals who have already gone through an "anticipatory socialization" favorable to cultural change. They have adopted values current in a group to which they aspire although they do not yet belong to it. Such anticipatory socialization facilitates the entrance of the aspirants into the "reference group" (Merton 1957:265).

2. Imitation. In other words, those change-prone persons who live in social contexts of constraint and cultural stability are restricted to imitating the behaviors of their external reference groups. The Anatolian village grocer who identifies with the progressive urban population and would like to keep a larger shop, live in a larger home, wear urbane clothing styles, is trapped by his village context into imitating the urban accent, and affecting something like a necktie (Lerner 1958:22-23).

The school girl in a 4-H program in the United States learning to make frocks out of chicken feed sacks knows that she is imitating urban fashions. Yet the effect of the general sprucing up of the appearance of the rural North American female through the imitative process should not be under-estimated.

We refer not to the specific style changes occurring in the patterns or in the feed sacks, but to the cumulative cultural shift from plain drab rural costume inherited from impoverished frontier days to colorful, stylish, becoming female dress emphasizing physical charms in a manner less possible with traditional rural styles.

3. Substitution. Another important individual process of cultural change is substitution of one cultural trait for another. For some millenia up until approximately a century ago, mankind developed a large store of knowledge and lore concerning the training and management of horses, mules, and donkeys. With the perfection of the steam engine, and its application to wheels, a few men began to acquire knowledge of railroad engines, retaining knowledge of horse management in order to travel between home and railroad. With the perfection of the internal combustion engine, however, men began learning an extensive new set of facts and beliefs concerning automobiles that displaced the traditional knowledge and lore about horses. They substituted conventional understandings about automobiles for conventional understandings about horses. The latter were forgotten and were not taught to youths, who learned only about automobiles.

In this example, we can discern the operation of another characteristic of human culture. This is that one of the dynamics of cultural change lies in individual relationships with the environment. For if a particular conventional understanding or set of conventional understandings is not used with fair frequency, it falls into desuetude and tends to be forgotten. If enough people in a society forget a particular understanding, it ceases to be either conventional or understood, and drops out of the cultural equipment of the group.

In extreme environmental situations, the precision of human adjustment may reach such a point that failure to learn sets of conventional understandings required for gaining a livelihood may handicap an individual to the point of death. Holmberg (1954:112) observed among the nomadic Siriono in lowland Bolivia a young man who had been captured in a slave raid and reared among non-Indian plantation folk. He did not acquire the basic Siriono patterns for bow making, arrow making, the muscular skills in their use and in stalking game that produce success in the hunt and survival with social prestige measured in number of wives.

In this individual's case, Holmberg (1954:113) was able to provide a satisfactory substitute in the form of a shotgun that permitted the Indian to hunt successfully, and allowed him to reclaim a wife whom he had lost to more able hunters. This was an instance of pseudo-substitution, inasmuch as the Siriono individual involved had never been able actually to acquire the wealth of tribal conventional understandings he required for success in his society. The next Siriono who acquired a shotgun and a dependable supply of ammunition, however, would substitute firearm skills for bow skills.

4. Adaptation. Another individual process of cultural change is adaptation. What is involved in this process is the individual modification of existing conventional understandings in accord with changed circumstances. One common type of change in circumstances that leads to adaptation is military conquest by a national state with annexation of territory and inhabitants. Sometimes, of course, territory and populations are transferred by purchase, but the process of adaptation is the same.

That part of the state of Arizona south of the Gila River was added to the United States by purchase in 1853. Inhabitants were given the option to remain in the territory and acquire United States citizenship, or retain Mexican citizenship by moving out of the ceded zone. Many rejected cultural change outright and moved south into Mexican territory.

Others chose to adapt by remaining. This meant in effect the small town of Tucson, the only Spanish-speaking permanent settlement. The majority population of tribal Indians passed from Mexican to United States sovereignty unconquered and unconcerned about the territorial cession. A century after the Gadsden Purchase, a social scientist was able to observe that Tucson had enjoyed a happier history of inter-group relations than almost any other city in the region either seized by conquest during the Mexican War or acquired by purchase soon thereafter. He attributed this to the successful adjustment of the leaders of the Mexican-American community in Tucson to certain Anglo-American values that permitted the Mexican-American inhabitants to retain a relatively wide and satisfactory range of their own traditional values. Specifically, the Mexican-American leaders became successful businessmen in Tucson, thus providing the minority group with spokesmen respected by the leaders of the Anglo-American inhabitants in their own value and status terms, and playing very similar leadership roles (Officer 1960:15-16).

Success in business is, of course, as common among Mexican citizens as any other nationality. In the sorting of residents in the conquered areas acquired by the United States, however, successful businessmen tended either to withdraw to Mexican territory, or to fail to compete against Anglo-Americans in the English-speaking commercial system with its different norms. The Tucson merchants of Mexican antecedents accomplished a successful adaptation that many other Mexican-American businessmen did not attempt or did not succeed in carrying off. As a result, they enjoy power and honor in their new country.

An obvious aspect of adaptation is cumulation of cultural traits. Cultural change under such circumstances is not a matter of substituting a new set of conventional understandings for an old set that can be conveniently forgotten.

In the cumulation of cultural traits, typically, a new set of conventional understandings must be learned and employed while an old set with equivalent functions must be remembered and also employed upon proper occasions.

The Mexican-American child in Tucson, for example, continues to learn respect for his Spanish-speaking elders, especially elder relatives (Barker 1953:23-29). At the same time, going through the English-speaking formal educational system, he learns patterns of respect for youthful achievement, science, and a number of other things not emphasized in the Spanish-speaking social system. Different conventional understandings govern proper social behavior in each system, and all need to be remembered and appropriately used.

### III. BASIC DRIVES AS FACTORS IN CULTURAL CHANGE

Man is considered by the biologist to be an animal. As a living organism, every individual human being must carry on basic animal physiological processes in order to survive. Man must carry on certain other processes in order to survive as a species. Yet the most conspicuous characteristic of human beings is that they solve most of their animal needs by techniques devised by men rather than by instinctive animal responses. Because all human individuals must constantly carry on their animal processes, a certain amount of similarity in their devised techniques for fulfilling their animal requirements is predictable. While this similarity cannot be expected to be as uniform as the instinctive responses of other animals to their biological needs, neither can it be entirely masked by the cultural differentiation of techniques achieved by mankind.

The basic biological process which maintains life in each individual is metabolism. Biologists employ a term denoting that state of normality or well-being toward which each individual animal is constantly striving: homeostasis. Each organism swings back and forth like a pendulum from deficiency to superabundance of the ingredients of biological well-being, many of which are contradictory.

#### A. Breathing

One of the fundamental components of metabolism is oxygen, required by the human animal to oxydize food materials to supply energy. The animal requirement for a supply of oxygen is so great and constant that every human is equipped with an automatic nervous system which keeps his lungs in constant operation. Each human's oxygen requirements are met by operation of its automatic nervous system which causes his lungs to inhale oxygen which is distributed throughout the body by the blood. The carbon dioxide formed by the oxydation of food is returned to the lungs to be exhaled. The human is so constituted, however, that the consciously controlled nervous system can take over operational control of a part of this process.

An individual can temporarily suspend the inhalation-exhalation process, or slow up or accelerate its action. Why should a person do so? He may fall into a pond, and since he cannot obtain oxygen from the water, have to suspend breathing until he surfaces. Why should he fall into a pond? For many reasons, many arising from other aspects of his metabolic process.

He may be moved to dive underwater to obtain large, succulent shellfish such as the Pacific abalone. This example brings to the fore several other aspects of the human organism. The body requires food for conversion into energy, in the production of which carbon dioxide which is poisonous is formed and requires removal, creating the necessity for breathing. To acquire food, men may be forced or may choose to seek it underwater, where air-breathing must be temporarily suspended if the human is to survive. Thus, one basic biological drive to satisfy one animal need produces behavior that disrupts the functioning of another animal need.

To expand the example, the man diving for abalone probably does so not because abalone is the only food available to him, but because he likes the meat. The taste of this particular food has acquired a value which motivates him to seek it in preference to more readily available food whose taste he does not value so highly, even though he risks death in its acquisition by the disruption of his normal breathing.

To go still further, a good many men dive into the ocean not in direct food-seeking, but in indirect food-getting. A great many of these men are in fact females, whose subcutaneous fat affords them somewhat greater protection against the chill of sea water than human males possess. Women are professional abalone divers on a number of Japanese islands (Maraini 1962:67, 23-24, 36, 39, 90), and oyster tenders in the artificial pearl industry in the Sea of Ise (Maraini 1962:19). While these women and their families consume some of their catch, they are commercial shellfishers collecting abalone for sale to Japanese whose palates appreciate the fine flavor of the Pacific abalone. They purchase clothing, other food, utensils and goods with the cash realized by selling their catch. Pearl divers and sponge divers do not eat either pearls or sponges. They exchange them for food, and for money which they use to purchase food, illustrating the large number of values that mediate between each individual human being's animal needs and the behaviors by which he satisfies them.

The influence of culture upon physiological behavior may be readily discerned in the conscious control of breathing by divers. Pearl divers off the coast of Lower California in the last century reportedly achieved enormous breath control (Pinart 1875). Women abalone collectors in Japan train themselves to control breathing for forty-five seconds to a minute, diving about twenty times an hour (Maraini 1962:71).

The fundamental need for breathing may be controlled for reasons arising not from any other biological need, but entirely from human values, culturally determined. Yoga

breath control as practiced by certain religious individuals, for example, arises purely from human values.

## B. Thirst

The need for water is apparently the next most vital as long as the organism is supplied with oxygen. The organism can survive longer without food than without water. The famous fasts of the late Mohandus K. Gandhi, for example, did not include foregoing liquids, only solid foods.

Yet while the need for water is acute for survival its intake is periodical, and the latitude left for human decision as to how, how often, and in what form thirst is to be satisfied is enormous.

The Papago Indians of the Colorado Desert, for example, have a word in their native language for the concept "thirst-enduring," a quality that was highly valued in the society (Underhill 1936). This cultural value inhibited water consumption, ideally limiting an individual to a couple sips of water in the morning, and a little more toward sundown, never drinking to satiety.

Yet, thirst can function as a fairly direct motivation for cultural change, despite multiple value mediation. The Papagos were for many years profoundly grateful to the United States for two accomplishments: the pacification of their Indian enemies, the Apaches, and the drilling of deep wells that provided permanent supplies of domestic water. There were villages that opposed wells being drilled near their habitations, for a variety of reasons including fear of evil winds issuing from holes in the earth. At one such village, government drillers bored a deep well, and equipped it with a windmill and storage tank despite the objections of the local Spokesman, supported by the village council. Some households in the village promptly began to use water from the well, despite the admonitions of the Spokesman against doing so. Then one dark night a thirsty well-user bumped into someone at the well, and recognized the Spokesman himself surreptitiously filling a clay vessel with well-water. (Dobyns 1952: 35).

The people opposed to the well had nonetheless not been able to resist the thirst drive. They began by slipping down to taste the water. This led to taking along a container to bring water back to the house, and increasing dependency on the new water supply. When the Spokesman was discovered drinking the well-water he had preached against, all opposition collapsed and everyone used it openly. The conservative

opposition to government programs that had characterized the region disappeared in the quiet laughter following the discovery. Soon the Indians living in this village were requesting government assistance instead of refusing it.

"In this case an administrator successfully instituted a technological change in an administered group belonging to a culture other than his own against the opposition of its leaders." It is extremely dubious, however, whether this can be done very often. "Only a very special set of circumstances made it possible here." One of these circumstances is the extreme aridity of the territory inhabited by the Papagos, and their relative lack of techniques for gaining access to subterranean water supplies. Also, few societies in today's world retain the respect for administrators of another culture that Papagos held in the 1930's (Dobyns 1952: 36).

The thirst drive was not sufficient to make a similar government well-drilling program successful in Peru's Viru Valley, one of the oases on the Peruvian Pacific littoral. The national government decided to begin sinking wells in the Viru Valley in 1947, to provide more irrigation water to a farming area complaining of chronic shortages, and to supply piped water for household use and for a sewage disposal system (Holmberg 1952:114).

Few villagers were willing to help widen the road to the first drilling site two miles up the Viru Valley from the village itself, and the well-drilling crew had difficulty finding a place to stay or eat (Holmberg 1952:115). Cooperation was so poor that even after the drillers struck water, they recommended against continuing the project, and no pump had been installed on the well by April of 1948 (Holmberg 1952:116).

A number of factors entered into village disinterest or opposition to the well. The government technicians disregarded a local opinion leader who possessed useful knowledge of the valley's subterranean water since he already owned a deep tube well. The government well was drilled on land owned by a large village landowner not trusted by the rest of the populace. A temporary governing board was running village affairs at the time, and a large number of prestigious men was ignored by the government technicians (Holmberg 1952:120-123). In addition, the villagers had a water supply system that had supported human habitation in the valley for thousands of years: they were not thirsty enough to be driven to drink water from the new well.

Under special conditions of aridity, provision of a permanent water supply can play a key role in cultural change, particularly in permitting demographic shifts through re-settlement into previously uninhabitable areas.

In Papago country the Indians have been moving from villages dependent upon seasonal valley-bottom water holes (where the flash flooding also permits flood-irrigation agriculture) and mountain springs to permanent villages based on deep wells dug or drilled by Anglo-Americans or Mexicans. Several mine camp wells put down during the 1880's attracted Papago settlements after they were abandoned when the mines played out (Dobyns 1952:34).

The Shendam Division of Northern Nigeria is another area where domestic water supplies have been critical to rural resettlement. Drilled wells have provided adequate water for some new settlements (Schwab 1955:489). Other settlements depend upon surface waters impounded behind small dams during the rainy season to carry through the long dry season (Schwab 1955:495).

In the valley oases of the Pacific littoral of Peru, tube wells have in recent years played a key role in the stabilization of plantation agriculture, and in the dispersion of rural settlement in areas such as the Viru Valley. The wells have been put down by private capital on privately owned land, rather than by government programs.

### C. Hunger

After water in the hierarchy of animal needs of humans comes food. Like water, food needs to be ingested only periodically, leaving time between feedings for its collection, or production, or acquisition more indirectly. In some few societies that wrest their food directly from nature with little in the way of technological aid, the need for food and the resultant food-getting drive dominate social relationships. Thus, "the most crucial problem with which the Siriono have to deal is that of securing enough to eat, and the fact that they have been much less successful than most societies in solving their economic problems has doubtless elevated hunger to its preeminent role as a motivating force in the society." (Holmberg 1950:93).

Physiologically and analytically, human nourishment must meet at least three needs. One is fuel, mainly from carbohydrates, to maintain body heat and to supply energy for movement and work. Another is protein for maintaining the blood's colloidal composition in a normal state and supplying

material for growth and body structure repairs. A third is the supply of a variety of vitamins and minerals vital to proper physiological functioning (Gillin 1948:262). Cultural preferences intervene, however, between the free choice of a balanced diet that satisfies physiological requirements.

Hunger appears to become a driving force toward cultural change mainly, and perhaps only, under conditions of extreme food scarcity. Living on a very thin subsistence margin, Siriono Indians display the most direct response to hunger of any society yet studied by a social scientist. Among the Siriono, the number of wives a man has reflects his prowess as a hunter - as a food provider. The opportunities for extra-marital sex relations a man encounters also reflect his food-getting prowess. (Holmberg 1950:96).

In better-fed societies, sexual relations are typically regulated in terms other than control of food supply. Yet under extreme and special conditions of conquest, warfare and famine, such rules of behavior are suspended, and a direct relationship between food supply and sexual gratification is established.

Accounts of World War II abound in descriptions of women in conquered areas consorting with troops of the occupying power in exchange for foodstuffs.

On the other hand, many societies have worked out cultural controls over the individual hunger drive. Fasting forms one feature of all the major world religions, and most of the tribal religions known. The Jewish Day of Atonement involves a 25-hour fast, without even water intake. The Roman Catholic sacrament of Communion involves, at least sometimes, a twelve-hour previous fast. The ninth month in the Islamic calendar, Ramadan, is a period of fasting between sunrise and sunset, although the sick, infirm, pregnant and nursing women, and children under the age of puberty are exempted (Murdoch 1904:77). Orthodox Hindus are expected to fast on the day of the Shivaratri festival until the ceremonies which take place late at night are over.

Among tribal peoples, a Northern Piman speaking Indian who had slain an enemy warrior ideally fasted for a period of sixteen days upon his return home, living on maize gruel and water (Underhill 1939:136-137). The riverine Mohaves in the same general area required their warrior-killers to abstain from meat and salt (and bathing) for four days after returning from enemy territory (Stewart 1947:269). Many tribesmen in the New World observed fast periods of this duration.

At the opposite extreme, human beings have worked out a pattern of feasting that appears to be one of the most human characteristics. Accurate observations of the quantity of food consumed during feasts are difficult to find in the vast ethnographic literature. Among the Lepcha, each person at a feast lasting from 11:00 a.m. to 9:00 p.m. reportedly consumed three pounds of rice, three bamboo vessels of an alcoholic beverage, three cups of a stronger alcoholic beverage, two double fistfuls of popcorn, two pounds of meat, four helpings of tea, not to mention soup, vegetables, and curry (Gorer 1938:99).

Native Hawaiians reportedly consumed five pounds of steamed taro each, plus other foods (Miller 1927). Individual Kazaks are capable of eating an entire six month old lamb (Levchine 1840:318), although it is not clear just how large a six month old lamb raised by the Kazak may be.

Individual gustatory feats on this order attract attention as exceptional enough to be newsworthy in industrial society. Thus, the New York Times of March 3, 1957, carried an account of a South African miner who drank off 42 raw eggs in twenty minutes and claimed to average 50 raw eggs per week, consuming them when he felt hungry!

Once again, however, the greatest extremes in food consumption appear to occur from religious motivations rather than the direct impulse of the hunger drive.

The Zuni Indians possessed a priestly order known as "Gluttons." Serious in council, clowns in public, they were charged with curing stomach ills. During a public performance, one reportedly consumed green and ripe melons, pepper, bits of stick, refuse, "unmentionable water," puppies, peaches (stone and all), wood-ash, pebbles, crackers, molasses, pieces of woolen jacket, and paper (Cushing 1920:621-622). Not so extreme in the nature of what is consumed, but more so in the amount, are priests of a Hindu sect headquartered in Mathura. Their devotion consists of eating as continuously as possible. (Pickett 1957).

The hunger drive becomes an important factor in social change under conditions of high physiological stress, such as the socio-economic dislocations of warfare. Civilian populations forced to move from one locality to another, or doing so voluntarily, typically exhibit serious concern over food supplies. Persons of Japanese ancestry forcibly removed from coastal California to inland Relocation Centers during World War II displayed much anxiety about their food supply in the Centers. In the fall of 1942, evacuees in the Poston Center demonstrated quite clearly their concern over food

when offered the opportunity to earn additional income harvesting cotton outside the Center in the Parker Valley. As long as the administration proposed depositing all earnings in a community trust fund, the evacuees displayed little enthusiasm for cotton picking. As soon as the administration permitted earnings to be placed in residential block, church, or social club trust funds that could be employed to improve the communal kitchens and mess halls, or for parties and similar purposes affecting the food intake of the evacuees, considerable enthusiasm for cotton picking developed (Spicer 1952a:51-53).

When a Cherokee visits a metropolis where the U.S. Bureau of Indian Affairs encourages Indians to migrate, one of his immediate needs is the satisfaction of hunger developed during the bus trip. Stories about adventures with eating abound in references to restaurants: the glass-fronted restaurant where people stand at counters to eat, the neighborhood bar where people are friendly, etc. (Spade and Walker 1966:16).

The Vicos manor Indian brought to the metropolis for medical treatments promptly gets hungry. Arrangements must be made with a restaurant so that he can purchase his meals while in the city.

Back in the mountains, Vicos laborers for whom a Peace Corps volunteer undertakes to cook quickly arrange for their own women to prepare their food in local style (Dobyns, Doughty and Holmberg 1965:56), thus stressing the mediating influence of culturally acquired tastes in satisfying the hunger drive.

This same influence may be seen in the behavior of the Papuans in coastal settlements who dump into the ocean or trade to inlanders the wheatmeal and dried peas they receive as rations. They purchase fish, meat, rice, and bread, yet appear to consume less than an adequate diet for lack of funds (Belshaw 1957:90). Hungry they may be, but not hungry enough to eat the wheatmeal and peas.

#### D. Elimination

The ingestion of food and water results in two more stimuli inherent in the human organism. The water and solids resulting from the breakdown of food must be disposed of if the organism is to maintain its health. The sympathetic nervous system controls the process up to the time of final elimination, but that event is turned over to the conscious nervous system for individual decision, culturally determined except under extreme stress.

The physiological signals are bladder pressure and colon pressure, relieved by micturition and defecation, resulting in a removal of tension in the organism in one of its cyclic activities (Malinowski 1941:188). Personal habits to some extent altering the functioning of the sympathetic nervous system in this regard are culturally set.

An anthropologist or agronomist from the United States strolling through the fields surrounding an Indian village toward nightfall to enjoy the beauties of an Asian sunset is subject to being hustled back into the village with the local men. Why? Because the women customarily go into the fields at nightfall and just before dawn in order to relieve themselves. Women (at least those of higher caste than the "Depressed Castes") by custom do not perform these necessary functions during daylight hours. This requires a high degree of conscious muscular control and training, and one would rather expect Indian village women to become somewhat snappish in the later afternoon hours.

Such acquired habits of elimination become highly ingrained in individuals, even to the point of discomfiting the organism when its environment is changed. Such habits become forces for cultural stability rather than change, once firmly established. One physiological factor in cultural change discovered over and over again in public health programs is that: "Riser privies, for psychological or physiological reasons, seem to cause constipation among squatters." (Foster 1952:13).

On the other hand, the conventional understandings with regard to elimination of wastes from the human body can foster cultural change. An association between physical as well as ritual cleanliness and holiness has existed in the Judeo-Christian tradition for thousands of years.

"Thou shalt have a place also without the camp, whither thou shalt go forth abroad. And thou shalt have a paddle among thy weapons; and it shall be, when thou sittest down abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee.

"For the Lord, thy God, walketh in the midst of thy camp, to deliver thee, and to give up thine enemies before thee; therefore shall thy camp be holy; that He see no unseemingly thing in thee and turn away from thee." (Deuteronomy 23:13).

This Biblical commandment for disposing of waste certainly makes good sense for a nomadic people in a semi-arid zone, and there are many settlements of Christians in the world

today who might heed the words of Deuteronomy with benefit to their environmental sanitation. At the same time, the general association of holiness and cleanliness expressed in this Biblical passage has fostered cultural change in terms of repeated innovations in methods for disposing of wastes, particularly in urban settlements. Again, we see a supernatural sanction fostering cultural change.

Under other circumstances, innovation in arrangements for disposing of human wastes may respond in part directly to the bladder and colon pressures, although usually to the pursuit of prestige. Thus, in many Indian villages, pit latrines covered with a movable concrete platform with a built-in water seal to seal in odors and screened with bamboo for privacy have been introduced. Their principal utility is to serve as show pieces for visitors, and to be used by small children, the sick and the aged (Sheppard) who have the most difficulty consciously controlling colon and bladder pressures.

#### E. Restlessness

Man usually ingests a greater quantity of food than is strictly necessary to maintain life. Whether this ingestion results from hunger, a basic animal drive, or from a human appetite, a value-position toward particular foods, man generally consumes sufficient food to produce more energy than he needs merely to keep alive. He is possessed, therefore, of energy to work off; he is restless and indulges in activities which afford him the satisfaction of fatigue (Malinowski 1941:188).

In other words, in turning omnivorous and predatory, man acquired the energy base for humanness.

Once the human being becomes mobile, it is a tremendously restless being. The energy of children is proverbial.

#### F. Fatigue

The human animal's pendulum-like swinging from one extreme to another is well illustrated in his penchant for engaging in activity until fatigued, and then resting until his muscular and nervous energy is restored. (Malinowski 1941:188). Perhaps the exertions that result in fatigue are always directly motivated by cultural values, even in those marginal societies where the direct basic drives to answer fundamental animal needs are clearly evident. Among the Siriono:

...The hunter and gatherer must go in search of food at least every other day throughout the year. He must walk long distances, as many as 20 miles a day, in his quest for food. He may be forced to run at top speed through almost impenetrable jungle and swamp to bag a single monkey or coati, and once having bagged his prize he may be forced to climb a tree to retrieve it or the arrow with which he shot it. Game and forest products must always be carried back to camp - sometimes a long distance away. In walking and running through swamp and jungle the naked hunter is exposed to thorns, to spines, and to insect pests; he may fall from a tree (as he frequently does) while harvesting fruits or retrieving game, he is exposed to attacks from jaguars, alligators, and poisonous snakes; he sometimes suffers intensely from heat, cold, and rain. At least 25 percent of the time he returns to camp empty-handed or with insufficient food to completely nourish his family, for which he may be chided by his relatives. In short, while the food quest is differentially rewarding because food for survival is always eventually obtained, it is also always punishing because of the fatigue and pain inevitably associated with hunting, fishing, and collecting food. (Holmberg 1950:94).

Most societies have worked out more efficient economic techniques than those of the Siriono, so have been able to afford escape from fatigue in this acute, and ever-present, form.

One of the characteristic cultural patterns that deals effectively with the problem of restlessness and fatigue is the cyclical alternation of periods of labor and periods of festivities. Even though the latter may be overtly defined as religious in nature, they serve the purpose of changing the boring routine, injecting feasting into the ordinary diet, humor into the serious business of gaining a living, etc.

#### G. Somnolence

Aside from the periods of bodily repose to restore muscular energy, the human body requires additional rest in the form of sleep (Malinowski 1941:188). As a matter of fact, this is one of the more regularly recurring requirements of the human organism. When, for cultural reasons an individual is deprived of food, it can survive longer without food than without sleep. This is not to say that sleep cannot be dispensed with temporarily.

The university professor is all too familiar with the undergraduate student who falls asleep during class. Students have presumably been reared in normal North American homes where sleep is encouraged by soft beds in quiet bedrooms that can be darkened even during daylight hours, and loose bedclothing is usually worn. Yet at college, students learn to sleep in moving vehicles, on the grass at public parks and on the university campus, in double-occupancy dormitory rooms with the other occupant pounding on a noisy typewriter, and in class. Perhaps it would be more accurate to say that these students are trapped by somnolence, because they attempt to ignore this basic animal drive so frequently that they sap their energies.

We have collected a few examples of student inhibitions of the somnolence drive that indicate the kinds of sleepiness they can build up.

1. Night-reader. One coed appears to inhibit her somnolence regularly. She claimed to stay up all night at least once a week. One reason she gave was her desire to be "different." Paradoxically, another reason was her desire to read her numerous book assignments in English courses at night when her environment quieted down so that she could study efficiently.

2. Term paper writers-daters. In one case, a student with a term paper due Saturday stayed up all night. He worked on it all Thursday night so he could go home Friday for a weekend date. In another case, the student had to write two term papers. He began his period of wakefulness on Sunday morning. Working through the night, he completed one paper due on Monday. Working through Monday night, he completed the second paper due on Tuesday. Then he went out on a date Tuesday evening. He spent a reported 60 hours awake before finally going to sleep Tuesday night. We might add that both these latter examples are drawn from the student body at Cornell University which places a perhaps exceptionally high value on social life as compared to academic achievement. Still, the last student mentioned reportedly received marks of 80 or better on his two over-night term papers.

#### H. Pain

Several of the drives already discussed make themselves felt by some form or other of feeling we classify as pain. Hunger is one form of pain, as is thirst, fatigue, bladder or colon pressure in acute form, and so on. In a sense these can all be classified as aspects of pain, and the drives of the individual organism to satisfy these particular needs as responses to a pain stimulus.

There are, however, other sources of pain external to the human organism, such as the thorns and spines the Siriono hunter runs into while pursuing game, the falls out of trees he suffers, the attacks by jaguars, etc. The human being is endowed with a drive to avoid such sources of external pain, or having encountered one, such as a hot coal from a fire, to return to a normal state as quickly as possible (Malinowski 1941:188).

The sympathetic nervous system plays an important part in the transmission of signals of external pain, and to some extent the avoidance or withdrawal from a painful stimulus is automatic. The conscious nervous system may overrule the sympathetic, however, as when the Siriono hunter bursts through the spiny, thorny jungle after monkey meat, which is highly prized in his society (Holmberg 1950:39).

Cultural beliefs clearly lead to all sorts of overriding of pain. Among the South American Abipones, for example, fatigue was formerly relieved, reportedly, by plunging a knife deep into the leg, to let the blood spurt out for a while before applying a clod to the wound (Dobrizhoffer 1822:II:35). Although the Abipones were equestrian after contact with Spaniards provided them with horses, they suffered like the Siriono from the bites of "swarms of flies, gad-flies, gnats, and wasps" during their two to three-month long journeys across three hundred leagues of territory (Dobrizhoffer 1822:II:151). They were trained from early childhood to endure pain without manifesting any symptoms of it.

## I. Fright

Closely related to the stimulus of pain is that of fright. The perception of the stimulus is somewhat different, being limited to the auditory or visual, but the response is essentially the same: to escape the perceived danger and relax (Malinowski 1941:188). The causes of fright are many and varied, and only a small fraction of them are natural. Most are culturally defined.

In Latin America, one form of serious fright is soul-loss (susto) which may be brought on by many causes, among them a sudden fall, an automobile collision (in which no physical injuries are sustained), or a long list of social causes.

## J. Sex Appetite

Another of the basic biological drives of the human is sex appetite among mature individuals, leading to conjugation

and detumescence (Malinowski 1941:188). As we have already pointed out in discussing the economy of the Siriono Indians, the sex drive appears not to be as primordial in human affairs as certain psychological views would have it. Sexual conjugation is a way to sharing in the available food supply among the ever-hungry Siriono (Holmberg 1950). In better fed societies, the sex drive appears to be more important because most people are normally well-fed. In a sense, people in these societies resemble the monkeys and apes studied in zoos where they are so well fed that the hunger drive does not stir them (Ardrey 1963:34). Concerned with sexual fulfillment as well-fed human animals may be, they still "conjugate in accordance with rules of law and morals, or else against them, and thus under cultural conflict" (Malinowski 1941:190).

Many are the civilized circumstances of inhibition of the sex drive. Among these are definitions of proper places and times for sexual conjugation to occur. The U.S. Navy sailor married two days before leaving on a Mediterranean cruise lasting more than a year would be understandably eager to reestablish the marital relationship. If he draws shipboard duty the day his ship docks at New York, and his bride comes on board to welcome him, they will inhibit the basic sex drive while aboard ship, even when ostensibly alone together, such is the controlling force of social inhibitions.

The sexual drive clearly constitutes one of the most powerful forces making for cultural change in the world. For all types of mankind found thus far in the world are interfertile. Man constitutes a single species, and has shown an historical tendency to mate across any racial or ethnic boundaries that developed during long periods of geographic isolation.

The biological drive toward sexual conjugation has repeatedly produced special populations intermediate physically and culturally between two antecedent groups.

Thus, the "Cape Colored" population of South Africa resulted from initial unions between Boer (white European) males and Negro females. An identifiable hybrid population with cultural traits derived from Europe and Africa resulted, which continues to this day to be intermediate between the South African racial extremes. The racist white government of South Africa moved only in recent years to downgrade the Cape Colored to segregated status under a Colored Affairs Department (Lelyveld 1966:109).

The early Portuguese and Dutch imperial rulers on the island of Ceylon produced progeny there that in time took on

the label of the European ancestors, without being absorbed into the local Singhalese population.

The handful of British rulers of the Indian subcontinent produced, despite the theoretical psychological coolness and social distance of the Englishman, an intermediate population of Anglo-Indians. Under imperial rule, the hybrid Anglo-Indians occupied social and economic positions intermediate between the European overlords and the Indian subjects. A few Indian rajahs and rich businessmen and knights held social and economic positions far above those of the Anglo-Indians, of course, but the generalization is valid.

In the United States, the American "Negro" actually is a population composed of a broad range of genetic hybrids ranging from virtually all European to some still nearly all African genes. The American Negro is, in effect, that part of the U.S. citizenry with any identifiable Negro ancestry except for those individuals who have succeeded in "passing" into the general population (Myrdal 1944:113). Miscegenation of African slaves, whites, and Indians occurred as soon as the former arrived in North America (Myrdal 1944:124).

Among many conquered Indian tribes in the United States, a "mixed blood" group stands physiologically and culturally and socially between the dominant whites and the subordinate Indians, often referred to as the "full bloods." The labels in many cases have come to denote cultural rather than physical differences. Yet the very creation of two competing groups fosters change, and the compromise enculturation of hybrid children by their parents inevitably produces a group with different propensities for change than the unmixed tribal population.

This tendency of the human sex appetite to foster cultural change has been fairly explicitly recognized by at least some organizations concerned with cultural conservatism. The Mennonite Church is one such organization. The Mennonites have maintained considerable cultural isolation from other people for nearly 450 years. Among the social mechanisms for Mennonite cultural stability is a strong inhibition of all sexual activities outside of marriage. Divorce is forbidden among Mennonites, so marriage is serious enough, apparently, to deter heterosexual activity among adolescents that might lead to hasty marriage. Revival meetings encourage confessions of sexual and other transgressions against the Mennonite moral code, so that social controls are efficiently maintained. Offenses are punished by excommunication, ostracism from church participation or socially, and enforced public confession. Unmarried women are conditioned to sublimate their sex drive into activities acceptable within the sect - usually religious fervor.

The Roman Catholic Church has also recognized the threat contained in the human sex drive, in its restrictions upon marriage between Catholics and non-Catholics. Modification of such restrictions both represents real cultural change within the organization, and the potential for even greater future change through the operation of the sex drive.

#### K. Territoriality

Certain very strong drives of the human animal are less easily observed and recognized because of the focusing of scientific attention more than because their consequences are not observable. Foremost among such drives is territoriality. Research on many animal species has shown that many kinds of animals behave in terms of territoriality, beginning with pioneer systematic observation of territorial behavior among birds.

Among the primates, possessing and defending a territory appears to be a "fundamental biologic need" (Carpenter 1940). Certainly a great deal of primate behavior is motivated by territorial possession.

Field observation of Madagascar lemurs has disclosed that even these prosimians live in troops that defend definite jungle territories. The Propithecus troops observed defend a quarter of a square kilometer territory, scent-marking branches and conducting ritualized confrontations at the boundaries (Jolly 1966:501).

The key point about territoriality among primates is that it is social, rather than individual as among birds and some other species. It involves group life, with internal social hierarchies, authority and obedience, and lethal violence in defense of the territory, at least in the case of man (Ardrey 1963:31).

#### IV. STAGES OF INDIVIDUAL CULTURAL CHANGE . . .

In the previous chapters we have outlined the physiological processes of cultural transfer, the individual processes of change, and basic biological drives that stimulate cultural responses and tend to limit them. Now we turn to the stages involved in changing the individual's conventional understandings. The process of cultural change typically occurs in an identifiable sequence of events affecting each individual member of society rather than all members at once. The proponent of cultural change who knows this sequence and takes it into account is likely to succeed in changing people better than the one who is ignorant of or ignores it.

##### A. Availability of Element in Social System

The first stage in individual cultural change is that of making a given innovation available within the social system to which the persons whose conventional understandings are to be changed participate. As our introductory chapter indicated, cultural change is a social influencing process dependent upon sensory perception save for self-generated or dreamed innovations. No new idea can be adopted until it becomes available for adoption.

The Papago Indians moved about their semi-arid domain in the Colorado Desert of North America on foot for hundreds of years. In the early 1700's Roman Catholic missionaries brought herds of horses into the Papago homeland as part of the mission institution (Bolton 1917), thus making mounts available to these Indians. Horseback riding and packing spread from Spaniards to Indians. Many decades later, Anglo-American railroad builders employed horse-drawn wagons in work on the Southern Pacific route to the Pacific Ocean. They were not directly concerned with Indian affairs as the missionaries had been. They were, however, interested in cheap labor, and the desert people had long sold their surplus labor. Papagos found jobs in railroad construction. There they became temporary participants in a social system using wagons, so wagons became realistically available to some Papago villagers for the first time, even though the U.S. government Indian Agent had been trying to persuade Papagos to use wagons for some time (Bliss 1952:24).

When Japanese residents of the Pacific Coast states and their U.S. citizen children were relocated at the Colorado River Relocation Center (Spicer 1952a:41), the population formed an ethnic, social, and political enclave sharply set apart from the existing Indian and Anglo-American population. Cotton growing was the economic mainstay of the

valley.. Yet, working in the cotton fields as a potential source of supplemental income did not become an element available in the Relocation Center social system until the local farmers sought harvest hands in the Center. The cotton crop had been harvested during the previous decade mainly by migrant Oklahomans and Texans. In 1942, the armed forces and the aircraft and other factories had virtually absorbed the rural labor force in the area. By October of 1942, when the rate of cotton ripening had outstripped the capacity of local Indian pickers, the Parker Valley growers watched their fiber quality deteriorate as it hung unharvested. They finally realized that the migrants would not arrive. So they urgently appealed to the administrators of the Colorado River Relocation Center for help from the 17,000 evacuees (Spicer 1952a: 41). Thus, cotton picking became an available alternative to boredom and dependency on the government financial allowance in the Relocation Center social system.

#### B. Individual Awareness

Once a potential innovation is available within the social system in which a given individual participates, the next stage of cultural change is awareness. We might compare the human to a sound recording machine. Sound is constantly being produced, so it is available for recording. The machine can, however, record only those sounds of which it is aware. It must be "turned on" before it can record.

In much the same way, the potential innovation may be available, but its chances of adoption depend upon people becoming aware of it. People have to be "turned on" like the recording machine.

The human mind is like a recording tape that has already been used. It is cluttered with pre-recorded conventional understandings once the individual is past infancy. The tape is erased before new sounds are recorded, but the human mind is not to be wiped clean so easily. Potential innovations need to gain human awareness in terms of all that is already stored in a person's mind. Typically, awareness is governed not merely by the quantity of conventional understandings already stored in the mind, but also by their quality.

There appears to be a common human tendency, under circumstances of great differences of power between members of two groups of a single social system, for members of the subordinate group to remain unaware of numerous conventional understandings that are available to them. Thus, in village Guatemala, many Ladino cultural elements are available to Indians and the latter observe them and probably even discuss

them apparently without becoming aware of them as potential innovations (Gillin 1945). Such elements are simply defined as Ladino.

This dichotomized awareness in social systems certainly is not limited to the sphere of intergroup relations. It is particularly important in the process of individual cultural change because peasants many times see themselves as participating in a social system distinct from that of "the government." The attitude survives in societies without peasants in such sayings as "You can't fight City Hall." As a consequence, the individual peasant may be aware of potential innovations in the power of "the government" that he remains unaware of as potential innovations for him. Something of this sort of block to peasant awareness seems to have been overcome by responsible extension workers in the Etawah Pilot Project in India. They had been specially selected for initiative and trained to seek novel solutions to the problems of changing peasant agricultural practices, so had developed high morale (Singh 1952:62, 67). These extension workers established green manuring with sanai in a critical season. When the project began, research had established the utility of green manuring. Seed of a good green manure was available and had been for years in a government agricultural cooperative store operated as part of the government effort to increase national agricultural production (Singh 1952:56-58). Nearly all residents were native-born, knew everyone else in the community well, and dealt with others on a personal basis except for caste considerations (Singh 1952:60). The villagers viewed government as "an outside organization." Most of their experiences with government officials such as policemen or tax collectors had not been pleasant, but had been expensive. The government had generally been represented by aloof but paternalistic and authoritative individuals. So the villagers "developed a strong attitude of avoidance" (Singh 1952:61). Possibly villagers were aware that green manure seed was available in the government store. Even so, they were not aware of its availability in their own social system. Only when government extension workers moved the seed out of the government or "outsider" store and into the villages, often in charge of a responsible villager (Singh 1952:59) did farmers become aware of it in their own social system.

Introduction of efficient farming practices on Navaho subsistence farms on the Fruitland irrigation project has been inhibited by the Navaho feeling that the land belongs to the U.S. government (Sasaki and Adair 1952:105) compounded by Navaho "defeated people" psychology and resultant hostility toward whites (Sasaki and Adair 1952:100).

When Parker Valley cotton growers appealed to administrators of the Relocation Center for harvest hands in October

of 1942, the appeal did not bring the possibility of picking cotton into the individual awareness of the evacuees. That awareness was produced by a series of verbal communications. An administrative staff meeting first decided that the evacuees should be given the opportunity to pick cotton as a means to earn cash and demonstrate evacuee support for the U.S. war effort (Spicer 1952a:41). The administrators called a special meeting with the evacuee leaders to inform them of the new element in the Center situation. These leaders then communicated the potential new pursuit in discussion meetings in the residential blocks. Other announcements helped make evacuees aware of the opportunity to work outside the Center (Spicer 1952a:42).

### C. Individual Interest

The next stage in an individual's acquisition of new conventional understandings consists of interest in a potential innovation. In this characteristic the human mind is unlike magnetic tape. Once a recording machine is turned on, the tape perforce records whatever sound is audible to the microphone. The human being, on the other hand, displays a selective interest in those potential innovations of which he is aware. That differentiation takes place in terms of the conventional understandings already established in a person's mind.

Residents of a Japanese fishing village displayed little initial interest collectively or individually in a professional Italian photographer whose desire to photograph scantily-clad female divers offered the prospect of easily-earned modeling fees. The villagers were quite aware of the photographer and his associates, since they took up residence in the local temple and strolled through the village each day talking to residents (Maraini 1962:49, 55-57). Yet the villagers evinced no interest in the potential innovation of posing for pay.

When the photographer went skin-diving and speared a sizeable fish with a spear-gun, on the other hand, awareness of and interest in this technological device went hand in hand (Maraini 1962:63). Technological improvements in taking fish from the sea interested the fishermen. Their cultural pattern predisposed them to interest in fishing technology as it did not predispose them to interest in becoming photographic models, even though both activities could bring economic and indirect social rewards.

This stage of individual interest in a potential innovation proved to be the critical one in the socio-economic change in the Relocation Center. We have outlined how

evacuee leaders in the Center made the population aware of the potential of picking cotton. When the day came for Center residents to go to work, very few did so (Spicer 1952a:42). The leaders themselves responded in terms of different personal interests. Some Japanese citizens wanted nothing to do with the proposal because of a concern over preserving strict neutrality with regard to the war. Others, both Japanese and U.S. citizens, espoused the administrative view that saving the cotton would improve inter-ethnic public relations. Some evacuee leaders expressed surprise at the "socialistic" scheme for handling the funds to be earned picking cotton, while some elder Japanese strongly supported the idea of a community trust fund advanced by the administrators. The Center operated on a theory of approximately equal income for all evacuees. Since individual and family-unit earnings from cotton picking would vary greatly, the administrators proposed putting all picking wages into a community fund to be spent later by the evacuee leaders (Spicer 1952a:48-49).

The evacuee leaders turned out to pick cotton right away (Spicer 1952a:42). They were interested in trying the innovation because they were most aware of the alternative, and we may infer because they were interested in having evacuees turn out as a vindication of their own leadership. Nearly all the other evacuees were apathetic (Spicer 1952a:49). They simply were not interested in trying it.

Within days, however, the number of evacuee cotton pickers quadrupled because a way was found to interest individuals in earning money. Residents in some blocks proposed that cotton picking wages be put in a block trust fund to pay for parties and dining hall improvements. (The evacuees ate in mess halls located in each block.) In other blocks, evacuees proposed that cotton picking wages be put into trust funds for church groups or other clubs. When the evacuee leaders obtained administrative approval for establishing these funds, people began to pick cotton, and competition developed between blocks (Spicer 1952a:51). In October, 1942, the five month old settlement had not yet developed a community wide structure, so evacuees were not interested in working for money to go into a community fund controlled by strangers. They were concerned over block kitchens and mess halls and block conditions and recreation (Spicer 1952a:53). So when arrangements were made to allow them to spend cotton picking proceeds at the block level, the evacuees displayed considerable interest in the innovation in Center subculture.

#### D. Individual Trial

Once a person's interest in an innovation has been aroused, the next stage is a period of trial. The individual tries out the innovation to find out whether it suits him. Advocates of change frequently overlook this stage, perhaps the most critical in the process.

Some kinds of innovation lend themselves to personal trial through vicarious means, at someone else's risk and expense, a situation favoring experimentation. Workers may be able to test out unfamiliar tools at the employer's risk. Thus, Papago Indians working on the railway line used horse-drawn wagons, became aware of these vehicles, became interested in them, and could assess their utility, all at the risk of the construction contractor. By the time some of them decided to purchase a wagon from the Indian Agent (Bliss 1952:24-25), they had already been able to observe the results of the crucial tests. All that remained untested - and untestable save by the actual event - was the social response to the wagon by their fellow villagers. Once the wagon was acquired, the Papago villagers quickly trained their horses to pull in harness, and put it to many hauling tasks (Bliss 1952:28-29).

When the Japanese fishermen became interested in the Italian photographer's spear-gun, they were able to have him demonstrate its efficacy at his risk (Maraini 1962:64-65). Thus, they did not have to risk the cost of a spear-gun to test the utility and suitability of this class of device to local conditions. The account does not inform us whether the fishermen then acquired spear-guns or not.

Similarly, we are left in doubt as to the individual trials of cotton picking by evacuees at the Relocation Center. Most of the evacuees had been urban professionals, shopkeepers, or suburban truck farmers. Few had been harvest laborers, and not many of this group had picked cotton (Spicer 1952a:44). Once the interest of the evacuees was effectively aroused by allowing wages to be spent on block improvements so individuals could see and share the benefits of their work, social sanctions such as lists of pickers posted on bulletin boards, and block gossip about pickers and non-pickers began to come into play (Spicer 1952a:51, 54). It is not reported whether individuals who tried picking cotton then gave it up as a bad job. Probably some did.

#### E. Individual Evaluation

The ultimate individual trial is that conducted by the person. This is the evaluation stage of the cultural change process. In the case of adoption of the wagon by Papago

villagers, personal evaluation brought satisfaction. Evidently Colorado River Relocation Center evacuee trials of cotton picking also brought individual satisfaction. Another example may clarify the distinction between trial and evaluation.

In 1946, an agricultural extension agent in New Mexico endeavored to induce Spanish-speaking farmers to raise a variety of hybrid maize in place of their local "Indian" type. Experimentation had shown that the hybrid was suitable for the locality and would yield more than the local maize. The agent helped the change by trading hybrid seed for local seed, thus putting seed in the farmers' hands at no cost to them. The first year, 40 of 84 farmers planted hybrid maize, and the second year 60.

The third year, the number of farmers planting the hybrid dropped, however, to 30 and the fourth year only three planted it (Apodaca 1952:35-37). The farmers went through the evaluation stage and the hybrid failed to meet certain criteria. The farmers grew maize for consumption and feeding their livestock. As much as the hybrid maize increased yields, demand kept pace so that little was sold. One of the principles of agricultural innovation appears to be that commercial farmers are more receptive toward technological innovations than are subsistence farmers (Sasaki and Adair 1952:110). This case suggests some reasons for this difference: The New Mexico farmers evaluated the hybrid maize partly in terms of its flavor, a consideration seldom entering into commercial sales. The hybrid tasted different but the farmers thought they would in time grow accustomed to the new flavor, since the higher yields were clearly desirable for stock feed.

The main form of maize consumption was the tortilla, a thin cake requiring some skill to produce. The farmers' wives objected to the hybrid maize because its consistency was not favorable to making tortillas (Apodaca 1952:38). This evaluation eventually won out.

Individual evaluation of green-manuring on India's Gangetic Plain brought results opposite to those in New Mexico. Farmers who had tried green manuring the previous season flocked to the government agricultural store to purchase sanai seed. By the end of June, about 300 maunds of seed had been sold compared to only 128 the previous season. By early August sales approached 600 maunds (Singh 1952:65). The farmers obtained yields sufficiently higher than those on fields not green manured to motivate a very positive evaluation of the utility of the practice.

## F. Adoption

After people have evaluated an innovation, they reach a decision to adopt or reject it. If they decide to reject it, of course, the process of cultural change is thereupon terminated. If they decide to adopt the innovation, then cultural change in fact occurs. It is truly cultural, rather than ideosyncratic, only when the new understanding becomes conventional, i.e., shared by a number of individuals.

## G. Integration

If the decision on an innovation is adoption, the final stage in individual cultural change is routinization of the new element. If the innovation requires movements not made before, the individual establishes new muscular habits and skills. When the Papago villagers trained their horses to pull a wagon, they themselves had to habituate themselves to handling the reins. The Colorado River Relocation Center evacuees who decided to pick cotton had to habituate themselves to the rapid open-fingered grab at cotton fibers attached to sharp-edged pods, and the swift stuffing of the fluff into a canvas sack dragged along the row by a strap over one shoulder. The Yir Yoront women and children who acquired steel axes quickly learned the muscular habits appropriate to efficient use of a steel as compared to a stone axe.

At a more complex level, the usages of democracy require routinization just as much as a new tool. In the Manus village of Peri, after social reformation was decided upon, open and conscious effort was required to end the old habits of "covert verbal attack" and insult and of self-destructive anger, and to replace them with patterns of egalitarian discussion in village meetings (Mead 1956:361), and the habit of regular attendance at meetings (Mead 1956:350). In Peruvian Vicos, seminars led by Cornell Peru Project field directors established the pattern of egalitarian discussion, instilled the habits of open discussion of issues, and equal treatment of all members of a council for five years before Indian serf leaders took over full responsibility for local affairs.

## V. SOCIAL PROCESSES OF CULTURAL TRANSFER

In this chapter we take up the social processes of cultural transfer between socio-cultural systems. Many of the process labels are the same as those employed in our discussion of the stages of cultural change as they affect individuals. This duplication of meanings reflects the fact that social science depends largely upon terms already available rather than inventing new ones, and that English does not distinguish between individual and group phenomena. We ask our readers to remember that we are here concerned with social process rather than individual. A fundamental point about the transfer of conventional understandings between cultures is that personal contact between persons reared in different cultural traditions stimulates change (Barnett 1953:302; Ginsburg 1958:214; Keesing 1958:401; Murdock 1955:365; Redfield 1953:123).

### A. Rejection

There are essentially only two social choices to be made when cultural transfer is possible. One is acceptance, which we shall discuss below, and the other is rejection. Rejection of cultural change by borrowing an element or elements from another social system certainly is not uncommon in human behavior.

The long human record contains many instances of rejections of cultural transfers on religious grounds. In Peru, civil marriage was made the legal form of matrimony some years ago. In the Vicos social system, this modern practice of the industrial and secular state has thus far been rejected. In colonial times the form of matrimony accepted in this social subsystem came to be that celebrated as a sacrament by a priest of the Roman Catholic Church. The social structure of the manorial system firmly imbedded church marriage as the practically universal form of adult union, preceeded by a period or periods of trial marriage (Price 1965). With the termination of the manorial system and increasing formal education of Vicosinos, a new opportunity has been offered them to adopt the form of matrimony legalized for the country, so rejection may not be final and irrevocable.

This is one characteristic of the social process of cultural transfer between interaction systems. Whenever participants in two social systems are in constant contact, opportunities for cultural transfer occur repeatedly. Rejection must also be constant, therefore, if transfer is to be blocked. The socio-cultural phenomenon of constant rejection has been recognized by anthropologists as the erection of boundary-maintaining mechanisms.

## B. Acceptance.

When the individual human being reaches the adoption stage in cultural change, there remains routinization, but the process involves no other persons (except insofar as the innovation itself requires other persons to be operative). The social process of cultural transfer in social systems is not nearly so simple. Acceptance in group terms is a long-continued process which has a technical label: diffusion. This term denotes both the spread of a given trait from social system to social system and its spread from participant to participant within a social system, although perhaps the label dissemination is preferable for the internal process.

The simplest model of diffusion of a trait in a given social system is the spread of rings over the surface of a pond after a stone is dropped. This model assumes that all conditions are such as to allow geographic diffusion at a uniform rate. Human social structures are seldom such perfect conductors as water; so other conditions are seldom equal and geographic diffusion proceeds at irregular temporal rates. This relatively unpalatable reality has stimulated interest in the analysis of cultural change. It has given currency to the concept of cultural lag: the survival of earlier conditions or forms of technology in areas where inhibiting factors have slowed the diffusion process at the same time that they have changed in more receptive regions. Lag occurs when two correlated cultural elements become progressively less adjusted to one another (Ogburn 1964:86).

This differential time of adopting an innovation is a consequence of the nature of the diffusion process. Numbers of individuals are involved, so time is required to make a new cultural trait effectively available to each one, unless the innovation occurs as a result of deliberate planning on so massive a scale of transcultural influence as to succeed in reaching all individuals in the changing social system simultaneously. Such circumstances appear to be extremely rare. Typically, contacts between participants in two social systems are limited to a small proportion of the numbers in the respective systems, so whatever innovation occurs perforce diffuses from those individuals in contact with other participants in the changing system.

Even in programs of guided cultural change, the resources at the command of the change agents are generally far too limited to permit them to attempt to influence all participants in the system to be changed at the same time. The Cornell Peru Project program of introducing technical agricultural practices to Vicos serf slightly-less-than-sub-sistence farmers affords an appropriate illustration. When the Project began its farmer training, there were some 363 families living in Vicos (Alers 1965:12). The Project lacked

personnel to attempt to reach all these farmers during a single season. At the same time, the disposition of these farmers to adopt new practices was minimal.

The total number of sharecroppers signed up and trained during the first season was only 17, or less than five percent of the family units. The success of 16 of the 17 sharecroppers during the first season's potato production convinced the serfs of the practicality and desirability of growing these tubers the new way. During the second season 85 farmers took part in the training program. Thus, the total number of farm families involved rose from less than 5% to 23.4%. At the first-year diffusion rate, more than 20 years would be required to teach the new farm practices to all the families, assuming no population increase. The more rapid second-year rate implied that the new agriculture might diffuse to all the families in five years. In the third training season, the number of farmers participating in the program rose to 156. This taxed the Cornell Peru Project personnel to its limits. This season, 43% of the family farmers received instruction in experimentally tested techniques for producing high potato yields. At such a rate, the entire population could be taught the new practices in three seasons, even allowing for population increase and some repetition by slow learners. In fact, nearly all Vicos farmers learned the new potato-raising practices by the end of the fifth season of Cornell Peru Project tutelage.

A few farmers continued using traditional techniques. The one farmer in the first year's program whose harvest was ruined by nematodes blamed the new technology for his loss and refused to have anything further to do with it. Diffusion of the new potato-raising practices has never reached 100% of the Vicos families. This situation characterizes the end results of most diffusionary processes. Seldom does a cultural trait diffuse to 100% of the participants in a given social system, particularly over periods of only a few years.

Programs are successful when they achieve acceptance by nearly all the possible population, even though a few cases remain outside the pattern. Thus, in the United States where state compulsory school attendance laws are rigorously enforced, it is almost impossible to achieve 100% attendance by school-age children. There are invariably exceptions: the seriously crippled child requiring a special program or specially constructed classroom facilities that are unavailable in the district; or the handicapped child who stands on the borderline between public schooling and institutionalization for whom no special program is available; the child of staunchly religious parents belonging to a sect opposed to one or another aspect of the public school curriculum who is

educated at home and ignored, or the subject of drawn-out legal contention, and so on. Yet no one maintains that compulsory school attendance legislation is not successful. What is important is the rate at which a given innovation changes from no acceptance to that 80% to 98% that constitutes effective general acceptance. This rate varies as a function of innumerable factors.

1. Socio-cultural factors. Some of the factors influencing the rate of cultural change within a social system are rather general conditions that may be termed "socio-cultural factors." Aware of the element of tautology in our discussion, we are apparently unable to avoid terminological duplication.

One significant factor thought to govern the rate of cultural change is the social scale (size and complexity) of the society itself. The Australian aborigines exemplify societies of small scale: an individual interacts with only a few hundred persons in his lifetime; division of labor is simply by age and sex, although three or four males may specialize as shamans, and there is some ritual specialization by totemic patriclan; otherwise, all interactions are in terms of a few standardized kinship roles (Sharp 1958). Our own society, on the other hand, with its large population, and myriad roles, is of large scale. An increase or decrease in scale is, of course, change; but such change inevitably leads to more changes (Siegel 1952:138). It has also been asserted that the larger a society is in social scale, the more rapidly can cultural change proceed without producing disequilibrium in the existing patterns (Wilson and Wilson 1945:134). The smaller a society is in social scale, then, the slower the rate of cultural change is that can occur without producing such disequilibrium.

Socio-psychological factors affecting the rate of cultural change have been variously interpreted by different social scientists. Aside from social scale, it has been observed that on occasion social change occurs very rapidly, particularly if the innovations provide "a welcome release" from what has been regarded as a "crippling traditional system" (Beaglehole 1955:384). Such change may be integrative, reorganizing the community to a more orderly life with higher morale.

An opposing view is that community disorganization is a result of swift and abundant cultural change. The community changing relatively slowly is thought to be able to accept an additional innovation better than one changing at a faster and all-pervasive rate so that its functional equilibrium is already disturbed. That is, the accustomed system of authority and cooperation, communication, and values is disrupted sufficiently to threaten community morale (Leighton and Smith 1955:82-83).

The positivistic view holds, however, that social disintegration is most likely only under circumstances of forced change that strike at land tenure and leadership patterns and the population base itself so that the social and physical conditions necessary for any society to function disappear (Beaglehole 1957:239). Even this interpretation is less positivistic than one formulated during World War II from African data that is peculiarly appropriate in view of the tremendous cultural change that accompanied the political independence of former colonial areas on that continent. Great changes achieved in brief periods, affecting "economic organization, scientific concepts, techniques, moral values, dogmas, and qualities" may arouse no determined opposition and be viewed as "development" without a diminution of equilibrium (Wilson and Wilson 1945:133-34).

Recent field research appears to be lending support to the positivistic theory of change in confirming that rapidity and thorough-goingness of change appear to go together. It has been suggested on the basis of the Manus case of rapid and wholesale reformation of traditional culture that change advocates seeking to install a new technology or persuade people to take up significantly different sorts of economic arrangements should strive to achieve rapid change, since the people changing may be better able to take up the new ways if they also put on new clothing, consume new foods, and inhabit new houses (Mead 1956:445-446).

2. Imitation: Another factor affecting the rate of diffusion of a cultural trait is its own nature. It appears that in social systems, as with individuals, whatever can be directly imitated diffuses faster (other conditions being equal) than that which must be modified or requires modification of the social system adopting it.

The techniques for raising high-yielding potatoes could be directly imitated by the Vicos farmers the Cornell Peru Project set out to change. Seed fumigation requires a barrel, the ability to mix a standard quantity of fungicide into a standard quantity of water, baskets, and time and muscle to dip tubers and dump them out to dry. The serfs could already plow furrows at regular intervals. Dropping fertilizer into the furrows posed no problems. Planting seed potatoes at wide and regular intervals could be insured by using a stick cut to the recommended length alongside the demonstration stick employed by Cornell Peru Project personnel to illustrate proper spacing. The serf farmer did not need to read a metric rule to find "30 centimeters". Nor did he have to understand enough Spanish to comprehend what a Mestizo extension agent was saying and then translate this verbal concept into action. This requirement short-circuited transfer of the message of proper seed spacing when Andean mission employees have attempted to communicate to Quechua-speaking Ecuadorian farmers. The

elements of the new potato growing complex, including the stick, were all broken down by the Project staff to the point where the Vicos serf could directly copy every operation. Verbal explanations were given to the serfs in Quechua so that they might comprehend the reasons behind the actions, and thus build conceptually from directly copied potato practices to using similar experimentally tested techniques to grow other crops.

3. Modification. When a trait from one socio-cultural system must be modified to conform to the adopting system, its rate of diffusion is likely to be delayed while modification is carried out.

In Vicos, the democratic principle of free individual choice in the election of delegates to a community wide governing council was delayed for several years until techniques could be worked out to make balloting effectively secret. When elections were first held, powerful men in each electoral district nominated candidates in open meetings, and delegates were selected by acclamation. Only several years later was a system of colored cardboard ballots devised that permits each voter to select the color coinciding with that worn by the candidate of his or her choice and drop it into the ballot box. This system allows non-literates to vote, as in India. It permits the introduction of free individual choice into a social system with relatively numerous and efficient face-to-face social controls. It is not the Australian ballot, but it achieves comparable goals because voting procedure has been modified to conform to the Vicos social subsystem and value system, emphasizing individual freedom of choice to the extent possible despite strong enforcement of a fairly stringent social conduct code.

There appears to be considerable consensus on the frequency with which innovations are modified in the process of acceptance (Kushner, Gibson, Gulick, Honigmann, and Nonas 1962: 34; Barnett 1953:331; Jeffreys 1956:730). The strong assertion, that innovations "invariably" are adopted to the existing patterns and norms of the culture (Dube 1958:130) seems a bit too sweeping, although modification has also been labeled "inevitable" (Barnett 1953:80). A more conservative statement has new traits or patterns "rarely" being adopted without modification, and sees them as "always" being reinterpreted into a "local cultural idiom" (Potter 1955:99).

Although new conventional understandings are modified to fit into existing cultural patterns, the context into which a few conventional understandings may be placed in dissimilar cultures may differ greatly (Miner 1939:241). This suggests that in fact reinterpretation may occur with somewhat lesser frequency than most theorists have thought.

A number of specific forces making for trait modification during the cultural change process have been identified.

The existing values of people changing their conventional understandings tend to produce reformulations in newly adopted cultural elements (Keesing 1958:401). Since values are typically formed largely in religious terms, people changing their conventional understandings - and especially those displaying the greatest religiosity - may find acceptable only those innovations which they can rationalize in terms of their religious traditions. This process is specifically identified for Islamic believers (Quint 1958:382).

The existing social organization also affects the modification of new conventional understandings, since they appear to be screened at different social levels such as elites, factions, kindreds, informal groups which operate like filters in altering the meaning and form of a conventional understanding disseminating through the society (Dube 1958:129).

Also involved in trait modification during acceptance is personal habit. As indicated in our discussion of individual cultural change, routinization is the final step, and it requires alterations in previously routinized behaviors. These can change the meaning or function of the new trait (Keesing 1958:399).

4. Dissemination. Either a copied or modified cultural trait that disseminates to nearly all the participants in a social system appears likely to bring about modifications therein. When diffusion proceeds with little or no apparent disruption of previous cultural patterns, the innovation is viewed as being integrated into the existing system. If it causes apparent disruption during its period of dissemination, however, the new trait is viewed as producing disorganization.

The distinction between integration and disintegration is extremely difficult to draw on purely scientific grounds. It seems to involve value judgements based upon preconceived notions of what is socially desirable and what is a social problem. Thus, the diffusion of effective practices for raising high-yielding potatoes in Vicos to nearly all its families resulted in relatively rapid integration of the new technology in Vicos family economies. The increased economic power of the families, coupled with other changes in the status of the Indians, constituted a serious social problem from the point of view of the provincial land-owning elite. Members of this group favored preserving the status quo under which they enjoyed political, social, and economic primacy. To face Indians with increasing wealth threatened them with having eventually to settle for a less dominant social status and less political power than they were accustomed to hold.

The facts in this case point to a significant proposition about cultural transfer. To the extent a trait diffuses to all participants in a social system, and to the extent the new trait differs from already accepted traits with equivalent functions, so the culture must be reinterpreted to produce suitable new configurations.

The school system has been in Vicos the kind of innovation so different from traits previously present in the Vicos subculture that its effective integration into the subculture has required extensive reinterpretations: in inter-sibling authority relations (elder brother veterans encouraging even forcing their younger brothers to attend school); creation of a new role of "literate"; insistence on teacher honesty and reasonable quality of instruction, etc.

There appears to be an impressive scientific consensus that an innovation accepted as part of a cultural system tends to foment further and consequent changes (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:35ff).

The more general types of statements of this proposition are usually neutral about the nature of the consequent changes. They stress that even a limited cultural transfer brings in its train "secondary and often tertiary effects" that may or may not have been anticipated (Hoselitz 1957:412). They stress that it takes only one innovation incorporated into a "social order" to set in train ever increasing change (Quint 1958:382). Or, they assume that a change in a society in equilibrium requires adjustment change to restore the steady state (Dobyns 1951:31).

One common view of the dynamics of consequent change is that the degree of integration in a society determines the probability for consequent change and conflict (Miner 1939:236). If the consequences are dislocations, then the more closely integrated the cultural elements, the more quickly dislocations will appear and the more extensive they are likely to be (Linton 1952:86).

A good many more specific configurational relationships in cultures have been identified, on the general theory that change in any part of a cultural system will necessarily be discerned in consequent changes in "idea-sets" somehow correlated with those in which change first occurred (Barnett 1953:90).

Thus, one line of thought predicts that demographic changes set in train changes in other aspects of culture (Ember 1963; Leighton and Smith 1955:87; Nash 1958:20; Barnett 1953:93; Murdock 1957:674).

Cultural values are seen as related to social situations (Belshaw 1954:60).

Diet, labor, communication, and transportation are seen as interrelated, so that change in one brings about change in the others (Leighton and Smith 1955:87).

Supernatural sanctions are seen as regulating the social system so that loss of them produces weakness in it (Useem 1957:30). A closely related view sees the collapse of social controls produced by "social and political upheaval" as opening the path toward change (Barnett 1953:71).

Economic changes are widely regarded as causing consequent changes in other cultural spheres.

Technological change or altered productive arrangements are seen as causing consequent cultural changes (Steward 1955:37).

Not only production, but also distribution and ownership changes are viewed as having far-reaching effects, and being capable of disrupting an existing social system (Linton 1952:87).

Technological change is viewed as altering values, especially when factory industrialization is involved (Beaglehole 1955:381). Industrialization fosters wholesale adjustment (Hunt 1957:320) because employing persons not formerly producing income, and defining alternative occupational roles foster change (Nash 1958:20).

There is impressive agreement by anthropologists that a cash economy introduced into a society formerly without one weakens family ties and traditional sanctions (Mair 1953:19) or reduces the size of the "functional family" as it saps the strength of the extended family (Foster 1958:12). The causal change may be defined as greater opportunity for individual profiting, but the end result of weakening extended kinship ties is the same (Linton 1952:84). It is also recognized that changing from a subsistence to a cash economy entails change in areas of culture other than family relations, such as values and the division of labor (Mead 1953:198).

Shifting from a subsistence to a cash economy is linked with urbanization as a cause of dietary deterioration (Foster 1958:11).

This change is also thought to make positions of economic privilege sources of personal gain (Mair 1957:51). The relationship is not limited to situations of change, though.

In Vicos, serfs relatively well off under the traditional manorial system effectively turned their positions of economic strength to personal gain. Serfs owning oxen and cattle demanded personal service from serfs who had to borrow cattle to stake on their fields to fertilize them, or to plow. This personal service exaction was in addition to the calculation of obligation in monetary terms when a poor serf had to borrow money from a well-to-do one (Vazquez 1965:9-10).

## VI. STAGES OF CULTURAL TRANSFER FROM ONE SOCIAL SYSTEM TO ANOTHER

Having discussed social processes of cultural transfer, we now take up the stages in the transfer of conventional understandings from one social system to another. These stages closely parallel those already discussed as stages of individual cultural change.

### A. Availability

Just as a cultural element must be available to the individual in a social system before he can be aware of it, so must an element be effectively available to a social system before its participants can become aware of the possibility of adopting it.

Any given culture consists of conventional understandings that are in many important respects complementary and/or supplementary. They may not be logically consistent with each other, but they do form a patterned and interconnected whole. Thus, adopting a new conventional understanding requires appropriate adjustments in pre-existing ones. Such adjustments are manifested sooner or later in behavioral changes.

This patterned connectedness of conventional understandings is not necessarily perceived clearly by advocates of cross-cultural change. As a consequence, guided change programs (as well as less structured contacts between two socio-cultural systems tend to make conventional understandings that link into patterns differentially available to participants in the socio-cultural system undergoing change. Advocates of planned change thus proffer conventional understandings that are not functionally linked, or fail to proffer some of the conventional understandings that are in fact functionally linked to the ones that they are promoting.

1: Withheld traits of donors. Advocates of change sometimes withhold conventional understandings that may be more critical for producing desired changes than the ones they promote. In Bureau of Indian Affairs education in the United States, schools and teachers have behaved as though their Indian pupils already shared the Anglo-American understanding that children compete against one another for grades. Yet tribesmen who rear their children outside the mainstream of Anglo-American life inculcate a conventional understanding that children solve problems cooperatively and share solutions. Often Indian school children do not understand such

cooperation to be cheating or in any way to be frowned upon. This is their understanding of proper interpersonal interaction in problem solving situations.

In Peru, the University of North Carolina is engaged in an attempt to proffer a complex web of conventional understandings concerning the operation of a national agrarian university to perform for Peruvian agriculture the sorts of services that land grant colleges have performed in the United States. One understanding about United States universities appears to be consciously or unconsciously withheld. This is that colleges and universities that are public institutions are governed by policy-making boards of trustees who function as institutional shock-absorbers between state politics and politicians and the university faculties.

The professor in traditional Peruvian universities has been a political activist in a great many instances, and frequently by necessity.

2. Proffered traits of donors. In Vicos, at quite another level of society, the social science staff (North American and Peruvian alike) shared the implicit understanding that a truly democratic election requires a secret ballot. When the Indian ex-serfs began to elect zone delegates to the governing council, however, the Indians did not share this understanding. They selected their first representatives by the Spanish cabildo analagous to a town meeting with nomination in open meeting and election by public expression of electors.

The scientific staff then made explicit its formerly implicit understanding about secret balloting, and explained this concept to the ex-serfs. Once the concept of and a practical means for secret balloting was explained to the Vicosinos, they quickly adopted the new practice and came to share the democratic understanding behind it rather better than before.

#### B: Awareness of Recipients

Awareness of a proffered conventional understanding can also be differential among the members of a socio-cultural system. The agricultural extension program conducted by the Bureau of Indian Affairs among residents of the Fruitland irrigation project in New Mexico provides a good example. The extension agent was male. He worked with Navajo men to teach them improved farming practices. No extension work was conducted among the women. As a consequence, the women remained unaware of the proffered conventional understandings about cropping, improved irrigation practices, insect control

and so on. Yet women and children conduct many of the critical farming operations including irrigation... Thus, the actual full farm labor force was not reached by the extension program, and key farm workers remained unaware of proffered understandings that were available within the Fruitland socio-cultural subsystem (Sasaki and Adair 1952).

### C. Trial Acceptance

Just as a stage of individual trial of new cultural traits may be discerned, so can a trial stage be identified in the response of socio-cultural systems to new conventional understandings. In the latter instance, the trial period is one during which a number of individuals begin to behave in terms of the new understanding, and test its degree of compatibility with already established cultural elements.

A good deal of social scientific thought has been devoted to the question of what occurs during and as a result of this trial period. A basic concept is that a conventional understanding and its consequences will not gain acceptance unless it proves to be functionally related with other cultural elements (Keesing 1958:398 and Linton 1940:484-5). One general proposition holds that a conventional understanding and its consequent behaviors are more acceptable if it can be fitted into an already present complex than if it cannot (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:10).

### D. Integrative Acceptance - Dissemination

If other factors are equal, the more easily a conventional understanding can be integrated into the existing cultural configuration, the more rapid will be its acceptance (Fisher 1953:142). A closely similar statement about competing cultural traits or complexes has the more easily comprehended and integrated winning out over the less easily understood (Newcombe 1956:127-128).

The converse formulation emphasizes that lack of conflict between the proffered and existing cultural traits or patterns fosters acceptance (Hoselitz 1957:413). The proffered element gains acceptance (Keesing 1958:401) to the extent that it demonstrates no conflict with important existing values. That trial is a matter of perception is also stressed (Foster 1958:40) in saying that a proffered trait perceived as doing no violence to established ways is likely to gain more acceptance than one appearing to conflict with them.

Human beings are complex, however, so a precautionary general proposition has been advanced on this score. This admonishes that while trait or pattern incompatibility may lead to rejection of a new conventional understanding, it does not follow that compatibility guarantees acceptance. Congruence with existing understandings seems seldom sufficient reason for accepting a proffered one (Wilson and Wilson 1945:46). If a proffered understanding competes with a custom already present, it follows that the people trying it out must find it superior to the old trait in order to forget the old and establish the new (Barnett 1953:359).

A conventional understanding proffered to the participants in a given socio-cultural system need not, however, necessarily directly displace a pre-existing one of equivalent function (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:12). A proffered and tried trait can become simply one more cultural alternative (Linton 1936:273-4; 278-85). It seems important in this connection to keep in mind that much cultural change consists of an increase in scale (Wilson and Wilson 1945:25), and that one means of scale increase is the addition of alternatives to a cultural inventory. Such addition increases the intensity of relations within the society.

The outcome of the trial period is affected by the satisfactions that the individual obtains from the trial, so we have already discussed this factor in Chapter IV and need merely mention it in passing here.

#### E. Factors Accelerating or Inhibiting Dissemination

Once a conventional understanding has been tried out by some participants in a given socio-cultural system, its further dissemination is largely regulated by the nature of that system. We will discuss this aspect of social and cultural change again below. Here, we wish to lay particular stress on the factors of social organization that are generally agreed to accelerate or inhibit the dissemination of cultural elements.

1. Class. One element of social organization that appears strongly to affect dissemination of new traits is social class. Different classes tend to respond to proffered changes differently (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:19).

One view of cultural change sees it as tending to enter a given socio-cultural system at the upper class levels, and then to diffuse across class lines to the lower status groups. One statement of this theory defines upper class members as more likely than lower to accept the conventional

understandings concerning "modern medical practices" since affluence, formal education, and close contact with clinics and doctors characterize the upper class (Gould 1957:512) and by implication predispose its members toward accepting innovations in prevention and therapy.

Another perspective of social class and change is that members of any class are more apt to adopt conventional understandings from classes above them than from those below them (Loomis et al 1953:276). When this process is underway, the rate at which traits disseminate from higher to lower class people has been asserted to depend upon the amount of inter-family relationship across class lines. Social distance is viewed as slowing the rate of change (Loomis et al 1953:281).

Related to this conception is the position of the group that fears it may lose power or prestige or wealth if a given conventional understanding gains currency (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:19). Opposition by such "vested interests" (or the "elite" [Goldschmidt 1952:142]) is taken to be a "particularly potent obstacle to change (Nimkoff 1957:68). It has been held that an advocate of change in income levels or an innovation that will change income levels needs to be quite independent of the group affected if he is to succeed (Deyrup 1957:193).

The absentee landlord often has the ability to hold back economic growth (Linton 1952:82). At the other end of the spectrum, organized labor can make capital formation difficult in either the private or public sector (Deyrup 1957:198) as Bolivia has discovered in recent years.

2. Peasantries. The landlord and organized laborers are not the only types of groups found to influence the rate of change. Peasant characteristics also enter into determining change rates (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:17). Another dimension of the upper class-lower class flow of conventional understandings is produced by the urban concentration of upper class people and elites. Cultural change typically reaches the peasant from a city which functions as an innovative center (Foster 1958:13; Redfield 1953:37-38; Redfield 1941).

The village upper class appears to adopt urban conventional understandings first, and these then spread to other villagers in their search for prestige (Quint 1958:382). Related to the dynamics of prestige-seeking in cultural change appears to be neutrality of formal education. It has been asserted, at any rate, that universal literacy will not change a peasant style of life where its uses are limited

(Redfield 1953:37-38). Personal influence constantly exerted is also seen as an important factor in producing cultural change among peasants who passively accede to guided changes, but return to traditional ways once the advocate of change disappears from the scene (Quint 1958:373-374). Peasants are regarded as skeptics who must see to believe, who lack abstract goals (Mead 1953:203).

Two other significant variables in peasant behavior have been identified. Land-owning peasants have been characterized as resisting industrialization (Redfield 1956:59). Commercialization of peasant economic activities is facilitated by the absence of mutual obligations between members of extended kinship groups (Dupree 1956:29).

3. Extended kindreds. The extended kindred characteristic of many non-industrialized societies is generally felt to inhibit the adoption of new conventional understandings, particularly when kinsmen owe mutual obligations to one another. (Kushner, Gibson, Gulick, Honigmann and Nonas 1962:18; Linton 1952:82).

The claims of kinsmen upon one another can operate against economic growth (Linton 1952:82). Such relationships can militate against innovations that would increase outputs (Hoselitz 1957:409). These customary obligations can retard the transition from a subsistence to cash economy (Foster 1958:12). The group-centered customary system of obligation can also inhibit individual initiative and foster nepotism in both public and private sectors (Hunt 1957:318). This kind of organization has been observed to lead nomadic groups to resist settlement (Dupree 1956:29).

In other words, the social structure of the extended family, along with familial values, can constitute a significant barrier to new conventional understandings (Foster 1958:32) in a wide range of specific circumstances.

4. Age. Another of the organizing principles of society, age, also enters into determining openness to cultural change. It is maintained that youths are more apt to adopt new conventional understandings than are elders (Sahlins and Service 1960:104-105).

There are repeated observations that geographic mobility associated with cultural change is greater among younger than older persons. If a villager is both young and has learned some skill that can be practiced profitably in a city, he is apt to migrate to one (Redfield 1950:51). This means, of course, that a significant effect of rural education is migration of the more intelligent and capable village youths to the city (Quint 1958:375).

5. Competition. Yet another structural feature of societies that fosters adoption of new conventional understandings is competition at the group and individual levels.

Rival groups that compete lead to change (Chadwick 1948:642) through antagonistic transculturation. The force of competition often acts as a spur to individual change (Foster 1958:37). When performance wins rewards, competition becomes potent incentive toward innovation (Barnett 1953:72). The Cornell Andean Program staff witnessed one example of this incentive when one of its mobile research-and-development teams spent some weeks at work in a jungle colonization area of Bolivia visiting farmers in three colonies to promote improved farming and animal husbandry practices, as well as knowledge of local dietary resources. This direct competition eventually spurred the government agricultural extension agent assigned to the area to visit the colonies systematically for the first time, whereas he had previously devoted himself largely to a family chicken-raising enterprise conducted in the provincial capital town.

The principle of competition has been employed successfully in the Vicos community farm enterprise that succeeded the Cornell period of tutelage. Potatoes and other crops sold by the community are planted, cultivated, and harvested by work crews drawn from the electoral zones. Each zone crew competes against the others responsible for fields of the same crop in an attempt to win local respect for growing the most potatoes or cereal grain. This competition, along with the change in land tenure that has the former serfs purchasing the land they cultivate, has virtually ended crop theft, which was rampant in the days when the manor was fair target for serf thievery. Interzone competition cannot abide crop theft from community fields that would prejudice the chances of victory by a zone crew.

Many instances of competition between religious festival sponsors fostering innovations and increases in expense and scale could be cited. The extreme case is one in which such competition leads to loss of the land (Castillo et al 1964a).

## VII. FACTORS IN CULTURAL TRANSFER BETWEEN SOCIAL SYSTEMS

Having discussed the general processes of cultural transfer and its successive stages in both individuals and socio-cultural systems, we now take up some specific factors involved in facilitating or retarding the transfer of conventional understandings between systems. These factors are of major interest to the planner of change, to the public policy maker, to the professional manager of national and community development since the development process requires transferring conventional understandings of many sorts from one socio-cultural system to another.

### A. Form of Innovation

One significant factor in the acceptance or rejection of an innovation and the rate of its dissemination through a population is the form of the innovation itself. The intrinsic characteristics of a conventional understanding and of its behavioral and material components have a pronounced effect upon its acceptability. Understandings are not, in other words, all of equal complexity, nor are their behavioral expressions all equally easy to integrate into existing cultural patterns. Some understandings are simply by nature more difficult to absorb than others.

1. Types of adoption decision. One factor affecting the acceptability of cultural traits is the type of decision required for adoption. One sort of innovation requires only individual decisions on adoption, so that introduction appears to be relatively easy, and dissemination is facilitated by such general processes as competition between individuals.

a. Individual decision. The adoption of new tools and sometimes weapons typically requires only individual decision making. When missionaries first made steel axes available to Australian aborigines, they gave steel implements to individuals. In this case, the freedom of each person to accept an efficient tool and employ it - even if only because it was less breakable and its greater efficiency allowed users to sleep longer - highlights the significance of this factor in facilitating cultural change. The stone axe, surrounded by religious beliefs, was a precious commodity whose use was controlled by the men who acquired them by trade and finished making them. The acquisition of axe heads involved long, ritualized inter-group trading, yet each Yir Yoront man could obtain them in a stable social system and finish them by easily learned techniques. Giving access to efficient steel tools to Yir Yoront women and children fatally weakened the power previously wielded by adult males. The

steel tools measurably democratized mission station society in comparison to the male centered aboriginal social structure, though the system became dependent upon the white missionaries and cattle station operators as new embodiments of authority (Sharp 1952;83-85).

b. Group decision. A different sort of conventional understanding is that which requires a group decision on adoption. The set of understandings about water management and inter-family relations that would permit efficient irrigation of Navajo fields on the Fruitland project requires a group decision. The Navajo colonists produced, when studied, less per acre than Mormon farmers across the river who had more primitive irrigation ditches but a functional group structure. The Indian fields were deteriorated by erosion during irrigation (Sasaki and Adair 1952:97, 107). The nature of irrigation systems requires that farmers take turns drawing water if field wetting is to be rapid and even. Taking turns requires a group decision. It demands unanimity among all water users of a given ditch or ditch system. Unanimous decisions are more time-consuming to obtain than majority agreements (Goodenough 1963:512; Dobyms 1952a:213; Keesing and Keesing 1956:116). Majority agreements require more time ordinarily than individual decisions.

Cultural change is facilitated if the structure of the innovation is such as to present the unanimous decision as a matter of individual choice. The factory system of production achieves this end. In a factory manufacturing steel axes, unanimity of workers and managers in axe production is absolutely necessary. Anything less than a unanimous agreement would result in the production of something else. Yet the factory system never presents this decision for consideration. This unanimity is taken as given, and the choices offered to managers, workers, and consumers are quite different. Those involved in axe manufacture had the option of working for the factory-operating enterprise or not. They chose to work for it, and in so doing implicitly accepted the decision to manufacture axes (or whatever else the enterprise might wish to produce). The functional requirements for producing a useful steel axe are fairly strict; there are distinct limitations upon the shape of the cutting tool that can be hafted on a three or four foot long handle and bite through wood. There are limitations on quality of material if the steel axe is to compete successfully against stone, copper, or iron axes. The ultimate consumer enters into none of these decisions requiring unanimity. All that he must decide is whether to use a steel axe or some other sort of axe, or some alternative form of blade. If he decides to use the steel axe, he must also possess or acquire the means with which to purchase or trade

for it, or steal it (Métraux 1960) unless some missionary in search of converts comes along to give away axes. The world-wide acceptance of steel axes (Métraux 1960) reflects the efficiency of this type of decision making at least when an efficient technological device is the innovation.

A similar case of world-wide diffusion is that of firearms. A gun is a complicated artifact compared to a steel axe, so its production appears even more demanding of unanimity concerning design and standards of materials. Yet none of this unanimity extends to the firearm user. The person who pulls the trigger on game or in warfare needs to learn few conventional understandings concerning guns in order to use one. Such a person is exempt from the necessity of acquiring any of the understandings required for manufacturing firearms.

The automobile is another such case: it is far easier to use one than to make one. The understandings governing automobile use are quite separate from those required for manufacturing. Thus it is with manufactured goods in general, and herein appears to lie one of the dynamics of industrialization: it makes innovative decisions relatively easy, at least when acceptance/rejection of artifacts is involved.

2. Simplicity-complexity continuum. What has just been said points to a simplicity-complexity continuum in the inherent characteristics of conventional understandings that seriously affect the mode in which they can or must be acquired and the rate of their acquisition.

a. Form and function perceived visually. One extreme of the simplicity-complexity continuum is the understanding whose form and function can be readily deduced from visual observation alone. This nearly ideal type is exemplified by the steel axe. To see a steel axe in use is to want one. Even to see the results of axe wielding creates curiosity about and demand for the tool, and generates raiding to acquire it (Métraux 1960:60).

A conventional understanding manifested in a behavior other than artifact production can sometimes also be discerned by simple observation and can be readily copied. An example is the usage of academic gowns at the university in Ghana. Academic regalia, derived like religious habits from late Medieval times, has diffused widely over the world where European model colleges and universities have been established. Such regalia conveys fairly precise status meanings to academic people sharing understandings concerning school colors and symbols of achievement of degrees. The regular use of academic regalia in Ghana fits well into a society containing many status-conscious individuals.

Academic regalia fit as a status symbol, but did not fit the hot tropical climate. At some point, an unknown innovator suffering the tropical consequences of wearing the symbol of academic status sacrificed tradition for comfort by taking off his academic gown and carrying it over his arm. The faculty and students quickly perceived the comfort advantages of not wearing the gown, and let it symbolize status while draped over one arm.

This illustration may be dismissed as merely a matter of style, yet the search for status and comfort suggests that the behavior may well endure.

b. Verbal explanation required. Another position on the simplicity-complexity continuum is occupied by those conventional understandings that are sufficiently complex to require verbal explanation to be grasped and transferred. Such understandings are found to be less readily transferable than those deducible from observation only. The understandings involved in the wearing of academic regalia are sufficiently complex to require explanation. An academic procession can appear to the uninitiated as merely a line of oddly dressed people.

A farmer rather easily can observe hand-application of artificial fertilizers. Yet he cannot then utilize such fertilizers efficiently without acquiring at least some knowledge of the composition of fertilizers, what they are capable of doing for and to various crops, and what amounts should be applied at which times in order to increase crop yields.

The individual farmer is perfectly well able to observe that alfalfa plants around a heap of cattle manure grow better than those in unmanured soil. He may or may not draw the conclusion that manuring increases crop yields, unless he belongs to a society that has come to have a conventional understanding about fertilizing plants and/or the observation of causes and effects.

Processed or artificial fertilizers do not resemble animal manures enough to permit the farmer seeing them for the first time to equate them with the manure that he already knows. At the very least, the use of such fertilizers requires verbal identification of the substances as fertilizers.

c. Explanation at a high level of complexity. Another position on the simplicity-complexity continuum is occupied by those understandings and assemblages of understandings that cannot be transferred from one socio-cultural

system without verbal (or written) explanation at a high level of complexity.

Compared to artificial fertilizer, the internal combustion engine carries a considerably greater requirement for explanation. One need not command many of the total understandings concerning internal combustion engines in order to operate a vehicle powered by one, as long as it is in good working order. In order to operate an automobile in a socially acceptable manner, however, one must practice a good many rules of the road understandings. Some of these are formalized in legislation and administrative regulations governing licensing vehicles and drivers, defining infractions, and providing sanctions. Others remain matters of driver convention.

While operating an engine powered vehicle requires that a driver share relatively few of the numerous conventional understandings concerning such artifacts, its continued use depends upon maintenance. Successful maintenance does require extensive grasp of the understandings governing the working of internal combustion engines.

The peasant who grasps the utility of an abundant water supply, and works to earn money with which to purchase an engine powered pump, may not be aware of the full complexity of the engine. When it stops running, he may well be frustrated because he lacks the knowledge to repair it, and the nearest competent mechanic is miles distant and expensive to boot (Erasmus 1961:6-8)! The habit of saving monetary capital to invest in technological capital may be discouraged because the potential innovator was not adequately informed about the full range of knowledge needed to succeed: that is about the cultural capital that must be acquired along with monetary and technological capital.

In social behavior, a modern cooperative requires a very high level of explanation if it is to be transferred from one socio-cultural system to another. Enthusiasts often confuse cooperation between individuals or families based upon mutual obligation with the modern cooperative. Reciprocal aid does not equip people to become effective members of a cooperative organization. Reciprocal aid generally takes relatively easily equated forms. Farmer Jones who works two days plowing Farmer Smith's field can tell whether Smith reciprocates by plowing his field two days. In rural districts, systems of equivalencies tend to be worked out so that Smith may repay Jones for two days' plowing with three days of harvest labor or cultivating, etc. In any case, this style of mutual aid brings readily recognizable returns for effort expended.

A modern cooperative is a very different type of organization. A farm producers' cooperative that pools sales disguises the relationship between personal effort and income that is easily perceived by the individual farmer. Profit sharing tends to be postponed. This requires not only highly complex explanation, but also emotional control and often has been achieved as the result of ideological commitment or religious fervor, e.g. certain kibbutzim (Spiro 1963:55-59), or class competition and individual aspiration. In other words, the more intensively cooperation is practiced and the more it pervades the lives of numerous cooperators, the greater is the amount of explanation required for the cooperative to be transferred from one socio-cultural system to another. Such a transfer may become a matter of religious conversion or its ideological equivalent.

3. Modifiability continuum. Earlier in our discussion we mentioned the fact that conventional understandings are often modified in the process of transfer from one socio-cultural system to another. It follows that the transferability of conventional understandings depends to a considerable degree upon the modifiability a given understanding can undergo without alteration or loss of essential meaning or form. It appears that those understandings that can be modified without changing function enjoy distinct advantages for acceptability and rapidity of dissemination.

The steel axe serves as illustration. Such an implement can be hafted on a long or short handle, or held in the hand, and it remains an effective cutting tool.

The more complex internal combustion engine and its fuels and lubricants can be modified only within a narrow range without causing a malfunction. In outboard engines burning a mixture of gasoline and lubricating oil, the substitution of a local oil for the petroleum derivative effectively stopped the engine. In one case, lubricating oil was not only expensive but scarce in the upper reaches of the Amazon River. One Brazilian whose lubricating oil ran out some distance away from any settlement where he could hope to purchase more hit upon an expedient. Knowing that fresh water porpoises abounded in the stream, and that these animals yielded a rich oil, he went porpoise hunting. Successful, he rendered out several cans full of porpoise oil. When he mixed the porpoise oil with his gasoline, filled up the tank, and started his engine, it promptly stopped, thoroughly gummed up with porpoise fat. This Brazilian had not had enough knowledge of engines and lubricants to understand that an unrefined animal oil could not perform as a refined mineral oil, even though both are lumped under the general name "oil".

Another engine illustration makes the point that attempts at modification can make such artifacts dangerous even when they are sufficiently understood to be maintained. This illustration is from a Latin American nation that shall remain nameless. Its army was equipped with U.S. armed forces vehicles. One type is the truck designed for beachhead landings in shallow water. Employed only on land, one of these vehicles had its tall vertical exhaust pipe cut off. When used to transport a number of civilian workers from an army camp to their homes, a tarpaulin was rigged over the truck to protect the passengers from rain. The canvass trapped carbon monoxide gas in the exhaust fumes from the cut-off exhaust pipe. Two young women died of carbon monoxide poisoning before the nauseated passengers could persuade the driver to stop by pounding on the cab. Passengers and driver alike did not share the understanding of the emission of carbon monoxide by internal combustion engines, the function of a long exhaust pipe in carrying these away from the occupied portion of a vehicle, and the behavior of the gas itself, to anticipate dangerous consequences from what appeared to be a relatively minor modification in the vehicle.

The Fruitland farming project is an example of the inhibition of change by modifying the basic scheme in such a way as to alter its function and meaning. Those Navajos with larger irrigated tracts have become or remained somewhat better farmers and achieved greater economic returns than those holding small tracts. Yet Bureau of Indian Affairs policy reduced the basic land tenure unit from 20 acres originally announced to 10 acres (Sasaki and Adair 1952:98). This modification created subsistence farms too small to permit the Navajo to farm on a commercial scale, as they would need to do in order to achieve incomes on a par with those that can be earned by working for wages, or those of Mormon farmers across the river (Sasaki and Adair 1952:110). Thus, the irrigation resettlement project originally conceived as providing Navajo colonists with incomes like those of other inhabitants was turned into something quite different: a permanent pocket of poverty.

4. Utility continuum. A proposition about socio-cultural change that seems widely agreed upon is that conventional understandings and/or their behavioral and material consequences are accepted to the extent that people judge them to be of utility in comparison to already shared conventional understandings, and to be rejected to the extent that people judge them not to have comparative utility (Kushner, Gibson, Gulick, Honigmann and Nonas 1952:15; Keesing 1958:400; Bruner 1956a:193-194; Quint 1958:384; Tax 1957:156; Foster 1958:36; Gillin 1948:543). Perceived utility does not alone determine the acceptance or rejection of a novel conventional understanding. As discussed else-

where, compatibility of the new with the old cultural patterns, and the prestige associations of the new also enter into the final result (Linton 1940:488). The short-term aspect of utility has been emphasized as the prospect of immediate gain that fosters social change because it follows the path offering least resistance (Mair 1957:72).

The social psychological view emphasizes wants and their satisfaction as of key importance in the acceptance/rejection decision. If available mechanisms fail to afford people "enough" of something they value, then they welcome change, at least in so far as the alternative increases the availability of whatever is wanted. A related statement asserts that if economic advantage be great enough and clearly enough perceived, then change occurs despite tradition (Mair 1957:52). Again, a limitation upon accepting new conventional understandings that raise income is the value people attach to these new conventional understandings compared to their valuation of conventional understandings they displace (Nash 1957:827). The novel must satisfy a want better than available means else a person will not adopt it (Barnett 1953:378).

Evident utility of goods or practices effectively available activates change (Beaglehole 1955:384) especially if a shortcut to an established goal be found (Keesing 1958:385).

Recurrent in these propositions is not only the concept of utility, but also that of perception of utility as a determinant of change. The conventional understanding whose utility is visually obvious in any cultural system enjoys better prospects for adoption than the one whose utility is less obvious.

a. Utility visually obvious in any culture. The utility of the steel axe in Siriono culture was immediately perceived by members of the roaming band to whom Holmberg (1954:107) made gifts of such artifacts. The steel tools were accepted eagerly and put promptly to use, with consequences such as increased wild bee honey recovery and palm cabbage cutting that added perceptibly to the per capita food supply.

When sharecropping training by the Cornell Peru Project demonstrated to the Vicos serfs how to raise greater tonnages of larger potatoes, the utility of the new potato cultivation complex was readily perceived by those serfs clustered about the original sharecroppers watching the harvest, hungrily hoping to win permission to glean them. Enrollment in the sharecropping training program in succeeding years rose steadily to a peak in the third year, and nearly all serf

farmers had adopted the new practices five years after the training began.

The cultural experience of the Vicos population facilitated perception of the utility of the new potato production complex, despite the strangeness of the behavior of Cornell Peru Project staff members cast in the role of patron of the manor. The serfs were farmers and had a lifetime of practical farm experience. They were also keen observers, accustomed to making decisions based upon observation supplemented by discussion and interpreted in terms of tradition. Organizing a community council to conduct a community farm enterprise and other business affairs for the ex-serfs was similar. The Indians readily perceived the potential utility of common ownership and control of the land, as well as the utility of cash farm profits in reaching this goal.

b. Utility hidden by cultural experience. The utility of other possible cooperative functions of the local governing council remained effectively hidden. Their cultural conditioning had not prepared them to perceive the utility of a consumers' purchasing cooperative working on Rochdale principles, for example. The Indians exchanged work among themselves in a reciprocal mutual aid system. This mutual aid and the manorial obligatory labor pattern alike were readily permuted into a community farm labor tax. No such model for mutual aid purchasing, much less Rochdale style cooperative purchasing, had ever existed under the manorial system. Family relations under manorial conditions approximated the noyau state (Ardrey 1966:187) or the amoral familism of southern Italy (Banfield 1958:10 ff) even though Vicos nuclear families were united to some extent in sibs (Vázquez and Holmberg 1966:301). The serfs knew only the Mestizo storekeepers in nearby towns as sources of supply when purchases were necessary to eke out the food supply, clothe the family, fuel the lamps, etc. The storekeepers engaged in cutthroat private enterprise, exploiting the Indians economically but affording them some political protection, too, in the role of godsib.

The serfs were accustomed also to fairly ruthless economic competition among themselves. They stole not only from the manor, but also from each other. They built grass-thatched huts in their fields at harvest time to stay there twenty-four hours a day to guard against thieves. Trust between serfs lay at a very low ebb. The utility of cooperative purchasing was, therefore, effectively hidden by the nature of Vicos conventional understandings concerning interpersonal, inter-family, and inter-sib relations.

c. No utility. The conventional understandings available in the world's many cultural traditions are not of

equal utility for peoples of other cultures. It must be recognized that some conventional understandings possess no utility for a participant in some socio-cultural systems. The set of understandings concerning the internal combustion engine has no conceivable utility for a Siriono free-ranging Indian. Such knowledge would be completely esoteric, so esoteric, in fact, as to be probably unacquirable. In any event, the Siriono have no machines to power, no roads over which engine-powered vehicles might operate, no fuels usable in internal combustion engines, no lubricants, and no economic surplus to export in exchange for any such items.

In Vicos, the lack of knowledge of internal combustion engine maintenance and repair made difficult the utilization of powered machines. Hand powered back-pack sprayers for applying insecticide to growing potato plants were immediately accepted by the serfs. After de facto independence, when Peruvian agricultural technicians ordered an engine-powered sprayer, after the first season when it went out of adjustment it sat in the warehouse for years because the Indians lacked the technical knowledge required to use it. Finally, a Peace Corps volunteer cleaned it and put it in working order, lashing it to the back of a local horse. Vicos horses are not, of course, accustomed to having noisy machines on their backs, and as soon as the Volunteer started up the power sprayer, the horse bucked it off. That disposed of the sprayer (Dobyns, Doughty and Holmberg 1965:76-77). It also demonstrated the limited utility of internal combustion engines in Vicos or any other population, unless the knowledge necessary to maintain and repair it is acquired by local residents who become mechanics. It also demonstrates the necessity of having in the social system appropriate means for moving such equipment while it is in use. That Vicos has purchased a truck to haul its potatoes to market does not negate the principle that internal combustion engines lack utility in Vicos, since it operates from Vicos to the market, not within the former manor, and is self-mobile to repair stations where competent mechanics are available.

## B. Characteristics of the Socio-Cultural System

As already implied, the characteristics of the socio-cultural system strongly influence the acceptability of new conventional understandings and their rate of dissemination.

1. Accumulation of capital. One characteristic of a socio-cultural system that significantly affects acceptance-rejection and the rate of dissemination of new conventional understandings is the degree of capital accumulation that the system has achieved. One of the most stable, unchanging types of society known is that of the simple hunting-gathering

band living on a small margin. People who must spend nearly all of their time seeking, preparing, and consuming food simply have very little time to experiment with new ideas, nor reason to contemplate alternatives. At this level, the game and plant food density and hunting-gathering capabilities of the people impose an absolute limit upon the duration of rituals or other occasions that combine extended family economic units into larger camp units. This limit was only five and one-half days among the White Knife Shoshoni (Harris 1940:53). After five and one-half days in one encampment, the 300 or so Shoshoni collected for social and ritual purposes had to break into extended family units and disperse in search of regions undepleted of food, plants, firewood, and game. The most basic form of capital is food or the means for acquiring it and/or preserving and storing it. Therefore technological knowledge constitutes a fundamental portion of any society's capital leading to change.

The Siriono acquisition of metal axes allowed the band to enjoy appreciably more leisure than it had before. By making trees where wild bees stored honey felleable, the steel axes permitted more drunken mead-drinking bouts, quarrels, and scuffling than ever before (Holmberg 1954:108). The increase in leisure stemmed from an increase in the food available. By increasing the efficiency of honey-gathering and palm cabbage cutting, the steel axe brought an absolute increment of high energy and staple food intake and greatly increased the quantity of food that an individual could obtain for a given effort. The food supply per capita increased even though techniques for preserving it did not.

Perhaps of more long-range importance to the Siriono was Holmberg's introduction of fowl-raising. The domestic fowl involved in Holmberg's first attempt were promptly consumed; on the second attempt, men began to keep their fowls - to protect them from predators and feed them. This represented a behavior change reflecting significant shifts in conventional understandings. (Holmberg 1954:111-112). The hunting-gathering traditions of the Siriono provided only two modes of food accumulation. One was success in searching out tortoises which can live for many days upon their own fat. These reptiles can be "stored" for up to a week by tying them with a vine (Holmberg 1950:34). The other was a sociological trait based upon success in taking game. The lack of meat preservation technology requires that game be consumed fairly promptly after a kill. Despite rather prodigious appetites, and a reluctance to share food with persons not members of the family, Siriono do share food within the family, among good hunters, and sexual partners (Holmberg 1950:36, 59-60, 96). The reciprocity principle basic to game sharing allowed a hunter to build up a limited line of credit among those with whom he shared his kills.

Neither mode for food accumulation permitted a significant long-term differentiation between persons. Nor did such techniques augment the total amount of food available to the Siriono band except insofar as individual hunting skill and luck varied. Only the introduction of new knowledge allowed the Siriono to increase the quantity of food collectively available to the band.

Perhaps the transition was facilitated by a certain similarity between turtle-tethering and chicken keeping. Neither had to be stored. Both had merely to be kept alive to be slaughtered and consumed as wanted. Yet a fundamental new set of conventional understandings had to enter Siriono culture. These Indians had to comprehend the fundamental difference between holding game unfed, as with tortoises, and providing feed for the fowl to consume. This involves comprehension of augmenting ultimate reward through its deferral, and controlled conversion of vegetable into animal food. The Siriono instance constitutes a case of diffusion of an already domesticated fowl to a previously non-food producing population.

The White Knife Shoshoni or Siriono band exemplifies the socio-cultural system which permits humans to survive by such a narrow margin as to constitute cultural barriers to the exchange of conventional understandings among geographically isolated economic units. Such societies afford little opportunity for their participants to exchange their own ideas or to mingle the conventional understandings of other peoples with their own. It appears to be necessary to concentrate ideas in order to stimulate change (Barnett 1953: 42). The band surviving by a minimal margin does not attain that degree of concentration and exchange of ideas that fosters change.

The general significance of food production and effective storage for cultural change cannot be overemphasized. The society whose participants produce their own food instead of depending upon uncertain nature to provide plant parts for plucking and game to be killed possesses an immeasurably greater potential for cultural change than the hunting-gathering band. The numerical preponderance of participants in food producing societies compared to those in food collecting societies testifies to the kind of survival advantage controlled food production provides. This demonstrates that the diffusion of the complex conventional understandings lying behind agriculture and animal husbandry already has reached most of the world's population. Relatively few human beings still depend upon food collecting and hunting for their livelihoods.

Cultural change now occurs relatively more easily from a food producing cultural base than from the former food collecting base, among most people in the world. This is not to assert that change occurs today with absolute ease; it is only that change now occurs in most societies with relative ease.

Before ending our discussion of the varying capacity of socio-cultural systems to change as a result of their differential characteristics, we wish to point out that not uncommonly the margin of survival of certain groups even within a food producing population is so small that these groups live under conditions approximating those in the food collecting band, at least in terms of change potential. One example consists of lower class women so occupied with their household duties that they literally have no free time during which they can change their behaviors, even if they have learned new conventional understandings about such things as the germ theory of disease causation and the desirability of drinking boiled water in order to reduce the amount and seriousness of illness in the family (Wellin 1955:87-89).

Once a food supply has been assured to a socio-cultural system, change is fostered by the accumulation of forms of capital other than food, and by persons not directly engaged in food production. Monetary capital accumulation becomes a fundamental factor in fostering further change in societies complex enough to use money inasmuch as a uniform medium of exchange facilitates the exchange between persons of the food-stuffs as well as other goods. The accumulation of monetary capital in the United States, the United Kingdom, France, Germany, Italy, the U.S.S.R., and Japan, permits these nation-states to finance accumulation of other forms of capital in less developed countries. Thus, the U.S.S.R. provides funds for constructing the Aswan Dam in Egypt to augment the technological capital of that country. The United States provides funds to construct a new campus for the National Agricultural University in Peru, and to train its faculty in order to augment the knowledge capital of that country.

Accumulation of capital for fomenting cultural change implies its concentration. The National Agricultural University of Peru changes as the U.S. Agency for International Development, in which the U.S. Congress concentrates federal capital already concentrated by collection from taxpayers, concentrates capital in the University of North Carolina via a contract to sustain the concentration of knowledge at that institution and its application to the task of institutional change in Peru.

2: Accumulation of technological and social devices. Capital accumulation implies a number of characteristics of a socio-cultural system that affect rates of change within it.

One such characteristic is the existence of institutions for the accumulation of monetary capital, of knowledge, and of technological devices. Peasants can achieve a quite comfortable living standard compared to a hunting-gathering band by developing networks of exchange that allow for some specialization. Thus, villagers whose territory includes a deposit of high quality clay can turn to part-time specialization in ceramic production, trading each vessel for that quantity of grain filling it (as is the custom in Peru's central Andes). The village located at altitudes inimical to successful agriculture can concentrate on raising livestock, and barter meat, wool, pelts, and hides and homespun woven goods for potatoes and cereals (Tschoepik 1947:54). Peasants or tribesmen inhabiting inhospitable areas may be able to specialize in extracting a commodity such as salt to trade for foodstuffs produced by better situated agriculturalists. Papago Indians formerly collected salt from pans along the Gulf of California coast to barter to riverine Pima Indians for cereals (Underhill 1939:103). In contemporary Bolivia, certain Indians still collect salt from the high altitude salt pans south of La Paz, to trade for foodstuffs.

Peasants inhabiting relatively unproductive areas can exchange labor for a share of the produce of better-situated farmers who cultivate areas larger than they can harvest without help: Vicos serfs developed this pattern under the old manorial system by going into the upper Casma Valley to harvest and thresh wheat, taking payment in kind to eke out the always short cereal ration. Desert-dwelling Papagos throughout historic times moved into the Altar River and Gila River Valleys to help Pima farmers harvest their grain, taking payment as a share of the harvest (Russell 1906:93-94).

There are limits to the efficiency of a barter system, however, and serious limitations upon the degree to which barter can sustain non-farming intellectuals who are freed to innovate. The exchange of products between specialized peasants is greatly facilitated by a medium of exchange.

One of the key characteristics in the capacity for change within a given socio-cultural system, then, is its accumulation of technological and sociological devices for circulating effective common units of exchange. The degree to which banking or alternative savings and credit-giving systems exist affects a society's capacity to exchange foods, and, therefore, to concentrate them at any given site of change, to concentrate monetary capital to finance planned change, and so on.

3: Concentration of knowledge. Another factor is the degree to which the socio-cultural system contains personnel training institutions. They are schools of all types which

educate students to share conventional understandings not fully included in family enculturation. The key type of educational institution seems to be that which trains the educational specialists themselves. This usually means some form of college or university which trains replacements for its own faculty and that of equivalent institutions, and trains secondary and primary school teachers. Each such institution of higher learning concentrates knowledge to which it adds by spreading it to additional individuals.

Such institutions foster the concentration of ideas in individuals which leads to innovation (Barnett 1953:41-43).

Another factor of tremendous import for change is the degree of urbanization of the population. The concentration of prospective pupils facilitates their economical and efficient education, in comparison to the cost involved in educating geographically dispersed pupils.

The same factor of cost as a function of relative distance as determined by urbanization also operates in general cultural change. The urban population can be more rapidly exposed to change by communications media of all sorts, ranging from a public crier to electronic devices, at least until it spreads to such an extent that communication becomes as slow between urban sectors as to approximate rural rates.

4: Expectation of change. The preceding section dealt with related structure features governing rates of change in socio-cultural systems. These structural features were discussed as though the institutions embodying them were in fact operating in an opinion climate favorable to change. Inasmuch as human institutions are composed of people, and people take both favorable and unfavorable attitudes toward change, our discussion has been biased in assuming the propensity for change. We now introduce another characteristic of socio-cultural systems - the orientation of the people toward change. Some peoples are traditionally-oriented admirers of the past; others are oriented toward the future; while some are indifferent. The social consensus on such orientations largely governs the effect of such institutions as banks, universities, and even cities on the change process.

a: Tradition-oriented culture. A traditional orientation may foster what has been termed conservative change. The attempt to follow the footsteps of the past, to emulate former conditions, may produce change. The Yaqui Indians of Sonora exemplify this situation. Largely driven out of the Yaqui River Valley at one time, numbers of these Indians have returned to establish essentially new settlements on several old Yaqui townsites, or as near to them as possible. The settlers carry out a ceremonial round largely independent

of the Roman Catholic Church, but this round had to be reconstituted from the memories of former participants and tribal religious leaders (Spicer 1954:37-38).

Cities whose intellectual leaders are oriented toward traditional values function not as centers of innovation, but as centers of religious conservatism. Such "orthogenic" cities promote a traditional moral order, or systematize and reflect upon an old culture, since they are headquarters for religious and/or intellectual elites occupied with interpreting tradition (Redfield and Singer 1954:59-60). Even such orthogenic cities often serve as centers from which orthodoxy and doctrinally approved behavior spread among folk believers whose behavior does not accord with the dogmatic demands of the elite.

b. Future-oriented culture. The opposite orientation, expectation that change will occur in the future, greatly facilitates change. The belief that cultural change is possible to achieve by deliberate actions and is desirable has led to thorough-going cultural change time and again in many societies.

In the present century, groups of young central European men and women imbued with utopian ideals and a belief that human society could be perfected by collective action fashioned in Israel the kibbutz agricultural settlement (Spiro 1963:38-59). This settlement departed from traditional cultural patterns of the young settlers as far as was possible. The kibbutz converted urban youths from intellectual or professional families into farmers. It converted descendants of families with strong kinship ties into parents of children reared in communal nurseries by full-time child-care specialists, developing primary group sentiments toward their nursery-mates, visiting their parents for a few hours only in the evening (Spiro 1963:125-137). The kibbutz stands out as one of mankind's spectacular successes in cultural redesign. There are other examples of wholesale, deliberate cultural renovation based on the expectation of change, and the struggle to insure that it is for the better. The Manus islanders of Peri village destroyed their homes built on piles over the sea, erected new dwellings patterned after U.S. Army barracks, legislated the emancipation of women and new sexual mores, formal education, and discarded ancient tribal customs immediately following exposure to the U.S. Army during World War II (Mead 1956:206-207).

Pacific island peoples exposed to manufactured goods have repeatedly followed prophets preaching "cargo cult" messages. These prophets admonish the islanders that prescribed behavior on their part would supernaturally bring to

their shores cargo ships laden with the goods that they covet (Lawrence 1964:63-115, 188-203; Mead 1956:201-203).

An element of utopian thought plays a significant part in predisposing a population to change its conventional understandings concerning many spheres of culture. Reformations or revitalization movements (Wallace 1956:265; Voget 1956:250) seem generally to contain significant utopian goals, as contrasted to nativistic movements which seek only to re-establish a vanished order or perpetuate an existing one (Linton 1943:231). The Handsome Lake movement among the Iroquois Indians achieved to a considerable extent utopian social goals, in contrast to the nativistic Ghost Dance movement in which numerous North American tribes sought the magical resurrection of deceased Indians and game animals and the disappearance of the all-conquering white man (Mooney 1896:665).

The Protestant Reformation pursued similarly utopian goals in terms of changing human behavior.

Among populations in which no utopian movement has taken place, the expectation of change appears to be significantly less than in the societies where reformation has occurred. Reformation need not be religious. It may be political and opposed to traditional religions as in the U.S.S.R., where belief in man's ability to improve his society leads to expectation of change to a pronounced degree. Soviet society is viewed by its convinced members as moving away from historic imperfection toward future perfection.

A parallel belief in the perfectability of human relations and national society clearly underlies the democratic process in the United States. It motivates international aid programs and domestic measures against poverty, racial discrimination, urban sprawl, and so on.

5. Social structure. The social structure of people exposed to the cultural inventory of participants in another society appears to regulate, to an important degree, the amount and nature of the change they are likely to accept.

a. Boundary-maintaining mechanisms. A significant characteristic of the social system consists of the kind and quality of its boundary maintaining mechanisms. A continuum of social systems ranging from a completely closed ideal type at one extreme to a completely open ideal type at the other extreme may be visualized.

The United States lies near the open end of such a continuum. It has admitted many and diverse immigrants over a long period of time, to mention only one criterion. Palau is another example of the relatively open society (Barnett 1949).

Near the closed end of the continuum lie Indian Pueblo societies located in New Mexico's Rio Grande Valley (Broom et al 1954:976) and the more westerly Zuni (Adair and Vogt 1949).

Boundary maintaining mechanisms are the ideas and techniques that enable a system to limit the sharing of its conventional understandings to a "well-recognized in-group" (Broom et al 1954:976).

When the Cornell Peru Project staff began its research in Vicos, it found the Indians had an effective boundary maintaining mechanism in throwing stones at unwelcome strangers.

Flight. The simplest boundary maintaining mechanism is flight. Among bands of humans, contact with hostile groups is minimized by geographic mobility. When Holmberg (1950:2) first contacted a Siriono band, he and his companions hunted with bow and arrows for eleven days while tracking the Indians, so as not to frighten them away with gunfire. When he finally overtook the encamped Siriono, Holmberg and his non-Indian guide "made a hasty entrance into the communal hut" sandwiched between Indian companions. They began to talk to the Siriono in their own language before the latter could flee or seize their weapons.

Flight becomes difficult for a sedentary population, yet the flight of key segments can function as a significant boundary maintaining mechanism minimizing cross-cultural contacts conducive to acquiring new conventional understandings. Physical flight from strangers was a standard behavior for women and children of Vicos as long as it lived under the manorial system. Women conditioned their daughters to avoid Mestizo men by telling them the men were insatiable, rough, and smelly. The manorial authorities, installed with patronal approval, minimized contacts for conscription age young men by sending them into the mountains when sentinels reported press gangs approaching. The manor afforded sufficient territory to permit effective flight by such selected individuals. Social and cultural boundaries could be maintained without the entire population having to flee, as did the small Siriono hunting-gathering band.

Silence. One effective boundary maintaining mechanism, especially with regard to the more covert aspects of culture, is silence. What the insider does not discuss the outsider cannot learn. Even after Holmberg (1950:3) gained Siriono toleration for his presence by his contributions to the food supply and his curative abilities, none of these Indians became his willing informant. The Siriono volunteered little information and deliberately withheld some. Siriono groups proved capable of silence for long periods - so long that one

traveler reported a band that had no spoken language, only whistling, even though such an assertion was patently absurd (Holmberg 1950:10).

Secrecy. Another boundary maintaining mechanism is to conduct activities for in-group members only, keeping them secret from outsiders (Broom et al 1954:976). Secrecy involves more than silence. It involves the physical exclusion of outsiders from in-group activities. It may involve conducting in-group activities in especially constructed retreats, as in the Australian aboriginal bush camps for male initiates.

The memorized ritual of Masonic lodges conducted only in the presence of members in special lodge halls exemplifies this mechanism as it is employed in modern Western society. Secret organizations have played a significant role in political change in several Latin American nations.

Ritual initiation. Another boundary maintaining mechanism employed as part of the secrecy of the in-group is ritual initiation. (Broom et al 1954:976). The Masonic initiation exemplifies the technique. The Pueblo Indians in the Southwestern United States have elaborate ritual initiation ceremonies for inducting youths into their secret ceremonial societies. Aboriginal groups in Australia also elaborated secret ritual initiation of boys into manhood. Ritual initiation typically inducts individuals into sub-groups within societies, rather than into the entire society.

Reinduction ceremonies. Some societies maintain ritual boundaries by conducting ceremonies to cleanse an individual returning to the society after an absence (Broom et al 1954:976). The Navaho Indians conducted an Enemy Way ceremony for warriors returning from raids, and have employed this chant to reincorporate young Navahos who served in the U.S. Armed Forces during World War II (Adair and Vogt 1949:553; Underhill 1956:245). A similar use of reinduction ceremonies occurred among the Plains Indian tribes.

In complex modern societies, however segmented into little communities believing in variants of the central great religious tradition, social boundaries appear to be more difficult to demarcate ritually. Yet social reinduction does occur even when ritual reinduction is not compatible with belief in the great religious tradition. Thus, in Vicos under the traditional manorial system, returned individuals were quickly reincorporated into the serf subsociety by strong social pressures. Occasionally a young man was caught by the press gangs seeking conscripts, and taken to serve two years in the Peruvian army. Such individuals usually returned to Vicos at the end of their service. Within a few days of their return, the social sanctions brought to bear by their

elders put the veteran back into the local "Indian" costume of loose shirt, jacket, split-legged homespun pants, and heavy grey felt hat. The army uniform was taken off and seldom put on again. The returned veteran had to prove his manhood by chewing coca with the other adult males, ignoring two years of army training aimed toward breaking him of this habit. Army-learned Spanish inhibited conversation with friends, relatives, and authorities, while native Quechua nuances had to be quickly re-employed. The manorial native authorities created early in Spanish colonial times, the staff-bearers (varayoc), took the lead in deliberate social reinduction of such temporary escapees, so the aura of religious authority hung about their reincorporative actions.

Localizing ceremonies. Another ritual boundary maintaining mechanism is the localizing ceremony in the homeland (Broom et al 1954:876). This mechanism characterizes tribal religions, and is significant today perhaps mostly among surviving tribesmen who remain in their traditional homelands under the territorial sovereignty of larger polities. A ceremonial of this type produces continual friction between the Taos Indians of northern New Mexico and the U.S. Forest Service. The Taos inhabit a part of their historic homeland, but the Forest Service administers other parts of it, including a lake sacred to Taos believers. Taos seek to conduct localizing ceremonies at the lake, leading to disputes with Forest Service authorities over Indian access to the lake.

The annual rituals of the X-Cacal Mayas of Quintana Roo, Mexico, certainly partake of the nature of localizing ceremonies (Redfield and Villa Rojas 1942).

Within the Roman Catholic great religious tradition, the patronal festival frequently assumes the characteristics of a localizing ceremonial. On the festival of the patron saint of Recuayhuanca, across the Marcara River from Vicos, natives of Recuayhuanca who have migrated to the Peruvian coast to work for wages return to their native village. They rent trucks to haul them from the coast to the road end nearest Recuayhuanca, and spend several days celebrating the festival of St. John the Baptist.

This local patronal festival pattern has been widely observed in the Mediterranean area and in Latin America. Clearly it constitutes one mechanism for maintenance of emigré ties to the community of origin. These ties comprise a significant force toward cultural stability, and locality identification even among migrants who succeed socially and economically in the city.

Ethnocentrism. An effective boundary maintaining mechanism is the cultivation of ethnocentrism, racism, and lin-

guistic superiority (Broom et al 1954:976). At the tribal level such boundary maintaining ethnocentrism is typically well established. The dialect area is coterminous with the body of believers in the religious tradition and the society. The group name can best be translated as "The People". By definition, all other beings that are "people" in English terminology are infrahuman in the eyes of the tribe.

The Northeastern Pai Indians of Arizona termed themselves Pai, and differentiated themselves from all adjacent tribes save one. Their western neighbors they termed Wamkava and alternately warred and traded with them. Their northern neighbors they termed Chimwava, and usually avoided them. Their eastern neighbors for centuries were the sedentary western pueblos whom they termed Moqui. They traded buckskins and cooked mescal hearts to these Indians for ceramic vessels and agricultural produce, and manufactured goods in historic times. The Pai did not, however, intermarry with Moqui until post-conquest times. Their southern neighbors they termed Jiwha, meaning the enemy with whom they fought, taking female captives to rape, sacrifice at victory dances, and sometimes hold captive. Yet the Jiwha and Pai spoke mutually intelligible dialects of the same language, whereas the Pai claim that Wamkava is not intelligible to them although it analytically belongs to the same language group. The Chimwava and Moqui spoke quite different languages.

Example after example of this ethnocentric psychology might be cited. To themselves, the Indians termed "Navaho" in Spanish and English are the Na Dene, "The People." To themselves, the Bolivian forest Indians known to us as Siriono are the mbia or "people" (Holmberg 1950:4).

At a more complex level of social structure, ethnocentrism and innate racism are diminished, but do not disappear from even industrial societies.

Each nation-state bears a name, and attempts to inculcate national patriotism and loyalties that transcend local ties and tribal memberships. The scientific validity of studying "national character" has been much debated among anthropologists (Gorer and Rickman 1962:xxix ff). It is a fact of human behavior on this planet, however, that the political leaders of nation-states do attempt to develop a national character in each such unit. This attempt constitutes a major force toward social change in many countries where tribal and ethnic subsocieties survive.

The significance of ethnocentrism in attempts at cultural change cannot be overlooked. The attempt to build an independent Nigerian nation-state has encountered, to cite one example, grave difficulties because of Hausa, Yoruba, and Ibo tribal ethnocentrisms.

The growth of Israel has brought difficulties bred in ethnocentric, even racist, separation between immigrants from industrialized European nations with variants of Western Civilization, and more recent immigrants from non-industrial nations with variants of Islamic Civilization. Nearly nine-tenths of the pre-independence migrants came from Western nations. In 1948 the Jewish population was 650,000. At the end of 1957 it had risen to over 1,700,000. Most of the 900,000 new immigrants came from Asia or Africa; few spoke Hebrew, or shared Zionist social ideals such as hard physical labor (Janowsky 1959:103, 106). Coming from ancient cities, they neither dreamed of conquering the desert nor wanted to be farmers (Weingrod 1966:vii). This internal phenomenon is quite apart from the Israeli-Arab conflict engendered by antagonistic ethnocentrism along communal lines.

Language. The high evaluation given language as a boundary maintaining mechanism is a significant factor not only in international relations, but also within many nation-states populated by diverse linguistic groups. ...

The Union of Soviet Socialist Republics has supported an extensive non-Russian language publication program as part of its solution to its "nationality problem."

The Republic of India has suffered civil rioting in protest against implementation of the constitutional plan to make Hindi the national language. Speakers of several other major languages have no desire to abandon their native tongues to learn Hindi. ...

Nation after nation, industrialized and non-industrialized, suffers this same problem. Students have rioted in Belgium over which language is to be used in the classroom. A foundation grant to a university permits founding a Cherokee language press in Oklahoma (Spade and Walker 1966) years after many observers concluded that Oklahoma Indians were well on the way to complete cultural assimilation in United States society. In fact, the Cherokee language and lingering conventional understandings from tribal times have insulated thousands of Cherokees from full participation in U.S. society. These boundary maintaining mechanisms help to preserve islands of Cherokee population in eastern Oklahoma.

Territorial Exclusiveness. An alternative to flight is to establish and defend territorial boundaries. While a band with the small manpower and frail technology of the Siriono takes to its heels under threat, most tribes defend tribal boundaries. Such boundaries inhibit the flow of conventional understandings from one group to another.

Living Northeastern Pai elders could still, 75 years after military defeat of their forebears, recite point by point the natural landmarks on the old frontiers of their tribal territory.

The Gila River Pimas, rallying against the onslaughts of Western Apaches pushed south and westward by tribes closer to English, French, and U.S. traders (and therefore better armed and munitioned [Secoy 1953:81-85]), developed a nearly professional military organization during the last century (Ezell 1961:136) with Spanish-Mexican encouragement. They held their riverine homeland and a desert hunting-gathering territory out to the mountain ranges defining the Gila River Valley. They provided asylum to refugee Yuman-speaking groups forced off the Colorado River into which the Gila drains (Dobyns, Ezell and Ezell 1963:137), and thus protected their western flank.

The frontier defined by military action greatly inhibits the flow of information that might foster peaceful cultural change. (Competition in warfare fosters another type of cultural change discussed elsewhere.) The penalty for territorial trespass was to risk being slain by defending tribesmen and to court vengeance raiding (Dobyns, Ezell, Jones and Ezell 1957).

The nation-state socio-political organization restricts this risk to periods of open warfare. However civilized we may have become, we still treat enemy aliens as subject to the death penalty for wartime trespass. During periods of peace, on the other hand, their citizens are able to move about outside their own countries without running the risk of legally sanctioned execution. Nation-states nonetheless defend their territorial boundaries by restricting passage to designated ports of entry. They also require identity documents, charge fees for traversing national territory, or for taking off from an "international" airport, and screen foreign citizens through immigration bureaus manned by officials with ethnocentric attitudes toward foreigners. Nation-states treat goods much like people at the territorial boundary, requiring them to go through customs and pay duties at various rates (except where domestic manufacture is so deficient that smuggling must be countenanced to keep the country going). All of these devices inhibit the flow of conventional understandings, and slow cultural change produced by cross-cultural contacts.

Technological devices that diminish the efficiency of nation-states in protecting their territorial exclusiveness may foster key changes in conventional understandings.

As long as the United States, the U.S.S.R., and other world powers could maintain their territorial exclusiveness by military action, they could conduct their foreign affairs within a wide range of options, up to and including total warfare. With the invention of nuclear weapons and long-range missiles capable of delivering nuclear warheads at inter-continental ranges, the degree of territorial exclusiveness has been so materially reduced as to introduce some new conventional understandings into the conduct of foreign relations. The growing conventional understanding that resort to full-scale warfare by any major power would almost certainly bring devastating reprisal on its own population under current technological conditions has gone far toward reducing the range of options for foreign policy makers. To consider resorting to the further reaches of the scale of martial activity would be to court domestic disaster.

Contact Agents. A boundary maintaining mechanism closely related to territorial defense is the designation of contact agents. These are people who handle aliens (Broom et al 1954: 976). This is a relatively sophisticated measure not characteristic of tribal societies. It is characteristic of kingdoms and nation states.

The rulers of the native kingdom of Dahomey for many years retained European commercial and political agents in a port-of-trade, Whydah, where designated royal officials wielded delegated royal power for dealing with aliens (Arnold 1957).

Diplomats are contact agents devoted to maintaining boundaries. Two nation-states may mutually agree upon isolating themselves from one another, as the United States and the People's Republic of China appear to have since 1949. They dispense with even diplomatic contact agents. Yet while mainland China and the United States do not exchange contact agents directly, neither appears to be willing to dispense with the services of some contact agents, so diplomatic relations are maintained by both in numerous other nations and regular meetings between U.S. and Chinese diplomats have been maintained.

The appointment of agents to handle aliens may work best when the aliens are clearly identified and territorially segregated, as in the Whydah port-of-trade situation. The People's Republic of China evidently seeks to enforce at least symbolic compliance with its internal norms upon the diplomatic contact agents present in Peking. Recently, the local chauffeurs employed to drive diplomats insisted that the diplomatic vehicles bear stickers proclaiming Mao Tse-tung's wisdom.

While contact agents were not characteristic of tribal life, they have become highly characteristic of conquered tribes during the long period of assimilation of tribesmen into national polities. Many U.S. Indian groups organized under the Indian Reorganization Act of 1934 have tribal chairmen and other officers who function as primary contact agents to handle the superordinate aliens.

This same pattern appears in Vicos, where the post-manorial community and its officers spend much time dealing with outsiders. Council delegates are responsible for supervising agricultural work by the electoral district residents and managing the community farm enterprise. The agricultural representative, the council president, the secretary, and the treasurer, on the other hand, deal largely with the outside. They obtain fertilizer allotments from the central government agency charged with fertilizer distribution. They deal with the produce wholesalers in the Lima market who purchase potatoes. They negotiate with government forestry officials promoting a massive forestation program for the Vicos uplands. They deal with the Lima beer company agronomist who demonstrates how profitably to grow high-quality barley for his company. They handle the Ministry of Agriculture officials supervising the crop loans obtained by Vicos, and so on. While this small group of leaders learns much about the workings of the wider society, it also serves as a cultural shock-absorber between the Vicos population and the greater society. These contact agents absorb the majority of the interaction with outsiders which might change Vicos conventional understandings. Thus, they determine to a significant degree precisely what conventional understandings in Peruvian culture they communicate to other Vicosinos, and which ones they filter out of the communication process.

In Senapur, the Thakur elite traditionally played this sort of cultural broker role. This group carried on most dealings with people outside the village, was most integrated into the conventional understandings of the Hindu society of the Gangetic Plain, and at the same time determined in large measure the understandings selected for diffusion among the other castes in the village.

In Bang Chan, the Buddhist priests played this cultural brokerage role to some degree. The proximity of this village to the national primate city allowed more individual and family travel to the city once transportation was established. Since Bang Chan was settled as a result of opening transport routes, there has apparently never been the elite monopoly on dealing with outsiders that can be discerned in rural settlements such as Senapur and Vicos. Rural change has kept better pace with urban change in Bang Chan than in Senapur and Vicos.

b. Flexibility-rigidity continuum. Another characteristic of a group that is significant for change is its relative degree of rigidity or flexibility of internal structure. Rigidity of social structure may be correlated with employment of efficient boundary-maintaining mechanisms. Rigid interrelationships imply such phenomena as unitary or limited avenues to achieve prestige, high degree of definition of interpersonal relations, authoritarian social controls, ascribed statuses, prescribed activities and so on. Absolute monarchies and theocracies have approximated the ideal type of rigidity most closely (Broom et al 1954:876). Tribes displaying considerable rigidity include the Zulu (Gluckman 1940) and the Pueblos in the Southwestern United States (Eggan 1950). Australian aboriginal hordes also approximate the ideal type (Warner 1937).

Flexible interrelationships imply cultural patterns such as multiple routes toward prestige, ambiguously defined interpersonal relations, equalitarian social controls, achieved statuses, situationally defined activities, and abundant alternative conduct patterns. Industrial societies with efficient agricultural sectors appear to display the greatest flexibility in these terms.

Cross-cultural contact in itself constitutes one determinant of cultural adaptability. Other things being equal, participants in a social system accustomed to cross-cultural contact and the consequent changes seem more disposed to adopt a new element than participants in a comparable but long isolated social system (Keesing 1939:62).

One component of cultural adaptability-rigidity seems to be a differential threshold for tolerating change. Apathy or hostility result as social pathologies only when change becomes so rapid or so extensive as to exceed the threshold of change tolerance in a given culture (Leighton and Smith 1955:83). The rapidity of cultural reformation among the Japanese during the past century, the Manus Islanders following World War II (Mead 1956) and the Vicos ex-serfs following 1951 (Holmberg 1960), and the stability of culture among various other peoples indicate a considerable difference between the level for tolerance of change in different cultures. Like other principles of social change dealing with individual psychological variables, however, this one presents the serious problem of how to verify the threshold of tolerance for change aside from the social pathological reactions that are consequences of exceeding the threshold of tolerance.

Another component in cultural flexibility is the capacity of the kinship system to adapt to new types of income, including cash, while maintaining itself. A kinship system with enough "extension" to permit some kinsmen to partici-

pate in the cash economy while others continue following traditional economic patterns seems to favor change. (Belshaw 1955:55).

It is well to remember, in discussing the flexibility or rigidity of cultures and societies, that conventional understandings have reality only in the minds of human beings, and society consists of people, so that to speak of cultural flexibility or rigidity really is to speak of personal adaptability or rigidity (Beaglehole 1957:253).

Like the nature of boundary maintaining mechanisms, the relative rigidity of social structure often becomes a significant consideration in modern nation-states in dealing with subordinate subcultural groups. Religious sects often possess such rigid value systems reflected in rigid social structure as to successfully resist attempts at planned change by the dominant population. The Jewish ghetto populations of eastern Europe prior to World War II (Bienenstock 1950; Zborowski and Herzog 1952:21, 32, 34 etc.); in North Africa before the aliya following Israeli independence (Weingrod 1966:6-14), the Amish in the United States (Kollmorgen 1942), the Hutterites (Eaton 1952) in North America, and the Parsis in India are examples of sects with rigid social structures defended by efficient boundary maintaining mechanisms that have long histories of resistance to cultural change.

c. Social division. Other factors being equal, it appears that the rate of change within a social system, including cross-cultural change, is significantly affected by the number of competing social units within the system. Another factor that affects this change dynamic is the degree to which planned change is fomented by centralized authority, as compared to the degree of free competition among sub-groups within the system.

A number of factions into which a social system is divided, the number of immigrant groups in a nation which maintain identification with their areas of origin - such factors appear to affect the rate of change.

The rate of cultural change in Israel perhaps best exemplifies this phenomenon among contemporary nation-states. In the political arena, Israel is a multiparty state. The Israel Labor Party (Mapai) competes with the United Workers Party (Mapam), the Communists, the three religious parties (Agudat Israel, Poale Agudat Israel, and Mizrahi-Hapoel Hamizrahi), the General Zionist Party, the Herut Party, Progressives, and others. These political parties permeate Israeli life. They play a role in union affairs, align agricultural settlements, cooperative agencies, promote youth movements, housing projects, and athletic organizations (Janowsky 1959:94-96).

Besides the parties, Israeli migrants from many nations have brought alternative cultural traits and patterns into the country. Even the Western oriented and educated elite contains many diversities, since its members have been educated at institutions throughout the Western world. In sum, the Israeli population is able to draw upon a tremendous range of training and experience in formulating the emerging nation.

Also contributing to the cultural diversity of Israel is the presence of three major religious groups. A resident Arab population remains within the country, consisting of Muslims and Christians who are accorded considerable autonomy in having their own courts with jurisdiction over marriage, divorce, wills, etc. (Janowsky 1959:96).

At the opposite extreme, the unitary tribal society composed only of persons speaking a single language, ethnocentrically distinct from all other beings, contains very little internal dynamic toward cultural change. The simple technology and social structure of the Siriono band bear witness to the cultural stability that can be a result of internal unity and sameness.

The Indian serfs of Vicos lived in a near-approximation of unitary tribal society prior to 1951. Everyone who resided in the manor shared pretty much the same conventional understandings, and the few individuals who ventured out stayed out, or if they returned were quickly reinducted into the subculture. One Cornell Peru Project strategy of accelerating social change was based on the proposition that the rate of change is proportional to the number of internal groups sharing different conventional understandings. This strategy encouraged young Vicos men to comply with the Peruvian compulsory military service law, and willingly serve two years in the national army. As some numbers did serve in the army and returned to Vicos imbued with ideas learned in the army and by travels elsewhere in Peru, they organized a veterans' club. This pioneer among voluntary associations created a formal organization oriented toward conventional understandings shared with the wider society, rather than content with those shared only by the residents of Vicos. A focus of infection with outside ideas was, in other words, created. Even when the club was not very active, the annual cumulation of the number of army veterans in the Vicos population constantly reinforced this different group. The old men of Vicos could not re-induct these young men into the traditional way of life with nearly the effectiveness that they had been able to reincorporate the occasional stray veteran in earlier times. Manufactured cotton clothing began to stay on these veterans' backs as they defied local clothing conventions. Younger brothers began to attend local school with increasing regularity as veteran older brothers insisted

they learn Spanish before conscription, thus defying the local cultural permissiveness toward children which allowed them to make decisions for themselves even on such matters as attending school. By 1960, the veterans were strong enough to take over from the traditional socio-religious authorities the privilege of carrying the litter of Our Lady of Mercy's statue in the local chapel in procession during the annual festival. Wearing their uniforms, the veterans made explicit the conceptual relationship between this local patroness and the patroness of the Peruvian armed forces, widening the horizons of the local residents who previously regarded this image as very much a local matter. Thus, the creation of even one new faction in the Vicos population made for accelerated cultural change.

6. Specific cultural content. The specific conventional understandings shared by participants in a social system significantly influence the course of cultural change in that system. Particular understandings influence people to change or resist change in numberless ways. These differences in different social systems mean that change techniques successful with one group will not automatically succeed with another. Non-westernized peoples are not all alike (Useem 1952:160).

a. Belief. The demographic trend of a population is influenced by its behaviors arising from specific beliefs. If a Russian peasant grandmother believes that a newborn child's first contact with the world should consist of a rag chewed by her with bacon rind and baked flour, her behavior is likely to take a different form than it would if she believed in the germ theory of disease and diagnosed her own pyorrhea (Gorer and Rickman 1962:50-51).

The behavior of laborers in factories or extractive industries reflects their specific conventional understandings. The labor relations "expert" who tousles the hair of workmen in a Palau phosphate mine to demonstrate good fellowship demonstrates his ignorance of the Palauans belief the head should not be touched (Useem 1952:157) and so inhibits production.

The Vicosino belief that plant plagues are caused by infractions of the incest rules focused their efforts for many decades upon incest control as a plant disease control measure. Only when Cornell Peru Project personnel arranged demonstrations of fungicides and insecticides to keep potato plants healthy did the Indian farming population focus its plant-protection efforts differently.

b. Sentiments. Differences in conventional understandings might not, in themselves, inhibit or foster cultural change, were it not that beliefs typically generate sentiments among their holders. Sentiments generated by beliefs and

expressed in behavior profoundly affect cultural change. Sentiment as such is neutral, facilitating or inhibiting possible innovation (Nimkoff 1957:62-64) in terms of specific compatibility or incompatibility. Thus, the Russian peasant grandmother's bacon rind and flour for her newborn grandchild express her love as best she knows (Gorer and Rickman 1962:51), but slows the spread of the germ theory of disease.

Thus, the Palauan workman whose North American foreman tousles his hair reacts less in terms of the belief about the head than emotionally in terms a North American would feel were his trousers jokingly unzipped by an out-group member (Useem 1952:157). His sentiment blocks rapid adoption of U.S. industrial work norms by Palauans.

c. Values. Cultural values are another set of conventional understandings that profoundly affect the course of cultural change. A value is neither belief nor sentiment, although it partakes of the nature of both. A value may be viewed as a preferred event. Different individuals prefer different events, but individuals in social systems tend to arrive at a consensus concerning preferred events affecting the group. An innovation compatible with the values of a given social system is more likely to be adopted than one which is viewed as incompatible with its values, other conditions being equal.

On Palau after World War II, U.S. citizens concerned with mining phosphates for shipment to Japan preferred to maintain production (Useem 1952:161). The islanders, on the other hand, preferred to gain social superiority for one or another competing clan through successful manipulation of the mine officials (Useem 1952:152-53, 163-4). The divergent preferred events permitted both groups to work together mining phosphates, but not without recurrent adjustments (Useem 1952:159).

d. Felt needs. The specificity of beliefs, sentiments, and values in given social systems brings about great specificity in the wants or needs that people feel and express. This specificity significantly affects cultural change inasmuch as innovations perceived as likely to satisfy felt needs are much more often accepted than those to which people are indifferent or opposed.

The importance of felt needs in the change process can be illustrated many times over from Navaho history. One example will suffice. U.S. administrators had for many years urged Navaho parents to send their children to Bureau of Indian Affairs schools when World War II began, but few Navaho children attended. During the war, 3,600 Navaho young men

served in the U.S. armed forces, establishing comradely relationships with non-Indians for the first time in their lives. Other thousands worked in off-reservation ordinance plants and other factories with non-Indian workers. They earned relatively large cash incomes for the first time, were able to live in homes with shower baths, wood floors, beds, etc. The war-time experience, and the post-war return to the reservation with regression to lower standards of living and of camaraderie, produced a general Navaho felt and expressed need for formal education. Suddenly the 21,000 school age children figure meant nearly that many wanting to attend classes where fewer than 6,000 had been enrolled (Underhill 1956:242-47).

### C. Characteristics of the Contact Situation

When social and cultural change occurs as a result of contacts between people reared in different cultures, the characteristics of the contacts can considerably influence the degree of change and its course in each group. In this section we attempt to set forth the principal dimensions of contact situations that appear to affect the outcome of cross-cultural contacts leading to transfers of conventional understandings. These include the frequency, intensity, and quality of interaction, and demographic trends.

1. Frequency of interaction. One characteristic of the contact situation profoundly affecting its outcome is the frequency with which persons reared in the two (or several) cultures interact with each other. An ideal type model for analyzing the effects of differential frequencies of interpersonal interaction can be stated in fairly clear terms. At one extreme the model predicts that if there is zero interaction frequency, then no social change can be expected to occur. At the opposite extreme, the model predicts that the greater the frequency of interpersonal interaction, the greater the amount of change in the two cultures whose bearers are in contact.

The relative simplicity of the technological outfit of some societies can be attributed to their isolation from other populations. Geographic barriers serve to minimize contacts between Siriono Indians and persons of other cultures. Siriono flight, an efficient boundary maintaining mechanism, reinforces the geographic barriers of the jungle. Thus, the Siriono approach the zero frequency of interpersonal interaction with non-Siriono persons. Individual Siriono have very limited opportunities to observe, much less copy, technological or social alternatives to their simple tool kit and band social structure. When Sirionos are captured and held as serfs, they learn to behave by non-Siriono cultural patterns.

Another position on the continuum from zero to constant frequency contact is occupied by societies located at some geographic distance from each other, so that participants of each interact sporadically as a result of special trips or expeditions.

The Gila River Pimas and Spaniards in colonial New Spain lived in such geographic relationship for many decades. Given the gross differences in Pima and imperial Spanish population, technology, and social structure, the region between the Spanish frontier and the Gila River operated as a cultural shock-absorber and equalizer. The full range of Spanish power could not be brought to bear upon the Pimas to reduce them to dependent status. The Indians remained free to choose the cultural traits they would borrow from the Spaniards. Their choice was based upon sporadic observations of Spanish military expeditions and missionaries who passed along the Gila River, and of traders who came to an annual fair there, as well as occasional Indian observations during trips to Spanish forts, missions, and settlements (Ezell 1961:5).

The invention of efficient mechanical transportation has decreased the number of instances of contact between societies of the Pima-Spanish type. Most inter-societal contact today involves repeated if not continuous face-to-face contacts between persons reared in different cultural traditions. Considerations of the percentage of total populations in contact have become a primary variable in assessing frequency of contact. When Spaniards conducted one annual fair among the Pimas, the periodicity of the fair mattered more than the number of traders involved (although the latter was not insignificant). Today, periodicity seems less important than the proportions of total populations in contact. The cultural differences between Mexico and other Latin American nations probably cannot be attributed solely to the effects of the Mexican revolution, or differences in colonial administration. Some of the difference reflects differential degree of contact between U.S. citizens and Mexicans, compared to residents of other Latin American republics. So many Mexicans have worked as unskilled laborers in the United States that even isolated rural villages all over Mexico contain residents whose behavior reflects some conventional understandings learned in the U.S. (Taylor 1933:35-40; Lewis 1951:36; de la Fuente 1949:35; Diaz 1966:217; Madsen 1960:229; Nader 1964). The hundreds of thousands of U.S. tourists entering Mexico each year are another significant component of this contact situation. The wide diffusion of the motel attests to the socio-economic influence of tourists. Latin American nations not yet invaded by U.S. motor tourists have not yet built motel networks.

The precise conditions of contact between persons reared in different cultural traditions determine the social change consequences when other variables remain constant. A case of social isolation behind an artificial barrier may illustrate the cultural dynamics involved.

In a large U.S. insurance company, a small voucher storage and retrieval work unit has been analyzed. At one time, this unit occupied a "cage" with exterior walls, an interior partition with a door opening into a corridor, and a wire screen with a door opening into the desk area of the larger work-unit of which it formed a part. This "voucher-cage" unit possessed a distinct, well-defined territory. Its physical boundaries were deliberately reinforced by piling empty cardboard cartons on top of the filing cases along the wire mesh. This effectively screened the voucher cage workers from regular observation by the unit supervisor in the larger area. Under these conditions, the voucher unit handled its task efficiently, even when part-time workers had to be trained to replace full-time veterans transferred out of the cage. Morale was high, for the voucher cage workers developed a distinct and privileged subculture. They played while they worked. They shot paper clips at one another with rubber bands. They sent a worker out for food when they wanted, not only at the company-designated times enforced in the larger work area. The corridor door permitted this, as well as moments of gossip or flirting with young male messengers in the corridor.

The distinctive work subculture of the voucher cage disintegrated when its walls came down after a company rearrangement of space. When the cage workers came under the steady gaze of the unit supervisor - when interaction frequency with this authority figure increased - such distinctive sub-cultural traits as rubber-band sniping were quickly suppressed, and with them, the morale of the cage workers. The supervisor carried out a program of forced transculturation of company rules among the voucher cage population. Limited reverse acculturation also occurred. When the workers in the larger unit observed the pattern of off-hours food-getting the voucher cagers attempted to continue, they generated enough pressure to win limited like privileges (Richards and Dobyns 1957:18). Thus, transculturation took place in fairly direct relationship to the frequency of interaction (verbal and visual) between workers in the voucher processing unit and their work unit supervisor.

The effect of frequency of interaction when other variables remained constant has been observed in the U.S. Bureau of Indian Affairs efforts to induce Papago Indians to farm in earth-bank flood-water impounding basins. A Bureau extension agent induced one Indian to re-initiate farming efforts in

one of these structures after other Indians had abandoned the effort. The frequency with which the extension agent personally advocated closed-basin farming seems to have been the main determinant (Dobyns 1951:32). An evaluation of the developmental achievements of Peace Corps volunteers assigned to Andean Peru found a significant correlation between institution building success of volunteers and the number of Peruvian clients individual volunteers acquired (Dobyns, Doughty and Holmberg 1965:279-280). These examples attest to the proposition that, other conditions being equal, the greater the frequency of interaction between persons from two cultural traditions while they are in contact, the greater will be the resultant transculturation.

. . 2. Intensity of interaction. The other conditions in the propositional statement above are not often actually equal. One that frequently varies is the intensity of interpersonal interaction. While the weight of the evidence certainly remains far from clear, it appears that it should be assumed for practical purposes that the greater the intensity of interpersonal interaction, the greater the consequent social change.

The results of psychotherapy, for example, may be attributable to the intensity of interaction between therapist and patient (Salter 1963:40-42, 120) rather than to the theory employed by the psychiatrist (Salter 1963:v-vi, 149-152). Therapy or interpersonal interaction can be a process that recurs with starting and termination points (Barnett 1965:221). The theory that customs persist because sentiments recur in individuals could hold only if the origin of a custom coincided with the first appearance of the sentiments. Clearly each person does not spontaneously produce social behavior, but feels as customs condition him (Lévi-Strauss 1963:69-70).

In social units, the same effect of intensive interaction may be discerned. The U.S. Bureau of Indian Affairs tried with indifferent success to persuade Navahos to send their children to school. Then when Navaho men served in the U.S. armed forces, the frequency and intensity of Navaho-Anglo interaction increased. Navaho service-men became "buddies" with their non-Indian comrades (Underhill 1956:241-46). This was the first time in history that significant numbers of Navahos were able to establish peer relations with non-Indians. The intensity of these peer relations helped the Navahos perceive the advantages of formal education.

a. Spoken communication. One of the variables in the intensity of cross-cultural contacts is the degree to which individuals in contact can converse. A common language facilitates intense interaction. A common experience in

cross-cultural contact is that children speaking a language not taught in the schools are seriously handicapped in learning the culture of the teachers until they acquire facility in the official language. They children in Vicos learn a dialect of Quechua in their homes. Upon entering the public school system they begin to learn Spanish. A one year "transition" grade is provided to teach Spanish and how to attend school. Only bilingual Vicosinos whose comprehension of spoken Spanish is good feel at ease with Spanish-speakers in commercial transactions and social intercourse (Dobyns 1965:26; Doughty 1965:17).

Yet such is the nature of the human animal that non-verbal communication is so frequent and important that scientific demonstration of the correlation between fluency and cultural change is extremely difficult.

Peace Corps volunteers in Colombia sometimes achieved results (as rated by their superiors) disproportionate to their fluency in Spanish (Stein 1966:179). In Andean Peru some volunteers who could hardly speak Spanish achieved significant results, while others who became fluent accomplished little (Dobyns, Doughty and Holmberg 1965:276-278).

Still, the importance of a common language for cultural change is attested by the effort individuals expend in order to talk to one another despite differences in language. Bilingualism or multilingualism characterizes individuals whose mobility leads them frequently to cross the frontiers between societies which use different languages. Alternatively, elements of the languages of people in contact have been put together to form new inter-societal languages such as pidgin "English."

A language can be employed as an effective boundary-maintaining mechanism, making for cultural stability. The small, compact settlement with a distinctive language lodged in the midst of a much more numerous society can preserve considerable stability in a force-free situation. The Rio Grande Pueblos are good examples. It would be extremely difficult if not impossible for any outsider to learn one of the Pueblo languages. The effective verbal communication between Pueblo Indians and members of the dominant group has been conducted, therefore, in either Spanish or English.

In situations of cross-cultural contact, the social pressures toward interaction are so great that the individual who is not protected by boundary maintaining mechanisms that provide firm psychological support can develop very real mental health problems.

The U.S. wife of a business man assigned to a foreign city can, if she does not learn the language (and at least some customs appropriate to women in her class) develop such anxiety as to require psychotherapy (León 1963:118). A small percentage of Peace Corps volunteers working in Andean Peru were found to display less acute withdrawal symptoms under cultural stress, not all of it due to lack of facility in verbal communication (Dobyns, Doughty and Holmberg 1965:260ff). A lack of facility at interpersonal and verbal communication in English may also be discerned in the Australian aboriginal behavior "wary walkabout" or paranoid schizophrenic flight (Cawte 1966:275-77). Cases of this type appear to constitute a very minor proportion of any changing population in a cross-cultural contact situation. The female Peace Corps volunteers that were found withdrawing from social problem-solving interaction constituted only about four percent of the sample analyzed (Dobyns, Doughty and Holmberg 1965:251-52). The total referrals of Australian aboriginals to mental hospitals appear to amount to 3.8% of the hospital population in Western Australia, compared to 2.8% aborigines estimated in the total population (Cawte 1966:269).

b. Temporal duration. Another dimension of the intensity of interaction between individuals of different cultures when they come into contact is the duration. It may be assumed that the longer individuals interact across a cultural frontier, the more likely is transculturation.

In some respects, the concept of temporal duration differs little from the idea of frequency of interpersonal interaction. Yet it behooves those concerned with promoting change to keep in mind that total intensity of contact depends not only upon the number of interpersonal interactions, but also upon the length of time each one endures. The formal educational system provides an example of the interrelationship between frequency and duration. The school day is standardized in length for a given school or class. Thus the total exposure of students to formal education usually is calculated in terms of the number of days (or weeks, months, semesters, or years) the students have attended class. Thus, frequency of attendance determines total duration of schooling, and in theory at least, the resultant degree of change in individual students.

Yet, class duration varies, too. A student studying academic subjects half a day and vocational subjects the other half cannot be exposed to as much academic training as the student taking such classes all day long, even though both attend school with exactly the same frequency.

In Vicos, the difference duration of interaction makes in transculturation may be discerned by comparing returned migrants. Those who spend several years outside Vicos typically return speaking Spanish fluently, having learned a trade, and become accustomed to wearing Western manufactured clothing. Those who spend a few months or weeks outside Vicos return speaking only a smattering of Spanish and continue to wear the Vicos homespun.

Perhaps the best evidence of the influence of duration of contact comes from experiments on the social dynamics of small groups. Individuals living in common residence units develop distinctive conventional understandings and symbols of separateness from other individuals with whom they interact for a smaller part of the time, other conditions being equal. (Sherif et al 1951:69-150). The same influence has been encountered among factory work groups of many kinds (Harding 1955:1223-1226).

3. Quality of interaction. Another characteristic of the contact situation affecting cultural change is the quality of interpersonal interaction. Quality is something other than the frequency and duration of contact or the fluency of verbal communication. By quality we refer to the relative social status of the individuals in contact.

a. Relative status of individuals and systems. Other conditions being equal, conventional understandings appear to spread from high status individuals to low status persons (Kushner et al 1962:43). On the theory that imitation is basic to cultural change, it has been asserted that "the agent presenting the new pattern who enjoys the highest prestige in the accepting society will be the most effective in inducing change" (Fisher 1953:142). This emulation of one's betters is often couched in class terms. In societies divided into classes, "there appears to be a nearly universal desire to approximate in some degree the behavior patterns of the upper classes" (Foster 1958:36). In cross-cultural contact situations, two groups usually develop images of themselves and of each other in terms of power and weakness, of superordination or subordination, and of superiority or inferiority (Keesing 1958:390). The change process has at least two dimensions. On the one hand, "a group which recognizes its social inferiority will borrow more extensively from its superiors than the superiors will borrow from it" (Linton 1940:491). In slightly different terms, "members of a given social class or stratum tend to take over the practices and consumption patterns of the classes above more than those of the classes below them" (Loomis et al 1953:276). Changes move from urban centers to the peasantry, "the peasant accepting innovations from the city because they are prestigious" (Kushner et al (1962:16 citing Foster 1958:13 and Redfield

1953:37-38). During this process, the peasant village upper class adopts urban traits before other villagers (Quint 1958:382). Within classes, leaders "take on" consumption patterns and practices from higher classes sooner than non-leaders (Loomis et al 1953:276).

On the other hand, the group that considers itself inferior tends to abandon those cultural traits disapproved by members of the superior group (Linton 1940:491). The Mohave Indians, who thoroughly enjoyed eating horsemeat during the last century, have not only abandoned it, but now disclaim their ancestors ever consumed it (Stewart 1947). They learned that Spanish-Americans and Anglo-Americans frowned upon horse consumption.

Persons of high social status can usually be identified, even in situations of cross-cultural contact, as occupying roles that are numerically scarce, yet needed. Thus, a physician enjoys a relatively higher status than his patients, even outside his specific technical role. A priest enjoys a higher status than his parishioners. The formal role ascription cannot be assumed, however, automatically to generate that socially meaningful prestige which may be readily translated into cultural change.

In the Poston War Relocation Center to which some Japanese and Japanese-Americans were evacuated in World War II, the difference between formal role attributes and real prestige proved to be the key element in many crises. Young Japanese-Americans (Nisei) born and educated in the United States won most of the top posts in the Center's self-government. Yet time and again, these leaders proved unable to change evacuee behavior as well as a group of older men. These Japanese-born (Issei) informal leaders were prestigious in the eyes of their fellow evacuees. They were barred from Center office because they were Japanese citizens. Yet other evacuees literally beat paths to the doors of their hot, dusty apartments to seek their sage counsel and advice. At one stage in the forging of a Center-wide social organization, individual prestige could be objectively measured (Leighton 1946:123, 133). When evacuees had a choice concerning changes in Center life, the high prestige Issei governed the decisions.

Seldom are human societies so disrupted as to expose the difference between role and prestige as clearly as in the Relocation Centers. It is most instructive because it was an unusual situation that permitted social scientists to perceive clearly the difference between formal role attributes and informal, functional prestige.

b. Conceptual identification. There is another aspect of status and prestige as factors in changing conventional understandings. It may be termed conceptual identification. By this we mean that those individuals who are influenced by individuals with high prestige define themselves as belonging to the same behavioral continuum as those to whom they accord high prestige. They view the high prestige persons as a meaningful reference group (Merton 1957) although not a membership group.

One of the commonly occurring cutting points on the conceptual identification continuum based on emulation of high prestige figures comes between people belonging to the middle class and those belonging to the lower class, despite the generalizations quoted earlier.

The concern that U.S. policy makers display over developing a middle class in underdeveloped nations has realistic bases in differential behavior. The middle class housewife in Santiago de Chile accepts U.S. foodstuffs on the basis of self-identification on a behavioral continuum with North Americans whom she considers as having high prestige. She purchases and her family consumes breakfast cereals, for example, since she learns from mass media and rare contacts with North Americans, that people in the U.S. consume them. She attempts to bake a chocolate cake for a visiting Peace Corps volunteer, even if she does include the raisins that contribute to the tastiness of Chilean pastries (Hovey 1966) on the basis of self-identification on a behavioral continuum with North Americans whom, she has learned, like chocolate cake.

The situation in the poverty-stricken squatters' settlements on the outskirts of Santiago is significantly different. The población or callampa family, consciously poor and lower class, laughs at U.S. style foodstuffs (Hovey 1966). The Chilean roto accords U.S. citizens no less prestige than does the middle class Chilean, in all probability. The roto simply does not view himself as living on the same behavioral continuum as the Chilean middle class or well-to-do and as North Americans. So their prestige fails to motivate him to emulate them. The prestige is recognized, but the recognition is meaningless as motivation toward cultural change in the absence of self-identification with a common behavioral continuum.

For several decades after the Navaho Indians were conquered by U.S. troops, they continued to live by sheep pastoralism. They perceived slowly the utility for their children of the formal education the conquerors offered them. The subordinate Indians could not perceive that classroom instruction was a path of vertical social mobility in the U.S. society

that might be preferable to family instruction in peasant pastoralism with social stability in a separate ethnic group. Then thousands of Navahos served in the nation's armed forces and worked in defense factories during World War II. The result was a widespread Navaho reinterpretation of the utility of formal education (Underhill 1956:241-46). This and other changes in the social habitat of the Navahos have converted their economy from peasant pastoralism to wage earning in diversified industrial and service occupations.

A parallel change in attitudes toward formal education occurred among Peruvian army conscripts from Vicos. Two years of compulsory service has provided numerous young Vicos Indians with experience as peers of other conscripts from all over Peru. While the army structure is authoritarian and stratified, it does define conscripts as peers. Peer groups were rare if not entirely absent from the Andean manorial social structure. Factors other than formal education determined achievement and well-being in Vicos prior to 1951. Placed in the army conscript peer group, Vicos conscripts were able to identify formal education as an important independent variable in Peruvian national society. When the Vicos conscripts returned home, they became strong advocates of formal education. Veterans insisted that their younger brothers attend school as their parents never had.

A similar situation exists in the returned migrant population. Those Vicos parents who have lived for significant periods of time in the coastal valleys, where skilled job opportunities are rather directly related to educational preparation, have insisted that their children attend the Vicos school.

These examples indicate that the effective boundary of prestige as a force for cultural change lies at the frontier of the peer group. Persons with low social prestige who experience peer relationships with individuals higher in prestige appear to be prone to acquire the cultural traits that characterize the high prestige group. Those persons of low prestige who do not experience peer relationships with prestigious persons appear unlikely to change by adopting cultural traits from those who enjoy high prestige.

The so-called subculture of poverty (Lewis 1959:2; 1966:xlii-xliv) may be comparatively unimportant as an assembly of conventional understandings that can be legitimately labeled a subculture, at least in terms of potential for cultural change. The behavior of poor people who behave differently from middle class individuals seems to stem from their own fundamental assumption of social inferiority and difference. The above examples suggest that this assumption can be shaken by experiencing peer relationships with persons

belonging to high prestige social categories (i.e., members of the middle class). They also suggest that the fundamental assumption of difference remains unshaken and operative as long as persons of a subculture of poverty (or ethnic background, or other basis of difference) do not experience peer relationships with high prestige persons so that they come to view themselves as living on the same behavioral continuum.

Viewing themselves as living on a different continuum may account for certain objections to the proposition that inferiors change more than superiors. The general argument that the tribal chief can make civilization acceptable has been refuted by Mair (1957:38). She maintained that "for the chief's example to be effective, the innovation must be something which is either a matter of indifference to the people or else appears to offer some positive advantage." We would say that the chief's example would be effective when his subjects assume that they live on a common behavioral continuum with the chief, and it would not work when they assumed otherwise.

Barnett (1953:313) grants the truth of the idea that the prestige of a new idea is one decisive factor in its being accepted or rejected, but with important reservations. Only a little analysis reveals that it is not true that "a chief, a king, a politician, or a social leader exerts influence under any and all circumstances."

Homans (1950:425) like Mair emphasized that unquestioning acceptance of a leader's orders occurs in the "zone of indifference."

It seems clear, then, that the general proposition that change flows from prestigious people to inferiors is often true, but often untrue also, so that the conditions that make prestige a key factor in changing conventional understandings need to be accurately specified for the general proposition to be a useful guide to action.

c. Power relationships between two systems. Up to this point we have been discussing the quality of interaction as it affects cultural change in fairly free choice situations. There are other important dimensions of social relationships that influence conventional understandings. Prominent among these are force and other sanctions that limit the choice of those faced with the opportunity of cultural change.

Monopoly on legitimate use of force. One situation that has occurred many times and can profoundly influence the process of cultural change is establishment of a dual or multi segmented society, one of whose constituent groups holds a monopoly on the legitimate use of power (Williams 1952:202;

Gerth and Mills 1946:78). This monopoly provides the group holding it with the option of employing force to promote particular conventional understandings.

In Vicos, the social scientists who subleased the manor acquired this class of power over the serfs. The non-Indian foremen were accustomed to seizing and holding animals, tools, or articles of clothing belonging to serfs in order to force them to work the conventional 156 days per year, keep their livestock out of manorial fields, render personal services to the managerial staff, and so on. The period of application of social science principles provides us with no examples of the use of power to promote cultural change, however, since the scientists chose to eschew forced change and to test theories about how conventional understandings change under conditions of free choice between known alternatives.

Only some limited actions of the scientific staff exercised the power it possessed. When the staff assumed the management of the manor, it had the jail torn down, thus removing a much feared and disliked form of forceful sanction. The scientific staff found that the serfs disliked intensively all forms of pongaje - the multiple forms of personal service serfs and members of their families rendered to the managerial staff. These included a wide range of duties: cook, nursemaid, concubine, sweeper, postillion, stable boy, maize husker and degrainer, warehouse and field guards. Apprised of serf dislike for pongaje duties by interviews, the scientific staff abolished all forms of pongaje. Whenever tasks that had been carried out by pongaje had to be performed, Indians were hired at going wages. The staff employed its power once to assign some of the 156 days of obligatory labor to school building construction rather than to field labor. The rest of the time, the staff used its power to diminish that power. They deliberately changed the conventional understandings that had supported the pongaje system for other conventional understandings that eliminated it. The conventional understanding that serfs were to be exploited gave way to one that they were to be accorded social justice and their legal rights. This and related changes stemmed from an allegiance to a different fundamental assumption (Holmberg 1958:13). The manorial system rested upon the fundamental assumption that Indians are inherently different from and inferior to Europeans. The social scientists undertook the change program on the fundamental assumption of inherent equality of human beings (Holmberg, Vázquez and Dobyns 1961).

The geographic expansion of European peoples equipped with an industrial technology has led to forceful imposition of certain socio-religious standards on a nearly world-wide basis. Head hunting has been emphatically repressed wherever

it has been encountered (Malinowski 1937:237-38; Belshaw 1957:256). So has cannibalism (Cortes 1962:195; Bernal Díaz 1956:436). Slavery has been largely eliminated, once opinion leaders in Western Civilization made up their minds to oppose it. Its termination in the United States occurred only as one result of a long and bloody civil war. The use of force clearly can, then, alter conventional understandings.

Cultures change not only under direct attack, but also indirectly as a consequence of actions by power wielders in pursuit of goals other than cultural change. For example, most Northeastern Pai Indians shifted very quickly from an aboriginal hunting and food-collecting economy to industrial occupations such as mine labor, track work, and service occupations in 1875 and the next few years. The reason was simple. The Pai had been militarily defeated in 1866-69. They followed traditional economic pursuits until most of them were forced to abandon their homeland in 1874 and move to an Indian Reservation. Non-Indian settlers quickly pre-empted the mountain springs that determine land use in semi-arid northwest central Arizona. The settlers brought thousands of cattle onto the virgin range. When the Pai escaped in 1875 and returned to their homeland, they found the springs and land resources occupied by members of the dominant group so they had little choice. If they were to live in their homeland they could do so only by shifting from aboriginal economic pursuits to industrial occupations in the U.S. economy. The forceful Anglo appropriation of Pai resources forced these Indians into numerous rapid alterations of their previous conventional understandings in a very few years, even a few months in some cases.

After the Spanish conquest of Peru and sale of crown lands to a private owner, legal control of Vicos land led to serfdom under a manorial system. This change occurred so long ago that it was not subject to direct observation by social scientists. We simply do not know what native customs may have been forcefully interdicted by the Spaniards, nor what changes were indirectly caused by Spanish assumption of power.

Competition. Often, groups that would like to change the behavior of others enjoy a monopoly on the use of power only in their own view. Those whom they would change also resort to force. Thus warfare or approximations thereto result. Under such circumstances neither group is able to change the culture of the other as it wants to do. On the contrary, such competitions tend to foster "piratical" acculturation (McGee 1898:243). That is, each changes in ways thought to strengthen it for the contest. This fosters changes the other group would most like to avoid. The armaments race between modern nations constitutes the most impor-

tant case of this dynamic of cultural change. The United States having detonated atomic bombs, the leaders of the competitive USSR felt that it had to achieve the same weapon capability. Then mainland China felt it had to achieve parity in weaponry, and France felt impelled to prove it could still compete as a world power.

On occasion, social systems exist without conflict even though the people come into constant contact with one another. An elite enjoys a monopoly upon the legitimate use of force within each system. Neither attempts to employ force to change the behavior of those in the other system. Then, cultural change occurs as a consequence of any of the other mechanisms producing changes in conventional understandings. This situation occurs when the social systems in contact are about equal in power, or are fictionally equal in power, being defined in this manner by those in authority. It can occur when a socially and politically dominant group follows a policy of cultural pluralism toward subordinate subcultural groups.

d. Media for information transfer. For most of the history of mankind, cultural change was entirely a consequence of personal influence during face-to-face interactions. This was true whether a conventional understanding was being disseminated in a social system, or diffused across boundaries to another system. There can be little doubt that face-to-face interaction remains the most important form of contact leading to cultural change. Man has relatively recently invented means of communication that influence people to change by conveying meaningful messages without face-to-face interaction.

Television. One medium for conveying messages that can lead toward cultural change is television. The television receiving set offers audiovisual messages to whomever will watch and listen. The degree to which television can change conventional understandings seems as yet unclear. There is some evidence that television watching among children may offer a refuge from unsatisfactory interpersonal interaction with peers (Berelson and Steiner 1964:535-36).

Radio. The radio has brought its auditors verbal messages for a considerably longer period than television. Transmitters and receivers are widely diffused over the world. Transistor technology has tremendously expanded the number of listeners by reducing receivers in both size and cost. There is clear research evidence that radio broadcasting can change at least some kinds of conventional understandings.

The radio-transmitted message appears to foster cultural change most effectively when it is reinforced by local dis-

cussion. In India, differential adoption of agricultural practices advocated in broadcasts to farmers has been reported. Farmers who discussed the radio messages in deliberately organized groups adopted the practices in higher proportion than farmers who heard the same broadcasts without discussion (Neurath 1960:670-74).

Cinema. The cinema has proved to be a powerful non-personal influence toward change. Indonesian independence was sparked significantly by U.S. movies, according to Sukarno (Barnouw 1966:20). Indonesians compared the affluence depicted in films with their own colonial poverty and concluded that revolution might bring them abundant consumer goods.

In Chile, the middle class housewife who emulates the North American diet guides her selections by observations in the cinema, by occasional observations of U.S. citizens and by reading. She buys corn flakes not because she has, in most cases, seen U.S. citizens eating them, but because she has concluded from viewing U.S. actors consuming this food in moving pictures filmed in the U.S., or from magazine advertisements, that U.S. citizens habitually consume corn flakes.

The children's game of "Cowboys and Indians" has diffused over much of the world by U.S. "Western" movies. The diffusion of implicit conventional understandings by moving pictures can occur apparently without logical connection with the value-structure of viewers. A provincial Mexican audience viewing a U.S. "Western" with Spanish subtitles cheers the U.S. cavalry when it appears in the film in the nick of time to save the heroes from hostile Indians. The audience cheers the U.S. cavalry despite lingering resentment against the U.S. among Mexican intellectuals, and even expressed in folk tales and songs (Paredes 1966:114-15), on the score of U.S. defeat of Mexico during the wars over Texas, the Pershing sweep into Mexico in 1916, and inter-group relations under pacific conditions. The moving picture viewers identify the screen Indians as villains despite the strong Indian heritage of the Mexican population.

On the other hand, when moving pictures are made not for entertainment but to influence decisions, the degree of cultural difference between film makers and viewers seems frequently to short-circuit communication.

This has been a constant pattern in the Cornell Peru Project effort to accelerate the diffusion of the conventional understandings of industrial civilization to the Indians of Vicos by showing "educational" films. Shown a film about insect-borne diseases, the Vicosinos inquired where the huge and horrible beasts shown lived. Lacking experience with

microscopes and other magnifying lenses, the Vicosinos concluded that the insects projected on the screen magnified many times were shown actual size or smaller (like human beings, horses, and other life forms familiar to them). The intended lesson of the film makers concerning disease vectors failed to reach the Vicos audience.

Moving pictures demonstrably can produce important cultural changes among their viewers, but deliberate efforts to change viewers in desired ways appear to be limited by audience frame-of-reference factors that have not always been taken into account by film-makers.

Publishing. Many forms of the printed word seek to alter the conventional understandings of readers. Several characteristics of printed messages limit their success at transculturation. A fundamental limitation is that of literacy. A person must be able to read a printed text to be influenced by it. This effectively ruled out printed materials in the early stages of the Cornell Peru Project in Vicos. Since none of the serfs was literate, there was no point in attempting to influence the population with the printed word. Indeed, testing showed that many Vicosinos could not interpret a still black-and-white photograph as a representation of reality. Thus, even picture books or magazines were of quite limited utility. This situation has changed as Vicos children have attended school and learned to read and write. Still, making an entire population literate takes time. By 1963, approximately eighteen per cent of the Vicos population had attended school and seventeen percent were able to speak Spanish (Alers 1965:442) with the proportion of literates being somewhat smaller. This meant that printed materials continued to be meaningless to the great majority of the population; and would continue to be so until the formal educational system had converted a much larger part of the population from illiterates to literates.

When a population is literate, a basic limitation on the influence of printed materials is the extent of their distribution. Only those literates who actually read a given text can be influenced by it. The cost of printing and then of transporting to the reader a newspaper, broadside, magazine, or book operates to limit readership.

In Vicos, a high rate of attrition in literacy skills occurs. Former students have little or no reading matter on which to practice; so their ability to read diminishes. While the economy has improved materially since 1951, few Vicos families can afford newspapers, magazines, or books. On the other hand, few government or private organizations are concerned enough with influencing in any way the peasant

population to distribute free materials in quantities sufficient to reach Vicos and similar settlements.

This dearth of economical reading materials is a principal limitation upon literacy programs all over the world (Lieberman, 1963:19).

4. Demographic changes. Contacts between persons reared in different cultures produce at times cultural changes that are the consequences of environmental alterations occasioned by the actions of one group or the other, rather than direct results of interpersonal interaction.

One significant change that has often resulted from cross-cultural contacts is an abrupt change in demographic trends. The arrival of Europeans in the New World unleashed among Indian populations Old World diseases that wrought great havoc. An aboriginal population that may have been on the order of 90,000,000 prior to these contacts was reduced to five percent or less of its original size (Dobyns 1966:414). Depopulation on this scale had serious cultural consequences among the survivors. In Vicos, the prehistoric gardening population had been converted into stock-raisers by the end of the sixteenth century when direct records began.

Variation in human population with direct cultural consequences means that the analyst of cultural change needs to take into account population size and density under pre- and post-contact conditions (Linton 1940:ix-x). Depopulation and repopulation have direct consequences in cultural change. Because social scientists have observed mostly growing populations, most theories deal with the structural consequences of increasing numbers. The appearance of moiety and sib divisions of a simple social organization, and voluntary associations, has been attributed to increasing population related to increasing food supply (Oberg 1955:483-84).

Five thousand has been advanced as the upper population limit of tribal organization, beyond which tribal organization cannot be sustained, and one tribe breaks apart into two or more new units (Kroeber 1955:304-05). Population density is, therefore, an index of cultural development in the view of many social scientists (Naroll 1956:688-93; Mason 1959:87 ff; Ember 1963:229-32; Murdock 1957:674; Spicer 1962:39, 99). In terms of the contemporary nation-state, population size is one fundamental ingredient in power (Davis 1958:199), with 45,000,000 as the rough threshold for great-power status (Organski and Organski 1961:13). Contemporary power stems in part from the national labor force, and in part from the citizen-army, as contrasted to the earlier mercenary army. Population numbers are direct components of such power.

At the local community level, several studies have recorded the correlation between settlement size and the complexity of institutional development (Dobyns, Doughty and Holmberg 1965:18-23; Maynard 1964:1; Young and Young 1963:24-27; Wilson and Wilson 1945:25).

a. Resource change. Man has proved capable of causing significant changes in natural resources. Such changes in the natural environment foster, even force, cultural adjustments.

Flora. One environmental change that has forced re-orientation of small-scale tribal economies is a shift in the natural flora. When two cultural groups are in competition for a single territory, environmental changes produced by one group may force the other to abandon traditional pursuits and take up new ones. Such has been the case when cattle-raising Europeans moved their livestock into areas of the New World previously exploited by hunting and gathering tribesmen. In the homeland of the Northeastern Pai Indians, cattle have grazed certain preferred plant species so they are or nearly are extinct. (Kniffen 1935:36). The Pai relied heavily on seeds from some of these plants. As they disappeared, it became impossible for the Indians to continue their aboriginal economic pursuits. The resource base was destroyed by cattle, so the Indians perforce learned industrial occupations.

Critical changes in floral resources that force the population to shift part or all of its economic activities need not result from differential land use in cross-cultural contact situations. Many groups have so altered their floral environment as to leave no alternative save to arrive at new conventional understandings. The Hopi Indians of northeastern Arizona discovered the utility of coal as fuel during pre-historic times. They mined seams and burned coal long before the industrial age. The Hopis made no industrial use of coal, however, utilizing it simply to substitute for wood in cooking and heating fires. The sedentary Hopis had cut the trees that once grew on the Black Mesa at whose southern tips the Hopi towns have long been located. The Hopis cut the timber so far from their towns, at least, that coal mining near home became preferable to wood cutting and hauling several miles. When the Hopis acquired horses and donkeys, they could pack heavier loads of wood faster than a man could. They then cut the timber off an even larger area.

Hopi deforestation went on for many centuries and involved only a few thousand Indians. Other groups have changed the natural flora in even more rapid and marked fashion, with pronounced cultural consequences.

Around the Mediterranean Basin, the early cutting of the cedars of Lebanon is a well-known instance of exhaustion of a significant resource. The archaeological-historical record shows that North Africa in Roman times was cultivated far more extensively than it has been since. Evidently destructive farming practices had much to do with the changes that made much of North Africa desert, and forced extensive change in Mediterranean trade.

In North America, forest clearing and destructive farm practices resulted in serious loss of protective plant cover and fertile top soil. This loss materially altered the agricultural potential, and the socio-economic development of certain regions (Bennett 1939:16-54, 125-168). The loss of flora in the Great Plains caused spectacular regional dust storms in the 1930's. These storms aroused the concern of the public and of public officials. A large-scale program of federal aid and soil conservation was launched. The political leadership established a special government service to disseminate new conventional understandings concerning farming. Stimulated by government financial support farmers formed hundreds of local soil conservation districts. The traditional north European farming techniques that scarred the land became progressively less visible as farm practices based on different understandings spread widely among farmers and halted, even reversed, the destruction of floral cover and topsoil.

In Vicos, the value of soil conservation has not diffused to the population. The benefits of manuring have long been understood by the Vicosinos (Vázquez 1952:56). As a result of Cornell Peru Project instruction, the ex-serfs have fertilized with sea bird dung recovered from off-shore islands. The Indian farmers have yet to learn, however, the techniques of soil conservation. Significant erosion of sloping fields deposits topsoil upon lower ones (Garrido and Barker 1966). The consequences of sheet erosion have not yet reached such a state of crisis as to motivate the Vicosinos to perceive a need for taking soil protective measures.

During the five years of direct Cornell Peru Project management of Vicos, obligatory serf labor was assigned to repair and maintain stone soil-holding terraces that are probably prehistoric in origin. The community farm enterprise has not continued even this conservation measure.

Vicos has an adequate firewood supply from recently planted eucalyptus in field borders, school forest, and house lot plantings, or wild brush at higher elevations. In one part of Colombia, people in one municipality must make long trips to purchase or steal firewood since they have deforested their hinterland (Duque 1958:165-157). The morals and values

of these people are placed under severe strain by their fuel requirements and cumulative deforestation.

Fauna. Just as man-made floral changes force adjustment of conventional understandings, so also do faunal shifts. The domestication of animals now thought of as livestock produced tremendous cultural changes. The evidence of the cultural consequences of animal domestication is not available, since the process took place before writing was invented. Some of the cultural consequences of having domestic animals have been observed, however, as peoples previously without livestock acquired them.

The horseback culture developed by North American Plains Indian tribes is well known. In South America, various Indian tribes on the Argentine pampas independently developed parallel cultural patterns. West of the Andes in Chile, the Araucanians adapted to mounted warfare so well they stood off the Spaniards for centuries (Padden 1957:104-121).

The diffusion of cattle, horses, sheep, goats and swine to Vicos occurred too soon after the Spanish conquest for us to estimate the original effects of their acquisition in other than general terms. Certainly oxen drawing Old World plows replaced men kicking Andean earth-turning implements. Conventional understandings concerning working the soil with animal rather than human energy came to be shared by all Vicosinos. Cattle became the principal form of serf investment and savings under the manorial system. The value of horse ownership and riding became established in the minds of the Indians. When some 75 Vicos horses were rustled in recent years, the former serfs spent as much and perhaps more than their market value on litigation to recover about half the number lost.

The cultural consequences of harnessing animal power may be discerned in Vicos. One striking change in animal ownership has occurred since the Cornell Peru Project began. The number of donkeys owned by Vicosinos increased by nearly 300 percent (Alers 1965:445). These animals are employed for packing heavy cargoes, such as community farm enterprise potatoes to market. Their spectacular increase both indexes and contributes to the augmented human dignity of the former serfs. In manorial times, Vicos serfs carried harvested potatoes to the warehouses on their backs. Under the present system of self-government, the farmers have increasingly replaced themselves with donkeys as burden-bearers for the community enterprises and their family farming endeavors.

Water supply. Water constitutes another component of the natural environment alterable in such ways as to cause

cultural changes. One of the most extreme examples of cultural change as a consequence of a diminution in water supply has been reported from the prehistoric Inca empire. Archaeological evidence of complex kingdoms in Peruvian coastal valleys is indisputable. These coastal oases were under Inca rule when the Spaniards arrived. The Inca achieved military conquest of certain oasis kingdoms by shutting off or diverting the flow of water upon which the coastal peoples were completely dependent for drinking and irrigation.

Unintentional environmental change caused by pasturing livestock on plants utilized by man can occur with water supplies. In the semi-arid fringe of the Colorado Desert, Indians farmed fields irrigated by springs (Dobyns 1964:20). Then, at the end of the past century, Anglo-American farmers in the Santa Cruz River Valley undertook to increase the surface flow of irrigation waters by digging water concentration galleries into the alluvial fill. Heavy grazing upstream increased both runoff volume and silt load during annual floods. The galleries channeled the floodwaters that formerly watered the long, narrow valley-oasis and deposited fertilizing silt over the valley floor. The channeled floodwaters eroded the upstream edges of the galleries. In a few years the floods cut a deep channel several miles upstream from the starting point. As the erosion took out alluvial fill, the subterranean water table dropped to the level of the channel floor. The springs went dry. Indian and non-Indian farming had to shift to pumping high cost subterranean water, with numerous cultural consequences (Castetter and Bell 1942: 164).

The United States government had wells drilled on reservation lands affected by the falling water table, and equipped them with pumps. The Papago Indians whose lands these installations irrigate regard them as U.S. government property. Having had long experience with the sanctions applied to those who harm or appropriate government property, the Indians take no responsibility for well or pump maintenance. If they can avoid it, neither do the Indians pay the water assessments U.S. Bureau of Indian Affairs levies in an effort to amortize the irrigation equipment. A fast-growing city a few miles away offers job opportunities. Many land holders go to work for wages to support themselves, and leave their fields uncultivated rather than pay water assessments. Thus, Papago farmers have become part of the urban proletariat by ecological change due to private Anglo-American economic activity, followed by socio-economic change due to public Anglo-American administrative action. The conventional understandings of the Papagos living in the valley today differ tremendously from those of their ancestors who farmed the valley's unscarred floor with surface-flowing spring waters.

The role of administrative action must be stressed here as compounding the effects of ecological change. For the U.S. government's unilateral decision to install electric-powered pumps to provide Papagos with irrigation water precisely parallels the Laotian government's decision to provide villagers with expensive tube wells in 1956 and 1959. Wells sunk in 1956 were out of repair by 1958, when a U.S. agricultural advisor repaired them. In two years, all were again out of repair. The villagers enjoyed well water as long as the wells worked, but like the Papagos, assumed no responsibility for maintaining government property (Arensberg and Niehoff 1964:91-92). And like the Navahos, one can add, who view their irrigated lands in a federally-financed irrigation project as a U.S. government responsibility. (Sasaki and Adair 1952:105).

b. Population change. Just as the growth of a population requires cultural adjustments to increasing density, so sudden depopulation requires adjustment to decreasing density. The attrition of manpower from military losses can proceed so far as to prevent a society from successfully defending itself. If small, it may then flee its homeland and seek asylum with friendly people, with consequent fundamental reordering of conventional understandings at all levels of complexity (Dobyns, Ezell and Ezell, 1963: 137-139). It may not choose to flee or may be unable to do so, and have to accept subordinate status, as happened to numerous tribal societies in North and South America, Africa, and Australia, under European expansion.

Since about 1800, the world's population has been rapidly increasing. Evidence for rapid depopulation due to disease is scarce and drawn from historical records of unknown reliability (Dobyns 1966:403-408). That epidemic depopulation can cause significant changes seems quite clear. The American Indian fear of smallpox, for example, constituted a conventional understanding with strong feeling attached that was quickly established after New World populations were exposed to this Old World disease agent in 1519.

Disease can so reduce a population as to force it to amalgamate with another tribe or society to survive biologically (Vellard 1956:81) with wholesale cultural consequences. It can also reduce a population so it cannot hold its territory, and a denser population can move into it (Wissler 1936), thus altering a whole series of conventional understandings of each group.

#### D. Summary

In the course of this chapter, we have discussed an extensive list of factors involved in the transfer of cultural characteristics from one social system to another. We reiterate that the limitations of language tend to mask cultural reality. In order to discuss cultural transfer between social systems, we have taken up numerous factors, one at a time. We have tried to isolate each factor in order to lay before our readers something of the significance of each one. Herein lies the limitation of language and an inevitable distortion of cultural reality. In fact no factor operates in isolation from the other factors affecting the cultural transfer process. Only analytically can one factor be separated from the others also operating at any given time in any given social system.

To state the case at its most difficult, every factor that we have discussed as influencing the process of transfer of cultural characteristics from one social system to another (plus others that we undoubtedly have not recognized) appears to be at least potentially operative. The relative importance of each factor varies from time to time, and only this variation provides the social scientist with that analytical leverage that permits him to distinguish, albeit dimly, the influence of any individual factor.

The interconnectedness of cultural characteristics, of the conventional understandings that make up a culture, probably cannot be overemphasized to the individual concerned with fostering the transfer of behaviors from one social system to another. This interconnectedness clearly implies that the broader the spectrum of activities aimed toward transferring conventional understandings from one system to another, the greater the probability of success.

In other words, the person, or group, engaged in the transfer of conventional understandings between social systems, who focuses upon a single factor as the key, runs a heavy risk of accomplishing nothing. This null accomplishment may be due to a number of reasons. The single factor chosen may not in fact be crucial for the transfer of the understanding or set of understandings the change agent seeks to transfer. This may be the result of faulty analysis, or of an a priori choice based upon no analysis at all. More importantly, concentration upon a single factor may lead to null accomplishment simply because, however great the effort expended on that factor, it is insufficient because one or several other factors upon which no effort is expended also affect the transfer. As in an atomic explosion a minimal critical mass of operating factors must be at work before the reaction can sustain itself.

One further consequence of the interconnectedness of cultural traits needs emphasis. This is the "chain reaction" to innovation in a given culture. If one part of a culture is altered its functional interconnection leads to further change. This feature of culture may be almost quantitatively stated: The greater the integration of a given culture, the greater are the consequent adjustments (sometimes dislocations), and the sooner they occur (Linton 1952:86). Again, in similar terms, the extent of integration in a society "expresses the probability" of change and of conflict (Miñer 1939:236).

A single change that is accepted and "incorporated into a social order" can bring in its train increasing change and innovation (Quint 1958:382). Secondary and even tertiary consequences flow from the transfer of even limited cultural items between systems, and the consequences may not be anticipated (Hoselitz 1957:412). The consequences are hard to predict because the functional interconnections very probably are insufficiently understood to anticipate the full effects of an innovation in a new cultural context. A homeostatic model is useful for understanding cultural change: the dynamic equilibrium being upset by innovation, the interconnected system of understandings and behaviors continues adjusting until a new equilibrium comes about (Dobyns 1951:31).

Some fairly specific types of interconnections between types of cultural characteristics have been identified.

If the settlement pattern is modified, for example, then further changes may be anticipated (Nash 1958:20). In Vicos the settlement pattern has altered as a result of the devolution of power to the resident Indians. Under manorial conditions, serfs lived on house lots assigned by the management. None resided near the manor house and chapel located near the lower edge of the estate. With the relaxation of controls and the example of the scientific staff residences equipped with a gasoline electrical generator and running (if impure) water, a line of Indian homes has been erected along the road leading into the public square formed by the old manor house facing the new teachers' quarters building, and the old chapel facing the mortuary chapel and new clinic building.

With this slight shift in settlement pattern has come change. This line of Indian homes is a main center of commercial activity. Almost every dwelling offers something imported for sale, soft drinks, beer, pasta, kerosene, matches, cane alcohol. Some of these products were sold before from household stores scattered over the estate, but now a wider range of goods is offered in the homes concentrated on the principal thoroughfare.

These homes are larger, more costly, than farmstead dwellings. Their owners have developed demands for electricity, running water, and other comforts.

So interconnected are the components of a culture that when any sector changes, that change must be reflected in the idea-sets correlated with it (Barnett 1953:90). Changes in the "social situation" lead to altered values (Belshaw 1954:60). In Vicos the changed experience of young men spending two years in the army learning Spanish and many new habits turned them into preferred mates, in contrast to former patterns of mate choice. Formal instruction in sewing with sewing machines altered the social situation of Vicos young women and matrons. In consequence, young women who had learned to sew became preferred mates, as compared to more traditional skills of spinning, herding, and housekeeping.

A shift from a subsistence to a cash economy brings changes in values (Mead 1953:263). Among the values affected are "traditional sanctions" and family ties (Mair 1953:19). Extended kinship ties are weakened by increased opportunity for individual profit (Linton 1952:84). The "strength" of relationships in the extended family diminishes with the decline in size of the "functional family" as a consequence of increasing individual independence during a shift from subsistence to cash economy (Foster 1958:12). The independence of individuals flows in part from the employment of those who traditionally would not produce income, in part from an increase in the net income within the social system, and in part from the aggregation of workers under central direction on a previously unknown scale (Nash 1958:20).

The shift from subsistence to a cash economy often produces a dietary deterioration. Urbanization has the same consequence (Foster 1958:11). Other factors clearly are involved, however, since these trends are no more than that. The human activities labeled diet, labor, communication, and transportation are so related that change in one brings adjustment in the others (Leighton and Smith 1955:87).

Industrialization is seen by anthropologists as a primary cause of cultural change. A change in tools brings in its trail alterations of social structure, realignment of roles and division of labor (Mead 1953:263). In sweeping terms, industrialization forces changes in the entire culture to accord with "the new economic ethos" (Hunt 1957:320). Any change in technology or the arrangements of production requires consequent adaptations in other cultural patterns (Steward 1955:37). Large scale technological change "inevitably" involves changes in existing value systems (Beaglehole 1955:381).

On the other hand, as a social hierarchy loses supernatural sanctions, other changes in the social system become possible (Useem 1957:30). Thus, one can discern the pervasive interconnections between conventional understandings, and their mutual maleability. The logic and the language of unlinear causality can not express the complexity of relationships involved in the cultural change process without speaking in tautologies.

## VIII. TECHNIQUES OF CULTURAL TRANSFER

At this point we take up the techniques of cultural transfer available to those concerned with transferring conventional understandings from one social system to another. From our earlier discussion of the principles of the individual psychological processes, the stages through which conventional understandings change, and the biological drives that bound the limits of change, it is clear that face-to-face communication produces the greatest amount of change (Kushner et al 1962:43). Other conditions being equal, the degree of directly fostered change tends to vary as a function of the amount of face-to-face contact between advocates and audiences (Dobyns 1951:32; Lewin 1943:57; Neurath 1960:674).

Part of the reason for this lies in the psychological climate encountered in many societies, to whose participants "impersonality is abhorrent". The program personally introduced by an advocate showing real concern has much more chance of acceptance than the impersonally presented one (Mead 1953:276). This generalization extends beyond those societies that emphasize personalism to all human societies.

Even in the United States, sometimes criticized as suffering from impersonal social relations, face-to-face relationships are most influential in generating cultural change. Among low-income farmers, for example, personal sources of information have been found to be more important influences than impersonal mass communications media such as radio broadcasts and farm magazines (Rogers and Beal 1958:329). Decision-making about voting in elections is influenced to a disproportionate degree by "opinion leaders." Found in all occupational groups and in each social and economic level, these persons influence other voters more than do radio broadcasts and printed publicity (Katz and Lazarsfeld 1955: 32). Certain women are marketing leaders (ibid., p. 246), fashion leaders (ibid., p. 269), public affairs leaders (ibid., p. 295), cinema viewer leaders (ibid., p. 308), and so on.

In a population that is not literate, the role of face-to-face communication becomes nearly all important. Neighbor-to-neighbor communication is the most important channel of diffusion of improved farm practices in Indian villages (Rahudkar 1958).

### A. Persuasion

Let us summarize briefly the face-to-face techniques that are available to the advocate of change. Verbal persuasion by the change advocate offers great possibilities for

effectively communicating new conventional understandings, although it may also open pitfalls.

1. Mass exhortation. One effective means of persuasion is the exhortation of people in a mass by an advocate of change. In secularized industrial societies, with many mass communications media competing for attention, one may tend to ignore the importance of public exhortation. Still, public lectures continue to attract crowds eager for additional enlightenment.

In other societies, public exhortation plays a greater role in cultural change in part because there is less effective competition. One analysis of Papuan behavior found that the seaboard peoples of the Rai Coast of New Guinea shifted from alignment with the Japanese toward the end of World War II to realignment with Europeans, as a result of one stirring speech. A native policeman fighting with the Allies delivered the speech, forcefully asserted that the Japanese never meant to provide the natives with the "cargo" (consumer goods) they believed the Europeans had been holding back from them. He also recounted statements he had heard in Australia about goals for post-war improvements in native housing, diet, clothing, transport, and utilities (Lawrence 1964:134-35). In long range terms, this New Guinean conveyed information that fit his audience's beliefs in such a way as to catapult himself into leadership of a new phase of the cargo cult in the area (Lawrence 1964:136 ff). He became something of a prophet by force of circumstance.

In the same Pacific area, the leader of a cultural reformation that transformed Manus Islanders' behavior in a very short time spoke in symbolic metaphors his island auditors found "irresistible" (Mead 1956:175). It has been suggested that charismatic leadership characterizes the prophet leading a revitalization movement (Wallace 1956:273-274).

2. Individual discussion. Effective as public exhortation may be, personal interaction in smaller groups appears to be even more effective. The public speaker with charisma can sway his auditors and carry them with him - if they do not forget his message soon after leaving the arena of exhortation. His capacity to absorb information or attitudinal feedback from his auditors to involve them in his programming is, however, limited. The advocate who engages a small audience in a discussion of alternatives enjoys the advantage of being able to involve his audience practically and emotionally in the change process. We say he enjoys this advantage because advantage it clearly appears to be. People are rather more ready to adopt innovations when they are involved in planning and execution of a program than when they are not involved (Kushner et al 1962:41).

Discussion has the advantage over exhortation of permitting the collection of information about local needs, and peculiar local conditions. In planning the location of dikes to control flood waters, an engineering or technical plan of high quality may not work in practice. If the planning agency has not studied the pattern of flood water flow on the spot, its technical staff can call for building dikes where the floods will erode them away instead of being diverted to productive use. Information about flood water flow is technical information local residents can furnish central planners if they are involved in discussions of a dike-building program (Dobyns 1952:221-23).

This experience and many others point out the lesson that centralized planning tends to foster change less effectively than the study of local needs (Mead 1953:274). Many examples of programs that failed can be cited to indicate how central planning prejudiced accomplishment from the beginning. When the Peruvian government decided to drill wells in the Viru Valley, the centrally planned effort brought the residents no benefits because it left out of account local knowledge about well drilling, social structure and land tenure patterns (Holmberg 1952:120-21). The stock reduction program on the Navajo Indian Reservation aimed to preserve the land base, and decentralize Navajo administration. The number of animals was somewhat reduced, but the integration of services and devolution of responsibility to local people never was achieved (Collier 1952:205). Intense Navajo resentment toward the Commissioner of Indian Affairs and the Bureau of Indian Affairs resulted (Spicer 1952b:185, 201). Central planning of agrarian reform in Latin America typically calls for land tenure reform as the necessary first step. Yet the Vicos serfs wanted remission of extra personal services more than immediate tenancy reform.

Discussion of a change program has the advantage of stimulating the development of an in-group feeling among those who must decide upon change. We have stressed the vital importance of perceiving that one belongs to the same behavioral continuum in fostering change by emulation of persons with high prestige. Here we refer to research indicating the in-group, out-group distinction in innovative behavior. During World War II, experiments in changing food habits and purchasing patterns of the U.S. civilian population found that members of discussion groups favored a discussed change more than they honored requests from outsiders (Lewin 1943:57). People tend to change when they are so involved in a program as to feel it to be their own (Dobyns 1951:31). The ability of people to adjust to new conventional understandings appears to be closely related to their own degree of control, real or perceived, over their own social circumstances (Nash 1958:112).

The ultimate dissemination of a novel conventional understanding depends upon its achieving popular support (Mead 1953:135). This can be achieved, of course, by either exhortation or discussion (or by use of mass communications media under some circumstances). The support of a majority of the prospective changing population constitutes a significant asset to the advocate of change. Yet the advocate need not begin with an absolute majority. To promote change effectively, his supporters need only to impress others with the idea that they are or will inevitably become the majority (Barnett 1953:327). The transfer of conventional understandings from one social system to another is easier and the change more permanent when the bulk of the population takes part in the program in some way, than when fewer people participate in it (Chadwick 1948:627).

The advantages of discussion apply to all the social groups whose participation in a program is required for its success. The interconnectedness of cultural patterns that requires a multi-variant approach to cultural change, rather than a unicausal approach, implies that all the groups concerned need to discuss the program to develop good rapport and a high degree of cooperation. This means administrators, technical experts, missionaries, as well as the people themselves (Rosensteil 1954:10) need to discuss their common interests if they are to work in concert and accomplishment.

Examples of persuasion at Vicos illustrate the options open. Public exhortation has long been a part of the manorial pattern: The priest occasionally celebrating mass for Indian serfs generally preached sermons exhorting them to obey their landlords and his overseers, to attend church regularly, learn the catechism, marry, and fulfill their ritual kinship obligations. This form of public exhortation long accepted made for cultural stability rather than change.

Traditional manorial patterns of interaction permitted little or no discussion. Indian serfs accepted a social system in which nearly all relationships involved superordination-subordination. Into this pattern, the Cornell Peru Project Director introduced the practice of discussion. After meeting with his scientific staff each Monday for a seminar on research findings and what they indicated about next steps in cultural change, he met on Tuesday with Indian foremen. He employed the seminar format to involve manorial system foremen in progressively more meaningful discussions of the day-to-day decisions about the labor force, and eventually in discussions of longer range policy decisions. Through this device, he and his successors taught Vicosinos the techniques of discussion and debate of policy issues, and involved them directly in program planning and responsible execution.

Another type of discussion went on between Indian serfs participating in the sharecropping and supervised credit program. The responsible anthropologist visited each participant regularly to discuss and re-discuss the entire range of new technical practices that successfully produced more potatoes.

The advocate of change enjoyed the advantage of representing the manor creditor of the sharecroppers or borrowers. Still, this authority did not convey the information the farmers required to carry out the new techniques. That information reached them in repeated discussions with the anthropologist and was adapted by them to their local conditions.

When the Cornell staff began its program of fostering improved standards of living at Vicos, it lacked the trust of the long-exploited Indian serfs. Public exhortation was not a realistic option for advocating change under such circumstances. Only after the new farming practices really produced a much larger potato harvest, only after a Minister of the national cabinet came to dedicate the first wing of the public school the serfs had believed would be elegant quarters for the strange patrons, only after months of seminar discussions, did the serfs come to trust the staff members and to see them as on the same behavioral continuum as they were. Discussion in groups and in pairs constituted the effective avenues of verbal persuasion.

## B. Demonstration

While verbal persuasion is the technique of change advocacy readiest at hand, the visual perception of new conventional understandings or their consequences in behavior, artifacts, production, and so on, is significantly persuasive also. Our previous discussion of the physiological and psychological processes of cultural transfer between individuals emphasized the influence of visual perception in changing conventional understandings. While the term "demonstration" is perhaps overworked in this connection, it remains the best label for persuasion through non-verbal three dimensional visual communication.

1. Unconscious proffering. One important type of demonstration is that which is entirely unconscious. This is the sort of proffering of industrial civilization a Papuan receives by visiting the Harbour Bridge, trading company warehouses and stores, and machine repair shops in Sydney during a trip to Australia, if he speaks only pidgin English and is not furnished with guides who seriously undertake to explain what he sees (Lawrence 1964:126-28). It is proffering that leads to frustration when the affluence the visitor sees cannot be readily transferred to his own people.

It is the frustration of the Mayo peasant from semi-arid Sonora exposed to the affluent society of southern California for three weeks. The abundance of water, piped into homes and used to irrigate lawns of no survival value, particularly impressed him. He worked for wages for several months to earn sufficient money to purchase a second-hand pump with which to irrigate his own fields. The unconscious profferring had not been long enough nor systematic enough to instruct him about machine maintenance. So when the pump broke down, he could not repair it, nor did he want to pack it on horseback to a non-Indian repairman in town (Erasmus 1961:6-8).

It is the frustration of the Papuan who has seen an Australian brewery and sugar mill and enjoyed satisfying relationships with white officers and civilians under war-time conditions, who finds that his own people expect consumer goods to be delivered to them magically, and that war-time promises of post-war aid are not kept once the war is won (Lawrence 1964:136, 169).

An element of this unconscious profferring has entered into the relationship between members of the Cornell Peru Project staff and residents of Vicos. By their presence in Vicos, the quality of their clothing, their use of jeeps, their cameras and tape recorders, the members of the staff exhibit their economic affluence. The scientific staff were all either college graduates or students, a high proportion holders of Ph.D. degrees. The Vicos Indians have not had to visit the United States to draw inferences about the nature of the U.S. population from that sort to which they have been so fully and frequently exposed. Probably every senior staff member of the Project has been approached by one or another Vicos parent ambitious for his or her offspring, with the request to take little Juan or Juana to the United States to school.

The presence of scientific staff members in Vicos demonstrates to the Indians the social and economic advantages of formal education, particularly higher education, and especially higher education in the United States.

2. Deliberate full scale demonstration. A few Vicosinos have visited the United States as participants in National Farmers' Union training programs conducted under contract with the Agency for International Development. Two spent several months working on farms in the upper Middle West. Later another Vicosino followed the same regimen. The working periods were preceded and followed by travel from Florida to the farms or ranches and back, visits to land grant colleges, cooperatives, and other institutions connected

with U.S. farming. Detailed follow-up studies of this trio of Vicosinos have not been carried out, as yet, to assess the detailed effects of their U.S. experiences. Enough is known, however, to indicate that the conscious attempt at instruction in U.S. farmer values and modern farm practices was eminently successful.

Each of the Vicosinos returned from several months of mechanized farming experience firmly committed to the joys of running a tractor. Members of the National Farmers' Union in one of the counties where the trainees worked reinforced this commitment by collecting enough money to purchase a medium sized tractor which they donated to the Vicos community. This donation permitted the trainees to maintain their tractor driving skills, and allowed other residents who had learned to run tractors on coastal plantations to maintain theirs. Critical mass in trained tractor mechanics and drivers was thus quickly attained at Vicos. Similar critical masses had earlier been obtained in army veterans committed to formal schooling, in subsistence farmers committed to improve potato growing practices, etc., but had not before been obtained in individuals competent to maintain any form of internal combustion engine.

The affluence of U.S. farmers impressed itself on the minds of the Vicos trainees. This included verbal messages from the farm families about the values and satisfactions of free individual enterprise and economies of scale. One trainee attempted to institute a large-scale chicken-raising enterprise. In order to achieve economy of scale, he required more land than he held in Vicos, so he applied to the community council for an additional assignment. Like all the trainees, he suffered from an attitude of disbelief by his peers when he tried to describe his U.S. experiences. The things that most impressed the trainees were often so foreign to other Vicosinos that they were simply not believed. His request was turned down. Frustrated, this Vicosino resembled the Sonoran Indian taken to southern California. After his U.S. visit, he lost his patience, his capacity to put up with traditional ways. Discouraged by his abortive attempt at pump irrigation, the Sonoran recovered his spirits and began clearing land for surface flow irrigation from a ditch project (Erasmus 1961:8). The Vicos Indian was discouraged by council refusal to subsidize his chicken-raising plans, but he soon blossomed as interim rentor of the thermal spring public baths located at the lower edge of the Vicos estate, turning a tidy profit on his entrepreneurial activity.

No Vicosino ever before operated a business on this scale, nor catered to a mixed Indian-Mestizo clientele. Yet his U.S. farm family friends so imbued him with the entrepreneurial ethic that he launched successfully into a new

realm of economic activity. He had served several years as a highly successful community farm enterprise manager for Vicos, so possessed many of the skills required to succeed in this enterprise, but the individualistic endeavor stemmed clearly from his U.S. experience. Perceiving economic advantages prompts most people to adopt new behaviors beneficial to them, social scientists have found, regardless of tradition, superstition, or the depth of their comprehension of the reasons for the new behaviors (Foster 1958:36).

### C. Applying Sanctions

One option open to the advocate of cultural change is to apply sanctions. We shall briefly review the useful sanctions.

1. Force. As already indicated, physical force can be employed to obtain changes in behavior and conventional understandings. The circumstances under which the application of force is an efficient means of persuasion are limited. In cases of cross-cultural contact, the use of physical force is perhaps limited entirely to instances of military conquest.

a. Explicit. The explicit use of physical force to secure overt change can succeed. During World War II, an elderly Papago Indian leader hoisted a Mexican flag over his settlement in southern Arizona. He encouraged the young men not to respond to notices from their selective service boards, on grounds that his settlement still recognized Mexican sovereignty. This small-scale separatist movement was forcefully terminated by an armed party of United States marshalls. They surrounded the settlement, moved in and arrested the aged Papago leader and the draft-age men. The leader was jailed and the fact of U.S. sovereignty forcefully proved.

During the same conflict, the United States government forcefully removed persons of Japanese ancestry from the Pacific Coast to relocation centers farther inland (Leighton 1946:41-47). The conventional understandings upon which Japanese migration to the United States had been founded suddenly failed to apply on December 7, 1941. A whole series of new cultural patterns were quickly forged in the relocation centers to which evacuees were sent. These in turn gave way over the next several years as individuals left the centers to relocate in inland states, and eventually to return to the West Coast once again.

Just as overt physical force can foster change, it can also foster stability. The sanction influences people, but the results of its influence depend upon how it is employed.

In Huapra, a Peruvian manor across the Marcará River from Vicos, the force of the Peruvian national police was employed in 1960 to attempt to interdict change. The renter of the estate obtained a detachment of national police to accompany him to Huapra, after its serfs, with the verbal permission of the property owner, began subjugating and planting an area previously uncultivated. During a confrontation the police opened fire on the Indians. Three were killed, and five seriously enough wounded to be hospitalized (Dobyns, Monge and Vázquez 1962:111).

The attempt at interdicting change by force failed, however, for lack of application of persuasive force. The initial police skirmish was extensively reported in the metropolitan press, arousing public opinion. Police were not sent to the estate again. So the outraged serfs were left free to establish de facto autonomy in the absence of a renter who dared not return to the manor for fear of serf violence against him, although he did manage to send in a female overseer for a period.

b. Covert opposition to power. On occasion, at least, the covert opposition to power can be employed to motivate behavioral changes. This is possible because of the perversity of the human animal. Often attracted by forbidden fruits, people do things because they are not supposed to do them (Foster 1958:38). Human beings are code and custom breakers (Barnett 1965:216). An example of this human characteristic was reportedly the mode of diffusing potato cultivation to French peasants. The story goes that the French crown, desirous of inducing conservative French peasants to plant the tubers, recently imported from South America, had potatoes planted on royal fields. When the crop had shown its suitability to local conditions, the royal fields were left sufficiently unguarded for the avaricious peasants to sneak in and steal tubers to plant in their own plots.

A parallel piratical acculturation occurred in Vicos in terms of eucalyptus tree seedlings. The Director of the Project early attempted to introduce deciduous fruit trees to Vicos in a manorial orchard and by encouraging an Indian army veteran to start another. Pine seeds from equivalent elevations in New Mexico were planted to attempt to start forestation with commercially valuable timber. Cypress seedlings were started, and eucalyptus seedlings set out in a school forest. The staff sought to persuade the Indian serfs to plant such trees on their house lots, with limited success. Later, agricultural specialists attached to the school planted eucalyptus seeds in hotbeds, and arranged for each school child to take a seedling home to plant near the family house.

The rate of planting achieved by such means remained relatively slow. Only in recent years did a government-subsidized large-scale forestation program plant thousands of eucalyptus seedlings in the agriculturally nonproductive upper reaches of Vicos.

Yet a comparison of panoramic photographs of Vicos taken in 1951 and 1952 when the Project began, and in the 1960's before the high altitude forestation program began, demonstrate a marked change in the appearance of Indian farmsteads. Houses plainly visible in 1952 were well masked by trees a decade later. This indicated that the rate of theft of eucalyptus seedlings from unguarded manorial hotbeds during the period before the Indians came to trust the strangers running the estate was far higher than the staff discerned at the time!

2. Social sanctions. There are numerous forms of social sanctions and these are far more important to the advocate of social change in most cross-cultural situations. Much we have already written indicates the nature and function of such social sanctions, so we can be brief.

a. Verbal sanctions. When the advocate of change and his audience participate in a single behavioral continuum, he may foster cultural change by the use of verbal sanctions.

The advocate can foster change by criticizing individuals face-to-face, if he enjoys a relationship that allows him to criticize people without antagonizing them. Usually one thinks of criticism as making for cultural stability, perhaps, because it is most commonly directed against those who depart from a group norm. Yet criticism cuts both ways. It is capable of fostering cultural stability and cultural change. In either event, the fear of criticism motivates far more than actual criticism, which typically arouses resistance. In a society that recognizes authority as a basic factor in interpersonal relations, if the authority structure opts for change, people are likely to be motivated to change (Foster 1958:39). They seek to avoid criticism by those in authority.

Much the same points can be made about gossip. In many societies, people seek to avoid being gossiped about. Rather than be talked about by his fellow farmers as stingy for guarding his fruit from marauding children, the Mayo Indian picks his fruit green (Erasmus 1961:7). The same reasoning applies in Peruvian provincial settlements. Lima stores import apples from Washington, peaches from Chile, while the middle elevations of the Andes offer a climate perfectly suited to the cultivation of deciduous fruit trees. Village conventional understandings relegate fruit to being picked green and wasted by roving children, however, so al-

most no marketable fruit is produced in the country. Only fruit trees carefully tended in interior patios produce fruits that ripen, and these are typically consumed entirely by members of the family. In contrast, coastal plantations produce fine oranges and papayas, however.

In Vicos, juvenile goatherds permit their voracious charges to pasture wherever they may find an unguarded blade of grass or tender leaf. This includes the unfenced fruit trees planted in the abortive manorial orchard, that must have developed tremendous root systems, for slight whips of trees little taller than they were when planted still survive and grow leaves for the goats to climb up and consume.

In the rural face-to-face community (and even in the provincial cities) one of the strongest of social controls is the question "¿Qué dirían?" "What would people say?" People would say one was stingy if he guarded his fruit from mischievous boys, who are accorded many degrees of freedom in Peruvian Mestizo and Indian societies alike.

b. Economic sanctions. If the advocate of change controls economic resources, he may foster or inhibit cultural change by using economic sanctions. Economic sanctions are essentially neutral in and of themselves. They may be directed equally well toward fostering cultural change or interdicting it.

There is nothing very esoteric in the process. Economic goods may be used as either reward or punishment. During the early period of United States sovereignty over the Gadsden Purchase area, progressive militarization of the Gila River Pima Indians (Ezell 1961) was fostered by economic rewards. U.S. representatives furnished these Indians with gifts as rewards for effective military action against the common Apachean enemy. U.S. agents provided the Pimas with iron hoes, very welcome to the industrious irrigation farmers who lacked significant quantities of metal tools. They provided some firearms and munitions, and livestock and manufactured clothing. The same policy had been followed earlier by Mexican authorities at Tucson. Consequent cultural change among the Gila River Pimas was clearly discernable.

In a later generation, U.S. Bureau of Indian Affairs agents offered Papago Indians, who would abandon the traditional grass-thatched round-house and build vertical-walled homes of sun-dried bricks, a free wagon, as direct reward. Numerous sun-dried brick homes were erected, only to be criticized as airless, cold, etc., at a later date, of course.

The Cornell Peru Project offered direct economic reward to few Vicosinos - mainly a handful of interpreters. The staff established the practice of paying the cash wage previously honored in the breach at Vicos. The staff also paid the going cash wage for manorial tasks earlier carried out by extra serf labor (pongaje). Economic rewards came to Vicosinos as a direct result of their changing behaviors, however, rather than from the project itself.

The hoes given to Pima Indians in the 1860's may seem a poor example of economic sanctions. Yet they are generically just the same as the sophisticated forms of long-term, low-interest credits, grants, and technical assistance employed as rewards for cultural change (or at least attempted cultural change) today. A hundred years ago it sufficed to give hoes to the Pimas to increase their wheat production to sustain non-Indian immigrants traveling the Gila River trail, early settlers in the Gadsden Purchase area and Mexican Cession, and to fight the Apaches. Today, numerous U.S. agencies engaged in attempts to change the conventional understandings of citizens of "underdeveloped countries" use monetary credits, mass-printed comic books, educational moving pictures, and numerous other more or less sophisticated kinds of goods to reward the people of several scores of countries. The artifacts have changed, but the basic influencing mechanisms remain constant.

Economic sanctions, like rewards, may be employed to foster or interdict cultural change. On occasion, when the U.S. has taken an official position against a military coup d'etat in one or another Latin American nation, economic aid programs have been suspended. Suspension has been interpreted variously as an attempt to undo events, or as punishment for the events of the coup. It indicates the conventional understanding of U.S. foreign policy that military coups d'etat are evil, and seeks, however ineffectively, to foster this conventional understanding among the citizenries of other nations.

There is little mystery about the use of economic sanctions in federal granting programs within the United States to foster cultural change. The U.S. Children's Bureau has from time to time threatened to cut off grant funds to the State of Arizona because its administration of funds failed to meet federal standards. This is simply a way to say that economic sanctions were being applied to force a change in the conventional understandings held by officials of the state. Funds granted on a per capita basis actually were not used for the entire population, the conspicuous exception being Indian children. The same mechanisms of economic sanction to shift conventional understandings operate in foreign aid programs.

## IX. TEMPORAL DIMENSIONS OF CULTURAL CHANGE

Our discussion of principles of cultural change might well be misleading were we to end without a few words about change rates. Perhaps we should label these as words of warning directed toward the planner or the advocate of change. For the influencing process may require time, and human conventional understandings are not changed, at least without preparation, overnight. Least of all are they changed easily by advocates of change foreign to the changing group. One of the major themes of one of the major anthropological analyses of the results of European-planned programs of cultural change among American Indian tribes is that plans simply did not work out as their conceivers expected. So seldom have results accorded with planners' goals that a first approximate statement of rates of change may be formulated. In the course of 350 years, two sovereign nation-states, Mexico and the United States, had achieved the objectives of political and military domination over surviving Indian tribesmen. Still, Indians did survive as social enclaves that had not been assimilated and failed to act as their conquerors thought they should (Spicer 1962: 581). Cultural assimilation or socio-cultural fusion, which has often been hypothesized as the ultimate end product of contact between persons reared in different cultural traditions (Wirth 1945:358; Linton 1940:502), simply had not occurred despite three and one-half centuries of efforts by planners and advocates of change to remold the Indians in a European image. Today the Indians in New Spain's Old Northwest are all pluralistic minorities (Wirth 1945:354-58) in the United States part of the region, and at least two of the Indian groups in Mexico have long histories of secessionism (Wirth 1945:361).

One general configuration of the contact situation appears to have been fundamentally important to the survival of unintegrated tribal enclaves. This was a European focus on religious and political change programs to the near exclusion of deliberate economic change. Indians could be forced onto lands of low value by European standards. Thus, Indian land, Indian resources, and much Indian labor held little importance for the European economy. So Indians were not brought into the European economy and the Indian populations retained localistic world views, particularistic customs, and largely self-sufficient economies (Spicer 1962:585). Economic autonomy as well as social organization distinct from urban patterns largely characterize most rural Indian settlements that have been scientifically studied in Mexico (Kunkel 1961:57-59). Virtual self-sufficiency in food and

clothing production has allowed the Indians to maintain Indian forms of family and community organization. Where there has been the most continuity in native economic structure, the least cultural replacement by dominant group traits seems to have occurred (Spicer 1962:586).

Only one of twelve major tribal groups, whose contact history Spicer analyzed, has been assimilated virtually completely during historic times. The list of unassimilated Indian enclaves in Northwestern Mexico and Southwestern United States is impressive. In Mexico there survive thousands of Tarahumaras, Mayos, Yaquis, Lower Pimas and a couple of hundred Seris. Only the Opatas have disappeared as an identifiable group. In the United States there are tens of thousands of Navahos, Western Apaches, and Upper Pimas, thousands of Western and Eastern Pueblos and Yuman speaking Indians. As a matter of fact, most of these terms designate linguistic groups or subcultural areas made up of several tribes. Each "pueblo" was autonomous when the Spaniards first entered the Rio Grande Valley (Spicer 1962:153) and this is still true. There are half a dozen tribes speaking Yuman languages: Cocopas, Yumas, Mohaves, northeastern Pais, Yavapais, Maricopas (themselves an amalgam of three or more historic groups), and so on.

The structure of Opatas society differed from that of the neighboring tribes in aboriginal times. The Opatas, unlike the Yaquis, were not organized into a political tribe (Spicer 1962:92), but lived in a number of smaller social structures. Then the nature of Opatas contacts with Spaniards also differed from that with other tribes. Jesuit missionization was a constant factor among the several tribes (Spicer 1962:91), beginning in 1627 among the Opatas (Spicer 1962:93). By 1688, some 10,000 Opatas lived in 22 missions. By that time, two additional key features of the contact situation had begun to emerge. Spaniards rapidly settled in Opatas country, and both ethnic groups came under attack from hostile Apaches (Spicer 1962:96). By 1764, no important Opatas region lacked Spanish inhabitants, the principal towns numbering 50 to 500 Spaniards living among the natives. At the same time that Spanish population increased, Opatas population declined to a little less than double the Spanish total. Thus, the Opatas missions were not as isolated from secular Spanish influence as those among neighboring tribes (Spicer 1962:97). The Apache raids welded Opatas and Spaniards together in a military partnership. By at least the middle 1700's, Opatas had become a regular part of the colonial forces defending the frontier (Spicer 1962:98, 101). Under these contact conditions of military unity in the face of common danger, a critical degree of social equality developed between Spaniards and Opatas. Mission records attest

to numerous marriages between Spaniards and Opatas women, and many ritual kinship relations. This was in stark contrast to Spanish feelings of marked ethnic superiority relative to neighboring tribes (Spicer 1962:99). Opatas fought in the War of Independence (Spicer 1962:101). In 1832 Opatas followed a Yaqui leader in an abortive attempt to gain tribal independence from the new Mexican nation. After that, Opatas followed Mexican leaders until the French intervention. Then an Opatas leader gained considerable renown as an Imperialist commander. The Opatas fought on both sides, and the Opatas leader regarded himself as a Mexican fighting for national issues, rather than a mere tribal chieftain (Spicer 1962:102-103). This attitude indexed the cultural position of the Opatas by 1864-1866. Never tribally organized, the Opatas, 237 years after initial missionization, regarded themselves as national citizens. After the French intervention, Opatas individuals were not usually identified in Mexican documents, reflecting the terminal phases of assimilation. In recent years, anthropological search for Opatas cultural survivals has been unsuccessful (Owen 1959:vi).

This brief summary of Opatas assimilation allows us to state at least an approximate rate for complete cultural assimilation under what may have been optimal conditions. We can count from the beginnings of conversion to Christianity among various Opatas populations to the period of general disappearance of Opatas as an identified ethnic group in written documents. The count yields a time span of from two to two and one-half centuries as the time required for Opatas assimilation. The apparently critical variable of definition of both Opatas and Spanish groups in contact as living on a single behavioral continuum clearly operated in favor of assimilation.

A common hostile enemy united co-resident Spaniards and Opatas in common activities which generated common sentiments. Even ideological competitors as basically antagonistic as the U.S.S.R. and the United States were united temporarily by the overriding threat of National Socialist Germany. The Apache threat on the frontier of New Spain and Mexico persisted for a century and a half, certainly long enough to weld two ethnic populations into a common front.

Intermarriage, following upon definition of Opatas women as socially acceptable to Spaniards, hastened cultural as well as biological assimilation. Spaniards mated with women of the other tribes in the area, but they apparently married only Opatas in significant numbers.

Still, two centuries is a long time compared to a human lifetime. It is even longer in terms of political programming. The facts of the Opatas case stand as a clear warning to the

advocate of cultural change. Under even the best of conditions, complete cultural assimilation of several thousand people appears to require on the order of twenty decades. Under less favorable conditions, it takes longer. One can only offer the eager advocate of change the counsel of patience, of devising more rapid means of change (if these are to be found), or of settling for less sweeping change.

Opatas assimilation occurred during an historical epoch when civilization was considerably less complex than it is today. Opatas assimilation began prior to the Industrial Revolution and was completed before its full effects had reached northwest Mexico. Few Opatas had to learn to read and write in the course of cultural assimilation. The modernization of Mexico requires the biological descendants of Opatas-Spanish intermarriages to become literate or become social isolates from industrial society. Even literacy does not necessarily qualify an individual for full participation in contemporary industrial society. Reading is functionally a means to the end of acquiring knowledge, not an end in itself.

Any single step in the change process requires time. The Vicos experience provides some approximations for more finite changes in this contemporary cultural context.

Modern agricultural practices, for successfully raising a single cash crop saleable surplus over subsistence requirements, can be taught serfs (and presumably peasants) not meeting their subsistence needs, in five years.

In five years, democratic discussion habits and rules of formal majority decision-making in a legislative body of elected representatives can be demonstrated and explained sufficiently for illiterate farmers accustomed to authoritarian decision-making to assume the responsibility of local self-government.

The formal education of an illiterate population usually takes more time. A school can be established in a year, if sufficient resources are allocated. Formal education is gradual, however, in that pupils progress from one level of learning to another. Thus, five years elapse before all grades in a five-grade school are filled with pupils, where schooling begins in an entirely illiterate population. The Vicos record, thus far, shows that a local elementary school has made some 20% of the total population literate in a dozen years. A considerable number of years still must pass before we can tell just how much time will be required to make the entire population literate, if this goal is indeed achieved. Clearly modernization of populations that have been very isolated socially from industrial society remains a relatively slow process.

It appears, therefore, that significant changes in one conventional understanding, or even in sets of several conventional understandings closely linked in function, can be achieved in a few years, even in a few months; by intensive effort on the part of advocates of change interacting with concerned and motivated adults. Modernization of total populations that have been socially isolated, on the other hand, clearly requires more than a score of years. This is about the minimal time required for only the first class of students to complete a full course of formal education.

Attrition among pioneer students from a socially isolated illiterate population will be high, thus retarding the rate of change even more. Once the formal lessons are learned, graduates of a formal educational system typically may be unable to implement any significant proportion of their formally learned conventional understandings until they reach an age that brings them social authority, or until they increase in numbers and political skills sufficiently to seize control of the traditional political apparatus.

The latter process has occurred to some extent in Vicos some fifteen years after the integrated change program began. Young primary school graduates seized control of the community governing council. Theirs is, however, clearly an elite control within the community, and an undereducated elite in terms of competition with other communities led by, and national agencies staffed by, secondary school and college graduates. It remains to be seen whether a series of turnovers of control bringing progressively better educated leaders to the forefront of Vicos affairs occurs.

A time lapse of 30 to 50 years for massive modernization of even a small socially isolated population without previous effective access to formal education seems a likely expectation.

The factors bearing on the temporal dimensions of cultural change which have proved significant in New World developments seem to be just as important in the South Asian context. In India technical and social change proceeded very slowly for decades until opposition to foreign rule united the country and efforts, very fateful even if only partly successful to date, were made to overcome divisive linguistic, religious, and social identifications (Desai 1948; Raghuvanshi 1951). Even so, enclaves of tribal peoples were brought into the orbit of the national effort only through special efforts and programs (Bose 1953; Das 1962; Guha 1951; Shrikant 1956). Within the tribal groups there has been a great difference in pace of assimilation and integration into the general economic and social scene. The Nagas, isolated by their marginal northern position and the rugged terrain of their homeland,

have been a continuing problem (Elwin 1959; von Furer-Haimendorf 1946). The Santals, a very populous tribal group, because of their more central position and close contact with ordinary Hindu villagers around them, live a settled life in agricultural communities which are much like those of their neighbors. They have not disappeared as an identifiable group, and, because of Indian caste and status considerations, they may not become completely assimilated in the near future, but they are certainly much less conspicuous than formerly, and they enter on rather even terms in the political and economic mainstream of the nation (Biswas 1956; Chattopadhyay 1947; Datta-Majumdar 1956).

In Southeast Asia, a noteworthy example of a conscious attempt by outsiders to change the cultural behavior of an entire nation was carried on during the first millenium of our era by the Chinese in Vietnam. During much of this long period most of North Vietnam was governed as a Chinese province with the governors prosecuting a planned systematic program to sinicize the local population:

The early Han Chinese records report that they found a simple essentially horticultural society in North Vietnam, where the hoe rather than the plow was still being used to cultivate wet rice and other cultural features were characteristically of a Southeast Asian type. Much of this original behavior, which in any case was clearly very different from that of the Han Chinese, was eventually obliterated or greatly modified, both in overt and covert behavior patterns. Changes were effected under the pressure of Chinese officials and soldiery through the higher and urban levels of Vietnamese society downward and outward to the peasantry. Traditional rural Vietnamese behavior proved somewhat resistant to Chinese influences, probably for lack of available actual models, since Chinese peasants were not imported in any known numbers, and soldiers turned farmers would have learned local techniques and forms of social and religious organization. Eventually, however, in the course of ten centuries many basic elements of Chinese civilization were adopted by the Vietnamese: the entire apparatus of government, kinship behavior, literary and artistic canons, and even Confucian and later Taoist and Buddhist values were incorporated by large segments of the population and became integrated as a Vietnamese cultural system. However, during this process a distinctive Vietnamese language was developed or maintained, although heavily influenced by Chinese speech and by Chinese logographs which were used by the literate elite. This retention of their own language, together with some other distinctive cultural forms, such as a relatively high status attributed to women, combined with difficulties experienced by the Chinese in administering Vietnam as a distant southern province, permitted the Vietnamese to retain a strong sense

of nationhood and a desire for freedom from Chinese political domination. Such freedom they were largely able to maintain after successfully revolting from the Chinese in 939 A.D.; but the Chinese technologies, social patterns, and ideas and values slowly acquired during the preceding ten centuries were preserved in full force until the modern period when the Vietnamese again lost their political freedom under the French occupation (Hall 1963; Sharp 1962).

All of our gross approximations of change rates indicate that to succeed, the influencing process of cultural change requires so much time that truly long-range planning, programming, financing, and staffing are needed. Emergency measures appear unlikely to achieve significant lasting effects, unless they are genuinely massive in staffing and financing. Governments and agencies concerned with change seldom command massive staff and financial resources. Given this situation, and the complex of variables involved in the influencing process, it would appear that modernization can be most efficiently planned in terms of structural modifications that effectively place people whose behavior is to be changed on what they will themselves perceive as the same behavioral continuum with suitable new models of behavior.

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