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The variety of manpower needs generated by advanced technology plus all that is known about human variability in aptitude, achievement, interests, motivations, attitudes, values and intellectual dispositions underscore the need for a highly diversified higher education system. Britain has lagged behind other industrial countries in providing a diversified system and might well undertake research on the problem of "fit" between students and institutions. As part of a longstanding interest in differential recruitment, the Center for Research and Development in Higher Education at Berkeley has been engaged in measuring the "non-intellective" characteristics of students, such as autonomy and creativity, and has attempted to determine to what extent institutions nurture intellectual ingenuity. A high degree of variability among students at advanced levels and significant interinstitutional variations in intellectual disposition have been discovered. Increasingly, studies are being directed to the questions of how students change during their educational career and what is the impact on student development of particular university features. Problems of planning and coordination are related to the development of a diversified system. Alternative ways are being sought by institutions that wish to attain distinctiveness while conforming to the broad goals of the system. The constraints of concerted planning and pressure to conform to conventional academic standards are threatening the continuation of educational distinctiveness in Britain and the US. (JS)

# RESEARCH INTO HIGHER EDUCATION

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# A RESEARCH BASE FOR A DIVERSIFIED SYSTEM OF HIGHER EDUCATION

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The title of this paper is obviously too pretentious. In the time available I can offer only samples of the many kinds of investigations necessary for designing and developing a pluralistic system of higher education. I need not discuss the topics of today's other speakers, and I shall ignore still other lines of research.

## I

Higher education is everywhere reaching an increasing proportion of young people and a growing number of adults. The United States has outstripped all other western countries in social demand for college and university education. But the pressure for access to higher education is intensifying everywhere. In Britain, social and educational tradition long retarded the growth of university enrolment. In 1962 I found that neither the universities nor the University Grants Committee planned to broaden the band of ability for university selection. In projecting university enrolment through 1970, the UGC assumed an essentially level proportion of university entrants to the age group, varying around 4.6 percent. Although the Robbins Committee concluded that by 1980 the country should be providing entry to full-time higher education for about 17 percent of the age group, it nevertheless presupposed a level standard of ability for admission. There is good reason to believe, however, that the threshold for admission to higher education will be lowered. Indeed, if I read the facts correctly, this may already have occurred. I suspect that Sir Eric Ashby spoke prophetically when he said[1] that "... by putting on the market, as it were, only Lincolns and no Fords, we have not fulfilled adequately our loyalty to contemporary society". Sir Eric went on to say: "In our present social climate I don't believe excellence can be safeguarded (as we have tried to safeguard it in Britain) by keeping mediocrity out of higher education. This is simply unrealistic. I believe it must be safeguarded as you are trying to do in America, by the peaceful coexistence of mediocrity and excellence. They have - after all - got to coexist elsewhere in society, and it is an educational commonplace that Gresham's Law does not hold for college degrees; indeed mediocrity is improved by association with excellence. Fords do not drive Lincolns off the market."

Everything we know about human variability in aptitude, achievement, interests, motivations, attitudes, values, and intellectual dispositions among students who will comprise the future college and university population underscores the need for a highly diversified educational system. Fitting students into

traditional educational structures will no longer serve their needs or the needs of society. Instead, the system of institutions will have to be adapted to the characteristics and potentialities of students.

Furthermore, the more we learn about manpower requirements, the more we are impressed by the necessity of differential educational opportunities. Both John Kenneth Galbraith and Barbara Ward (Lady Jackson) recently pointed out that land long ago ceased to be the almost exclusive basis of economic development. Capital replaced land as the source of power over enterprise. But capital is no longer scarce, and therefore no longer critical. Galbraith pointed out[2] that specialized talent has now become the primary factor in industrial enterprise. "..... the great sources of wealth," said[3] Barbara Ward, "are now in the mind, in research, in all the manifold applications of trained intelligence....."

It has been said that although the industrialized countries of Europe achieved their present economic level in spite of restricted educational opportunity beyond elementary schooling, it took them a long time to reach this stage of economic growth, whereas the more generous extension of secondary and higher education in the United States, the Soviet Union, and Japan at earlier points in their development was a significant force in the attainment of their present high level of economic and technological advancement.[4]

The world is experiencing a second industrial revolution for which advanced technology is the impetus. Britain led the first industrial revolution, but now lags in the second, both because its production of highly qualified manpower in science, technology, and management is insufficient, and because its output of technicians is too scant and too inefficient. Speaking of the scarcity of technicians, one of the recent reports of the Committee on Manpower Resources for Science and Technology has said[5] that "Up to the present this manpower group, so vital to effective utilization of qualified manpower, has been fed largely from the shop floor and by part-time study." Sir Peter Venables estimated[6] some time ago that a tenfold increase in the number of young people between 18 and 20 in full-time attendance at technical colleges was essential if the country's need for technicians and technologists was to be met.

## II

One of the basic research tasks in engineering a scheme of diversified higher education is to explore the pool of available talent; to study the dispersion of interests, aptitudes and abilities through the labyrinth of institutions and programs which comprise the system; to follow students into their careers and their civic and cultural activities, and to plan their return for re-education.

Too often we have described talent only in terms of the abilities required for an elite system of higher education emphasizing the arts, the sciences, and the major professions. But attributes other than verbal ability may be more relevant to diverse educational and vocational performance, as

Lady Venables has shown[7] in her studies of selection for technical curricula.

Furthermore, in assessing scholastic aptitude we have ordinarily measured a very limited range of attributes. In studies at the Center for Research and Development in Higher Education at Berkeley, our interest early turned from conventional measures of academic aptitude and achievement to such characteristics as theoretical and aesthetic orientations; intellectual independence and personal autonomy; impulsivity; interests, motivations, attitudes, values, and goals. Our purpose has been to learn how these attributes are related to openness to change and to continuing development along significant dimensions of personality and performance. We have looked especially for indices of creativity, and we have asked to what extent colleges and universities recognize the signs of intellectual ingenuity or artistic talent and the degree to which they nurture creative behaviour.

Some of the characteristics with which we have been concerned are presumably relatively stable , while others are more responsive to experience; some are essentially peripheral, while others are central and pervasive; and some dispose the individual toward openness and change, while others incline him toward inflexibility and arrested development. Our knowledge of the relationships of these attributes to various kinds of educational attainment, to vocational performance, and to personality development beyond the years of formal education is at present elementary, indeed, but we are investigating these associations along many fronts.

Several of the Center's investigations are designed to chart the flow of students with diverse attributes and backgrounds through the maze of institutions and curricula in the United States. What are the points of entry? How do students fan out within the complex? Is their course straight toward well-defined educational goals or is it circuitous? Are there stages at which they may reassess their interests, abilities, and aspirations? Are there successive choice points at which they may change their educational programs or move from one institution to another? How can the whole course of the individual's educational journey to more effectively rationalized?

As the result of one of its "flow" studies, the Center has recently published[8] an analysis of the patterns of employment and college attendance of some 10,000 high school graduates in sixteen communities across the United States. Forty percent of the graduates in this study entered college as full-time students. Slightly more than half of the entrants stayed for four years, but only half of them were graduated in that period. Although level of ability was related to college attendance, there was a closer association between socio-economic status and college entrance. Relatively few students from high socio-economic levels ~~went to~~ college regardless of ability, but a disproportionate number of those at lower levels failed to go even if they had high academic aptitude. The variable most related to attendance and persistence was motivation. The report observed that this motivation is probably formed early in life, largely in response to parental influences and early school experiences. Among other factors interdependently associated with college attendance were personal autonomy and nonauthoritarianism, a strong interest in theoretical and aesthetic

matters, and an experimental, flexible turn of mind. In this country, a somewhat comparable study is under way at the University of Essex.

Presently in process at Berkeley is a study of how students distribute themselves among the colleges and universities in four states representing different regional educational traditions and varied systems of higher education. The first phase of the investigation will determine how 37,000 high school seniors deployed themselves in the labor force, in higher education, in homemaking or in the military services, and what happened to them during the first year after leaving high school. The second phase will concentrate on the processes by which 47,000 ninth grade students make decisions concerning future education and work and the relative influence that parents, schools, peers, interests, values and intellectual dispositions have on these choices.[9]

In your country the Committee headed by Dr. F.S. Dainton, the Vice-Chancellor of the University of Nottingham, is about to report a somewhat comparable study of the flow of students from school to University with particular reference to specialization in science and technology. I have seen some of the findings,[10] which have profound implications for the structure of both secondary and university education.

## III

The Center's flow studies are recent phases of its long interest in differential recruitment to American colleges and universities. One of its research reports summarized the scholastic aptitude of entering students for the country as a whole, for its four principal regions, and for type of institutions and level of programs. This and other investigations[11] have documented the enormous variability in academic aptitude of a national sample of college entrants and of particular student bodies. In one of the states studied, for example, only 16 percent of the freshmen in the least selective institution had scholastic aptitude test scores above the average score in the most selective institution. Both institutions are small private liberal arts colleges. In the national sample the variability of aptitude scores was approximately the same for the least selective institution - a southern Negro college, and the most selective one - Yale University.

The Center has also discovered an unexpectedly high degree of variability among students at advanced levels. For example, in one of our studies the average aptitude score of seniors in the least selective medical school was only slightly above the general average of undergraduate college entrants. The most and least selective medical schools are as different intellectual worlds as are the most and least selective undergraduate colleges.[12]

But the Center has been less interested in differential recruitment in scholastic aptitude and achievement than in certain other characteristics. In company with the Robbins Committee and other investigators in Great Britain, we have found great differences in the social and cultural composition of student

bodies. In the United States students from lower socio-economic levels are more heavily concentrated in certain groups of institutions than in others. The state colleges and the junior colleges are attended primarily by students whose fathers are in low-status occupations, whereas the private liberal arts colleges tend to attract more than half of their students from homes in the high-status occupational categories.

In Britain, Abbott has pointed out[13] that institutions with relatively large numbers of entrants from culturally limited homes have an especially difficult problem of successfully introducing these students to the world of ideas, of quickening their aesthetic interests, and of widening their cultural horizons. I remember writing in the Universities Quarterly some 20 years ago that, as the British universities admitted more students with culturally limited backgrounds, informal methods of general education would prove inadequate and more formal programs of liberal studies would need to be devised. However, I see little evidence that this has happened, the general year at Keele to the contrary notwithstanding.

Since the Center's studies, and those of Lady Venables and of Jackson and Marsden[14], among others, have underlined the importance of family background and motivation in stimulating working-class youth to take advantage of opportunities for further education, it follows that both Britain and the United States will have to devise a wide range of compensatory programs to offset the limitations of cultural background and unkindled intellectual interests.

On a visit to Britain in 1948 I asked Mr. Tomlinson, then Minister of Education, why the Labour Government was not reorganizing the secondary schools. He replied that the grammar school was one of England's most successful institutions, and that the Labour Government, instead of abolishing it, wished to send working class students to it. How discouraged he would be if he knew how slowly the social composition of the grammar school changed. "Every custom, every turn of phrase, every movement of judgment, informs the working-class parent and the working-class child that the grammar schools do not 'belong' to them," wrote Jackson and Marsden.[15] These authors went on to say that "..... the 'open' school which belongs to the neighbourhood, the 'open' university which involves itself in local life rather than dominates or defies it from behind college or red brick walls" must be created. What is in order in both our countries is an intensive program of research on methods of arousing and satisfying suitable educational aspirations. Only if this is done will a democratic society realize its ideals, and an industrial society avail itself of the human resources which are now the most crucial forms of economic capital.

The Berkeley Center, as I said a moment ago, has long been involved in research on what are termed - sometimes erroneously - "non-intellective" characteristics, such as attitudes, values, interests, and more pervasive and deep-seated aspects of personality like autonomy, creativity and intellectual disposition.[16]

Without going into detail, let me summarize quickly some of our findings concerning differential recruitment in various aspects of intellectual disposition.

The student bodies of three academically selective liberal arts colleges have been compared on instruments designed to measure interest in ideas and aesthetic orientation. On a combination of these two measures, 35 and 37 percent of students in two of the institutions were above the normative mean, whereas more than twice as many of those in the third college were so elevated. Dr. Paul Heist of the Center has devised an index of intellectual orientation comprised of eight categories ranging from one characterized by broad intellectual interests, theoretical and, especially, aesthetic orientation, to one reflecting little interest in ideas, even an anti-intellectual attitude, and a highly pragmatic orientation. He compared the characteristics of women students in five institutions. In one, 22 percent of the women fell in the three highest categories, but in another, 74 percent were found at the same level. In another study, 13 percent of entering students at Berkeley were classified in the top three of the eight categories while 56 percent of the freshmen at Reed, a small distinguished, highly selective liberal arts college to the north, were so categorized.

Significant inter-institutional variations in intellectual disposition are found not only at undergraduate, but also at more advanced levels. Medical schools can be differentiated on the basis of the proportions of their students who have high scores on both the theoretical and aesthetic scales of the Allport-Vernon-Lindzey Study of Values, a combination which tends to characterize persons with both strong intellectual interests and creative potentiality. Three medical schools, Harvard, Chicago and New York University, have an unusually large proportion of such students. It is not surprising that these institutions produce a large number of medical teachers and researchers.

There are interesting differences in intellectual disposition among groups of students studying certain subjects or professions, or those preparing for different specialties in these fields. Majors in physics, for example, differ from those in engineering. Furthermore, majors in various fields of engineering differ from one another. Mechanical engineers are much less theoretically oriented than those in electrical engineering, whose profiles look very much like those of students specializing in physics. Neither is medicine a unitary field when characterized by students' orientations. There are differences in combined scores on theoretical and aesthetic scales among students in a variety of medical specialities.

Studies of differential recruitment would seem to be essential in monitoring Britain's efforts to diversify its systems of higher education. For example, one might ask whether the new universities, which propose to develop distinctively do, in fact, draw different kinds of students from those who enter Oxbridge or the civic universities. Likewise, one might explore possible differences in recruitment to the technological universities and parallel fields of study in the other universities. One might ask, too, whether the new polytechnics draw students who differ in interests, motivations, attitudes, values, and intellectual orientations from those who enter the technological universities, or, for that matter, the degree or non-degree programs in technical colleges. One might then go on to characterize the aims and programs of the institutions, and to consider ways of distributing students more "appropriately" among available educational opportunities.

The State of California presumably has a diversified educational system, incorporating some common and some differential functions among three groups of institutions - junior colleges, state colleges, and the campuses of the University of California. Some studies, however, indicate that student attributes and institutional characteristics are incongruent. For example, the University purports to emphasize theoretical and scientific training in agriculture, while the California State Polythechnic College puts greater stress on agricultural production and practical agriculture. The two institutions differ considerably in the amount of time students are required to spend in the basic and supporting sciences. Nevertheless, the two student bodies do not differ significantly in theoretical and scientific orientation. Various reasons for the incongruence may be hypothesized: the institutions did a poor job of selection; students were unaware of their own psychological characteristics or of differences in the educational programs; or the choice of institutions was determined primarily by geographical proximity.

Although the policy is now being debated, Britain's system of financial aid to students presumably frees them in considerable degree from the necessity of attending local institutions, and makes the entire complex of universities available to them. The growing system of scholarships and loans supplied from federal, state, and private sources in the United States may make greater student mobility possible. The distribution of students among institutions within and among the states may consequently change markedly.

The question of "fit" between students and institutions is a highly complicated one, but no system of diversified higher education can ignore the problem of aiding students to distribute themselves relevantly - whatever relevantly in fact means - among different kinds of institutions and courses. We have three tasks: 1) mapping the attributes of the potential student population; 2) mapping the educational complex; and 3) somehow superimposing one map on the other. The problem of consonance and dissonance in student and institutional characteristics is more manageable now not only because of progress in identifying and measuring a wider range of human attributes, but also because we now know much more about characterizing institutions. From the sociological view of institutional analysis, Clark, formerly at the Center and now at Yale, has recently described[17] approaches to the characterization of colleges and universities in whole or in part. To me however, the most promising method of describing and differentiating college environments has been developed by Pace and his associates. Pace's work has culminated[18] in the development of the College and University Environment Scales which may be used to identify institutional stress on practicality, community, awareness, propriety, and scholarship. Pace has also devised[19] methods of describing subcultures and of characterizing some of the main features of institutions such as their administrative, curricular, instructional, and extracurricular structures and activities. Perhaps studies are under way to determine what differences exist among the institutional and subinstitutional environments in the British complex. It would be both interesting and instructive in any event, to have answers to such questions as the following: What differences in institutional climate exist between the technological universities, other newly established universities, the civic universities, Oxbridge, and the polytechnics? Are there significant differences among the institutions in any one of these groups?

Are institutions all of a piece; for example, are there differences in environmental press, to use Pace's term, among the divisions of a particular technological university, or among those of other new universities, Sussex, for example?

## IV

It is not only desirable to study the characteristics of students and institutions; it is even more important to ask how students change during their educational careers, and what is the impact on student development of particular features of institutional character. Put more technically, the question is: do different treatments have differential effects on students of comparable or dissimilar initial characteristics? This is an extremely difficult question methodologically, but nevertheless it is one to which an increasing number of investigations are being addressed.

Many of these studies can be grouped under the general rubric of "persistence and change". There have been many studies of so-called student wastage by Malleson and others in this country and in the United States. I should like to mention only two. In a Center study of 21 women and 25 men who were rated as exceptionally high on manifest or potential creativity, only two were graduated from the college they entered. Heist reported that the proportions of identified creatives who withdrew from seven quite dissimilar institutions ranged from approximately 50 percent to 80 percent.

This loss of creative talent seems to be as great in science and engineering as in the arts. In fact, there is some evidence to suggest that most institutions almost systematically weed out the nonconforming, inventive, innovative scholar. In his recent article[20] in the Universities Quarterly, Snyder of MIT reported that that institution "..... is losing three times more students who preferred as freshmen to try out new solutions, fool around with ideas, or take cognitive risks than those preferring a well ordered life with tangible results." He reported that students with high scores as freshmen on a so-called complexity scale had a final grade point average slightly below that of the group with low Complexity scores. MIT seems to reward students who are safe and straightforward intellectually and discourage those who show evidence of having an open, critical and flexible turn of mind and who tend to look for novel and complicated rather than simple and conventional solutions. None of the institutions the Center has been studying succeeds in understanding the potentially creative individual or in providing an environment which he finds congenial, much less one in which his gifts will flower.

Studies of student change and institutional impact require appropriate measures of output. The Center has been only mildly interested in the usual measures of academic achievement. Beyond this, it has attempted to assess a wider range of outcomes, in fact, essentially the same attributes emphasized in studies of entering students, namely attitudes, values, cultural interests,

intellectual sophistication, and intellectual orientation. It has been concerned about students' ability to think critically, their intellectual and aesthetic interests, their intellectual flexibility and openness to ideas, their ability to tolerate ambiguity and to entertain new solutions, their personal autonomy and independence of judgment, their freedom from undue constraints in thought and action, their ways of relating themselves to others, and their emotional stability.

Final characteristics, of course, are functions of input. Outcomes are presumably the result of interaction between students' initial characteristics and their college and non-college experiences, plus what might be called the normal process of maturation. It is difficult, indeed, to single out the unique effect of any one of these factors on individual development. There is, however, a growing body of evidence on the degree to which students do change during college.

The classic study of student development was Newcomb's Personality and Social Change, which appeared[21] in 1943. The subjects were students at Bennington, a college for women. Newcomb and a group of associates have now reported[22] a study of changes over the college years in a recent generation of Bennington students. The report stated that the most salient norms in the Bennington community are individualism, unconventionality, intellectuality, and somewhat less prominently, tolerance of differences in others' behaviour. The major directions of change in the student body over four years seemed to represent adaptations to the community norms which were pressed on students by a variety of positive and negative sanctions. The main directions of change were toward increased individualism, intellectuality, tolerance, and unconventionality. Changes in individualism were reflected in greater self-awareness, self-confidence, independence, and self-expression. The development of intellectuality was marked by greater and broader intellectual awareness, heightened intellectual involvement, and long-term intellectual commitment. Greater tolerance was expressed in increased understanding and acceptance of differences in attitudes, values, and points of view. It is significant that the nature of these changes depended in ways too complicated to detail here, on a degree of congruence between the students' initial attitudes and the community norms.

Dr. James Trent of the Berkeley Center has compared[23] changes between freshman and senior years on the part of students in five Catholic colleges and more than 1500 students attending a number of public, private, and Protestant institutions. On a scale presumably measuring a general readiness to express impulses, a propensity for active imagination, a tendency to value sensual reactions and to seek gratification either in conscious thought or overt action, he found that in all colleges seniors scored higher on this scale than they did as freshmen, with the sole exception of the Catholic college seniors, who scored lower than they did when they entered. That is to say, the Catholic students changed in the direction of greater acquiescence and more restricted and uncreative behavior; in a word, toward greater docility. These findings, I suspect, could be duplicated in some colleges of certain other denominations.

Most studies of student development report only mean changes in groups of students over two to four years. But means obscure individual variations; changes may be in either direction. The Center's studies, however, have

brought to light some fairly dramatic instances of individual development, although admittedly they are more often intensifications of initial tendencies than radical alterations in personality.

Heist has called my attention to a student who, during four years, gained almost two standard deviations on a scale measuring interest in ideas and abstractions and who gained almost as much on a scale of aesthetic orientation. The student also gained two standard deviations on the Complexity scale. His Autonomy score moved from the 50th to the 98th percentile; he was at entrance religiously liberal, and became more so. He became much less constrained, more ready to express his ideas and feelings. He started out as a fraternity man, but became disillusioned with this environment and was really influenced toward intellectualism by his acquaintance with two young campus scholars. Space precludes other examples, including ones representing little measured development and others reflecting actual "deterioration".

The problem of sorting out environmental influences is, of course, even more difficult than that of measuring behavioral changes. However, there are studies under way not only of massive institutional effects, such as Trent's, but also of the impact of faculty cultures, faculty-student relationships, peer group relationships, patterns of academic experience, and various residential accommodations.

Oxtoby has just reported[24] that almost all studies on the effects of institutional environments on students' behavior are being done in America. Nevertheless, he noted that such work has begun over here at Brunel, Bradford, Leicester, Essex, Sussex and elsewhere. It would be fascinating to compare outcomes in some of the newer British universities with those in the more conventional ones. One would like to know whether the results of studying industrial management in a technological university closely identified with commerce and industry differ from those in a more self-contained academic environment. What are the differences in outcomes, if any, between sandwich courses and programs of full-time continuous college study? What are the differences in initial characteristics and attitudes toward learning between students who are firm-based and those who enter technical colleges or technological universities directly? Do the two groups also differ in academic attainments?

Here I wish to make my only comment on the economics of higher education. In the United States, and I take it in Great Britain as well, higher institutions are going to be increasingly subjected to various forms of cost-effectiveness analysis. Unfortunately, the outputs which are ordinarily used in these analyses are such items as the number of students produced at various levels in relation to initial intake, the number produced per full-time faculty member, or unit expenditures at various levels of instruction. Such variables as these ignore behavioral outcomes and the relative effectiveness of institutions, education programs, methods of instruction, or organizational and administrative arrangements. It is an investigation of these and other effects that I have been urging. Until such effects are measured, cost-effectiveness analyses will be relatively meaningless and, if improperly used, dangerous.

V

Let me turn now to a different but not unrelated aspect of the development of a diversified system of higher education. I refer to the problems of planning and coordination. The number and variety of students to be educated, the diversity and complexity of the careers for which they must be trained, the rational selection of educational treatments, and the scarcity of financial resources combine to make system-wide planning, cooperation and coordination essential. Speaking at the annual meeting of the American Council on Education in Washington on October 12 this year, Sir John Wolfenden said[25] that if each of the 44 British Universities and other institutions offering degree-level work did exactly what it pleased, "..... the chances of the emergence of a coherent and efficient overall pattern would be infinitessimal." He might have added that Britain not only faces the necessity of coordinating its universities; it has before it the even more difficult problem of articulating the several forms and levels of post-secondary education, especially the universities and the new system of polytechnics.

Producing statewide master plans for higher education has become fashionable in the United States. These plans vary enormously in scope as well as in the range and adequacy of the research which undergirds them. The work of the Illinois Board of Higher Education provides one of the best current examples of the planning process, although it by no means reaches the level of sophistication exemplified in Blaug's paper on "Approaches to Educational Planning".[26] The Illinois Board published its basic master plan in 1964, and this plan has been under continuing revision. A Master Plan, Phase II appeared in 1966. In preparing these plans, the Board had before it the results of numerous investigations conducted with the cooperation of institutions, faculty members and other professionals, and college and university administrators. Between 1963 and 1966 the Board published fifteen of these studies, ranging from the admission and retention of students to college and university governance.

The Berkeley Center has underway an intensive investigation of the substance and process of planning in five states which differ in planning experience, forms of statewide coordination, and patterns of public and private institutions. The emphasis in the study is on how cooperative planning may affect the diversity, distinctiveness, and flexibility of individual institutions, with especial reference to the preservation of their identity and functional autonomy. Among the effects to be observed are changes in institutional character; the structure of authority; the roles and relationships of governing boards, administrative officers, faculty members, and students; and inter-institutional relationships.

Planning and coordination are closely related. Some years ago the Center published[27] an investigation of the coordination of higher education in twelve states. This investigation is now being updated and expanded by the American Council on Education. From these and other studies it is apparant that there will be increasing tension between institutional autonomy and central control, between local enterprise and central initiative.[28] These tensions characterize the British as well as the American scene. It will not be possible

to resolve the tensions rationally until we learn far more about how planning and coordination limit the choices which are open to particular institutions; how limits on self-determination affect faculty and administrative morale; how constraints on functions, programs. and student intake influence an institution's external relationships; and to what extent concerted action leaves room for local imagination and innovation. When completed the University of London-Chelsea study (Project No. 8. Register of Research, SRHE) will answer some of these questions.

One of the most interesting documents I have seen, one for which I think there is as yet no counterpart in the United States, is the memorandum on "The Essential Liberties of Institutions of University Standing" submitted by the Ministry of Education to the Robbins Committee. No doubt the Department of Education and Science would amend this memorandum materially today. Nevertheless, the document suggests the areas in which the effects of central coordination and control, whether of a government ministry or a grants committee, should be investigated. "Autonomy" has become a relative term, and the "essential liberties" of educational institutions involving as they do such matters as responsiveness to social needs, broad public accountability in purpose and performance, and the relationships of colleges and universities to the state, may in the end be philisophically and even politically determined. But we will be less polemical about the issues involved if we can bring to bear upon them empirical knowledge about inter-organizational relationships and influences.

## VI

One of the major purposes of planning and coordination is to design and maintain diversity among institutions and educational programs. Secretary Crosland's famous Woolwich address was a call for diversifying higher education at degree level by establishing a new system outside the universities. The Department of Education and Science announced that once the new polytechnics had been designated, no new ones would be added to the list for ten years, and that during the same decade there would be no new universities or accessions to university status. The Department apparently believed that it could assure diversity by stopping the scramble for "higher" status and arresting efforts to imitate prestigious university models.

If American experience is indicative, this is a vain hope. The state colleges of California have never accepted the non-university status which successive statewide plans have, from the Colleges' point of view, imposed on them. Neither in California nor elsewhere, to my knowledge, has anyone identified effective social supports for diversity and distinctiveness among institutions of higher education. Until such external and internal supports can be discovered, the effort to allocate functions, programs students and resources among institutions will be abortive.

Among the studies now under way at Berkeley is one of the extent to

which individual campuses in the University of California may attain distinctiveness while conforming to the broad goals of the system as a whole. The new campus at Santa Cruz is modelled, to some degree at least, on the new University at York. The Santa Cruz response to the impersonality and the monolithic structure of the Berkeley campus is to decentralize the institution into a number of relatively autonomous colleges, each with a distinctive academic emphasis. Faculty members become fellows of these colleges as well as university teachers and researchers. The size of each college is small enough to permit students to know one another and to get acquainted with the fellows. The Chancellor at Santa Cruz has declared that the University will take the education of undergraduates seriously, and will not sacrifice their liberal education to excessive specialization, professional attitudes, or research.

But strong influences toward conformity to educational tradition are already apparent. Speaking not only of Santa Cruz but of other experimental institutions, the director of the Center's study of distinctiveness recently wrote[29] as follows:

> "The criteria for hiring and promoting the faculties for the new colleges, on the basis of the evidence thus far, are essentially the same as those used at the older campuses... This is the way, we are told, to assure that the faculty of the new college will not be regarded as second-rate and that the work will be first-rate. But it is a widely held belief now that the traditional criteria for placement and advancement, which have emphasized publications, research, guild standing, and professional mobility, have helped to create the problems that have produced the current student disaffection."

Furthermore, the older and larger campuses at Los Angeles and Berkeley still provide the model of scholarship and research which faculty members, whatever their professed interests in undergraduate liberal education, may be expected to emulate. Scholarly norms are established by a faculty member's peers, not only among his immediate colleagues, but among scholars who comprise his scholarly or professional society. Will his commitment to the Santa Cruz educational philosophy, even if sincerely made when he accepts appointment, survive the powerful pressure toward conformity to the conventional academic and scholarly world?

In the course of my visits to some British institutions last year, I was told that departmentalism had already raised its ugly head at a new university organized into schools of related studies rather than departments. In a discussion there of the pressures toward similarity and conformity with which the University might have to cope, two scientists declared that every change in their fields since the University was established had been in the direction of a more traditional departmental organization. This institution is not a member of a highly integrated system such as the University of California. Nevertheless, it is subject to certain kinds of standardization under the University Grants Committee, such as a uniform faculty salary schedule, the cost and planning of academic buildings and residences, and the purchase of equipment. Although no

one in the universities or the UGC may want it, allocation of financial resources by formula is probably just over the hill. These minimal steps towards uniformity may not destroy educational dissimilarity and distinctiveness. But the future almost certainly holds still more concerted planning and coordination. Will these constraints tend to press the new universities into a more conventional pattern? We may ask the same question about the new technological universities. I participated a year ago in an animated discussion of the likelihood that these institutions would disown their long tradition and do everything possible to breach the academic citadel of the established universities. Surely students of organizational behavior are studying these problems.

I implied a moment ago that it is probably futile to try to freeze the status of particular institutions or of educational systems. Willy-nilly, technical colleges with courses approved for CNAA degrees or with a large component of advanced work will strive to become polytechnics, and it will be amazing if some of the polytechnics do not manoeuvre into a position from which, when the propitious time arrives, they can move into the university club. Again, students of organizational behavior have at hand a remarkable opportunity to study transformation from one educational character to another. The new technological universities have been converted in a short time from technical colleges to colleges of advanced technology, and then to technological universities. In the United States, teachers colleges are changing from single to multi-purpose institutions, and state colleges are becoming universities in structure if not in true character and quality.

The Berkeley Center is about to undertake a study of the processes of institutional change and adaptation. Such questions as the following will be asked: What were the changes in control and financing, and the consequences of these changes in relations with external agencies and constituencies, levels and sources of power and influence; in the institution's autonomy, initiative, and distinctiveness; and in internal organization and administration? What were the professed changes in purposes and functions of the institution, and the consequences of these changes in student recruitment and admission, faculty selection and staff morale during the transition from old faculty orientations to new attitudes and expectations? What does organizational theory have to offer in predicting or guiding productive changes in major aspects of an institution's life? What can be learned from the study of institutional evolution concerning organizational behavior on the one hand, and the means of guiding fruitful educational change on the other? No doubt we will learn something about these questions from Burgess' Study (Project No. 12, Register of Research, SRHE) of the transition of CATs to university status.

This has been a sketchy and spotty sampling of the kinds of investigations which are needed in the development of a diversified system of higher education. To organize a comprehensive investigation of these problems is extremely difficult in the United States because of the sheer number of institutions and students, and because of the enormous variation in kinds of colleges and universities and in arrangements for their governance. Britain, however, has a more manageable problem. Elvin has pointed out[30] that the necessary research will need to be done by a variety of agencies, both governmental and voluntary, including,

presumably, the Department of Education and Science, the University Grants Committee, voluntary associations of universities and scholars, as well as particular institutions and individual researchers.

## VII

May I be so bold as to suggest that the Society for Research into Higher Education might appropriately serve not only as a clearing house and disseminating center, which it already has so effectively, but also as an agency to lay out a program of research into the major problems of developing a comprehensive system of higher education. The Society need not, and presumably, could not assign any of these researches to particular agencies or persons. What it could do, however, would be to stimulate the necessary investigations, coordinate the efforts of individuals and organizations voluntarily engaged in research, encourage collaboration, and take major responsibility for considering the implications of the findings for educational policy and practice.

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