A PROPOSAL FOR A PROGRAM OF EXPERIMENTAL FIELD RESEARCH
IN TECHNOLOGICAL CHANGE

CORNELL UNIVERSITY
Ithaca, New York

April, 1951
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A PROPOSAL FOR A PROGRAM OF EXPERIMENTAL FIELD RESEARCH
IN TECHNOLOGICAL CHANGE

Since 1947, under the Cornell Program of Studies in Culture and Applied Science made possible by the Carnegie Corporation of New York, investigations have been under way to determine the impact of modern technology on a selected number of underdeveloped regions. The field research in Siam, India, Burma, China, Peru, the American Southwest and Digby County, Nova Scotia and the related activities which have grown out of it—the Summer Field Seminar, the Applied Anthropology Seminar at Cornell, the Research Evaluation Seminar, The Case Book, etc.—have all been described in progress reports and need not be reviewed again here. In retrospect we feel that we have been very fortunate in our choice of research sites. The inauguration of such a program in 1947 has proved extremely timely and important, for in the period that has elapsed since then, the matter of developments, economic, social and political, in the backward areas of the world has become one of the central issues of our day. The training and perspective which the Cornell team has acquired during the work has helped its members to serve this growing interest in a variety of ways. For instance, two members of the group have served on the Committee on Economic Growth of the Social Science Research Council (which is giving much attention to research in underdeveloped regions) and two others have been asked to contribute to the Point Four Manual being prepared by the American Anthropological Association for the U. S. Department of State. These are but two examples of a large number of such activities into which all members of the Cornell team have been drawn.

The Cornell team is pleased with the progress thus far made in research, in training both social science and technical students in the human relations problems of underdeveloped areas, and in the other activities in which it has
engaged. It proposes to continue this program vigorously. For instance, Professor Allan Holmberg is now preparing to leave for the field with a group of students for a prolonged period, and the Summer Field Seminar promises to be especially well-attended and vital this year. In fact we are eager to improve our present research techniques and to add to them. Lately we have had convincing evidence of the help that new photographic techniques can give in social research and so one of the projects submitted here is concerned with integrating and deepening our research through the utilization of such photographic techniques. Also we continue to be concerned about the comparability of our data and its availability for purposes of generalization. Therefore one of our proposals has to do with a system of maintaining and filing data in a way that will permit systematic cross-comparisons showing common elements and differences in the various areas in which we are working.

In our progress report bearing on work accomplished in 1949-50 it was stated (pp. 9-10) that the staff strongly felt as a next step the need for experimental programs to be conducted in the field on the basis of data and hypotheses derived from the observational studies made to date. Such action-research, it was explained, would aim at demonstrating what social science information and design can achieve toward universally valued goals such as increased food production, development of marketing facilities, improvement of health and nutrition and the like. Such experiments, carried on by an independent, scholarly agency and providing models and suggestions for the vast network of action programs now being undertaken by national and local governments, the United Nations, E.C.A., Point Four, etc. are urgently needed now, for programs are being launched at a time of stress and emergency by organizations which are interested enough in the results of research and experimentation but which do not feel that they can afford the time for such activities, and indeed, are ill equipped to carry them on.
Therefore four field projects of this experimental, almost clinical type, are proposed and detailed in the pages that follow. As the statements show, they would be carried on in the regions in which we have been doing our most intensive work, in which we have the best local contacts, where scientific controls are available, for which we have the most background information, and for which we have some firm hypotheses. Better still, in all these cases we have assurance that officials and those responsible for action programs are decidedly interested in what we can demonstrate and recommend.
PARTICIPANT EXPERIMENTATION IN PERU

Statement of Project and Its Scientific Value

The essence of this proposal is to undertake a broad scientific experiment in technological and social change on an Indian hacienda in the Andean region of Peru. The aims of this experiment, which are both theoretical and practical, may be summarized in brief as follows:

1. To develop generalizations and theories concerning the relationship between the introduction of modern technology and the processes of social and cultural change.

2. To test already existing theories, hypotheses, concepts, and methods relating to the field of applied social science.

3. To refine the tools of quantitatively measuring socio-economic change.

4. To promote interdisciplinary research and action on programs of modern development.

5. To train students, administrators, and technicians in a broad integrated approach to the practical and theoretical problems of economic and social change.

6. To assist in raising standards of living among the Indians of the Andean area to a point where they can take a progressive and independent role in the modern world.

Research Area

It is planned to carry out this experiment on the Indian hacienda of Vicos where a basic community-type study has already been made. This hacienda lies in the inter-Andean valley of Callejon de Huaylas, a natural corridor of about 120 miles in length, from 5,000 to 10,000 feet above sea level, and situated about 150 miles from the north coast with which it is connected by a narrow gauge railroad and by two gravel roads of relatively recent construction.
Actually, Callejón de Huaylas is but an Andean extension of the coastal valley of Santa, the two regions being connected by a gorge (Canon del Pato) through which the Santa River—the largest on the coast of Peru—flows.

Callejón de Huaylas is one of the most densely populated regions of Peru. The political department within which it lies (Ancash) contains in the neighborhood of a million inhabitants, most of whom are Quechua-speaking Indians or bilingual mestizos who gain their livelihood largely by subsistence farming, the former under the domination of a few large landowners by whom they have been exploited as peons or sharecroppers since Colonial times.

Up until recent times, largely because of its isolation from the coast, little attention was paid by the Government of Peru to the region of Callejón de Huaylas. Yet, since Colonial times it has been known to be one of the country's greatest potential sources of industrial wealth and manpower. Because of this, the Peruvian Government, a number of years ago, formed the Santa Corporation to undertake modern development of the valley. As a consequence, Callejón de Huaylas is now the scene of rapid agricultural and industrial change, actual and potential. Since Peru's largest supply of coal and iron ore is found here, a smelting plant is being constructed at Chimbote, an excellent ocean port at the mouth of the Santa valley; immense dams for hydroelectric power are being built in the gorge that connects Callejón de Huaylas with Santa valley; a linen factory is already functioning near the village of Carhuaz, attempting to draw its labor from nearby villages and farms; modernization of agriculture is under way. Numerous other projects are planned for the immediate future. Because of its natural resources, its large unskilled labor supply, its proximity to the coast, and its potential industrial and agricultural significance for the future of Peru, Callejón de Huaylas was originally selected by Cornell as a field station in which to initiate studies on the human and social aspects of technological change.
Research to Date and Conclusions

A. Total Peruvian Program. As originally conceived, the Peruvian research was envisioned as contributing to the overall aims of the Cornell Program in Culture and Applied Science through a number of particular studies focused on the human and social aspects of technological change which were to be carried out for a period of at least five years in several phases. First, it was planned to make a series of basic intensive cultural studies of a wide variety of social contexts in the area: an Indian commune, an hacienda of landless peasants and absentee landlords, a mestizo village of small commercial farmers and landowners, a factory, a mine, an urban center, an industrial village, a predominantly "Spanish" village, and, finally, the Santa Corporation itself which has been and still is responsible for much of the present change. These units, of course, were not to be studied in isolation but in their functional relations to one another and to the national scene in terms of Peruvian economy, power structure, law, politics, government, and religion. Second, it was planned to test the hypotheses of the basic initial studies by survey and experimental methods. Finally, and at the same time, it was planned to compare and integrate the results of the Peruvian studies with those of similar researches now being carried out by Cornell and other institutions.

B. Accomplishments of First Research Phase. In collaboration with two Peruvian students, Mario Vazquez and Humberto Ghersi, graduates of the Institute of Ethnology of the University of San Marcos in Lima, we have made basic cultural studies of three interrelated units—the Indian hacienda of Vicos, the mestizo village of Ñarcara, and the linen factory of Pati, situated near the village of Carhuaz. Results of these studies are now being analyzed at Cornell and field work continues at the factory and the village where an observer has been in continuous residence for the past two years.
During the coming summer two graduate students from Cornell, William Stein and Joan Snyder, are expecting to initiate other basic research in the area—the former, a study of an Indian commune; the latter, a study of the relationship between national institutions and local structures. It is also likely that the Cornell group will be joined by two other graduate students, one from the University of Pennsylvania and one from Yale who will, respectively, be making comparative studies of the psychological problems of culture change and the processes of socialization. These latter studies will be carried out in areas where we have already gathered basic cultural data. In addition, geographical and historical studies of the region are being made in collaboration with the Institutes of Geography and History of the University of San Marcos.

C. Conclusions of the First Research Phase. The results of our studies so far indicate that while considerable planning has taken place with respect to the exploitation of the natural resources of the area, the same cannot be said with respect to the preparation of the human element for participation in a modern way of life. On the contrary, little or no thought has been given to the major human and social problem of this region and, for that matter, the whole Andean area—the so-called Indian problem. Yet, the ultimate success of the economic developments in industry and agriculture will depend on the contented adjustment of subsistence, landless Indian farmers, who now constitute sixty per cent of the population, to commercial agriculture and industrial life. Herein lie the difficulties of greatest magnitude. Now living under the domination of whites and mestizos, the Indians are given few opportunities for self-expression in the outside world. They are too poor to buy land; the land on which they are living is steadily declining in fertility. In most instances, they are forced to work without pay, they are badly undernourished, they are not supplied with health and educational facilities, they are victims of coca and alcohol.
All of these and other frustrating conditions, of course, have produced in the Indians attitudes of distrust, fear, suspicion and even hate towards the outside world. Precisely because of these attitudes, they have so far resisted, and will likely continue to resist, the half-hearted, piecemeal, unintegrated attempts at modernization which have been initiated thus far by the more "enlightened" hacendados and industrialists or by the Peruvian Government. In short, socio-economic conditions among the Indians have reached such a sorry state that a wholesale type of change is necessary in order to bring them in line with the modern world and make them productive elements in an emerging democratic Andean society.

Our studies in Callejón de Huaylas so far clearly support the logic of this broad and complete approach to socio-economic change among the Indians of the Andean area. In fact, such an approach shows every promise of being accepted enthusiastically by the Indians, for beneath a rather deep-seated pessimistic outlook on life—resulting from their previous experience—they strongly feel the need for and want drastic changes in their present mode of existence. Fortunately, they have not yet become apathetic to the outside world, nor to the hope that they may soon be given an opportunity to improve their lot within it. This is clearly reflected by the vigor with which they occasionally defend what few rights they now possess and by the behavior which they display in their own society where they assume the obligations of leadership and responsibility with diligence, dignity, and pride. It is likely, therefore, that if given an opportunity to develop progressive and optimistic views of the world they would rapidly adjust to modern conditions and would soon be able to take a productive and responsible place in Peruvian national life. Actually, the hope of the Andean countries as a whole lies in the mountain regions where their masses of hard-working Indians live, and unless these are soon given opportunities and assistance in changing and improving their lot.
considerably, present conditions of unrest and dissatisfaction are apt to lead to more and bloodier revolutions within the next few years and to extreme conflicts in their adjustment to modern life.

Research Plan

In view of the foregoing conclusions, we are now prepared to enter into the second phase of our research—that of testing the hypotheses which have emerged from the observational studies made so far. This we plan to do by experimental methods, selecting for our study the problem of the hacienda Indian which has the widest possible theoretical and practical significance for the development of the region of Callejon de Huaylas and the Andean area as a whole. Our studies at Vicos, for example, clearly indicate that inefficient and unsuccessful hacienda operations—and they are found all over the Andean area—are due to such factors as ruthless exploitation of the natural and human resources; to the Indian's lack of economic security and legal protection; to his poor health, nutrition and education; to his inefficient agricultural practices. We would like, therefore, to attempt to change these conditions in as controlled a manner as possible and by the best methods of social science, in order to study systematically the impact of our program on native economy, social structure, and the system of beliefs. To carry out such an experiment in health, we have already been promised the collaboration of Dr. J. L. Hydrick, Peruvian representative of the International Division of Health of the Rockefeller Foundation and it is likely that collaboration for experiments in agriculture, nutrition, and education can be obtained from the Institute of Inter-American Affairs and the respective Peruvian ministries involved.

In order effectively to carry out such a proposal, however—in other words, in order to control the variables of a broad social experiment—it will be absolutely necessary for us to secure control of the hacienda at which we
are working for a period of at least five years, preferably more. Without such control, there can be no guarantee of having a free hand to conduct our research in a scientific manner and no certainty of continuity in our work. We could, for example, be told to leave the hacienda whenever our work did not please the present administration. On the other hand, by having control of the hacienda, we would have a security of being able to continue our work and of ensuring—if not the success of our experiment—at least the scientific validity of our results.

While it is not yet certain that the hacienda can be obtained for broad experimental purposes, the outlook is hopeful. Vicos is owned by the Peruvian Government, which is, naturally, interested in furthering the development of its depressed peoples. For the present, however, the hacienda has been assigned by the Government to the Public Benefit Society of Huaraz, Capital of the Department of Ancash, which in turn leases it to a corporation engaged in the production of flax and linen. This corporation operates a linen factory (Pati) where we are also making an industrial and labor relations study.

In view of present operations of this corporation—which are none too successful—it is by no means certain that it intends to re-lease the hacienda or that the Public Benefit Society desires to continue the existing arrangements. The present lease has something like a year or two to run. The annual rent is in the neighborhood of $1000. This includes the right to use about 40,000 acres of farming, forest and grazing land, and the rights to the labor (without pay) of one member of each Indian family—there are about 500 families in Vicos—for three days of each week. Our present relations with the administrative personnel are cordial, both at the hacienda and the factory, and, of course, they might even be willing to cooperate with us on a broader scale. But this is not certain. Meanwhile, we have their permission to carry out
experiments of limited scope which we expect to initiate during the coming summer.

Present plans involve an experiment in health, nutrition, agriculture, and education with two matched-lineages of ten or twelve families each. One of these lineages will be used for experimental purposes; the other, as a control. As now designed this initial effort will include such procedures as the following:

1. Medical examinations of all the families in both lineages and, among the members of the experimental lineage, the introduction of medicines to cure prevalent diseases, together with instruction in sanitation, housing, and public health. Our studies thus far indicate that such examinations will be welcomed by the Indians, as will the treatment; and we already have the assurance that medical personnel will be supplied for this purpose through collaboration with Dr. Hydrick and the Peruvian Ministry of Health.

2. A nutritional survey to determine what are the deficiencies of diet, and what can be done in realistic terms to remedy these deficiencies. It is expected that collaboration on the technical aspects of this work can be secured from the Institute of Inter-American Affairs.

3. The introduction of improved agricultural tools and practices (seeds, techniques, etc.) in consultation and collaboration with technicians of the Institute of Inter-American Affairs. Our present data indicate that some Indians, at least, have the means of paying for these introductions and would welcome them, if we act as the agents through whom they can be obtained.

4. The introduction of incubators and improved strains of chickens. Eggs are one of the chief sources of cash income for these people but their strains of chickens have so degenerated that present returns amount to very little.

These are but a few of the possible introductions that can be made with profit at the present time, but in terms of immediate funds and personnel it
will be necessary for us to limit ourselves to a small-scale operation with a few people in order to control as many of the variables as possible and in order carefully to survey the possibilities of obtaining the hacienda for future research and action.

At the same time that the experiments are being carried out, of course, observational studies will be made on the effects of our program. Consequently, we will have an opportunity to check whether our predictions are correct, where resistances arise, and what methods of introduction meet with the greatest success. Moreover, by having a control group we will have some way of measuring the effects of our action. We feel that such a pilot experiment will not only serve to test and sharpen some of our concepts and methods but will assist us in discovering better ways of adapting the underdeveloped Andean peoples to the modern Peruvian nation.

If the results of our initial experiments meet with our expectations and if it is possible for us to secure control of the hacienda, we would like to enlarge our present design into a broad social experiment that would encompass all of the Indians on the hacienda and that would last for at least five years, beginning in 1952-53. We would expect to realize the aims of this experiment, as stated in Section I, through the formation of an Indian cooperative, the basis for which already exists in the Indian society and which could itself take over the operation of the hacienda after our period of participant experimentation was over. This we realize could not be done without careful planning but as now envisaged the design would involve the establishment of a series of annual quantitative targets—to be set, insofar as possible by group discussion under local leadership—in agricultural improvement, conservation practices, better communications, land reform, forestation, animal husbandry, housing, sanitation, health, nutrition, education, and recreation. The plan would also involve annual reports of progress to the people involved and
periodic appraisals of the program so that modifications could be made where necessary.

Such an experiment would be of great potential value. In the first place, it could be carried out with relatively little expense, since the profits of the hacienda, instead of being withdrawn as they now are, could be put back into the operation for bearing the cost of improvements. In the second place, it is certain that we would receive assistance and cooperation from some branches of the Peruvian Government, from the University of San Marcos, and from private agencies engaged in welfare work of one kind or another in Peru. In the third place, such an experiment, if successful, could be used as a model for planning social change all over the Andean area and as a training ground for personnel of technical aid programs in Latin America. Finally, it is likely that such an experiment would yield results that would greatly advance our knowledge of theory and method in the field of applied social science.

Allan R. Holmberg
### Proposed Budget

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- Paid by Cornell
+ Paid by income from the hacienda
x Supplied by Peruvian Government or private agencies
o Not needed.
A SYSTEM FOR MAKING POSSIBLE THE COORDINATION AND COMPARISON
OF DATA FROM DIFFERENT CULTURAL AREAS

The further development and expansion of a system of record keeping and filing of field data obtained in the cultural areas under study by the Department of Sociology and Anthropology, and permitting systematic cross comparisons that will show common processes and differences in these areas is an important item in our current and future research.

Such a system has been put into operation in the Nova Scotia studies being conducted by Leighton, and the Southwest material collected during the last three years is currently in process. We feel that this operation is of first-order importance for three principle reasons:

a) It makes it possible to follow changes through time which are otherwise likely to be lost in long-term projects.

b) It prevents duplication of field research by rendering it possible to tell at any time what work has been done on any topic.

c) It is an essential step toward developing systematic cross comparisons that will show common processes and differences in all the cultural areas under study in the program of the Department of Sociology and Anthropology.

The method resembles the Yale process described in "Outline of Cultural Materials." However, the Yale system is concerned with the processing of material from source. It is understood that Yale may ultimately render a service for raw data. The field notes which we are currently processing are of this latter type.

Each interview is typed on master stencils and capped with a "banner" which identifies the culture area, general context of the interview, name
of informant, place, date and time of interview and the field worker.

The context of the interview is categorized according to a system derived largely from the Yale outline.

8 1/2" x 11" full page copies of the master stencils are duplicated for the chronological file of each field worker's interviews and are put up in volume form. The master stencils are then cut into paragraphs and used for duplication on 5" x 8" cards. Banners appear on both chronological and card files and serve for cross reference purposes as well as for identifying the data on any individual card.

The system is flexible in application in that typing can be done by the field worker at the end of each interview or from his written notes by a central processing unit. Duplication may be carried out in the field or centrally depending on the needs of each project.

Cost of processing will vary depending on the quantity of interviews reports, whether interviews are directed or not, whether typing is done by field workers or typists and relative cost of labor in different culture areas. It is estimated that the cost of processing would be approximately $100 per month for each full-time worker in an area. An estimated ten field workers will be engaged for a full year throughout the five-year period for each project. Thus the cost of processing the bulk of material from each area is $12,000, or $48,000 for the four projects for five years.

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1. Thus the original context for any excerpted statement in the card file can be readily established. The analyst working from the card file or the chronological file or from both can direct his investigation as he wishes, establishing original context of excerpts where necessary and obtaining additional evidence from the card file to supplement a topic in any of the chronological files.
BUDGET

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<td>A Proposal for a Program of Experimental Field Research in Technological Change in India</td>
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April, 1951
Outline of the Proposal

This is a proposal for exploratory research concerning an important but hitherto neglected aspect of the economic growth process. The proposal grew out of discussions between the two authors which were begun in the spring of 1953 and were resumed in the fall when Mr. Wolf was preparing a report for the Ford Foundation on "Capital Formation and Foreign Investment in Underdeveloped Areas: An Analysis of Research Needs and Program Possibilities." These discussions revolved around the proposition that the emergence of entrepreneurship is intimately related to the institutional environment in which the entrepreneur must operate and to the process by which this environment is altered in response to entrepreneurial "needs". The notion of "institutional flexibility" referred to in Mr. Wolf's report grew out of these discussions. While the report, owing to its particular focus, was mainly concerned with entrepreneurship as a major determinant of the demand for capital, it suggested that the inter-connections between entrepreneurial behavior, the character of the institutional environment, and the process of institutional change offered a promising and largely unexplored field for research. This is the field that we now propose to explore.

Justification

A great deal of current research in the field of economic growth is designed to produce results to be used directly in investment planning.
While public investment can and must play a major role in the development of presently nonindustrialized societies, it is evident that most of these societies do not have and are unlikely to have the monolithic sort of decision-making structure that will enable them to get along without private entrepreneurship. It is also clear that these societies do not presently possess institutional structures that are conducive to the broad exercise of entrepreneurial initiative as we know it in the West. While this deficiency is easily recognized, we know too little about how to amend it—about the kinds of institutions that are required and the ways in which they can be successfully introduced. It is true that a great deal of work has been done since the war on the historical role of entrepreneurship in the growth of Western economic societies; but, having been based largely on Schumpeterian analysis, this work has concentrated on the entrepreneur as a technological innovator operating within an exogenously determined institutional framework. Institutional change, unlike technological innovation, has thus been treated as independent of the growth process rather than as a central feature of it.

Indeed, most economists probably accept a Topsy theory of institutional change. But they also have an uncomfortable feeling that a self-respecting science should not resign one of its most important branches to the fatalists. This ambivalence is reflected in the following observations by Horace Gray: "...when any institution reaches an advanced stage of obsolescence, it tends to be superseded by some new institution that is more positive in character and better adapted to the needs of the time... All institutions are subject to the same evolutionary process in a dynamic society. They arise in response to definite social needs, serve for a time the purpose for which they were created, eventually become impotent or actually detrimental, and
are gradually displaced by new institutions designed to meet new needs. The observation and analysis of this process in the economic field are proper functions for the economist and should be the objects of scientific inquiry devoid of emotional predilections." Proper though they be, the functions have not been discharged.

Abstraction from so obviously important an aspect of growth is plainly legitimate for some purposes. But it would seem to be illegitimate if one's aim is to gain a broad insight into the essential nature of privately initiated economic development, and especially if one is interested in the possibilities of promoting this type of growth in areas where it has hitherto been uncharacteristic. Institutional progress—if this term may be used to describe the rise and spread of growth-conducive institutions—is as much an inherent feature of the growth process as technological progress. An exploration of the specific ways in which institutions shape the activities of businessmen; of the institutional requirements for growth-promoting activity; of how these needs are felt and articulated; and of the ways in which appropriate institutional innovations make their appearance would seem to promise an increased understanding of the growth process and of how it can be facilitated. The aim would be to seek an analytical rather than a chronological explanation of the appearance and role of entrepreneurship in the growth process—to develop an institutional dynamics to complement economic dynamics. Ultimately, it is hoped, a framework of this kind will make possible more effective development programming in underdeveloped countries by helping to answer the questions (a) what institutions, under given circumstances, are most likely to stimulate indigenous entrepreneurship; and (b) how can such institutions be most appropriately and successfully introduced, or derived from the modification of existing institutions?
Proposed Method of Investigation

To pose the problem is easier than to propose a suitable method of attack upon it. For this reason, an initial exploratory investigation, as proposed here, must be undertaken before it can be determined whether, or how, to proceed with more specifically oriented inquiries. Such an investigation would consist mainly of a systematic exploration of the relevant literature of theoretical and institutional economics, economic history, and sociology. From this, it would be hoped, there would emerge new insights concerning both the institutional "needs" generated at different stages and by different aspects of economic growth, and also concerning the process by which appropriate institutions are (or are not) brought into being in response to these needs. These insights, it is expected, would lead to the formation of hypotheses that could be tested by subsequent field research of several different types.

In other words, we are suggesting that the nature of the interrelationship between institutional change and economic growth should be explored both analytically and empirically.

The analytical approach would seek to establish a frame of reference for a systematic appraisal of the ways in which institutional arrangements—through their effect on the calculus of benefits and costs, and in other ways—can influence entrepreneurial or other economic behavior. A major aim would be to discover and describe a rational basis for institutional innovation and so gain new insights concerning the kinds of institutional changes that are progressively required for self-generating growth. Such an attempt, if successful, should make it possible to couple institutional planning with economic planning more efficiently than has been the case hitherto. Better programming should result.
The empirical investigation would consist of both historical and current field research concerning the processes of institutional change. One purpose of the empirical studies would be to test the hypotheses developed by the analytical approach. Another would be to throw light on the process by which institutional changes conducive to entrepreneurial activity are brought about. Available historical materials concerning the parallel emergence of entrepreneurship and new institutions in the western world and elsewhere, especially the Far East, would be examined with a view to discovering common elements and the reasons for them. Current field research would be designed primarily to provide a picture of this sort of development as it occurs in presently underdeveloped and developing countries.

During the year for which aid is now being requested our aim would be to proceed sufficiently far with the analytical and the historical explorations to determine whether either or both of these approaches would merit continued investigation. We would also give thought to the problems of testing hypotheses by future field research, including the feasibility of employing the facilities available at the Cornell regional research centers in Asia and Latin America.

To indicate the character of our preliminary thinking on these matters, and to suggest specifically and concretely some of the lines along which exploration and research might proceed, we have summarized some of our untested ideas in an Appendix.

Advantages of Conducting the Research at Cornell

The research and training program conducted at Cornell by the Department of Sociology and Anthropology under a grant for research on the
impact of technology, and under the India and Southeast grants; the public administration work of the School of Business and Public Administration, especially that in Indonesia; the international research program of the School of Industrial and Labor Relations; various aspects of the work of the College of Agriculture, and especially of the Department of Agricultural Economics; and the discussion a couple of years ago concerning the possibility of utilizing the special facilities of Cornell for the more effective training of scientific and technical personnel for work in underdeveloped countries, provide a sympathetic environment, a varied group of interested specialists and other facilities that, in the aggregate, will be of great assistance in carrying out the research program here proposed.*

Proposed Budget

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<td>C. Morse, 2/3 time, plus 2 summer months</td>
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* A more detailed statement of ideas and plans for this program is available in the separate Appendix to this proposal.
Appendix

PRELIMINARY AND TENTATIVE ELABORATION OF IDEAS

As with all exploratory studies, it is impossible to state in advance precisely and in detail what one hopes to find or how one intends to proceed. It may none the less be helpful to set forth some of the concrete ideas that have turned up in preliminary thinking about these problems. They are necessarily tentative, incomplete, and subject to modification on the basis of results obtained in our proposed exploratory study. Hence they should be understood to indicate only the lines along which we now think that research might eventually progress.

The sections that follow deal successively with the three types of research—analytical, historical, and field—that we regard as essential to a rounded investigation.

I. ANALYTICAL RESEARCH

Changes in institutional arrangements affect the appearance and behavior of entrepreneurs in several ways. For example, they may change the structure of career preferences. They may alter the array of enterprise opportunities. Or they may change the anticipated and realized costs and benefits to be derived from any given enterprise opportunity. In the latter two cases, the influence of institutional arrangements is manifest largely, if not entirely, through their effect on the entrepreneurial calculus of benefits and costs. The hard economic core of entrepreneurial decision-making consists of choosing among alternative enterprises, productive techniques, scales of investment, and quantities of output. Since every such decision involves a choice among differentially costly (and remunerative) ways of producing revenue, we can regard
the central economic task of the entrepreneur as involving a choice among alternative "cost commitments". Each type of cost commitment will be unique in some respect, and each will be affected in some degree by the institutional environment. Similarly, each cost commitment will have attached to it a prospective stream of revenue which will also be affected by the institutional pattern. The entrepreneur is thus in the business of exchanging a calculated commitment, which depends in part on institutional arrangements, for a similarly calculated prospect.

If cost commitments once made were unalterable, and if the size and shape of the corresponding stream of pecuniary returns over time were to be determined by forces entirely beyond the influence of the entrepreneur—if, in other words, all net returns were simply a gamble in probabilities—it is doubtful that the risks of large-scale investment would be widely incurred. But cost commitments and the flow of returns can both, within limits, be tailored to circumstances by the manipulation of variables that are, in greater or less degree, subject to the entrepreneur's control. What these variables are, and the extent to which they can be manipulated, depends on existing (but not immutable) institutional arrangements. Thus the function of entrepreneurship involves far more than the estimation of probabilities and a passive waiting for the results of the market's toss. It involves continuous adjustment and adaptation within what is essentially a "power complex". It is an exercise in strategy.

The consequent fact that the entrepreneur cannot remain indifferent or passive to his institutional environment suggests that the reactions of entrepreneurs to existing institutional arrangements, and their resultant efforts to change them, may be a place to look for an explanation
of institutional change. By examining the reasons why entrepreneurs in differing circumstances might desire change we should gain a better insight into the processes by which institutions are shaped to needs and thus into the relation between institutional change and economic growth. Historical and field research, as indicated below, would supplement this approach by directly studying entrepreneurial behavior.

By way of illustration, we may suppose that entrepreneurs, like all administrators (and diplomats), strive to maintain a balance between commitments (or responsibilities) and power (or authority). We may therefore suppose that, as the cost commitments requisite for continued growth increase in size and complexity, and extend over longer time horizons, entrepreneurs desire either an increase in the magnitude of the probable gain or a decrease in the degree of uncertainty, or both. Lacking the former, we might expect entrepreneurs to seek to increase their degree of control over certain determinants of their situation and reduce their dependence on others, to replace ignorance with knowledge, and to eliminate the rule of arbitrary chance so far as possible. These needs, if properly met, will permit growth along the indicated lines to continue; if not met, or met improperly, growth will be slowed or stopped. For example, two ways in which entrepreneurs have often sought to reduce the degree of uncertainty is by formal or informal association to control either the product market or the labor market. Whether such actions promote or inhibit growth is an important question, on which we need more light. Thus entrepreneurs prefer monopoly to competition, and if not given some monopolistic protection they may not innovate or expand. On the other hand, too much monopoly can be equally stagnating. Hence it is impor-
tant to achieve the "proper" amount and kind of monopoly. Similarly, high prices and low wages are, in an obvious sense, good for the entrepreneur, and businesses often move to low wage areas, or oppose labor unions, for this reason. But a tendency for wages to rise more than prices has apparently been a major characteristic of most (perhaps all) of the countries which have undergone substantial growth. The existence of institutional arrangements that permit money wages to rise relatively to money prices as output per manhour rises may thus be a necessary condition for self-perpetuating growth. But here, again, if the institutional requirements are not properly met—if, for example, unions concentrate on their share rather than the size of the product, or a prematurely liberal social security scheme is introduced—the result may be stagnation.

The following examples of what seem on their face to be important interactions between institutional arrangements and entrepreneurial behavior may serve to indicate some of the areas that would seem to merit analytical study.

Economic rationality and the institutional setting: some examples and observations

Simply stated, one of the major questions to be explored is, How do institutional arrangements affect the rationality of any economic calculus? Behavior with respect to economic matters may, of course, be influenced by such non-rational factors (in the sense of not involving calculation) as custom, habit, ignorance, prestige, and emotion, but this is not relevant to the question raised here. While admitting that behavior in the economic sphere is not always determined by considerations of economic rationality, we are asking, rather, how behavior that is rational may vary with the surrounding conditions. This is a more
difficult question. A few examples will illustrate the sorts of consider­
sations involved.

While the theories of monopolistic competition have devoted con­
siderable attention to the demand side of the relation between market
structure and business behavior, less attention has been paid to the
cost side. One recent exception is Oscar Lange's, "A Note on Innovations",
which suggested that there might also be a relation between market struc­
ture and preferred types of production techniques. Lange attempted to
show how the market position of the entrepreneur would affect the criteria
of rational choice among alternative production functions. This method
of analysis, properly modified, might throw light on such matters as
the correlation between feudal-type social structures and the adherence
to unproductive techniques in underdeveloped countries.

The division of prospective total costs between overhead and variable
has an important bearing on the scale of cost commitment, on the probable
risk entailed by the commitment, and hence on the choice among alternative
commitments. Institutional arrangements are often influential in deter­
mining whether costs that would be variable under some circumstances may
become overhead in others. For example, in underdeveloped countries it
often appears necessary for producers to make paternalistic provision
for workers in order to obtain an adequate and certain labor supply.
Examples are the dormitory system operated in connection with Japanese
textile plants; the living accommodations provided at Jamshedpur by the
Tata Iron & Steel Co., and the similar provision for workers in the D.M.
Nacional metal products factory, Mexico City. These arrangements would
seem to increase the proportion of overhead as compared with similar
enterprises in the West. More generally, as Wilbert Moore has shown
(Industrialization and Labor), cultural factors in underdeveloped countries pose special problems for management in recruiting and training labor and keeping it on the job. These and other factors that shape the costs of doing business, it should be emphasized, will do so not only through their effect on cost structures. They may also affect either the total cost of producing a given output or the distribution of cost as between the producer and rest of society.

The "ancient tradition of high prices and low volume", which the IBRD mission to Cuba found to be the general philosophy of businessmen on the island (and which is characteristic of underdeveloped countries) is an example of economic behavior which seems perverse or ignorant to westerners but which may, in fact, be quite rational. Indeed, the Cuban mission described at some length how the indicated attitude was fostered by the conditions under which business was conducted. But having done so, the authors of the report disregarded the implications of their analysis and made the following hortatory recommendations:

"Businessmen and managers should fulfill their role as the driving force behind growth of the economy. This implies a positive attitude towards risking capital, interest in and support of technological advance, a willingness to go in for new things in a better way, a revision of unsuitable price policies, and quality improvement."

A necessary (if not a sufficient) condition for producing this kind of behavior, it would seem, would be to create or permit to be created, the kind of institutional environment that would make such behavior rational. But that is precisely where the task becomes difficult.

For a final illustration we may consider the traditional preference of
savers in underdeveloped countries for gold, foreign funds, and real property. Since these are assets that cannot or will not be generally offered to savers by industrial and agricultural entrepreneurs contemplating long-term investment, the forms of wealth accumulation resulting from saving do not, for the most part, increase the national capacity to produce. Unfortunate though this may be, the preferences of savers may be entirely rational, under the conditions given, and there may be no effective inducement to effect the institutional changes that would be necessary to produce a different rationale. Indeed, it is quite possible that the institutional determinants of traditional savings habits may be so deepseated that the super-imposition of modernized financial institutions will not suffice to provide an adequate supply of long-term loanable and venture funds. Mosk suggests (Industrial Revolution in Mexico) that this has to some extent been the case in Mexico. At a more general level the following remarks by Abramovitz (in "Economics of Growth") concerning the determinants of the supply of savings are pertinent: "The motives and conditions identified by Marshall and others are something less than established...what we really want to know is what sort of cultural and psychological forces...form the basis of these motives. We are, in fact, pushed beyond the limits of economics as that subject has so far developed, and it is no wonder that we find the theory in a rudimentary state."

The examples given, while not represented as typical, suffice to indicate how non-Western institutions may give rise to non-Western types of economic rationale. This, in turn, may give rise to further institutional "needs" and patterns of change that differ from those in the West. By studying the implications of existing non-Western value systems (which are
not likely to change rapidly) for rational economic behavior it may be possible to anticipate and accelerate modifications of Western institutions that otherwise would occur so slowly as to retard growth to a significant degree.

II. HISTORICAL RESEARCH

A systematic examination of the outstanding works of economic and entrepreneurial history, including those relating to non-Western (especially Japanese) industrialization, would be designed to answer such questions as the following:

1) What were the particular institutional innovations that have contributed most directly to the germination and growth of entrepreneurship, and especially to the transition from the entrepreneurship of the trader to that of the producer? The works of Usher, McLaurin and others with respect to the rhythm of technological invention and the translation of new ideas into operating techniques might prove suggestive in connection with this question.

2) How did the particular institutional changes so alter the calculations of costs and benefits by potential entrepreneurs as to cause them to act (and invest) in ways that would promote growth?

3) What were the means or processes by which particular institutional innovations (e.g., credit facilities, market protection or subsidies, educational and training facilities, etc.) were brought into being or rendered more effective when they were needed to encourage entrepreneurship?

4) Is there a pattern in the process or processes by which "islands of entrepreneurship" have emerged in currently underdeveloped
countries which suggests how such entrepreneurship can be deepened and widened in these countries?

5) What has been the role of foreign investment in stimulating (rather than substituting for) indigenous entrepreneurship?
This is one of the questions raised in Mr. Wolf's report of February 28, 1954, to the Ford Foundation.

Historical research along the above-indicated lines should probably be supplemented by detailed investigation of the process of development of one or more of the economic institutions that have played a crucial role in Western economic growth. The limited liability company is one obvious candidate. The purpose of such intensive research would be to discover:

1) the ways in which the need for the institution first came to be recognized;

2) what groups first felt the need for change, and why—i.e., how the inadequacies of the then existing forms became apparent and to whom;

3) how the new form evolved conceptually;

4) how the form evolved as a working reality— who promoted it, how it was promoted, and how the resistances were overcome or circumvented;

5) what the general obstacles and the particular sources of opposition were;

6) how conditions external to the observed institutional change facilitated or hindered its progress;

7) how the form evolved to meet changing needs, and how successful the evolution has been.
An effort would also be made to determine the extent to which the conclusions with respect to the process of development of a particular institution are of general application, and not confined to the particular case studied.

III. FIELD RESEARCH

Even before testable hypotheses had been formulated, it seems likely that field research might be profitably conducted along four lines. First, on-the-spot investigation of "islands of entrepreneurship" in underdeveloped countries, (see above), particularly in South and Southeast Asia could be undertaken. This would be preceded, to the extent possible, by an investigation of the information already available concerning, for example, the origin and character of entrepreneurship in India. Second, individual entrepreneurs in such countries who had successfully broken away from traditional patterns could be questioned concerning the incentives that had led them to make the break; whether others had also done so, for similar or different reasons; the obstacles they had encountered; what they had done about them, what else they thought needed to be done, and how; whether others had encountered similar obstacles and had similar remedial ideas. Thirdly, a similar line of questioning could be pursued with American and other non-native firms that had established enterprises in the underdeveloped countries. Fourthly, a similar line of inquiry could be pursued with American firms that had considered establishing enterprises in such countries but decided in the negative after reasonably careful investigation. In general, the aim would be to identify, so far as possible, the institutional innovations that had been responsible for new enterprise or that were needed for it to appear or grow.
The experience of the Cornell Department of Agricultural Economics in investigating the institutional factors affecting land use should provide useful guidance with respect to field research methods into the interaction of institutional change and entrepreneurial behavior.