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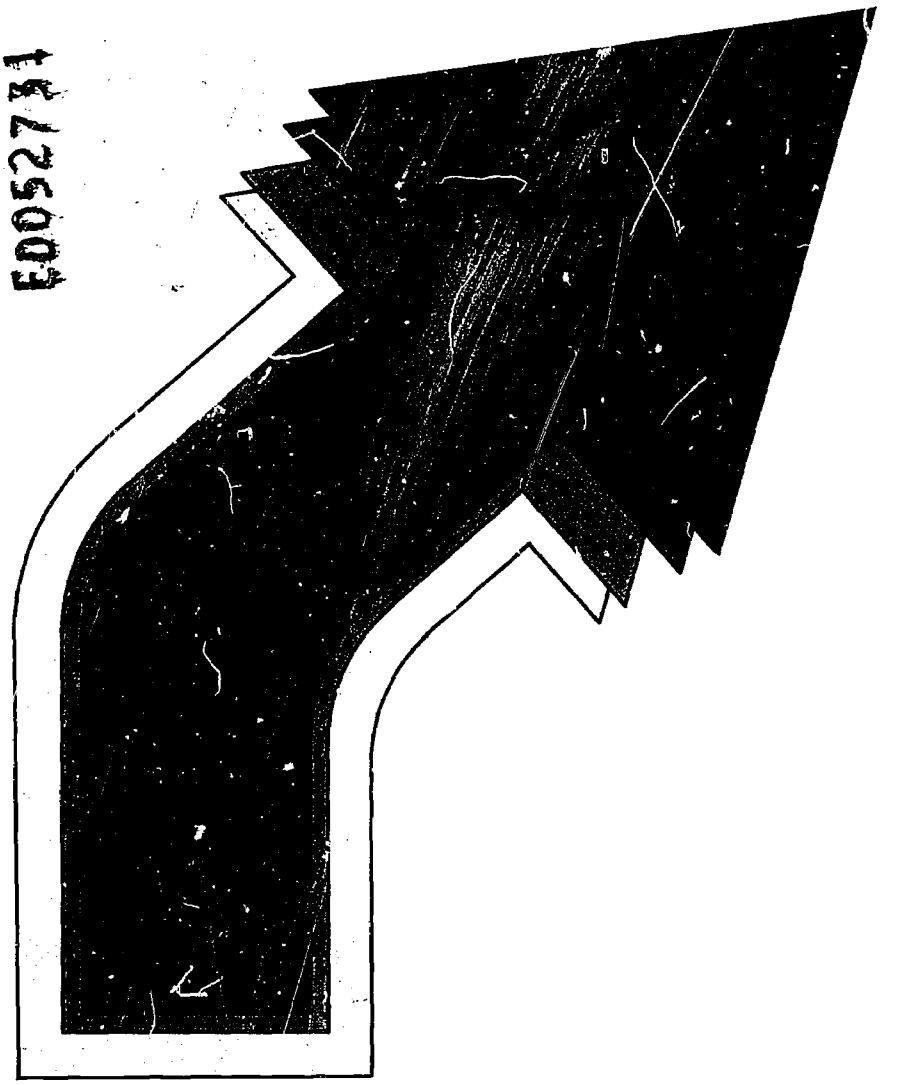
ABSTRACT

This monograph discusses some of the reforms and changes that have taken place in professional schools. Chapter I discusses: (1) the nature and characteristics of professions; (2) the evolution of professional education; (3) the purposes of professional education and some of its persistent problems; and (4) the forces that are pushing for radical change in professional education. Chapter 2 deals with the unresolved issues, including issues of national and social policy and relationships in the professions and between the professional schools and the university, as well as curricular problems. Chapter 3 describes attempted reforms including (1) reforms in undergraduate education, such as curricular changes, calendar changes, changes in the use of the media, and in new interdepartmental approach; (3) flexibility in course requirements; (4) changes in the calendar; (5) new organizational patterns; (6) new clusters of academic units; (7) changed admissions policies; (8) reconsideration of academic degrees; (9) innovations in teaching techniques; (10) the adding of internationalism to the curriculum; and (11) attempts to develop in the student a sense of morality, ethics and professional identity. Chapter 4 deals with models, guidelines and criteria for reform. (AF)



CHANGING PRACTICES IN EDUCATION FOR THE PROFESSIONS

By Lewis B. Mayhew

SREB Research Monograph No. 17

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Stanford University

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FOREWORD

The Southern Regional Education Board owes its origin in good measure to a post World War II concern for sustaining adequate programs of professional and graduate education available to all the people in the Southern states—programs in medicine, dentistry, veterinary medicine and so on. Contractual agreements between state governments, universities and SREB to share such programs were the first examples of interstate cooperation in regional development.

Dr. Lewis B. Mayhew has drawn together materials showing that once again it has been professional programs which have served as models to the entire higher educational enterprise. He traces a significant body of parallel educational reforms which have begun to merge in the curricula of professional schools. Interdisciplinary organization of courses, introduction of the behavioral sciences, emphasis upon international aspects of education—all these may be low-key innovations, but they add up to fundamental changes in education for the professions. Schools of arts and sciences and other components of higher education may well benefit from the pioneering experiences of the professional schools.

This is the fourth in a series of SREB research monographs dealing with the subject of college and university curricula. *The College Curriculum: An Approach to Analysis,* 1966; *Innovation in Collegiate Instruction: Strategies for Change,* 1967; *Contemporary College Students and the Curriculum,* 1969, each by Lewis B. Mayhew, are now out of print but their major contributions are to be incorporated in a forthcoming publication by Lewis B. Mayhew and Patrick J. Ford. I would like to take this opportunity to express the appreciation of the Board to Dr. Mayhew for making this series possible.

WINFRED L. GODWIN, President
Southern Regional Education Board

PREFACE

This effort to perceive common elements in educational reform in professional fields was first stimulated by casual reading of several critiques of professional education. It seemed that critics of legal, medical, theological and engineering education were dealing with similar deficiencies and searching for equally similar means of rectification.

This monograph attempts to test this hypothesis in a preliminary and tentative way: as professional schools and their organizations and spokesmen attempt curricular reform, they experiment with similar methods which in aggregate suggest a new and generally applicable model or pattern. Some professional fields seem to have been particularly active in producing serious and detailed recommendations for change.

Though limited, available evidence is remarkably consistent. The reorganization of one school of agriculture, as a prelude to curricular reorganization along interdisciplinary lines, approximated interdisciplinary efforts in a law school. Placing first year architecture students in an actual descision-making situation was matched by introducing first year medical students to clinical work or placing college freshmen in a teaching situation. Adding anthropology to the experience of social work students was comparable, and for the same reasons, to bringing anthropologists and sociologists into schools of engineering and education.

The reforms described have not yet been tested, so their value is still unknown. However, I found consistency of experimentation in several experiences. After I had completed the first draft of this monograph I visited a school of architecture whose dean, in listing the reforms he was attempting, illustrated—point by point—every type of reform described in the draft. A conference of library educators revealed that there was little activity actually in progress. But the elements considered or recommended were exactly those which experimenting medical schools and law schools were attempting.

This monograph is intended to stimulate further thought about the nature of professional education, curricular reform and closer cooperation between the various professional fields. It is also intended to be of help to professional faculties considering the range of possibilities for reform. And, hopefully, it will stimulate more detailed study of the individual professional fields so that gradually a truly composite picture may emerge.

LEWIS B. MAYHEW

Stanford University
October 1, 1970

TABLE OF CONTENTS

Foreword iii

Preface v

The Professions 1

Unresolved Issues 17

Attempted Reforms 31

Models, Guidelines and Criteria 71

chapter 1

THE PROFESSIONS

Not since 1910 when Abraham Flexner published his report on *Medical Education in the United States and Canada,* and thereby brought about drastic reform in the nation's medical schools, has there been as much need and as great opportunity for reform of professional education generally. The public, practitioners and the professoriat, each in response to different spurs, have pointed out weaknesses and malfunctionings of formal education for both the older professions such as law, medicine and theology, and the emerging professions such as social work, library science, nursing and business. To clarify the opinion and factors forcing curricular reconsideration, we must first delineate the nature of the professions and the traditional purposes of professional education.

Nature of Professions

Not all vocations can or should be considered professions. Nor do all generally accepted professions conform exactly to a theoretical ideal. However, explication of a theoretical ideal points to curricular problems and needs which formal professional education faces. A profession consists of individuals with specialized knowledge obtained through intensive education which allows them to provide esoteric services in a near-monopoly fashion to a public which recognizes and accepts the utility of the monopoly. The nature of the specialized knowledge is not always clear, often being a mixture of practical and theoretical knowledge. Nor do we always clearly understand the ways in which knowledge is best acquired. These factors account in part for the circumstance that in even the most typical of the professions, medicine, an actual monopoly of the right to provide esoteric services does not exist. Teachers, ministers, physicians and employers frequently provide services claimed by counseling psychologists, and police officers and accountants frequently provide some kinds of legal advice and service. And, of course, college professors, trained in scholarship and research, offer the professional service of teaching, for which they have had no specific training, and to which the specialized education they did receive is scantly relevant.

Two other characteristics of a profession are essential, difficult to

describe, and particularly vexing as aims of formal education. The first is a self-generated and maintained set of ethical principles which direct the vocation to serve society and to safeguard the public when it accepts without understanding the advice or service offered. The second characteristic is that members of a profession constitute a group with an ethos of its own that enables the individual practitioner to feel a deep and lifelong commitment to the practices and life-modes of the profession. Both the process of acquiring a set of personal professional ethics and the process by which an individual is acculturated into a subgroup in a complex, radically changing society are exceedingly difficult to bring about or to describe.

Further educational demands occur in American society as various occupational groups try to change themselves or their images by becoming professional to increase status. Insurance salesmen wish to be perceived as giving people expert and objective advice. Librarians evolve an arcane expertise on bibliography, reference and the effects of reading; business managers seek to create a science of management; and psychologists seek, even through legal means, to reserve the title psychologist to members of the clearly ordained professional group.

As members of an occupational group seek professional status, they follow a reasonably consistent course. Detachment is a hallmark of a profession which allows the practitioner to remain objective and not too personally involved in an individual case. This detachment derives from universal or theoretical elements as contrasted with the particular or the immediate. As Hughes writes: "Inside most professions there develops a tacit division of labor between the more theoretical and the more practical; once in a while conflict breaks out over issues related to it. The professional schools may be accused of being too academic. The academics accuse other practitioners of failure to be sufficiently intellectual."[1]

The need for this subdivision leads inexorably to formal educational requirements. Degrees are increased and preparation time expanded before entry into a profession so that the aspirant can obtain the needed theoretical or universal knowledge as well as the practical skills which the public really demands. And since interest in or ability to cope with larger and larger amounts of theoretical knowledge is probably not universal in the American public, established as well as aspiring professional groups compete briskly for recruits to train. Thus a generally accepted, if not always stated, criterion of an occupation's movement into the pale of the profession is how selective the training institutions can be. Nathan M. Pusey, in a highly critical report on theological education for the Episcopal church, complained that the ministry was ceasing to be professional, in part because its schools were forced to accept too large a proportion of applicants having a "C" or poorer record in undergraduate work.[2]

[1]Everett C. Hughes, "Professions", *Daedalus*, Fall 1963, p. 661.
[2]Nathan M. Pusey and Charles L. Taylor, *Ministry for Tommorrow* (New York: The Seabury Press, 1967), p. 71.

Evolution of Professional Education

We can observe the evolutionary process by which occupations become professions and simultaneously create educational and curricular problems in the history of professional education in the United States.

During the American colonial period the colonists at first depended on European-trained lawyers, doctors, and clergy who had emigrated to this country. Later, colonists sent their children back to Europe for training in the three ancient professions. Gradually, however, these two sources proved inadequate, and the American colonists began to fashion indigenous patterns of professional education. At first this was exclusively through apprenticeships, for the colonial colleges lacked faculties of law or medicine, or even genuine professional faculties of theology. Colonial apprentices actually performed professional duties, though relatively unsophisticated. The physician's apprentice washed bottles and mixed drugs, while the lawyer's apprentice copied legal papers and served writs. But they also acquired some theoretical groundings by reading the professional books of those to whom they were apprenticed.

Gradually, however, more stringent educational requirements were established, as in the case of the New York City Bar, which required four years of college and five years of apprenticeship for admission to membership. Some colonial colleges began to create professorships in the professional fields, principally theology and law. While these professorships did not contribute greatly to the late and postcolonial preparation of professionals, their very existence established a seed from which ultimately would flower the full range of professional schools in American colleges and universities.

Still a third trend was expansion of the apprentice system. Practitioners who discovered an interest in or talent for teaching added to the number of apprentices with whom they would work until finally proprietory professional schools evolved and the program became more and more didactic.

Formerly, apprentices had learned empirically by doing. In these new schools they learned through lecture and discussions. And then, of course, came the conversion of lecture notes into textbooks, which removed professional training one more step away from actual experience.

Because of frontier conditions, because these early schools were proprietory (conducted for profit by practitioners who divided their time between practice and lecturing) and because of a growing egalitarian mistrust of experts, the quality of professional education in the United States in the first half of the nineteenth century stayed at a low level of substance and sophistication. However, after the Civil War, profound changes began. Medical research and practice increasingly drew on such sciences as chemistry and biology. Lawyers began to value economic insights, and even in theological schools the newer German modes of scholarship appeared.

This led professional schools to gravitate to where colleges (eventually to become universities) were located, as did the Litchfield Law

School when it moved to New Haven and became part of Yale, and when the College of Physicians and Surgeons in New York City became part of Columbia University. Finally, Harvard and Johns Hopkins established themselves as models for professional education by lifting legal and medical curricula to high intellectual and theoretical levels. With a few institutions producing graduates of high quality, with the impetus to assign professional status to the modest occupations of agriculture, engineering, and home economics which the land-grant institutions provided, and with the coercive power for reform wielded by newly emerging state examining authorities, conditions developed for colleges and universities to enter the formal education of many different kinds of professional workers in a substantial way.[3]

We can currently observe this same process. Originally men became college presidents through public status and recognition in another vocation, for example, the ministry. Then scholars were prepared for college administration through something not unlike the apprentice system, i.e., serving as committee members, committee chairmen, department chairmen, or assistants to administrative officers. Then a few people became interested in the abstract study of higher education and argued that it would be possible to prepare college administrators through formal programs of education. As the number of individuals so involved in the theoretical study of higher education increased, and as the demand for college administrators expanded, an incipient subprofession grew up and struggled first for respectability and then for a well defined theoretical domain that could develop the special knowledge and skills a professional college administrator was presumed to need.

Purposes of Professional Education

As the existence and the legitimacy of professional schools to prepare future members of a profession was accomplished, two overarching aims of professional education came to define the parameters of the curricular problem. Professional education, if it is to justify itself to the society, must attract sufficient entrants to insure an adequate supply of practitioners, and must produce graduates able to discharge the duties of the profession with success.

McGlothlin argues that several principles for professional education are suggested by each of these two aims. From the aim of sufficient quantity:

1. When professional schools obtained a monopoly for qualifying entrants for the professions they also assumed the obligation of supplying enough entrants.
2. Members of the profession and the professional schools must cooperate to assure sufficient numbers of students in the schools.
3. All feasible methods, including reorganization of the ways pro-

[3]This summary is based in part on John S. Brubacher, "The Evolution of Professional Education" in G. Lester Anderson *et al., Education for the Professions,* the Sixty-first Yearbook of the National Society for the Study of Education. (Chicago: University of Chicago Press, 1962), pp. 47-67.

fessional services are provided, should be tried to help offset the shortages which plague the professions and therefore the society which they serve. The place of the professions is seriously threatened by shortages which require society to turn to non-professionals for the services it requires.[4]

And, from the aim of quality, he derives these principles:

1. Professional education should be directed toward significant objectives, including professional competence, understanding of society, ethical behavior and scholarly concern.
2. A professional school should periodically review its procedures and programs and make such modifications as are needed to insure that they are contributing fully to movement toward the objectives.
3. Each of the objectives given above is valid, but professional schools have been more accustomed to emphasizing professional competence than the others. Additional effort should be placed on the other objectives to increase the quality of programs.
4. A program of professional education cannot ignore either the aim of quantity or the aim of quality. It must establish a moving equilibrium between them but it cannot allow quality to drop below an essential minimum.[5]

Persistent Problems in Professional Education

Within American society there has developed a unique method of providing the required professional services. For a number of professions, formal preparation for future practitioners is conducted in professional schools lodged administratively and economically within complex university structures. The apprenticeship system of preparing practitioners has largely disappeared in most of the older professions and is rapidly eradicated as newer vocations seek professional status.

But these professional schools must modify their curricula to cope with some long-existent problems as well as presently emerging ones. The present solid entrenchment of professional education within the national fabric is pointed out by McGlothlin, who argues or predicts six elements for the immediate future:

1. Society's demands for professionally educated persons will continue to increase, but these demands cannot be met without substantial change in professional education programs.
2. The professions as now organized will continue with such modification as occurs coming through evolution rather than through cataclysmic change.
3. Knowledge on which practice of the professions rests will continue to expand.
4. The knowledge and skill required for practice of a profession are too complex to be transmitted by apprenticeship.
5. No one can precisely predict the future life of an individual,

[4]William J. McGlothlin, *The Professional Schools* (New York: The Center for Applied Research, Inc., 1964), p. 22.
[5]*Ibid.*, p. 31.

but his occupation will likely be that for which he obtains professional education. In addition, professional people will be leaders in civic affairs.

6. Professional education can satisfy both occupational and general aims. It can aid students to obtain knowledge and skills required by professional practice, and it can help them to modify their personalities to the end of practice. It can also, either directly or by collaboration with the rest of the university, help students to achieve the aims of professional education.[6]

That sanguine view assumes the solution of a number of problems both in the professions and in professional education itself. The first problem is finding objectives for a profession which are acceptable to its members and to the society the profession serves. Currently, for example, some would contend that the profession of arms has lost its essential validity of purpose. Second, there is the problem of attaining the uniqueness which is so essential for an occupation to qualify as a profession. Uniqueness must come through the educational program that will help those who follow it render a unique service which is substantive rather than purely formal. Yet this uniqueness must not degenerate into social withdrawal, a caste status or special privilege. Third, the professional must win recognition, without which it cannot perform its essential services and without which it cannot select highly qualified potential members. Without recognition, the place of a professional school on a university campus is jeopardized—witness the long struggle of schools of education to be accepted as full academic partners. And without recognition, financial support is hard to acquire and hold.

As professions and professional schools seek recognition, they encounter still another problem—that of standards. Professional service implies service of a special order requiring competence rigorously tested before the professional is permitted to practice. But this raises such knotty questions as, What connection actually exists between educational standards and professional performance standards? There is increasing evidence of a wide gulf between academic standards maintained by the professional schools and the actual standards of performance in successful practice.

This matter of standards or quality, as has been earlier indicated, must be considered conjointly with the problem of supply. Professional schools must seek out and educate enough students to meet demands for service, but they must be students who can profit from the programs of professional schools. In times past, it has been estimated that no more than ten percent of the population has the ability to be educated for professional service. But, as shall be seen, this estimate fails to both meet increased societal needs for more professional people and to take into account newer notions of the nature of potential talent. Since professions and professional schools are human institutions, they are inclined to perpetuate older ways of performance even when the times call for radical change. Hopefully, reform can be orderly, but as the

[6]William J. McGlothlin, *Patterns of Professional Education* (New York: G. P. Putman's Sons, 1960), pp. 231-37.

earlier-cited Flexner study of medical education showed, reform is sometimes so overdue that genuine trauma must occur to produce it. The Flexner study resulted in the elimination of almost half of the medical schools in the country.

A particularly vexing problem for professional education is the place of theory and skill. Professional service requires mastery of a body of knowledge as well as professional craftsmanship. But the question as to which a professional school should emphasize has had almost a pendulum-like quality. Currently there is evidence that a number of professional schools have moved too far in the direction of theory and some reform now represents attempts to moderate that swing.

However, professional schools can and have erred in the direction of overemphasis on practice, ending up with a "how-to-do-it" procedure which limits members in adapting to changed conditions.

A related problem is that of specialization, including the subquestions of how much and at what point preparation for specialization should be undertaken. Once again a pendulum-like trend becomes apparent, with the tendency in one generation for specialization to come early in the education career while in other times specialization occurs much later.

Frequently the professions collectively reveal a conflicting pattern. Thus, at the same time, some engineering educators are arguing for a four-year curriculum of engineering science with specialization either in graduate school or on the job, while medical education, by making the curriculum more flexible, encourages students to begin or at least to anticipate specialization within the first year of their medical school career. The very fact that professional schools are located within universities raises questions of relationships, and these in turn have curricular significance. The definition of a profession as a self-determining collectivity requires considerable autonomy for the professional school. Yet the university has a stake in such things as standards of admissions, qualifications of faculty, and characteristics and expense of curriculum. The matter of conferral of degrees is illustrative. According to a purist view of the autonomy of professions, the professional schools should be able to set graduation requirements and determine when students have achieved these. Yet the university may wish to impose quality control judgments to insure that the product of each associated professional school is at least generally the equal of all others. The curricular involvement of this problem is in establishing proper relationships between the professional schools and the college of liberal arts and its graduate school. The university will generally maintain that a reasonably heavy increment of liberal arts education should be part of the experience of each graduate. Such heavy increments reduce time for purely professional work, and are all too frequently judged inappropriate by professional faculty members when the work in the arts and sciences is offered outside the professional school. This has never been an easy problem but seems more insoluble as liberal arts faculties take on many attributes of professional schools and teach their courses with an ultimate professional aim in mind, which may be antithetical to the professional goals of medicine, law, or home economics. Deeply involved in this

matter is the responsibility of educational institutions to prepare citizen-leaders in the attributes of citizenship, presumably derived from the liberal arts and sciences. The professional school itself has high interest in producing technically competent practitioners, and at times seems to wish to achieve this at the expense of other educational preparation.

Last, the professions and the professional schools must solve problems of relationships with other professions and with the subprofessions. There are jurisdictional matters as to who should prepare public administrators—the graduate school of business or the school of engineering. Some professions are frankly competitive for functions. Psychiatry and clinical psychology are illustrative. As complex human problems requiring professional services become more and more interdisciplinary, the problem of relationships will become more acute. Then, increasingly, professional practice will require the services of many workers trained somewhat differently than the professional person himself. Engineers, architects, dentists, and teachers all require assistance of various sorts. This raises the question as to who should prepare those assistants and whether some professional assistants should be encouraged ultimately to seek full professional recognition. This matter seems particularly acute in nursing, which now views itself as a profession, although its practitioners are typically used at the discretion of and for the service of the medical profession. Involved in these relationships is the matter of continuing professional education—who should provide it and how should it be financed? Given the rapid expansion of relevant knowledge for the professions, it seems axiomatic that continuing education is essential. Yet few institutions within the university structure have been able to institutionalize continuing education in all professional fields requiring it.[7]

Forces for Change

Assuming that these perennial problems could be solved, there would still be powerful forces for radical change in professional education. First, it has become apparent that a society as complex as that of the United States must establish national goals for at least a decade in advance if it is going to produce the sort of life its people want. Consider the sixteen national fields for which various agencies have helped to articulate goals:

1. Agriculture
2. Area Redevelopment
3. Consumer Expenditures
4. Education
5. Health
6. Housing
7. International Aid
8. Manpower Retraining
9. National Defense
10. Natural Resources
11. Private Plant and Equipment
12. Research and Development
13. Social Welfare
14. Space
15. Transportation
16. Urban Development

[7]This discussion of problems is based on G. Lester Anderson, "Professional Status and Continuing Problems," in G. Lester Anderson *et. al., Education for the Professions,* pp. 14-24.

Lecht finds that "not enough manpower will be available in the next decade if the American people and their government try to achieve simultaneously all standards that knowledgeable people regard as desirable and reasonable in the various areas identified as national goals."[8]

But even assuming that the manpower were available, the professional schools seem presently unable to create the requisite educational programs to prepare high-level personnel to grapple with these interdisciplinary and interfield problems. Institutions are now struggling to deal with the proper allocation of natural resources and healthy urban development, but as yet no means to solve either has been agreed on. During the 1960s the educational establishment was able to produce the workers needed for achievements in space, but the retraining and redeploying of some of those workers during the 1970s poses a serious administrative and curricular problem.

One of the basic assumptions on which the whole edifice of formal professional education is based is that individuals with potential for professional work can be identified, and that the work offered in the professional schools assures successful professional performance. Yet this assumption has recently come into serious question.

Selection into professional schools has been largely based on intelligence or academic aptitude in the hope that the more intelligent would be the more creative. MacKinnon and others, however, have found little relationship between intelligence and creative achievement. Says MacKinnon:

> As for the relation between intelligence and creativity, save for the mathematicians where there is a low positive correlation between intelligence and the level of creativeness, we have found within our creative samples essentially zero relationship between the two variables, and this is not due to a narrow restriction in the range of intelligence. Among creative architects who have a mean score of 113 on the Terman Concept Mastery Test, individual scores range widely from 39 to 179. Yet scores on this measure of intelligence correlate negatively, -.08, with rated creativity. Over the whole range of intelligence and creativity there is, of course, a positive relationship between the two variables. No feebleminded subjects have shown up in any of our creative groups. It is clear, however, that above a certain required minimum level of intelligence which varies from field to field, and in some instances may be surprisingly low, being more intelligent does not guarantee a corresponding increase in creativeness. It just is not true that the more intelligent person is necessarily the more creative one.[9]

Successful performance in schools and colleges, including professional ones, has historically been indicated by grades, on the assumption that success in courses was predictive of successful performance at work. But this also has come into question. Hoyt generalizes after a careful review of most of the available studies of the relationship be-

[8]Leonard A. Lecht, *Manpower Needs for National Goals in the 1970s* (New York: Frederick A. Praeger, 1969).

[9]Donald W. MacKinnon, "The Nature and Nurture of Creative Talent," in Dael Wolfle *Discovery of Talent* (Cambridge: Harvard University Press, 1969), pp. 192-93.

tween college success to postcollege accomplishment that "we can safely conclude that college grades have no more than a very modest correlation with adult success, no matter how defined. Refinements in experimental methodology are extremely unlikely to alter that generalization. At best they may determine some of the conditions under which a low positive rather than a zero correlation is obtained."[10]

And Ivor Berg reinforces this point in an elaborate study of education and job performance in a number of vocations ranging from unskilled, blue-collar to professional and managerial. He finds that by and large relationships are positively minimal or slightly negative between job performance and length and level of education.[11] If such studies are further validated, professional schools, if they are to continue to warrant the support and regard they have achieved in the past, will be forced into radical revision of the entire process of education, beginning with techniques of admissions and extending to organization of courses and requirements for graduation.

The third force pressuring professional education to change is the insistent demand on the part of the Negro and other culturally deprived minority groups for a fair share of the American society. For all education, but especially for professional education, this poses several distinct problems. The overall cultural and health deprivation in which the large majority of the Negro population has been reared has not provided the training and experience needed to successfully survive professional curricula as presently offered. Negro youth was typically not motivated to seek professional education; hence for years professional schools did not feel obligated to make specific provisions for students with less than adequate backgrounds.

Now, however, with a new social ethos which requires professional schools to increase radically the proportion of Negro youth admitted, the issue appears poignantly.

However, even if the difficult matters of admissions, remedial work, financial support and subsequent entry into the professions were solved, we would have to accommodate still another vexation. Historically, professional schools have evolved in the United States in consonance with Western civilization and, indeed frequently, even more narrowly in consonance with white Anglo-Saxon Protestant values. The emerging black community questing for an education, including a professional education, which is derivative from their own black cultural experience, has placed demands difficult and perhaps impossible to meet in 1970. The argument and the challenge is eloquently put by the LeMelles who remark:

> The unprecedented prospect for progressive change in higher education for the black American over the next decade should not obscure the magnitude of the problem. Reorientation of an entire education subsystem cannot be achieved without painful frustra-

[10]Donald P. Hoyt, *The Relationship Between College Grades and Adult Achievement: A Review of the Literature* (Iowa City: American College Testing Program, 1965), p. 45.
[11]Ivor Berg, *Education and Jobs: The Great Training Robbery* (New York: Frederick A. Praeger, Inc., 1970).

> tions and some agony. To obtain genuine and lasting results radically creative steps will have to be taken to give new direction and to compensate both quantitatively and qualitatively for past deficiencies. New leadership and the input of major resources will not suffice to permit the black colleges to attain their true objectives. The tutelary approach to education, which resulted from the worst influences conspiring to miseducate black youth and which has generally characterized a significant segment of traditional Negro educational leadership, is no longer tenable, and more of the same would undoubtedly be disastrous. The fallacy of the mere application of large sums of money to correct complex problems, without fully understanding how such funds should be applied, has been lamentably illustrated in the recently lost war on poverty. The kind of leadership that will perform the innovative role that black higher education needs must be distinctly different from that leadership of the past which accepted the limitations placed upon the status of black Americans. It is for this reason that this book insists that a black educational leadership, distinctly different in its ideals, in its perception of the status of black Americans, and in its willingness to provide new directions, is alone capable of exercising such high responsibility at this critical juncture in the destiny of black America.[12]

A related force which demands change in professional curricula must be mentioned although we have yet to comprehend fully its true significance. This is the tidal wave of student dissent, protest, and unrest which characterized American college campuses from 1964 to 1970. The student cry for greater relevance in the curriculum would apparently have implications for the professional schools. But this implication is tempered by the frequently observed phenomenon that protesting students typically came from the nonprofessional schools, especially from the humanities and social sciences, and that the greatest support for existing institutional practices came from such professional fields as medicine, engineering, business and law.

Perhaps the complexity of this matter as well as the potential long-term importance to professional education of student protest may be illustrated by a student strike at Stanford University called in protest over punishment imposed on a small group of students. Eventually, the issue was presented for vote to the full Academic Council of the University on whether or not a kind of amnesty should be accorded the students. The faculty of humanities and sciences and the faculty of the medical school gave a strong Yes vote. The No votes (in effect denying the validity of student protest) came from the remaining professional schools. The total voting pattern might be explained by factors unique to Stanford University, but they might also have broader significance.

Stanford's meteoric rise into the elite of American Universities came about largely through the success of its professional schools. The engineering and business schools affiliated closely with West-Coast business and industry and acquired financial power and influence. The law school has always somewhat segregated itself from the rest of the university system but has kept clear power relationships with the central admin-

[12]Tilden J. LeMelle and Wilburt LeMelle, *The Black College: A Strategy for Relevancy* (New York: Frederick A. Praeger, Inc., 1969), pp. 15 and 16.

istration. The School of Education is considered one of the finest in the country, and it also has gained prestige and influence through close ties with practitioners in the field. The medical school vote as the amnesty issue was almost an aberration. Since it moved from San Francisco to the Palo Alto campus it has been highly innovative and has encouraged students to work in other areas of the university. The faculty has expressed concern with the political and social life of the nation, and both faculty and students participate in a culture closer to that of the social sciences and humanities graduate students than one finds in other medical schools. In general, the professional schools at Stanford have been task-oriented and their faculties generally distrustful of the broad amorphous yearnings of protesting students lodged in the school of humanities and sciences. The Stanford experience suggests that professional schools and their students were somewhat immune to the demands of protesting students, and it seems likely that student demands will be much less forceful in those schools where they feel their needs are being accommodated. However, the facts that student protests have become so pervasive, that students are now included in policy-making bodies of professional as well as liberal arts schools, and that student protest is finally focusing on curricular matters and on university preoccupation with training for a distrusted establishment suggest that what they have to say will eventually force consideration of professional curricula.

Among the recognized forces driving professional schools to reform is the technological revolution and the exponential increase in knowledge or relevant information. While the manifestations of these are legion, the successful attempts of professional fields to respond are few. Simple expansion of the time required for professional preparation is no solution, as medicine and engineering have discovered. As fast as knowledge is produced today, a student would require a lifetime for even partial coverage. Nor is ever and ever more refined specialization the answer. Both the professions and the society need generalists and specialists who can understand the contributions of other specialties.

Thus, professional schools must search for new ways of organizing information so that students can perceive broad dimensions and develop skills to acquire special knowledge when necessary in the future. They must discover patterns which will provide some general common preparation, time for specialization and time to find relationships with other specialties. They must also discover ways of preparing new sorts of generalists such as doctors' assistants or nurses turned general practitioners who can provide service or appropriate referral to patients. And they must find efficient ways of introducing to the curriculum pertinent knowledge previously unknown or considered esoteric: the vast majority of drugs in use in 1970 were unknown in 1940; social and psychological side effects from freeway systems were unsuspected at the end of World War II; agriculturists, who in the first half of the twentieth century focused attention on United States farm problems, have had to acquire foreign languages to meet their responsibilities in solving the worldwide food crisis.

The technological revolution has produced an array of problems which require both professional attention and technical aids to solve

them. And professional students must learn both, in addition to much previously found to be necessary. Consider these obvious examples: legal questions involving noise from jet aircraft; quick reproduction of printed material; easily used devices for recording sound or sight from a distance; the concept of a fair trial in a time of instant communication through television; medical problems from pollution of the environment and radioactive fallout; physical reactions to intensified noise; agricultural problems from DDT and other pesticides; the end of the family farm; architectural problems produced by new highway systems which create suburbs but ruin the central city; new systems of transportation, such as the superjet airline—all of which require entirely new knowledge and insights in a changed curriculum.

Then consider these obvious devices for professional practice, only recently available, which require detailed training in their use: television as an instructional tool, the computer as a medical diagnostic device, electronic storage and retrieval systems for knowledge, techniques of modular construction or systems analysis for building highly complex instruments such as atomic-powered ships or spacecraft.

These are here and the curriculum demands are large. But the demands from the logical expansion of the technology in the future are enormous: new sources of power, applications of lasers, worldwide use of high altitude cameras, breaking the genetic code, three-dimensional photography, automation and cybernation in management, control of weather or capability to choose the sex of unborn children. All of these and more must be given curricular attention.

Such advances as those in the technology and the increase in knowledge, as well as other changes in social structure, call for greater professional services which older ways of training people cannot meet. A change in political posture regarding human welfare results in a drastic increase in need for social workers beyond the capacity of existing schools. Concentration of the majority of people in urban areas attracts professional workers, but leaves other regions undersupplied but with increasing expectations for professional services. The schools must somehow persuade and prepare people to work in the ghettos, rural areas and small towns. The possibility of ultimately eliminating tooth decay means that dental workers, while able to fill cavities, also must be ready for still unknown dental services.

Many of these changes invoke criticisms of professional education as it has been practiced during the first half of the twentieth century. Medical schools, aided by federal grants, are said to have become so preoccupied with research as to contribute seriously to a general decline of medical care in the United States. Law schools have not prepared their students to deal with the revolutionary age of post-World War II society. Schools of education have not produced teachers able to cope effectively with universal education. Engineering schools, through emphasis on theory and research, are accused of contributing to a general decline in the relative worldwide industrial position of the United States.

There are differences in professional preparation for different fields. Medicine and law have been graduate, while education, architecture and engineering have been undergraduate education. Journalism offered a

larger element of the liberal arts than did forestry. Medicine, dentistry and nursing based much of their curriculum on clinical practice. Education and business provided but little applied practice in the curriculum, assuming that students would receive those experiences on the job.

Reflecting a basic pragmatism in American character, professional education in the past has been highly practical. Professional schools were created to produce practitioners, and students enrolled in them to prepare for work. There was little in the ethos of professional education to suggest a learned profession of intellectuals. Also uniquely American was the notion of producing a uniform, standardized professional person through a series of required courses presumed to bring about the qualities the profession itself required. These two beliefs brought about a highly prescribed curriculum stressing more application than theory, with little or no time in the curriculum for any liberalizing subjects. If the faculties thought at all about the matter, they felt that such luxuries as work in the liberal arts and sciences could be provided by a separate faculty in the undergraduate school.

Generally, while professional faculties granted that some basis of broader, theoretical or contextual subjects was necessary, this was interpreted narrowly. Thus premedical education should consist of organic and inorganic chemistry, comparative anatomy, German and zoology. The engineering context consisted of not much more than chemistry, physics and mathematics, while prelaw students were encouraged to major in either history or political science or both.

As each new professional field joined the university it aimed to achieve high prestige there by being as highly selective of students as the market would allow, as rigorous and demanding as the ability of the students would tolerate, and as jealous of the time of the students as university regulations would permit. There was a definite hierarchy of professional schools with those at the top unwilling to risk contamination with those at the bottom. Thus medicine and law presume themselves to be the aristocrats while education, nursing and home economics are pure plebian.

Consistent with the American system, professional schools placed their main emphasis on formally organized courses, which were professor-centered and based upon the disciplinary treatment of a textbook. While it has gradually become obvious that specialization was the rule in professional practice, in professional schools the textbook core of required courses seemed to presume a common professional career for all graduates.

The curriculum was compartmentalized in time. Preprofessional and general education were first, then basic science and theory and applied courses. When that was out of the way, students were presumed to know enough for some actual experience either in school or on the job. The possibility that these elements of study and experience might be mixed was not a popular idea, and in several fields is still not well regarded.

Reforms in professional education, current knowledge of developmental needs of students and prevailing curriculum theory all support

a new attitude toward the curricula of professional schools. A psychological rather than a logical structure seems desirable.

Ideally a new student in a professional field needs some direct guidance as to the nature of the field, some early practice in the field and the opportunity to select for himself a concentration and a way to achieve it. This does not mean any reduction in essential basic theory or science. But it does suggest a different ordering of such work and in differing proportions. And it also dictates a reduction in the sheer amount of material previously held to be essential. Much of the rationale for intensive prescription was the belief that all professional students should first of all be prepared as generalists. Since such a belief is contrary both to reality and to what students perceive as reality, a freer system is appropriate. Once students have accustomed themselves to professional study, their own experience will order an essential structure. This, of course, has been the process for the successful experimental undergraduate colleges in the past. And it seems realistic for professional schools as well.

If this new free elective system is honestly put into effect and the full resources of the university made available to professional students, several results can be expected. A smaller full time faculty could accommodate a larger number of students by exploiting opportunities throughout the university. The Stanford School of Education enjoys a high reputation and a high productivity with a relatively small faculty. Its students are literally forced to do considerable work outside the school. And the newly established freedom of election makes this possible. As students seek insights from different fields, a natural approach to interdisciplinary work could evolve which could then bring professors from the various fields into greater concert.

Also, relevancy can be achieved through practice. Many professional schools have drifted away from reality just as the arts and sciences have become excessively academic. As a general rule the various elements of the curriculum—arts and sciences, professional arts and application—should focus on actual practice. This clearly means that a change from a preoccupation with basic research in professional schools is necessary, and that even those students who will proceed to research careers will first have a grounding in practice.

At times those in professional schools may be forced to confront colleagues in the sciences and arts with a demand to direct their work to meet the needs of professional students. When faculties in the arts and sciences will not yield, of course, the professional schools will be forced to the more expensive expedient of becoming mini-universities as they offer courses which recognize the validity of application. But the thrust of student and social pressure in the 1970s in such that all elements of the university are likely to become more sensitive to real human problems, including needs of the professional schools.

From the two elements of psychological structuring of materials and experiencing of reality comes the third reform, focusing on problems in an eclectic or interdisciplinary way. Thus the professional curriculum increasingly should insure that real problems in the profession are presented early and that student search for solution be many-faceted. Rather than

deferring student consideration of real problems until late in his academic career, we should confront him with them as he enters professional school and force him to grapple with them throughout his program. Problem solving is by its very nature interdisciplinary; to focus on problems means that the curriculum will be interdisciplinary.

chapter 2

UNRESOLVED ISSUES

Problems of Policy and Relationships

Issues of national and social policy and relationships in the professions are particularly pressing. First, there is the matter of social need and numbers of professionals. A major argument for the great expansion of higher education in the United States since the end of World War II has been the claim that a technological society needed the trained manpower which only education could produce. And the argument is even more impressive with respect to the professions. A society with increasing expectations of health, education and welfare service requires more and more doctors, nurses, teachers and social workers, and looks to professional schools to provide them.

But this simple-sounding aphorism conceals unanswered questions. We must know how many doctors and nurses we really need. In the medical fields, is there really a shortage, or is there widespread misuse or inappropriate deployment of existing professional talent? But knowing needs of the immediate future is not enough. What are the likely needs for people in the several professions ten and twenty years ahead? The professional schools must begin now to train them. The potentialities for error, of course, are enormous, because of rapidly changing social and economic conditions. Engineers, once in oversupply, became a scarce commodity, only to reappear in oversupply-all within two decades. The 1960s began with a presumed critical shortage of teachers, while a decade later, highly qualified Ph.Ds search for jobs even vaguely related to their training.

Quality also is important, and the ways in which professional schools develop quality. Will quality of medical doctors be diluted if the size of entering classes is increased, if styles of instruction are changed, if the proportion of basic science is modified, or if admissions standards are lowered? If a serious shortage of professional workers develops due to a change in national policy, as when federal welfare programs increased the demand for social work specialists, should long-maintained degree requirements be modified to accelerate the production of needed workers? If more and better prepared professionals are needed, are institutions justified in experimenting with new instructional devices which

might make training more efficient? To what extent should the professional schools in the United States concern themselves with the production of or utilization of foreign professionals? And if they should, how should they modify their curricula appropriately? There seems general agreement that more of all sorts of professionals will be needed, but there is very little agreement about questions of standards and training.

A second broad issue for education is the changing nature of professional work. As described in Chapter I, there are some generally accepted characteristics of a profession which have dictated the form and substance of training programs. There is a systematized body of general knowledge related to the profession which entitles it to be regarded as a learned profession. Thus the professional school does more than develop technical competencies. However, each profession does use an accepted and unique set of standardized procedures for practice; hence the school must develop skill in using those. The professions' claim to provide unique and specialized services is based ultimately on the public's acceptance of their authority. Once a profession has gained this acceptance, it is jealous of newer groups of people seeking professional status in kindred fields.

Professional education thus must help maintain public acceptance of existing professions but must also, on occasion, find ways of training new professions. Medical schools, for example, seek ways of training nurses and doctors' assistants to replace general practitioner doctors and law schools to train nonlawyer legal specialists. Then, as new professions become established, their rights are safeguarded, not just by public acceptance, but by licensing as well. And professional schools must give students the knowledge and ability to pass required examinations. Professions govern themselves through codes of ethics, protect themselves and try to increase their effectiveness through professional associations that influence professional education. Then, too, professions have a well recognized system of regards, both monetary and symbolic, which glorify good practice.

The prototype of such a professional person is the medical doctor engaged in private practice. Much of the education of the other professions has been designed to produce people who approximate the medical ideal in service and prestige. However, changes in actual professional practice tend to modify the ideal, and education must prepare people for these changed conditions. At present, this is not the case.

A vast majority of professional people are employees, not practitioners, dealing with individual clients. Thus, as organizational men and women, they owe little loyalty to their client. Professions find it harder to discipline their members because of the wide variety of subspecialties which have emerged, each with its own demands for training and its own esoteric language which shuts each off from the parent profession and other subspecialties. Thus the professional schools which once could offer a general core curriculum must now offer many different curricula during a period of uncertainty as to appropriate content.

There is some evidence that until recently the learned aspects of the professions were de-emphasized in favor of technical skill. Much

of the reform movement in professional education aims to rectify that condition of emphasis on skill even over the objections of the profession itself. Also, there is evidence of a steady commercialization of professional practice. Previously, professions maintained an Olympian posture of placing the needs of clients ahead of all other considerations. Ethical questions were easily resolved according to that posture. As more and more professionals have descended from Olympus to the market place, the professional schools must now consider new and better ways to socialize new members.[1]

There are three other unsettled issues involving the relationship of professions to the professional schools, each of which entails curricula.

First is the question of content. While there is general agreement that the professional school should prepare future practitioners, there is friction over what the content should be. If the school becomes too academic it alienates the profession; but if it swings too far in the direction of application, it jeopardizes its reputation with other academics and with prospective students. If the professional school conforms too closely to the requirements of specialized accreditation (which is the sanction of a profession) it puts itself at odds with its own university relationships and student demands for curricular relevance. However, to ignore accrediting bodies could jeopardize ultimate success of its graduates.

Second, there is tension over the role of the professional school as innovator within the profession. The mythology of higher education holds the university to be a critic of society and an agent of social change. However, it has not generally been so, nor have its professional schools helped change professional practice. Save for a very few, professional schools have been content to codify and pass on conventional lore to insure that their graduates are fully accepted within the profession and by the licensing agencies. But at times reformation is essential and the professional school must risk even the wrath of the profession.

Third, there is difference of opinion as to who should be a faculty member in a professional school. For example: Stanford University School of Education is research-oriented, so when it searched for a professor of junior college education, it wanted a publishing scholar. None could be found within the ranks of junior college administrators, so a publishing scholar who had had minimal contact with a private junior college was appointed. For this, key leaders among California junior college presidents attempted to boycott the Stanford program in junior college administration, and even tried to jeopardize funds for the program. Very likely the trend is away from appointing practitioners to professional posts, but as it continues new devices, such as practical internships for young professors, will be necessary to link the practicing professional to the professional school.

There are also unsolved and almost overpowering problems in the

[1]This series of points is based on T. Keith Glennan, ed., *The Professional School and World Affairs* (Albuquerque: The University of New Mexico Press, 1967), pp. 374-79.

relationship of professional schools to the university. The magnitude of these is revealed in a study of engineering at UCLA.

> Let us consider the dilemma of the modern professional school. During the late 1800s and the first part of the 1900s, the role of the professional school in the American University was quite clear. The Morrill Act, establishing the land-grant colleges, was written over a hundred years ago and had no European counterpart. Before World War I, the United States imported most of its technology and science. As a result of World War I, the American industrial plant was established, but the U.S. continued as a substantial importer of science. With the advent of World War II, the U.S. industrial plant was extended and a new era of scientific investigation began. The National Science Foundation was established shortly after World War II, mainly to improve the quality of the nation's science and mathematics. This admirable institution has conducted its affairs with vision and awareness of the long-term interests of the country. Unfortunately, the prestige and financial power of the NSF, together with the public preoccupation with science, have severely warped the very fabric of the American university.
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> At a time when American technology and professional management were being recognized throughout the world, a counter-trend was developing in the U.S. universities. The visible signs of achievement and national recognition afforded by a National Science Foundation grant became irresistible on the campus. The warming flow of prestige, graduate students, and promotions that accompanied the flood of science money found no natural enemy to maintain the normal balance in the academic jungle.
>
> The voice of the scientist found reverent audiences. Support for the humanities withered. Before long, the professional schools began to seek ways of adapting to their new environment. Some engineering schools courted respectability by dropping their engineering titles and calling themselves schools of "applied science." The engineering societies coined the euphemism "engineering sciences" to describe engineering courses. Some professional colleges felt that acceptability in the scientific community could be achieved by eliminating undergraduate studies and becoming professional graduate schools similar to medicine and law. All of the professions were affected by the changing times. Medicine itself was experiencing new problems. Medical doctors who engaged in clinical research and teaching have become difficult to appoint and promote, although the new academic norms readily recognize and reward the life scientist on the same staff.
>
> The pressures upon the personnel of the professional colleges have become overpowering. The flight from teaching is well documented, and the effects upon both undergraduate and graduate programs have been accumulating. It is easier to teach a mathematics or a science course than a professional course with open-ended problems. It is easier to concentrate in a specialized scientific area than to undertake the solution of substantial professional problems with a slower paper production rate. The young assistant professor has little choice. Faced with the perils of "publish or perish," only the foolhardy will assume a professional stance.
>
> Professors, like all other living organisms, tend to replicate them-

selves. One cannot expect a young professor who has gone directly from his Ph.D. to teaching without any professional experience to produce anything other than a Ph.D. with little understanding of the profession in which he has little desire to practice. The inbreeding consequences of the past two decades have influenced the professional curriculum. In engineering, for example, the undergraduate mathematics and science courses have received a long-overdue renovation and modernization. On the other hand, the older, empirically based engineering subjects have been discarded and too often have not been replaced with a modern professional stem.

The long-term consequence for the professions is evident, for it is apparent that the professional schools cannot play the pure science game and survive. Nor is survival of a school for its own sake important. If the professional schools have nothing more to teach than science or mathematics or even the humanities, it is doubtful that they can do a better job than the respective schools of science, mathematics, or humanities. If engineering colleges have nothing more to offer than science and mathematics, or if there is nothing distinctive about any of their courses, if there is no professional design stem, then the engineering school can never hope to be anything other than a second-rate school of science. Neither a change of title nor a retreat to the graduate school could hide the inferior quality or the lack of purpose and prevent the profession's ultimate departure from first-rate universities.

The *raison d'être* of a professional school is not easily found in course content. On the contrary, the curriculum reflects the faculty's interpretation of the school's missions. An investigation of the role and function of the professions in the university and in society tried to determine the distinguishing features the professions had in common and to examine in detail the differences between the professions on the one hand and the sciences and the humanities on the other. The question was posed, "Is education for the professions an anachronism that should be retired?" Within the university, the separate existence of the professional schools cannot be justified on the basis of the search for truth. The professions can draw support only from the American tradition of service to the community.

Collectively, the professions occupy a unique position in society. Their function can be characterized by the one word—responsibility. Responsibility calls for training and judgment. Society often attempts to insure levels of professional competence by specifying education minima, requiring examinations and issuing professional licenses. The special competence often demanded of the professional man is a measure of society's dependence upon professional decisions, for the world of the professional is a decision-making arena. Society expects action from the professional. No matter how imperfect his tools or understanding, the problems he faces cannot be avoided; they demand solution. It is an overriding characteristic of the professions that decisions must be made in the face of incomplete knowledge and with a finite probability of failure. At the same time, the professional very often carries an attendant moral, legal, or ethical responsibility for his decisions. It seems only reasonable, then to assume that the prime responsibility of the professional school must be the preparation of men who will

understand and discharge the obligations of the profession. It is obvious that this entails the design of educational programs that offer preparation for a life of action and responsible decision-making.[2]

Curricular Issues

Specific curricular issues are closely interrelated, so that we cannot order issues according to importance.

High among the issues is the question of whether the professional school should concentrate on either preparing for initial job competence or providing students with a broad base of principles to facilitate long-range growth and development. This question seems especially critical in such fields as engineering, nursing, and law. Particularly as associate of arts degree programs in nursing have begun to produce on-line nurses, the institutions granting bachelor's degrees have moved in the direction of training supervisory nurses and nursing administrators. But if the time is spent on organizational theory, personnel psychology and theory of management, the program may not develop the high technical competence the young nurse needs in her first position.

Similarly, in engineering the rationale for undergraduate programs to stress broad engineering science, together with the humanities and social sciences, is to provide a base upon which long and constantly changing engineering careers can be built. But such a curriculum may fail to meet the expectations of first employers that the men they hire function effectively soon after starting to work. And, of course, young lawyers have long complained that their legal education, grounded in case work and precedent, does not provide the skills to draw a will, plead a case or counsel with a client.

Schools of education have been vexed by the same problem in their programs to prepare administrators who are expected to become superintendents or prinicipals upon receipt of their advanced degrees or supervisory credentials. They do need to know the education code of the state in which they will work, how to prepare and administer a budget, and how to approach a bond election. But if the school spends much time on such matters, time is unavailable for work in basic economics, political science or philosophy—subjects which could contribute to the broader vision the future educational statesman needs.

The attempted reforms display just how central this issue is, and how mixed the schools are regarding the matter. On the one hand the stress on basic science and theory and on the social sciences seems to have the ultimate objective in mind. On the other hand, the re-emphasis on clinical and field work, and the creation of problems courses for specific technical solutions seems to stress the immediate needs of students to identify with the profession and to feel comfortable in its practice.

This issue, of course, is just a reformulation of the problem of balance within the professional curricula. McGlothlin has characterized professional education as consisting of three parts: (1) the basic arts

[2]Allen B. Rosenstein. *A Study of Progression and Professional Education* (Los Angeles: University of California, 1969), Vol. II, pp. 6-8.

and sciences, (2) the professional sciences, and (3) application.[3] But he offers little help; nor do the actual practices of the various professions provide guidelines of proportion. Architecture, for example, devotes 12 percent to arts and sciences and 88 percent to professional sciences. Business generally seems to devote 40 percent to the arts and sciences and 60 percent to professional sciences, while social work education, including undergraduate work, gives two-thirds to the arts and sciences and one-third divided evenly between professional sciences and application.[4] But even such figures are misleading and provide little help in resolving the issue. McGrath and others have shown that what the arts and sciences professional faculty members most desire for students are really the basic sciences for professional work (biological sciences for agriculture and medicine, and social and historical sciences for law and social work.)[5]

A direction of resolution seems to be emerging from curricular reform, although there are countercurrents to it.

There is a tendency to assume more and more graduate work in the professional fields (business, education, architecture) and at the same time to relax admissions requirements so that a variety of undergraduate preparations are judged acceptable (medicine, social work and law). This development allows the undergraduate to concentrate on a broader range of the arts and sciences (if their faculties concur). However, at the same time, the countertendencies in medicine and law to accept students with less than a bachelor's degree would have the reverse effect on the proportion of time devoted to the arts and sciences.

There are also countertendencies regarding the balance between professional sciences and application. The increase in clinical or field experience suggests that some professional schools are training in applications, which once was left to the profession itself or to postgraduate training, at the expense of more work in the professional sciences. But engineering has built up engineering science and reduced applied courses which really substitute for clinical experience.

Part of the confusion surrounding this matter of balance stems from the fact that in so many of the professions the responsibility for each of the three types of preparation rests with a different agency accountable only to itself. Thus the exclusively professional graduate schools (medicine, law, dentistry and—increasingly—business) assume that the undergraduate college will provide appropriate courses and programs for the arts and sciences components, but they have no direct control over actual provision of courses. And even in the undergraduate or mixed professional fields (engineering, education, nursing) separate faculties offer the arts and sciences courses, over which the professional school has virtually no direct control. Since the faculties of liberal arts colleges (both within and separate from universities) are themselves becoming more professionalized and organize their courses to conform to their own

[3]McGlothlin, *The Professional Schools*, p. 36.
[4]*Ibid.*, p. 38.
[5]Earl J. McGrath, Paul L. Dressel, and Lewis B. Mayhew, *The Liberal Arts as Viewed by Faculty Members in Professional Schools* (New York: Teachers College, 1959).

professional goals, the possibility of a seamless educational program for professional work is remote.

Curriculum theory implied by a number of attempted reforms suggests that professional students should, for example, receive training in the social and behavioral sciences the better to comprehend their future professional practice. But if social and behavioral scientists see as their chief mission the teaching of professional science for future psychologists or sociologists, the assumptions of the professional faculties will be invalidated.

Then, too, in some professions, training in application is either done in any agency different from the professional school, or a different agency is responsible for required standards of performance and certification. Engineering, education, theology, law and, to some extent, business assume that training in application will, for the most part, be given elsewhere. In law, medicine and dentistry, state licensing and certification boards set examination and experience standards without much regard for what the professional school might wish to teach or be able to teach most effectively.

In general, the professional schools know that they must teach broad principles and concepts because there is not time to offer all or even a small part of the specific information which the competent practitioner should command. But without some voice over what the undergraduate college or liberal arts departments will offer, or what competencies employers or certifying agencies will except, and which can be developed later, professional curricular revision must take place almost in a vacuum.

It is this problem which gives an air of unreality to a number of attempted innovations. Saying that ethical development is important and that the humanities should have something germane to contribute merely restates the problem. If the professional school does not rely on the undergraduate college, then it must rectify the deficiency itself with a consequent reduction of time for developing more practical skills and a firmer grasp of professional science.

The desire to bring professional schools closer to the university and the few attempts to restructure the university, as well as the decided interest in interdisciplinary and interdepartmental courses, seem designed to bridge the gap between education in arts and sciences and the professional sciences. If faculties of law, medicine, and engineering accept the concept of professional education as an all-university concern, (of course, some will not wish to lose their traditional independence through such a concept) they may be in a better position to influence, or at least know about, an important segment of the education of their students. If professional faculty members and humanities faculty members join in offering interdepartmental courses, a few of the fissures might be closed. As to the other end of the problem—providing practical experience—the tendency seems to be to intensify practice both early and late in the professional school itself, regardless of the cost in time from other important matters.

A troublesome issue in the graduate professional schools is how to train both future research workers and future practitioners in the same school with the same faculty. Graduate schools of education face this problem acutely. Schools of education in large, established universities were created to produce practitioners—teachers, administrators, specialists. But as it became apparent that the practice of education might be improved with a broader research base, and as schools of education struggled for respectability within the university, they tried to add theory and research approaches to their curricula.

The needs of a future professor of educational psychology and a future associate superintendent differ considerably. The one probably should be able to consume research findings without the ability to do research, while the other needs both skills. Similarly, the man who can show, out of vast professional experience, capacities needed by a superintendent is not the person who has spent his career learning and using the skills of rigorous scientific inquiry. Now, a few schools have begun to add faculty members who are trained and experienced in one of the research disciplines which are relevant to the professional school: economists to schools of education, sociologists to schools of law, behavioral psychologists to schools of medicine.

But immediately problems of academic citizenship, influence and general orientation of the school arise. If a few social scientists are appointed to a law school, they may be regarded as second-class citizens in the law school; at the same time they may be viewed as fallen from the grace of their own discipline. Or if the disciplinary appointees come to outnumber the application-oriented professors, as has happened in several schools of engineering and education, the interests of the practitioner are jeopardized and the influence of the applied professors attenuated. Further distortion of the balance between practitioner and research faculties has called into question relationships with the field. Practitioners expect schools to provide replacements and to service a number of their applied needs. But a school dominated by research people considers application and practice as inferior activities which interfere with the important work of the school—research and the preparation of future research workers.

Reforming efforts have as frequently added to this problem as they have helped solve it. The whole thrust toward more basic science and theory in engineering and medical schools seem to move them to prepare research workers rather than practitioners. The net effect of bringing the social and behavioral sciences into professional fields appears to have strengthened research rather than practice. But earlier clinical work, the descent of professional courses into the undergraduate college, and efforts to provide international experience seem to be forces in the opposite direction.

Underlying many of the curricular issues of professional education is the simple matter of accommodating the expanding body of relevant knowledge into the curriculum. Knowledge accumulates so rapidly that even if human tolerance of study would permit, lengthening the curriculum would be insufficient. Both engineering and medicine have

tried that, and medicine at least seems to have reached such a point of diminishing returns as to reduce admissions. Young people don't relish the thought of waiting until their mid-thirties to complete their formal education. Yet statistics and torts, molecular biology and ethics, psychology and computer science, and sociology and design must be balanced if effective lawyers, doctors, teachers and architects are to be prepared for life in the twenty-first century.

Many reforms, while still only palliatives, attempt to resolve this curricular issue. Interdisciplinary work might extract the essence of several fields, much as the general education program of the fifties sought to extract the essence of the liberal arts and teach them in two collegiate years. Freedom of election can add the students' own criteria of utility and relevance to the faculty criteria for selection of materials. Some of the new media—tape recorders and video tape programmed texts—might shorten or at least rearrange study time.

Even attempts to regroup students for curricular purposes are in a way an effort to cope with the knowledge-time equation. Since students learn so much from each other, why not exploit some free or living time for educational purposes?

However, few curricular studies in the professional fields do more than complain about the knowledge issue. I suggest that until they do address the problem directly, resolution will not emerge.

A cluster of problems emerges directly from attempts to add to or enrich clinical or field experience for professional students. The pedagogic values of trial experience for law students at the University of California conflicted with the judicial demand that only licensed lawyers practice at the bar. Financing internships in college administration is a difficult task, as is supervising cadet teachers so that supervisors are present when needed. While library students can gain applied experience and some financial support working part-time in the university library, the relatively small faculty of the library school cannot provide close supervision and the library staff itself is too busy. This limitation applies even more seriously to ministerial training. The harsh reality is that clinical experience is expensive if it is good. And few of the suggested reforms have faced this issue. It may be that simulation of experience through computer and video tape recordings can approximate some values of closely supervised clinical work, but such expedients still miss the essence of field work.

A sub-issue of this problem of clinical experience is the role of the clinical or supervisory professor in an academic setting. He is appointed because of his experience as a practitioner, yet his experiences are different from and valued less in a modern university than the research and scholarship experiences of academic professors. In schools of education excellent supervisors have neither time nor inclination to conform to university expectations basic to rewards. The educational clinical professor concept urged by James B. Conant (part-time spent in actual practice, part-time on the college campus) has not proven successful.

In schools of medicine, as the emphasis has shifted toward biochemical science, part-time clinical professors have not been able to keep up with the intellectual achievements of the rest of the faculty. But research-oriented professors handling clinical work are apt to emphasize the phenomenon being observed rather than the patient, thus developing unfortunate attitudes in medical students. It is a paradox that the more professional education buries itself in science, principle, theory and research, and the greater the prestige of the particular school, the more difficult it is to maintain the role and usefulness of the practitioner in teaching students. Yes most theories of reform reaffirm the virtues of student contact with the field and with real practitioners.

This matter is confounded by another issue, the amount and nature of research appropriate for professional schools by faculty or students. The point is emphasized by comparing the enormous research achievements of American medical schools with the general decline in the public image of the medical profession and the decline in several indices of national health. In 1950 the United States ranked sixth in infant mortality, in 1961 fifteenth, and in 1967 eighteenth.[6] Some believe that medicine has so much focused on research that it has forgotten the patient.

The same observation holds true for other professional fields. As engineering schools have gained wealth and academic respectability, their model has been graduate schools of science with emphasis on research. The sponsored research obtained by the better engineering schools has imposed such rigorous and expensive standards that the schools no longer can provide realistic training for engineering at a profit in the civilian market place. Several of the best known professional schools—education at Columbia, engineering at Stanford, business at Harvard—gained their influence through direct and continuous concern with the practical problems of the field and through preparing the next generation of highly qualified practitioners. But as these schools turned their efforts toward more and more basic research, contacts with the field waned and the possibility emerged that their overall influence on the professions would ultimately decline.

This is a sensitive matter. Few would argue that research has no place in the professional schools. But evidence mounts that a preoccupation with research leads to rejection of practice or even of concern for practical application of research. It leads the professional faculties to concentrate more on producing new research scholars than on producing the adequately trained professionals society needs.

At the same time, reform movements in some professional fields call for more and more research. The two major critiques of business education, for example, urge that:

> The quality of business research must be greatly improved. Research should lead and advance business thought and practice, not follow it. Progress in research will give vitality to the whole of business education. There is need for more active corporate support of business. . . . Retired business executives are not regarded as promising recruits to business school faculties. Whatever their

[6]Rosenstein, *A Study of Progression and Professional Education*, Vol. II, p. 3.

other abilities, they are ordinarily not likely to be outstanding teachers, scholars or researchers.[7]

Nursing, education, social work and administration make the same plea. And more opportunity for students in professional fields to engage in independent research is also a major suggested reform.

Intrinsic to this problem is the question of emphasis on behaviorism and humanism in professional schools. As professional schools have plunged deep into research, more emphasis has been placed on quantification and rigorously controlled experimentation. Research in molecular biology now allows consideration of disease as a mathematical equation without even considering the human being who is ill. Theorists in legal and business education anticipate the day when legal or decision-making processes can be produced as mathematical models as though human beings were not actively present. Schools of education appear to have embraced behavior modification theories from psychology and have established that human behavior can and should be changed even as the human being is unaware of what is happening to himself. Theological schools, partly as a backlash against an earlier trade-school reputation, have adopted an equivalent to behaviorism for a research emphasis as they stress rigorous biblical and historical studies. This trend toward rigor and quantification has produced astonishing achievements in the acquisition of new knowledge, but at the expense of developing in students an active concern for the people they should serve. One theological student expressed his perception of the impact of the professional school on him with the complaint that the faculty cared more for certain details of the theology of Martin Luther than for the teachings of Jesus Christ.

The problem is how to restore humanism to professional education so that students become reawakened to the human beings for whom the professions exist.

Efforts to remind the professions of the people they serve conflict with other reform movements. The final resolution is in doubt. Attempts to immerse students early in clinical experience intend to make them aware of the human condition with which they should be concerned. But at the same time attempts to use social and behavioral sciences and mathematics reinforce feelings that the profession is a science, and that experimentation, even with danger to a patient, student or client, is generally justified.

A last issue is the question of how long professional education should be, and whether varying lengths of time for the different professions are warranted. Actual practice, of course, varies from four years for nursing and forestry to ten years or more for medicine. There is a tendency for all professional programs to become longer as relevant information increases. Further, there seems to be a status element as other professions note the prestige in lengthy training for medicine and ponder such preparation for themselves. However, status is scarcely a defensible criterion for length of a program. If utilization of available knowledge

[7]Leonard S. Silk, *The Education of Businessmen* (New York: Committee for Economic Development, 1961), pp. 33-34.

were used as a test, all professional curricula could be stretched to a student's lifetime.

Even within a single profession there are programs of varying lengths, but there is no available evidence that length of program makes effective practice. Nurses, for example, may pass the same examinations and enter into active practice after two-, three-, four- or five-year programs. And both medical and law schools offer programs of varying lengths determined by what undergraduate preparation is required for admissions.

These issues have reached an impasse; no good ways have emerged to resolve them. But an impasse cannot be tolerated for professional education; all of higher education must be reformed. Thus the search must go on.

Various innovations and attempted reforms reveal conflicting tendencies. Greater theory conflicts with more practice, greater scientific rigor conflicts with attempts to restore humanism to the work of professionals, and greater specialization conflicts with attempts to introduce interdisciplinary work. Nevertheless, there does seem to be an emerging pattern, the elements of which we must question.

It seems clear that professional education is drawing closer to the rest of the university to gain strength from relevant disciplines. Hospital schools of nursing are disappearing, and nursing educators want virtually all nursing education to be within higher education. Almost all reports on professional educaton reject the separate trade school concept, and indicate that only in a university setting can the requisite interdisciplinary and interdepartmental work be carried on. Professional facuities increasingly resemble professors rather than practitioners, with the role of clinical professor becoming increasingly difficult.

This means that for the most part professional curricula emphasize basic science and theory rather than applied work. We assume that practice will change and that preparation in specific technique is preparation for obsolescence. Only grounding in basic theory can allow the practitioner to continue to grow and to fit new applications into his broad theoretical framework.

Such a posture implies that professional schools are less concerned with developing high competence for the graduate's first job than with providing a base upon which a full but changing career may be built. Time alone will determine whether this is a tenable decision.

chapter 3

ATTEMPTED REFORMS

Professional education is undergoing major transformation. Not all fields exhibit the same ferment. Librarians and agriculturists don't seem particularly active, and not all schools in a professional field accept suggested reforms. But in many of the professions, identity crisis is causing serious curricular experimentation. Declining undergraduate engineering enrollments raise questions about content and method, for instance. We don't know whether the experiments will work and professional instruction will improve, but we can describe the attempts under several rubrics. In the classical professions of law, medicine and theology, as well as the newer ones, schools are trying to adapt to the last third of the twentieth century and to prepare their students for the twenty-first.

In accordance with the American propensity for solving educational problems with new courses, there is much experimentation with new course and research structures. Interdisciplinary and interfield efforts are particularly popular, as when psychiatrists and endocrinologists pool their efforts to teach about thyroid problems; engineers, architects and economists organize a jointly taught sequence on urban planning; and professors from schools of business and education blend insights about the art—or is it science?—of administration and decision-making. Perhaps the most active cooperation is in the social and behavioral sciences.

Medical educators have finally recognized that health and disease are as much social as biological matters and now seek to use psychology, sociology and anthropology in the basic curriculum. Law schools, which had remained aloof and withdrawn from the rest of the university, have begun to bestow the accolade of law professorships on economists, political scientists and even, as at the University of Denver, on a sociologist. Education and social work, once preoccupied with the psychological bases of professional practice, seek greater contributions from sociology and anthropology, since human change and betterment cannot be accomplished without awareness of how groups, societies and cultures organize themselves.

In the past, graduate professional faculties disdained undergraduate teaching, saying that preprofessional work could safely be left to others,

especially since the basic science and theory needed for professional work had to be retaught anyway.

But a real détente seems in the making. At Wisconsin, Berkeley, Denver, and Northwestern, professors in law and the social sciences have created interdisciplinary courses on such subjects as social policy for undergraduates. At Stanford, distinguished historians, economists, engineers and lawyers have created a joint sequence on international affairs.

More practice-centered are the decisions of social work to reintroduce undergraduate social work courses, and the attempts of a few law schools to offer undergraduate courses to prepare paralegal workers. This reawakened concern for younger students is also present in other undergraduate professional schools. A lively introduction to education, including some teaching experience, is urged for freshmen. Engineering educators continue the search for ways to make the undergraduate curriculum an effective blend of humanities, social sciences and broad engineering science, leaving specialization for graduate training or work experience. Theology reformers see the need for a program beginning at the undergraduate level to help students think theologically, a first-year graduate program to help students decide vocational issues, and the seminary to concentrate on preparation for the active ministry.

Then too, with admittedly faltering steps, the professional fields have finally begun to realize the contributions which the humanities long claimed they could make to the attitudes, values, ethics and indeed the humaneness of professional persons. Some educators recommend that half the undergraduate curriculum in business should be outside the professional field, and that business students should be encouraged to study art, literature and philosophy. An applied humanities sequence at the University of California at Los Angeles seeks to show through historical study the interaction of ethics, politics and aesthetics with engineering. Some medical schools have expressed this same concern by revising admission requirements so that bright students who majored in the humanities are as acceptable to medical school as those who took organic chemistry, comparative anatomy and the ubiquitous scientific German.

Reformers in professional education are trying many ways to reorganize and reallocate students' time. In the past, especially in engineering, medicine and law, the prescribed curriculum was so tightly scheduled that an unfortunate lapse at registration time might jeopardize a student's chances of graduating. Now greater flexibility and freedom of election is the rule. Not all doctors need to know the details of gross anatomy, so why make it a requirement? There is the aphorism that the better the lawyer the less he is inclined to "know the law" in the sense of possessing vast amounts of legal detail, so why require so many detailed courses? If it is true, as it clearly is, that few engineers stay with the speciality they studied as students, why not let them explore a bit through more electives? It might broaden their horizons.

However, more than freedom seems necessary. Much curricular thinking has been restricted by the traditional requirements of the academic

calendar—four years of two semesters each. Breaking such patterns might be more efficient and might even force some rethinking about curriculum and teaching. Thus, Yale now views its medical program as consisting of three blocks rather than four. Princeton's architecture program is comprised of three modules extending over six years rather than the previous monolithic five years of rigidly prescribed work. Not all medical students need a bachelor's degree, nor even the junior year of undergraduate work, and some find the senior year of medicine a waste since it duplicates what they will do as graduate interns and residents. Thus, acceleration for some or extension beyond the normal four years seems to make sense. Harvard Medical School is seriously considering making such freedom from required time demands possible—and respectable. Although the trimester has not proven the panacea some hoped it would be for undergraduate education, trimesters of fifteen weeks can enable students to finish an undergraduate curriculum in engineering science and a master's degree in an engineering specialty in less than the five years which the undergraduate engineering sequence had required.

There is some experimentation with a common curricular stem for related professional specialization. Not unlike the earlier suggested common undergraduate work in engineering science as a stem for graduate or employment specialization is the idea that a common first two years in basic health science might be appropriate for future dentists, doctors and research workers in health. The dean of the School of Dentistry of the University of Missouri at Kansas City sees this arrangement as a logical outgrowth of a center for health science. Some theorists in social work education are also convinced that a common undergraduate preparation for social workers, nurses, legal aid workers and others in helping professions could be useful if departmental barriers could be broken down.

Common experiences, more interdisciplinary work and better articulation between the professional and undergraduate years suggest that appropriate administrative and organizational structure must be developed. Reformers agree that traditional school and departmental structure is divisive and tends to compartmentalize student thinking; the quest is on to find better alignments. First, professional schools again strive to draw close to the university. During the apogee of specialization of professional education, a serious question was raised whether medical and law schools really needed the university except as a financial base. Their professors rarely saw or spoke to those in the arts and sciences, and the professional faculties seemed able to fill students' time with their own courses.

But, perhaps inspired by education's willingness to consider the preparation of teachers a university-wide affair, professional faculties have begun to ask for and offer help to other parts of the university. Through more joint appointments, cooperatively taught courses, and student enrollments from other parts of the institution, a few barriers at least have begun to tumble.

Even more radical changes are in the wind. A few institutions see

administration as essentially the same whether for business, education, hospital or philanthropy. Then why not a school of administration and policy formation? At the State University of New York at Buffalo, a *single faculty* responsible for administration in business, social work and the underlying social and behavioral sciences is being considered. Such reasoning also suggests the breakup of the traditional school of arts and sciences—an anachronism which has lost its once presumed unity and integrity. In such a view the health-related sciences belong with medicine, nursing, dentistry and public health, while the social sciences belong more properly with law, administration and social work. The possibilities of such cooperation and groupings challenge the mind. And that is probably what reformers most want.

If organization and curricula change, then change in degrees and degree requirements seem likely to follow. There is widespread agreement that too many different degrees are offered by the nation's colleges and universities.

One cluster of reforms views the problem of degrees as follows: The number of different bachelor's degrees should be kept to a minimum, but requirements should be sufficiently flexible to allow differentiation of programs within each. Each advanced degree should be a definite recognition of a formal educational program but should not be predictive of candidacy for still more advanced degree work; a master's degree in a professional field should prepare students for direct employment or for further graduate work. Master's degree requirements should be broad enough and compatible enough with master's work in related fields so that students could change career aims without losing an inordinate amount of time in transfer to a new program. And both in the professional fields and in science and arts we should recognize reality by creating appropriate intermediate degrees between the master's and the doctorate. Regardless of degree level we should insist that the several components —general or liberal, basic science or theory and applied professional subjects—not be separated into different time periods or levels.

Professional education, like all education, depends on instruction and modes of learning, and here, while slow in coming, there is change. Professors have begun to question excessive lecturing and formal classroom experience and are willing to consider other methods of education. By far the most pervasive reform is the attempt to provide more clinical or field experience early in students' education.

In medicine, clinical experience in the first year helps motivate students for subsequent work in basic science, besides contributing to their socialization as doctors. Law students should spend the summer between the first and second year in a law office, court, governmental bureau or other legal function. Social workers need clinical work both as undergraduates and during the second year of their graduate professional program. And future ministers need much more intensive and better supervised clinical experience than the traditional part-time preaching now usually done chiefly for financial reasons.

Renewed interest in individual research and independent study stresses a new faith in the student's responsibility for what and how he studies.

This may take the form of a real-life design problem undertaken by a freshman architecture or engineering student, or independent laboratory research of a senior medical student—with research time actually allotted rather than stolen from clinical rounds and required lectures.

This trust in individuals underlies uses of the computer and other new instructional media. One campus locates computers so that students can use them to solve complex problems; on another campus each medical student is required to spend time in a computer-based diagnostic center, testing his own patient assessment with that made by a computer which knows every case in the history of the teaching hospital. Video tape and sound tapes allow storage of lectures, operations, clinical interviews and technical procedures to which students can refer when they feel the need. In one school of dentistry for example, movie films of fifty complex dental procedures are stored in the clinic with nine projectors. A dental intern who is unsure of how to proceed can stop, view the filmed procedure and return to his patient, presumably with greater understanding. Nurses with a five-minute film clip, several oranges, and a hypodermic needle apparently develop greater skill in giving injections on their own than in the presence of a teacher. And television allows large numbers of students to view intricate surgical procedures.

Before World War II most American professional schools assumed that their graduates would practice in the United States, and that there was no need for the curriculum to transcend our culture. But faster transportation and communication, the nation's involvement in world affairs, and the internationalization of knowledge have rendered such assumptions obsolete. While sometimes grudgingly, all professional schools have re-examined their curricula with a view toward internationalizing it. Medicine tries to give professors international experience; law professors contribute to undergraduate general education in courses on international law and foreign trade arrangements; and some schools have presented foreign concepts with courses in anthropology and the study of comparative cultures.

Two other moves toward reform are expressed more as statements of concept rather than of specific accomplishment. The first is the quest for better ways of developing a personal professional identity in students. Through relatively close contact with professional faculty members the student is expected to acquire, almost unconsciously, ethical principles to guide him in his practice. But for many reasons—increased numbers of students, more complicated ethical dilemmas (heart transplant, dealing with organized crime) and delocalized collegiate institutions—the more informal ways no longer work. New ones must yet be found.

Secondly, since it is generally agreed that the half-life of knowledge in a profession has shrunk to perhaps five years, those in active practice should constantly seek re-education. But while everyone knows this, institutions have not yet seriously thought through content, organization or method of financing for continuing education for professionals. Except in education, agriculture, and to some extent in administration, continuing education programs for professionals are rare in universities.

These needed reforms, are not isolated phenomena peculiar to professional education. Similar changes in all of higher education exhibit many of the same weaknesses and lack of system.

Reforms in Undergraduate Education

Colleges and universities have begun to make curricular changes, sometimes in response to student needs and demands, but as frequently due to other forces and factors. The success of these reforms appears to depend in part on the primary reasons for initiating change. Several, brought about for economic reasons or to satisfy faculty desires, appear largely irrelevant to the educational needs of college students, or even antithetical to them. And some have failed to achieve the purposes for which they were attempted.

Consider first the decline of general education as a distinct function. General education really began at Columbia in 1918, took on characteristic form at the University of Chicago in the 1930s, spread through several of the great Midwestern universities in the 1940s, and gained respectability through the publication of the Harvard Report in 1947. It consisted of interdisciplinary courses seeking behavioral objectives linked to man's nonvocational life. While the number of required courses has not shifted appreciably since 1947, the character of those courses has changed, and will do so more rapidly in the future. General education is being replaced by the distribution requirements, popular in the 1920s and 1930s, which ask students to take courses from each major division of knowledge.

Ostensibly this shift provides greater flexibility for students; in fact, the reform of general education does not seem likely to improve the curriculum for students because the distribution system fails to force faculties to create courses for the nonmajor. Even if the change proceeds, as it has in a few places, to the free elective system, it still will not bring improvement.

The shift to distribution requirements arose from unwillingess of professional faculty to teach nondepartmental and staff courses. The academic climate was such during the 1960s that young Ph.Ds would not accept a position in which they would teach a staff course; they saw their own future related more to the department and to departmental offerings.

A second category of reform most starkly stated consists of changes in academic calendars. Pittsburgh really began the movement when it created the trimester to enable fuller utilization of scarce classrooms, laboratories and equipment. That effort was followed quickly by other attempts to gain year-round operation. Schools on the semester system changed to a four-quarter plan and schools on the quarter system either tried the trimester or emphasized that the four quarters already insured year-round operation. Then came a flurry of other modifications. Some tried the three-three (three courses in each of three terms), four-one-four (the "one" being a month of interim studies), four-four-one, a three-semester academic year, (starting the year in early September so the semester ended before Christmas) and even a revised single course

plan (one course taught in seven weeks). These were spawned for a number of reasons. Calendar change is easier than real curricular revision, makes a school feel it is accomplishing something, and can boost faculty morale or attract attention to the institution. Perhaps the most cynical attempt was the major university on the quarter system which divided each quarter in half so that professors would teach the first five weeks and students would do independent study the second part, thus allowing faculty more time for their own work. Only with such a bribe could senior professors be persuaded to teach lower division courses.

Third are reforms in techniques using the media. These include open- and closed-circuit television, computer-based or assisted instruction, language laboratories, tapes, recordings, multimedia classrooms and programmed learning. Once again economics have motivated experimentation. Was it possible, through the use of technology, to bring about savings in the instructional budget by presenting a professor to a larger number of students, shortening the time required for students to master something, or making students responsible for more of their own education, thus increasing the student-faculty ratio? By and large, this goal has not been attained, although use of the media has become central in higher educational practice. There are, to be sure, thousands of experiments, but the bulk of the college curriculum has continued as though the electronic revolution had never happened.

A fourth major category of reform consists of newer ways of grouping students and teachers. This seems to have been stimulated more by educational needs than were some other reforms. New groupings include team teaching at Chicago State College, the house plan at Stephens, the experimental college at Hofstra, block scheduling at Florida State, cluster colleges at Michigan State and University of the Pacific, and the creation of the Santa Cruz branch of the University of California with its separately housed colleges of 600 to 1000 students. These seem designed to capture something of the spirit of the older small residential colleges in a larger, more economical institution.

Descriptive reports indicate some success; students do like the smaller groupings, and when students get to know one another well by being in a series of the same classes, they seem to develop more rapidly. If the serious problems of cost and faculty satisfactions can be solved, some form of regrouping may prove a fertile approach to reform. However, in the enormous state colleges and universities, with older ways of organizing built into the physical plant, the possibility of affecting large proportions of students seems remote.

Efforts to change the curriculum in response to student needs are noted in the many attempts to create *ad hoc,* issues-inspired courses and courses of differing lengths. This effort seems to have originated from student creation of free-university sorts of courses. Each set of recommendations that has followed a campus upset includes ways of offering new style courses and of getting them approved through the administrative curricular apparatus. Such examples as the experimental courses at San Francisco State, freshman seminars at Stanford, and the

new freshman year program at Antioch appear well received. But difficulties abound. Quality control is an issue—that is, how to insure professional competence to teach a wide-ranging, problems-centered course or, if teams of faculty are used, how to afford it.

Logistics also are involved—how to accumulate library holdings and make them available for constantly changing course titles. At Stephens College, for example, a seminar required of all junior year students changes its focus each year; the library certainly has not been able to keep up. But above all is the same problem which plagued the older general education interdisciplinary courses: How can we prevent *ad hoc* courses from being superficial, offering a false sophistication to students who experience them? Older courses in personal adjustment or functional mathematics failed; new-style courses may fail also.

Still another promising reform consists of providing off-campus experiences which enable students, in theory at least, to test academic ideas in real life. Well organized and financed efforts frequently have produced dramatic results. Cooperative work-study at Antioch or Northeastern seems essential to the impact those schools have had on students; and at Northeastern, a university of 26,000, the cooperative work-study program allows it to compete with lower tuition public institutions. The overseas campuses of Stanford University appear to be one of the most impressive elements in a Stanford undergraduate education.

Several questions arise, however. If every institution attempts overseas experience, are there enough places abroad to put students? Even now, parts of Europe which once welcomed students are much less open and receptive. The European ghettos can't absorb too many more transients. Even an expanding economy would find difficulty accepting over two million cooperative study students from freshman classes. Of course, cost is a factor. Smaller institutions, already facing serious financial crises, find the administration of a full off-campus program too expensive. And if junior colleges become the main route for lower division education, can fruitful off-campus experience be fitted into a two-year program?

Having viewed higher educational reform in general, we can now examine in more detail curricular reform in professional schools.

New Courses and Research

Interdisciplinary and Interdepartmental Courses

Consistent with American higher education course orientation, there is considerable interest in new course and research structure to update professional education and make it more effective in preparing students for rapidly changing and more complex conditions. There is widespread belief that courses have tended to be too narrow and too closely tied to traditional departments, hence experimentation with interdisciplinary or interdepartmental courses. In medicine, for example, there might be a new integrated, interdisciplinary approach to an orthodox course such as pathology. At Johns Hopkins the course in the science of disease is divided into several aspects of disease. Students

are introduced to each aspect by both bedside visits and autopsies, and are led in turn to the various laboratories—biological, chemical and microcellular pathology and bacteriology.[1] Such attempts are based on the widely shared belief that traditional curricula based on departmental autonomy are obsolete and restrict collaborative teaching and effective learning.

A few institutions of theological education are seeking to cross, or even eliminate, departmental lines and divisions. The United Theological Seminary of the Twin Cities thus begins the student's training with courses in The Christian Faith and the Social Order, The Christian Faith and Human Personality, and The Christian Faith and the Economic and Political Orders. Only later are students allowed into more restrictive courses such as Biblical Theology and Interpretation of Historical Theology. At Princeton, in theory developed for architecture, planning has become the focus of the curriculum which invites major contribution from professors and students in engineering and the Woodrow Wilson School of Social Policy. These combined efforts are integrated through an actual design study of some real urban area on the East Coast. The School of Engineering at Stanford uses a similar approach and has brought together people from architecture, economics and business to offer joint courses on planning, on the assumption that no one point of view is adequate for instruction in planning and design.

We can see the problems created by necessary interdisciplinary courses in recommendations from several professional school associations. In a survey of recent trends in engineering education the problem or task course, as a modern offspring of earlier general education courses, appeared promising. The alternative to the survey need not be a disciplinary course, but rather an offering of courses which focus on a particular set of problems and bring various disciplines to bear on them.[2]

The nursing curriculum generally appeared less fragmented in 1968 than it had in earlier years, with such highly specialized courses as Disaster or Operating Room Nursing displaced by broader emphases on health, the community, and collaboration with the health team. Social work education also is moving away from an earlier isolation and is searching for ways to emphasize interdisciplinary in-service teaching and research programs and to make greater use of teaching staffs from other professions and disciplines.[3]

Some schools of education have also begun the slow, essential task of cutting back on specialized courses in favor of broader ones. At Harvard, for example, six or seven previously offered foundation courses have been eliminated and replaced by a staff-prepared course, Introduction to Education, that utilizes a case approach, tutorials, field experiences and a series of written exercises called briefs, with information and insights from a number of relevant disciplines needed to support a

[1]John H. Knowles, *Views of Medical Education* (Cambridge: Harvard University Press, 1968), p. 153.
[2]*Journal of Engineering Education*, LIX, No. 4 (December, 1968), p. 313.
[3]Kurt Reichert, Director of Division of Standards and Accreditation, Council on Social Work Education, "Report of the Fifth International Survey of Training for Social Welfare" (unpublished and undated).

position.[4] It should be clearly understood that these efforts are just beginning and there is no real evidence that interdisciplinary work can be carried out successfully. Both the intent and the state of the art are revealed in a remark made by Paul Sanagaro in connection with a study of theological education:

> Speaking of the development of the student as a professional person, the simple fact of the departmental autonomy in medical schools is a major barrier to his developing a unified view of the profession . . . the attempts to overcome this by conjoint teaching and integrated teaching having all come about in the last few years and are notable for their lack of success.[5]

Social and behavioral science: One variant of interdisciplinary work—the attempt to use materials from the social and behavioral sciences in the preparation of professionals—must be treated as a major category of reform. Whether in medicine, law, theology, library science or dentistry, there is widespread belief that these sciences can be useful and that they are sufficiently advanced and productive to make definite contributions to professional training. For example:

> The growth within medicine has brought it to a period of transition and movement not unlike the situation it faced a hundred years ago. In response, it is again reaching outside itself for help. Secure in its century old partnership with the natural sciences, it now seeks the added collaboration of the social and behavioral sciences.[6]

In autumn 1966, five thousand behavioral and social scientists were employed in 447 professional schools lodged in doctoral institutions. Medical schools were by far the largest users of behavioral scientists, with psychiatry and psychology the best represented, and with a fair sampling of sociologists. Business schools, next in rank, chiefly employed economists, psychologists and political scientists. Schools of education and public administration, of course, employed large numbers of behavioral scientists.

A resume of the principal social sciences as used in professions will suggest their pertinence to professional education.

Business: Economists deal with money and banking, foreign trade, and industrial economics, while psychologists, sociologists and political scientists are concerned with management, organization, leadership and human relations.

Education: In addition to the expected use of psychologists to deal with learning, counseling and the like, sociologists, economists, anthropologists, historians and political scientists are gradually being added to teach education as viewed by their specialties.

Medicine: Especially in departments of psychiatry, both socially and biologically oriented behavioral scientists have been prominent

[4]Theodore R. Siser, *The Graduate Study of Education* (Cambridge: Harvard University Press, 1966).
[5]Kenneth Underwood, *The Church, the University, and Social Policy*, (Middletown, Conn.: Wesleyan University Press, 1969), Vol. II, p. 302, quoting Paul Sanagaro.
[6]Lester J. Evans, *The Crisis in Medical Education* (Ann Arbor: University of Michigan Press, 1964), p. 1.

in the past. In addition, medical education increasingly uses anthropologists and sociologists to explore ways of delivering health services and methods of increasing preventive medicine.

Law: Until recently, law schools have not used social and behavioral sciences. A few have begun to sponsor social science research and to appoint economists and sociologists to teaching posts.

Social Work: A recent re-emphasis on the contributions of sociology and anthropology and a search for ways of adapting the insights of political scientists and economists is correcting an overemphasis on psychological and psychiatric fields at the base of social work education. In general, however, social work, as law, has kept the bulk of the curriculum quite professional and taught by those trained in social work.

Communications and Journalism: As these fields have expanded to include the mass media, mass culture, films, programmed learning and the processes of communication, they have slowly accepted as full-time staff members people trained in psychology, sociology, anthropology and economics. And these people have begun much heavier interdisciplinary research than these professions pursued in the past.

Engineering: In the past these schools have not used social and behavioral scientists. However, that pattern is rapidly changing, with the new belief that engineering cannot and should not function in a social vacuum. In systems analysis and human factors research, social and behavioral scientists are working with engineers on problems of transportation, urban planning, waste disposal, pollution control and depletion of natural resources.

Architecture: A number of schools are seeking ways to add benefits of social and behavioral study to curricula in architecture. As yet no generally accepted format has been discovered.

While the need for social and behavioral science materials in professional education is generally well recognized, attempts to include them are still by trial and error. The law school at the University of Denver has a broad interdisciplinary program in judicial administration, an important ingredient of which is a seminar, Methods in Social Research, in which law students are taught to use social science research on legal problems and questions of justice. At Wisconsin, graduate students in several of the social sciences have been accepted into law courses and some law students have been accepted for tutorial work in social science departments. Wisconsin is also developing law minors for Ph.D. candidates. While the social and behavioral components of the normal medical curriculum are still minimal, and in most schools token, the growing body of research on medical problems from a social science framework is generating increasing willingness to accept such a dictum as:

> The sources of human wellness and disability are social, behavioral and biophysical in nature. It follows then that medicine in the aggregate must develop the ability to identify and to deal with all of them.[7]

Undergraduate Courses

Although some see most professional education as moving inexorably

[7]Knowles, *Views of Medical Education and Care*, p. 48.

into the graduate years, a number of professional fields are entering, or re-entering, undergraduate education, for a number of reasons: (1) to allow professional fields to contribute to students' general education; (2) to help guide undergraduates to decide on professional careers; (3) to prepare sub- or paraprofessional workers for whom a bachelor's degree is sufficient; (4) to gratify professional faculty who want more contact with younger students; (5) to experience interdisciplinary insights which can come from working with undergraduate problems in issue-focused courses and (6) perhaps most important, to bring the professional schools back into the main stream of the university.

Since this movement is still so new and experience so limited, no comprehensive resume is possible. But some appraisal of the development may be obtained by looking at a few examples.

At Stanford a revised undergraduate curriculum anticipates that ultimately all freshmen will take seminars, many offered on an overload basis by senior professors from the graduate professiona' schools. Illustrative of these freshman courses are:

> Evils of Sociological Plannin,
> Roy Cohn, Professor of Surgery
>
> Using medicine as a focus, examples of the failures of sociological planning will be presented. The constant conflict between the good for the individual and the good for society will be emphasized.
>
> Distribution and Delivery of Mental Health Services
> Thomas A. Gonda, Professor of Psychiatry
>
> This seminar will examine the diverse factors (biological, psychological, social, economic, and political) that are contributing to the dramatic changes in the patterns of distribution and delivery of mental health-care services.
>
> Technology and Society
> Stephen J. Kline, Professor of Mechanical Engineering
>
> This seminar will examine the relations of technology and society with emphasis on concepts and tools that allow better understanding of decision-making . . . where both technics and social values are important. It will include materials on the viewpoint of the scientist and technologist and on how technology operates, using both literature and in-depth current examples . . . [and] discussions of personal value systems and how they influence social decision-making processes.

A conference held by Catholic University to consider The Law in the Libral Arts: The Social Dimension, revealed something of the needs as well as the issues in this intrusion of professional work into the undergraduate years. Law should be returned to the undergraduate school because concerned students are asking legal questions which can be adequately answered only by people schooled in the law. While some law faculty seem uninterested in teaching undergraduates, and there is a lack of materials appropriate for undergraduates, this condition can change. If lawyers won't come to the undergraduate schools, people trained in

labor or political science may have to obtain some background in the law to offer the desired courses.

While the undergraduate school should not be turned into a prep school for the graduate study of law, an appropriate undergraduate course could fill a guidance function. Probably the ideal undergraduate course should not teach substantive law—torts property—but rather approaches to, or methodologies of the law and the relationship of law to other knowledge. This would be liberalizing and would remove some of the veil of mystery which surrounds professorial practice. In effect, such a course should:

> give the student an appreciation of the method of law's evolution, to give him some notion about the efficacy or the adequacy of its functions, the notion of its methods, and the ways in which change is achieved in the law. Because if a student sees law as something which is static and irrevocable, then he becomes addicted perhaps to the notion that this is something which can be learned for now and all time, and to form a highly warped notion of at least American legal institutions.[8]

At this same conference possible approaches to law courses for undergraduates were described. These analyses stressed the differences in purpose between undergraduate and professional education and how the differences dictated method. For example, this notion is revealed in one course:

Materials for a Basic Law Course for General Undergraduate Consumption

> There are at least three different functions that a course on the legal system for undergraduates in a liberal arts college might fulfill. The first would be that of acquainting students who are not prospective lawyers with the legal system and its role, past, present, and future.
> The second function of such a course would be as a vehicle by which to interest and to thereby recruit able undergraduates for the legal profession.
> The third different function such a course might have is to serve as a vehicle by which prospective law students could evaluate their aptitude for the study of the law . . . .
> The materials that I would propose would frankly seek to be a survey. They would seek to give a macrocosmic rather than a microcosmic view of the legal system. Now, such a course might cover all or some of the following topics: the development of legal systems; the development of the common law system; using discursive material; the Anglo-American legal system; and the nature of legal analysis. There should also be some kind of brief discursive treatment of the nature of the system itself, even including undergraduates, a brief discussion of the role and structure of the court system, the legislature, and the executive might be necessary.
> Then there are essential or significant aspects of the legal system: the men who made this system and who make it; the titans

[8]Albert Broderick, *Law and the Liberal Arts* (Washington: The Catholic University of America Press, 1967), p. 66.

of legal systems, the great judges, and the great lawyers; and why. I think we ought to let the students see the anatomy of a legal case, and what documents look like, and we would talk about what we had seen. Finally, there is great rhetoric in the law; for example, Justice Frankfurter's concurring opinion in the case of *Wieman* v. *Updegraf*, involving the loyalty oath or some opinions by Justice Jackson. Then one could raise some of the questions about what are the alternatives to the Anglo-American legal system, the influences of society on the law and the presuppositions of a legal system. Still other potential topics might be: the different conceptions of the way in which disputes might be resolved; the adversary system versus alternatives to it; the economic assumptions of a legal system; the conceptions of justice and the conceptions of freedom; and, finally, alternatives to legal systems themselves.[9]

The movement of social work, long restricted to the graduate years, into undergraduate education is in response to some similar but other quite dissimilar motivations compared with law. We now recognize that history, philosophy, literature and other arts can illumine human problems and human aspirations and thus edify social workers. Thomas Walz has summarized justification for and aims for an undergraduate social work program. This analysis could apply to most professional fields:

> Manpower shortages have become chronic in social welfare. The pressure has correspondingly increased on the colleges and universities to prepare and produce these service technicians and professionals . . . .
>
> Another important demand for undergraduate social work programs is coming from the college students themselves. Many of them are socially concerned. They seek social welfare as a career which can offer them the meaningful investment of self that they are searching for . . . .
>
> If we recall the original conception of a liberal education as a moral education and as an education for knowledge for social betterment, we can see how an undergraduate social welfare curriculum makes a distinct contribution to liberal arts programs. It offers a look at societal values and their implications, and it does not skirt discussing values in the objectivity of science. . . .
>
> A further argument for an undergraduate social welfare program relates to the self-interest (survival needs) of the university itself . . . the university has needed to demonstrate to its own students and to the community its concern with the major domestic issues of the time.[10]

Humanities in Professional Fields

Another belief now pervasive in most professional schools is that the humanities should be an important part of the curriculum. While the idiom may differ slightly from field to field, the central thrust of the argument is common. For medicine the hope is that work in the

[9]Richard Wasserstrom, Dean, College of Arts and Sciences, Tuskegee Institute (administration, law).

[10]Thomas Walz, "The Philosophy and Objectives of Social Welfare Education," in *Issues in Planning for Undergraduate Social Welfare Education* (Atlanta: Southern Regional Education Board, 1970), pp. 9-20.

humanities will produce doctors with enlivened consciences, increased responsiveness, broadened interest, clarified purpose and, in the end, also quickened ethical sense. From engineering comes the cry that the estrangement between the humanities and the professional schools must end, for without deep appreciation of an active participation in all phases of the humanities, the professions become sterile and lose relevance to society.

To prepare business students for life and not just for their first jobs, at least half of the undergraduate curriculum should consist of courses in the liberal arts. These can start an individual on the process of developing analytical ability, balanced judgment, vigor of mind and imagination, and an understanding of men and social forces conditioning the times.

These hopes are somewhat dashed by the preferences of professional faculty members for required courses in the humanities. Although the picture may have changed somewhat, the actual curricular preferences as shown in recent writings seem to conform generally to those revealed in the following table. They reveal that the liberalizing courses professional faculties most prefer are the ones with the closest affinities for actual professional work.

Percentages of Combined Professional Faculties Favoring Certain Policies Toward Liberal Arts Subject

Subject	Required Of All	Optional But Encouraged	Optional	Discouraged Or Prohibited
English Composition	96.4	2.2	0.6	0.2
Mathematics	64.1	17.6	15.6	1.5
History	56.5	29.6	12.4	0.8
Chemistry	51.6	19.0	24.7	3.7
Speech	50.7	28.3	17.8	2.3
Physics	47.5	24.2	24.9	2.4
Economics	45.1	28.7	22.8	2.5
Literature	44.3	32.9	20.6	1.1
Psychology	42.1	31.0	24.1	1.8
Biology	42.0	22.7	29.4	4.7
Sociology	32.1	32.5	30.7	3.5
Foreign Language	30.5	34.9	30.8	2.9
Philosophy	27.0	41.1	29.3	1.6
Physiology	27.0	18.8	44.8	8.3
Political Science	26.8	36.0	32.1	4.1
Music	13.0	19.1	58.0	8.4
Art	12.1	24.7	55.0	7.1
Religion	7.7	20.9	61.7	8.7

Source: McGrath, Dressel and Mayhew, *The Liberal Arts As Viewed by Faculty Members in Professional Schools,* p. 35.

Nevertheless, there is a drive to bring the humanities not only into the preprofessional curriculum, but to the professional school itself, even a willingness to lessen professional requirements to accommodate these new materials.

Doctoral students in the School of Education at Stanford are required to take approximately twelve hours in normative studies—history, philosophy, literature—to develop a broad perspective for the practice of education. An engineering curriculum study at the University of California at Los Angeles urges that the engineering school develop a sequence of courses in applied humanities, beginning in the freshman year and using a sequence of critical periods of man's social evolution to develop a foundation for later work in the humanities and to display their role in the profession. The sequence offers examination of the forces, interests and activities which make up the community of man.

> A study of Rome, for example, offered a forum for the specialist from each discipline to illuminate his portion of the composite social picture. The system of laws that give an order to society could be presented within the framework of the culture that made it meaningful. The interdependence between every aspect of a society and its technology would slowly emerge, as the student began to see that the very existence of a great city must wait for the creation of aqueducts and roads to allow large numbers of people to live in close proximity. He would gain some understanding of how the leisure to appreciate and develop the humanities must await the advance of technologies to free man from the grinding struggle for his very existence.[11]

To indicate the relative significance of the humanities in engineering, a proposed illustrative curriculum is reproduced at right from Rosenstein's study.

Most professional schools are in one way or another trying to fit more of the humanities into their curricula. Undergraduate professional schools are loosening professional requirements and recommending work in the humanities or requiring some variant of distribution requirements. The graduate professional schools encourage preprofessional students to take work in the humanities and modify entrance requirements to insure that applicants are not penalized for doing so.

Temporal Arrangements

The second major category of reform consists of new temporal arrangements. Because of the enormous increase in knowledge in professional fields, and the American curricular tendency to accommodate new knowledge in new courses, the time required for basic professional training has increased. Further, the quantity of prescribed course work deemed essential in most of the fields has also increased so much that students have had little time for reflection and virtually no time for individual interests. These trends have risen in part from the widespread belief in a core of knowledge which every practicing professional should possess. And, of course, this faith was reinforced by the increase in

[11]Rosenstein. *A Study of Progression and Professional Education*, pp. 4-19.

PROPOSED ILLUSTRATIVE CURRICULUM

Years \ Stems	MATHEMATICS Deterministic Distributed Parameters	MATHEMATICS Deterministic Lumped Parameters	MATERIALS AND SCIENCE ENERGY AND MATTER PROCESSING		MATHEMATICS Probabilistic INFORMATION PROCESSING	DESIGN and LABORATORIES	HUMANITIES
	Math. Calculus		Chemistry		Computer Probability & Stat.		Applied Humanities
1	Math. Calculus		Chemistry	Physics Mechanics			Applied Humanities
	Math. Calculus		Biochemistry	Physics Electr. & Mag.		Introduction to Design	
2		Math. Differential Eqs.		Modern Physics		Model & Measurement Lab.	Humanities
		Math. Transform Theory		Materials		Statics-Strength Design	Humanities
	Math. Partial Dif. Eq.	Deterministic Lumped Parameter			Information Dynamics	Statics-Strength Design	
3	Deterministic Distributed Parameter	Deter. Lump. Para. Circuit Syn. and Feedback			Automatic Information Process	Exp. Engr. Lab.	
	Deter. Distr. Para. Diffusion Process	Deter. Lump. Para. Auto. Controls		Physics Quantum Mech.		Exp. Engr. Lab.	
				Thermodynamics	Probabilistic Lumped Para. Signals & Noise	Economic Decision Theory	Humanities
4				Thermodynamics	Probabilistic Lumped Para. Auto. Controls	Design	Applied Humanities
	Deter. Distr. Para. Wave Phenomena			Advanced Materials		Design Lab.	Humanities
	Deter. Distr. Para. Solids Continuum Mech.		Biotechnology			Design Lab.	Humanities

NOTE: Courses can be rearranged in accordance with student interest. For example, the last two courses in Deterministic Distributed Parameters can be advanced two semesters and Probabilistic Lumped Parameters courses delayed for two semesters.

testing by the various licensing and certifying agencies for knowledge of basic skills. But it has derived even more from the concept of preparing the generalist.

Actually, specialization has rendered a general core obsolete except for basic science or basic theory. What surgeons and dermatologists need to know as a core are two widely different things.

Flexibility and Electives

The reforming response to these changes and problems has been various.

First, and probably most important, is experimentation with curricular flexibility and freedom of selection. Education in architecture, for example, was once a monolith of five tightly prescribed years. A suggested change calls for a curriculum of three modules, the first a somewhat common course pattern for two years. The second culminates in an A.B. degree, which allows a relatively freely elected concentration in related fields. The third, culminating after the sixth year in a first professional degree, provides time for intensive specialization.

In medicine there is a concerted movement to curtail the time students spend in formal classes and laboratories to allow them more time for study, reflection and independent research One suggested curricular revision in medicine assumed that an educational program was a continuum from elementary school to professional practice which, if approached creatively, could be shortened and made more effective. It conceived of medical education as eight to ten years divided between three years of undergraduate work, three of medical school, and two to four years of graduate education.[12]

Theological education seems to be moving away from the prescribed core of courses once thought essential to insure quality.

The two major critical reports on business education also see free electives inside or outside the business school as a desirable third of the total program.[13]

In engineering the general tendency is to make curricula more flexible and to give students greater freedom of choice, although many still question the value of this movement. Greater freedom can militate against any overall view of the interrelations among the elements of professional education.[14]

Of all professional groups, none has been more consistently introspective about curricular matters than representatives of engineering education. Their comments in the *Final Report*: *Goals of Engineering Education*[15] could almost stand as the credo for flexibility as a matter of reform for most of the professional fields:

The Administration of Educational Programs

(1) *Existing programs should be made flexible* . . . . Tightly specified curricula tend to delay modernization and discourage valu-

[12]Knowles, *Views of Medical Education and Care*, p. 160.
[13]R. A. Gordon and I. E. Howell, *Higher Education for Business* (New York: Columbia University Press, 1959), and T. C. Pierson, *The Education of American Businessmen* (New York: McGraw-Hill Book Company, 1959).
[14]Pusey and Taylor, *Ministry for Tomorrow*, p. 93.
[15]Final Report: *Goals of Engineering Education* (Washington: American Society for Engineering Education, 1968).

able experimentation. Provision of free electives with an effective advisory system would permit students to follow programs which offer the greatest challenge to their abilities and the best preparation for their next steps after graduation.

Flexibility of individual programs is needed to allow for the diversity of interests and talents of particular students and provide engineers with a wide range of competencies to meet the needs of industry and government.

The principle of flexibility will permit engineering schools to offer their strongest programs, building upon established strength, free from constraint to offer programs they are not prepared to administer.

(2) *Expanded opportunities for interdisciplinary study are needed.* Many of the recommendations for curricular changes suggested by engineering graduates point to the existence of a clear demand for and interest in interdisciplinary programs. Some students may have the ability and desire to begin interdisciplinary work during their baccalaureate programs, but some programs are so specialized that the student has no opportunity to study any engineering subject in depth outside of his own field.

(3) *Credit hour requirements should be reduced.* One of the aims of educators has been to find the balance of courses needed to make engineering education a general scientific-technological education. The movement toward general education has often meant addition of new courses to the curriculum to the point that it has become difficult to obtain a bachelor's degree in eight semesters. Compared to requirements for a bachelor's degree in mathematics, physics, and chemistry, engineering demands almost an additional semester's work.

The restrictive effect of an excessive academic load often prevents the student from engaging in other worthwhile activities of college and community life, and in courses outside of his major field where he might gain the breadth of perspective and develop the creative imagination needed by the engineer of the future. There appears to be a lack of evidence that credit hour requirements for graduation are correlated with the quality of the products.

(4) *Many prerequisite courses should not be required.* The requirement of many prerequisite courses often unnecessarily discourages qualified students in one area from taking courses in other fields. Wherever possible, prerequisite material . . . should be acquired through self-directed study.

(5) *Provisions for transfer into engineering are needed.* Too many engineering colleges make it almost impossible for students to transfer to engineering above the freshman level. There is real opportunity to increase the enrollment of first-rate students other than through the freshman class.

(6) *The role of cooperative education should be recognized.* It is generally recognized that actual practice of engineering periodically interwoven with classroom and laboratory instruction can provide . . . balance of their intellectual development. Currently 50 colleges of engineering in the United States provide curricula on the cooperative plan largely at the baccalaureate level. These curricula have much to offer to engineering education of the future both undergraduate and graduate, basic and advanced. . . With increased emphasis on continuing education throughout a

professional career, early development of a capacity to deal with alternate periods of study and practice has many advantages. And the cooperative plan extends educational opportunities to talents of students of limited financial resources.

Changes in Calendar

Professional fields have found traditional ways of dividing the academic year and academic programs are awkward and inhibit change. Over the generations practices and procedures of a two-semester or three-quarter academic year, four-year bachelor's degree and one- or two-year graduate program, tend to crystalize, harden, and become almost sacred.

One way to break the calendar-imposed lockstep is to revise the calendar. As indicated earlier, calendar revision, important in undergraduate college reform, is now considered seriously in the professional schools. Although examples are still limited, they may be predictive of the shape of things to come.

The Yale medical school has rejected the four-year concept in favor of a plan which divides the medical curriculum into three approximately equal time units. This is consistent with the recommedation of the Association of American Medical Colleges Curriculum Workshop that medical schools should individualize the education of physicians to the extent that some students could accelerate their programs and graduate in less than the standard four years.

Both social work and nursing have accepted two-year junior college training for some kinds of practice. At least one school of veterinary medicine has instituted a trimester system of forty-five weeks which allows a student to complete degree requirements in slightly less than three years rather than the orthodox four.

The master of arts in teaching builds on the base of a bachelor's degree a full calendar year of clinical experience and instruction and a supervised year of paid internship in place of the previously accepted academic year-long master's degree in education.

Underlying some attempts to modify the calendar and, if possible, reverse the century-long, steady increase in the time required for professional education, is the notion that somehow basic education in a profession and specialization can be provided more efficiently if separated. An early manifestation of this idea appeared in the engineering science movement. The argument ran that the several specialities in engineering—mechanical, civil, electrical, etc.—should be developed on the job or in graduate school, and that the undergraduate school should stress basic engineering science. The idea has not been universally accepted. Some schools—especially those in state colleges—feeling pressures from employers, have insisted on special training in the undergraduate school.

However, the majority opinion of professional education favors some variant of this concept. A few institutions have insisted that there should be no undergraduate school of engineering at all. At the University of California at Santa Cruz, for example, it is assumed that the master's degree in engineering should be the first professional degree. There

is some emerging belief that the various health-related professions might be based on a common core of basic health science. The future physician, dentist or Ph.D. in a health science would take two years of a common curriculum. Then at the point of intensive clinical experience or research effort the specialties would separate. The reports on business education previously mentioned also moved in this direction. Both believed that the undergraduate curriculum in business should stress the humanities, mathematics, statistics, economics, and the social sciences, a stripped-down program in functional business subjects and a few broad courses in business policy, principles and organizational theory."[16] Only slightly presumptuous is the claim made in the name of social work education.

The best undergraduate preparation for the helping professions, whether the graduate goes to work or proceeds to graduate studies, is a sound general education in the liberal tradition. The biological and behavioral sciences comprise its scientific foundation. Its roots in the democratic social values are nourished in the humanities, and aspiration and human potential are illuminated in philosophy and in the arts.

> The cluster of occupations with which we are concerned have much in common. They share a base in the biological and behavioral sciences. They also hold in common human values. These scientific and value elements, made explicit, link liberal education and preparation for the human service professions.[17]

The presumption is that there could be a core base for a number of the helping professions.

New Organizational Patterns

Underlying the reforms thus far discussed are serious questions: How to bring social scientists into professional work? How to relate undergraduate and graduate professional education?

Pervading the several attempts to restructure the professional fields are designs to link the professional schools more closely to the university. As professional schools grew strong and concentrated on excellence of practice, they also grew apart from each other and from the central university of the arts and sciences. And of course, the faculties of arts and sciences contributed to this split by coming to resemble another professional school themselves.

Pressures have begun to operate in the opposite direction, however. Through joint appointments of people to several schools, through the concept of university concern for teacher preparation or business education, through increasing the power and influence of the vice president for all academic affairs, including the professional fields, and through professional fields slowly opening their doors to students majoring elsewhere, the university may become reunified. This will never be an easy task. The divisive forces are enormous and the existence of a multiversity is a reality, with all the lack of cohesiveness that term appplies.

But medical education can no longer be effective without close ties to the natural and social sciences; engineering education cannot ignore

[16] Silk, *The Education of Businessmen*, p. 30.
[17] Verl S. Lewis, "The Relevance of Social Welfare to the Liberal Arts," in *Issues in Planning for Undergraduate Social Welfare Education* (Atlanta: Southern Regional Education Board, 1970), p. 5.

psychology or economics; education, business, law and the whole range of arts and sciences need each other.

New Academic Units

One device for bringing together the disciplines and professional fields which need each other is the experimentation with new clusters of academic units. Centers of health sciences which bring together medicine, dentistry, nursing, paraprofessional fields and even the basic health sciences now exist. There are also attempts to place in one school or college responsibility for preparing people for administration. On the premise that all administration is the same—public or private, educational, hospital, philanthropic or business—a few attempts have been made to create a school of administration and policy science. Several rather extreme departures from orthodoxy may illustrate the directions and purposes these new administration alignments are taking.

The University of Wisconsin at Green Bay has focused its entire curriculum and administration structure on ecology. And because ecology is pandisciplinary, it has organized its colleges in the framework of environmental themes rather than according to traditional fields or disciplines. Thus, there are the colleges of Environmental Sciences, Community Sciences, Human Biology, Creative Communication and Professional Studies (business, public administration, teacher education, leisure sciences, mass communication and social services). The State University of New York at Buffalo has adopted in principle a new organization consisting of a University College (into which all students are matriculated as freshmen) and seven faculties (arts and letters, educational studies, engineering and applied sciences, health sciences, social science and philosophy, law and jurisprudence and applied social science and administration). There is intent in this structure to end professional education for undergraduates, although this is not yet accomplished. More explicitly, the structure was created so that various departments could participate with greater ease in the programs of more than one faculty. In theory, no faculty would be purely professional. For example, the faculty of law and jurisprudence was expected to offer work for undergraduate students. Originally, applied social science and administration were intended to provide undergraduate work as well as professional work in business, social welfare and probably library science. However, these last-named departments have not been put into effect. [18]

Changed Admissions Policies

Another innovation in administration is a revised admissions philosophy. Faced with anticipated increases in demand for professional services (and with trends to bring more minority groups into the professions), and considering recent evidence that there is little relationship between academic grades and ultimate adult success, several professions have changed posture. The previously cited Workshop on Medical School Curriculum argued that only by increasing the size of entering medical

[18] James S. Schindler, "Emerging Patterns of Management Education on the State University of New York at Buffalo Campus," in *The Next Half Century in Higher Education for Business* (St. Louis: American Association of Collegiate Schools of Business, 1968), pp. 17-19.

school classes and by reducing attrition can the nation's need for more doctors be met. Medical schools should search out prospective students from deprived backgrounds, and when students deficient in educational background are admitted, tutorial help and additional time to complete degree work should be provided. Professional schools have begun to recruit actively from minority groups and to experiment with new courses to cope with minority experience in the curriculum.

Academic Degrees

Last among these administrative approaches to curricular reform is reconsideration of academic degrees. While there is no absolute agreement, there is a trend for the master's degree to become the first professional degree. In those fields in which this is most decided, several patterns occur:

1. Undergraduate work in a profession, such as business, followed by a master's program in the same field
2. Undergraduate major in the liberal arts followed by a master's program in a profession, e.g., social work after a sociology major
3. Undergraduate program in a profession—say, education—followed by a substantive master's, such as one of the liberal arts
4. A five- or six-year professional program yielding either a bachelor's or master's degree, as in architecture or engineering.[19]

Since degree requirements do define the parameters of a curriculum, educators are reconsidering the principles of degree structure. Spurr has developed five such principles which could be the basis for widespread reform.

1. The number of degree titles should be kept as low as possible, allowing for substantive variation within each for subject matters, emphasis, quantity and even quality of effort required.
2. Degree requirements should be flexible with respect to time necessary for completion.
3. Each degree should mark a successful stage of academic progress without implication or prejudgment as to a student's capacity for the next stage.
4. Degrees should be so interrelated as to facilitate opportunity for student motivation, interests, and intellectual achievement.
5. The various components of education (general, basic, theoretical, professional) should not be separated into discrete time periods.[20]

Application of these principles to a professional field—for example, social work—would produce a B.S. with perhaps a major in one of the social or behavioral sciences, a master of social work which could variously be completed in one, two or more years, and which would lead equally into practice or consideration for doctoral candidacy. The requirements for the master's degree would have enough in common with

[19] Stephen H. Spurr, *Academic Degree Structures: Innovative Approaches* (New York: McGraw-Hill Book Company, 1970), pp. 75-76.
[20] *Ibid.*, pp. 26-67.

some other professional fields as to allow students to change emphasis without retracing a full master's program.

Techniques of Teaching

Important to these attempts at curricular reform are innovations in teaching technique. Perhaps the most pervasive tendency is to increase clinical or field experience and to introduce this much earlier in the student's educational career. This means that in medicine students would be introduced to clinical work within weeks of entry into a program. At Western Reserve, for example, each freshman assumes responsibility for working with a pregnant woman. He gets to know the family, follows the case through delivery and the early years of the infant's development. By the time he graduates he is actually rendering medical service to the family. At Yale first period students serve in neighborhood clinics on the theory that work in basic science will be much more humane when students have a personal reason for knowing. In addition, the process is designed to bring the patient back into primary focus in medical practice.

Some teacher preparation programs now provide teaching experience for college freshmen as vocational guidance, and others are seeking to attain clinical experience with a semester of observation and a year of supervised teaching. At Carnegie-Mellon, for example, students spend a term observing and helping in a laboratory school, a term observing in a public school and a term of supervised teaching.

In law there is a growing feeling that such experiences as a moot court (trial) are too artificial and that students, preferably between the freshman and sophomore years, should spend an intensive summer in a law office, governmental agency or court. Greater opportunity for law review for more students is also sought. Social work now accepts an undergraduate major which would intensify clinical work in the second year of graduate professional study.

A proposed reformed curriculum for theology puts field experience at the heart of the first year of professional education and seeks to relate academic subjects to that work. Architecture and engineering students are given a real-life design problem and are expected to assume professional consequences for the solution.

In effect, most of the professional schools actively seek for their students the clinical exposure which medicine, nursing and dentistry are presumed to have been providing. The health fields are trying to connect clinical experience more closely to work in the basic sciences and theory.

Several approaches illustrate the nature of attempts to provide clinical experience in various fields and to uncover some problems and issues. The first of these is a program of clinical experience for law students at the University of Connecticut.

> The Law School employed three lecturers-in-law (legal interns) to assist the clinic director in the development of a closely supervised clinical experience for more than 30 second and third year law students. The program was restricted to clinical training in criminal law because of the lack of faculty personnel to supervise a civil division.

> The interns completed a six-week training session in Connecticut criminal procedure prior to their admission to the State bar in mid-September. Since then they have accepted 54 cases involving the defense of indigents accused of criminal offenses in both state and federal courts. In each case, two students have been assigned to assist them with the investigation, research and courtroom presentation. Although Connecticut students are not yet permitted personally to represent clients, the present program allows them otherwise actively to participate in the decision-making process. In a pyramidal supervision system analagous to the clinical procedure of medical schools, the clinic director is involved in each case as an aggressive advisor and accompanies the intern-student team during every important courtroom appearance.
>
> The clinic staff complements the criminal defense cases with a two-hour seminar session every other week. The classroom phase of the program attempts to bind together the clinical experiences of all students and relate them to traditional legal materials. As a result of a recent evaluation, the format has been altered so that many sessions will focus on in-depth analysis of one case, including all the motions, memoranda, and transcripts of court proceedings, in light of tactical, ethical and legal considerations.[21]

This pilot program proved successful but one-sided because students gained experience only with criminal defense. A next step will be to devise a similar context for work with prosecutions and corrections.

> [This clinic program described above has] the virtue and the vice of being within the general pattern of other clinical experiments being conducted in a number of law schools. Although Connecticut appears to be unique in using interns as *teaching* supervisors, it follows the approach of other schools in segregating the clinic from the mainstream of legal education. Thus, the clinic has become a separate and distinct course at most law schools (including Connecticut) instead of *the clinic method* becoming an essential teaching tool in many traditional law courses. As a result, the clinic staff has been set aside to supervise its own narrow specialty rather than being employed as an immediate available resource by the rest of the teaching staff.
>
> Those involved in clinical education constantly speak of the "feedback" and "enrichment" that the clinic will furnish to the rest of curriculum. Assuming the validity of these statements in the absence of available and measurable evidence, it is suggested that the "feedback" and "enrichment" would be more meaningful and apparent if the clinic experience were tailored to meet the narrow educational needs of appropriate law school courses. To achieve this result, it is not proposed that each law professor need become a clinician. Rather, it is urged that the clinic staff lend its expertise to a number of teachers who desire to heighten student interest through the clinic method. In effect, clinic personnel will be brought in to teach the traditional course with the regular professor.[22]

[21] *Council on Legal Education for Professional Responsibility, Inc.*, Vol. III, No. 7, February, 1970.
[22] *Ibid.*

Independent Study and Research

The movement to have students gain a different sort of experience through independent study and independent research, modeled after Ph.D. programs is another innovation. Those interested in reform are convinced that there has been too much formal classroom work, too much lecturing and too frenzied a pace for students in highly organized sequences. As a remedy, medical students are given time, especially in the last two years, to work on independent research; social workers are encouraged to do research in connection with their clinical work; and lawyers, particularly in those schools trying to relate the social and behavioral sciences to law, undertake original research.

New Technology and Media

Few educators discuss in any systematic way a cluster of technologically based techniques which offer curricular substance as well as process. Widespread use of computers in educational programs is judged a real potential. There is growing demand for computer services in academic research. Graduates in an increasing number of fields use the computer as a professional tool on the job. There is a great demand for computer scientists and technicians in all major occupational sectors. And there is widespread interest in research and development in the computer sciences and related disciplines.

The University of Missouri medical school regards the computer as such a potentially powerful diagnostic tool that a separate computer center has been created, with computer-based diagnostic rooms so that every medical student will spend time making diagnoses with the assistance of a data bank of medical histories from both in- and out-patient records for the entire history of the school. In many of the programs at the University of California at Irvine, the computer is an instructional device. For example, genetics is currently being taught through computer-based simulation which makes it possible for students quickly to solve complex problems of genetic drift. A few institutions have provided computer outlets at various places on the campus for student use in problem solving. The University of Massachusetts at Amherst anticipates forty such outlets, expecting that each professional school and academic department will be responsible for training its own students in computer uses. Faculty members from several large computer science programs offer short how-to-do-it courses for faculty and students.

However, the bulk of literature on curricular reform in the professional schools proceeds as though the computer did not exist. This is somewhat strange in view of widespread published predictions of what computers and other of the new media will accomplish educationally. That vision portrays individual consoles by which students could have access to a wealth of specialized information, the catalogues of great libraries as well as video tape or film libraries. With access to teaching programs of varying lengths and complexities, professional students on their own could learn techniques much more quickly and efficiently.

Before such a vision is realized, professional schools, as all of education, must resolve some perplexing issues. Technologically, great acceleration of learning is presently possible with computers, but at enormous cost. Information could be available at terminals, but this information must be prepared by people who are committed to doing other things.

At the very time when professional schools are introducing greater variety into their curricula to appeal to differing student interests, to emphasize computer instruction from stored information might produce a uniformity which is intolerant of the random and sometimes aberrant thoughts essential for creativity. Thus, for the moment, we must judge the computer as only a potentially powerful factor in curricular reform.

Similar statements can be made about other educational media or technology—television, tape recordings, multi-media classrooms. Many professional schools have adapted some media, but few have made media-based instruction central to the professional curriculum. All academic departments of the School of Medicine and the School of Nursing at Duke University use television in teaching, but few departments substitute TV productions for live teaching. Duke videotapes psychiatric interviews exhibiting nonrepetitive examples of patient care so that student therapists can review these episodes, and television equipment is available in patient examination rooms in the outpatient clinic so the student physician can play back immediately his procedures, thereby improving them.

The Oregon State University School of Forestry's self-learning center, equipped with study carrels, work tables, cabinets, recorders and slide projectors, became useful once instructional materials in forestry were assembled. Students unable to attend lectures can listen to recordings of them. Instructors absent from a class session can learn from tapes what progress has been made. Instructor's tape exercise instructions and leave them at the center for subsequent student use, and slides and other visual materials first used in class are deposited at the center for student viewing at leisure. Notes and photos from required summer field experiences also are lodged in the center.

Lecture rooms in the School of Medicine at the University of California at San Diego are equipped with electronic response systems for use during lectures, which allow students to transmit anonymous answers to multiple-choice questions and to queries raised by the instructor during his discussion.

The University of Michigan School of Nursing uses video tapes to teach the preparation and administration of medications, and uses the School of Social Work video tape equipment and correlated programmed instruction to develop student skills in interviewing. Carnegie Tech teaches basic circuits and fields courses by programmed texts.

The Center for the Study of Medical Education at the University of Illinois designed a series of clinical and laboratory simulations which require sequential decision-making as data accumulated. The materials are printed with opaque overlays to move students along the various steps.

The relative unimportance of media in the professional schools is

illustrated by the fact that in the comprehensive resume, *New Media and College Teaching,* edited by James W. Thornton, Jr., and James W. Brown, only a few of the several hundred examples of media use described come from the professional schools. Nonetheless, if curricular reform proceeds, these technologies are likely to become more useful and important.

Another pedagogical practice prevalent among professional schools is to borrow techniques which have worked in one profession and apply them in another. The most obvious are the various professional schools' attempts to approximate the practical experience which the teaching hospital or clinic allows. Case study, which grew naturally in law schools because the case so frequently poses the actual substance of law, has been adapted first by graduate schools of business and then by schools of education and theology. On the assumption that professional practice ultimately must consist of complex decision-making, these schools, with varying degrees of sophistication, accumulate information about a real or hypothetical case and ask students to work through the case until they reach a decision. Case materials have been widely used in continuing education workshops and conferences in both education and business. Institutes for improving college administration sponsored by the American Council of Education and by the Western Interstate Commission for Higher Education have each developed libraries of case materials which could become an important educational resource.

International Education in the Professions.

A unique element of curricular reform, the magnitude of which is only gradually emerging, is the attempt in professional fields to add internationalism to the curriculum. The reasons for this development are quite obvious:

> Professional people from every field, from medicine and law to social work and education are prominent in the ranks of the overseas Americans; the professions have developed an international emphasis for the simple reason that the functions they serve must be performed in all societies.[23]

In the past, people in the professions had been inclined to take a rather culture-bound view of their subject matter, which proved a serious limitation when the United States and its citizens accepted a world role at the end of World War II. A brief resume of practice and recommendation for international education in several fields illustrates how professional education is responding to this change.

For schools of business administration and public administration, it is suggested that every school should study the nature, extent and timing of its involvement in internationalism. Every school should have some world affairs content in its curriculum. The school should sponsor lectures on international matters; students should be encouraged to enroll in international courses elsewhere in the university; faculty

[23]Glennan, *The Professional School and World Affairs,* pp. 1-2.

members should be encouraged to seek international experience; schools should accept qualified foreign students and faculty; and student and faculty should both be encouraged to learn foreign languages. Some schools could go further by introducing comparative and cross-cultural materials into existing courses. They could initiate courses of specialized international character, and could support faculty research of an international nature.

Certain schools could develop a special institutional competence in the world affairs aspect of their profession. They could establish internationally focused courses to prepare students to specialize in the international practice of their profession. They could incorporate international content in basic and professional courses, recruit and develop faculties with strong international backgrounds, operate in-service training programs in international problems, offer short term institutes for non-Americans, undertake internationally focused research, disseminate research findings and offer technical assistance projects for the development of professional education in overseas countries.

The concerns of engineering and agricultural schools in international education present a paradox. Schools of agriculture, generally having the smallest number of foreign students, have over the past several decades adopted major commitments in overseas projects. Engineering schools, on the other hand, having perhaps the largest proportion of foreign students studying in the United States, have engaged relatively little in formal overseas projects.

Generally schools of agriculture have participated in international projects but have moved slowly to undertake curriculum revision with an international component, to prepare students for international service. At present, there seems to be a struggle in agricultural colleges over how to incorporate overseas experience into campus programs. While performance has been less than adequate, several imperatives emerge. Each school has the responsibility to give each of its graduates a reasonable comprehension of world affairs. Very likely schools of agriculture should do more to encourage study of esoteric languages. Colleges of agriculture should provide students with training in a selected technical field, augmented with studies leading to an understanding of the interrelationships among people and countries of the world, which might be developed in seminars on international agricultural development. All colleges should insist upon an adequate foreign language requirement.

While engineering schools have attracted large numbers of foreign students, only Michigan State University has made serious effort to develop comprehensive programs to bring internationalism into American engineering curricula.

Since American engineering schools should help build engineering schools abroad, we must produce specialists who have both technical competence and understanding of the international scene. Clearly they should be able to speak the language and should be exposed to the history, manners, customs and social mores of the region in which they will likely work.

Engineering schools also should pay more attention to the needs of foreign students studying on the United States campuses, not only for the sake of these students, but for the further edification of American students.

Law schools present still a different history and set of problems. Currently, in contrast with earlier years, more law school professors are teaching courses in the international field, more students are taking these courses, and more students and lawyers are coming to the United States from other countries for legal training. American law schools have made their biggest progress in developing courses and teaching materials dealing with comparative law, public international law, international business transactions and international organizations. However—and this is likely to be true in the future—few law graduates will be primarily engaged in international practice. Thus the predominant need for legal education in the United States will be in the general education of the larger body of students who will not specialize in international law but who should get a basic understanding of the problems and limitations of law and of legal institutions in an international context.

As for the professional component of law schools, there are several urgent recommendations: greater emphasis on empirical and process-oriented research on the relationship of law to economic and social development, and courses and experiences showing the role of law in land reform, economic development, regulation of business and other fields acutely relevant to developing countries. Law schools should be increasingly involved in legal assistance activities. They should seek techniques for greater cooperation among law schools in such activities as selection of foreign students and meeting the requirements of legal assistance work abroad.

"Increasingly medicine schools have become concerned with international medicine. The interest may stem from global epidemiology, medical missionary education, desire to expose physicians to medicine in another cultural setting, observation of rare diseases, preparation of teachers or members of the Peace Corps, international health organizations, and the broad influence of travel."[24]

Medical schools have tried to meet these needs by increasing emphasis on the social environment, reflected in the way several new schools are pioneering with departments and curricula which stress community medicine and preventive medicine programs, departments of behavioral sciences and interdisciplinary activities. Over all, there seems to be the feeling that students most need experience in overseas programs and work with physicians and students from abroad. Thus the major reform in medical education will likely be increased participation in world and international health programs.

The thirteen accredited schools of public health in the United States have long been involved in international service but only recently have they begun to formalize their training programs to meet increasing demands for personnel to work in international organizations and

[24] *Ibid.*, p. 234.

on problems involving more than a single country. Generally, a school of public health is intended to provide graduate education of physicians, dentists, nurses and other health personnel for careers as administrators, research investigators, teachers and practitioners in agencies or institutions concerned with community health. The curriculum in such schools has generally stressed the nature of man and his physical and social environment as these interact to affect his health. The basic techniques of investigation and administration, the economic and political setting of health services and the application of the knowledge in promotion of community health are taught.

As schools have acknowledged international responsibility, several reforms suggest themselves. Students should be taught the elementary steps in preventing or reporting any disease recently arrived from abroad, the immunization protection needed by American citizens traveling abroad, awareness of how international health services are organized and ability to assimilate and utilize experiences from around the world to obtain acceptance of public health services. Students also should be taught to use innovative procedures developed by other countries when they are appropriate to use in the United States. They should be given an understanding of the relationship among other countries between public health and organized medicine, and should be trained to deal with health professionals from other countries.

Until recently, schools of education have given little or no attention to international opportunity and careers except in several surveys, notably Percy Bidwell: *Undergraduate Education in Foreign Affairs, and Non-West Studies in the Liberal Arts Colleges.* While a few outstanding programs have been created, the overall picture was found to be rather impoverished.

To rectify this condition, several recommendations have been made. First, each institution should create formal guidelines to help determine the desired contributions of courses in history and the humanities to the student's world view. The undergraduate course requirements of a prospective teacher should probably include some study of a foreign, preferably non-Western, culture. The social and behavioral sciences contributing to the study of education should be used to introduce more comparative data. Such comparative social sciences as anthropology should be used more frequently in the preparation of teachers. Curriculum reformers thus suggest that the education of American teachers in the past has overemphasized the behavioral sciences and understressed the social sciences, which have the greatest potential for generating international insights.

Morality, Ethics and Professional Identity

Only two other major rubrics of curricular reform need to be considered. The first of these is a sustained quest on the part of professional schools to develop in the student some feeling of being a professional, and concomitantly, to identify better ways of developing in students workable and acceptable professional ethics. In one sense, some professional schools are relying on the humanities to develop a broad personal

philosophy of life in which a system of ethics can be developed. But in a few of the professions the belief grows that the professional school itself should take more direct responsibility for professional ethics.

The barriers which professional schools currently encounter in developing a professional self-image and a system of ethics for students are illustrated in the perplexities of medical education. In contemporary medical schools it is difficult for medical students to acquire a unified view of medicine or a clear concept of their role and their obligations in medicine. Medical education itself, in the formal sense, does not have a rational basis, deriving rather from historical, cultural, traditional and accidental factors. Thus there is really no solid base upon which to develop substantive curricula, much less a base which leads to an awareness of moral problems.

Today's medical students don't necessarily enter medical school with the intent of becoming practitioners; hence in their formative years they don't quite know which sort of moral directives they should accept. The lack of relationship between medical education and the medical profession only causes them further difficulties. Some medical educators have felt that professional schools should rely on undergraduate colleges to develop a sense of moral responsibility. However, not all educators in the undergraduate college will accept this as their responsibility. Also, many undergraduate efforts to develop moral sensitivity have proven inadequate. Medical students enter medical school but little sensitized to moral questions. Most medical schools provide either no formal instruction in ethics or only principles more related to economic conditions of the profession than to larger social issues.

Still a further barrier to the development of professional autonomy in students is the division of medical schools into departments, whose very independence and autonomy inhibit meaningful synthesis of disjointed educational experiences. Fundamental biological research, and not human problems, have become the guiding force in medical education, partly in reaction to the charge of being a trade school, and partly because of the availability of important federal fundings. Advanced concepts in molecular biology and the application of mathematical techniques have made it possible to conceptualize disease without considering the actual human being. For example, one third-year medical student in an important research paper could remark, "Scientists can now strip away the human body and study the heart and blood system under the cold light of mathematics." With such a point of view, the clinical investigator becomes increasingly concerned with mechanisms at the cost of the patient.

But even when medical faculties approach important ethical questions, the current emphasis on research weights opinion on the ethical nature of practices. A number of distinguished medical professors have been reluctant to see federal restrictive policies developed to prevent abuse of drug experimentation. If regulations were drawn so tightly as to place the safeguarding of the health of the patient above research aims, fundamental research could conceivably be seriously retarded. And several other minor elements intrude.

Drugs are used so frequently in medical schools that students come

to accept as normal the use of powerful drugs, without realizing the psychological or physiological change power which so many new medicines possess. Using students as volunteers in experiments, a practice which has grown up in part because of financial needs of students, gives students the feeling that experimentation with human beings is appropriate and normal.

The increased use of electives allows students great choice, but it does tend to break down the cohesiveness of a medical class. Thus, one further device for acculturation has been weakened. Over half of the medical students are married by graduation and have lived part of their lives away from the medical school, in a working society, a separation almost guaranteed to prevent intense identification with the profession and with the ethical concerns that perplex it.[25] These same perplexities also confront the other professional fields.

Continuing Education

The last element of curricular reform, continuing education, has developed from an impressive set of premises but has turned out to be a puny effort on the part of the professional field. When one examines actual organizational or curricular devices to meet needs of rapidly expanding knowledge and shifts in professional practice the results appear modest, if not meager. A few schools of business and engineering have created master's programs to retread people from one profession into another; notably, bachelor's degree-holders in engineering receiving a master's degree in business. Schools of education conduct summer programs to upgrade the education of teachers. Colleges such as Sarah Lawrence have developed programs for matriculating mature women and preparing them in mid-life to go into new careers of teaching. A few land-grant institutions have created elaborate extension divisions with the avowed purpose of upgrading continuing education. But even at land-grant institutions, which probably have the best record in continuing education, the picture is far from bright. Ralph Tyler could generalize that, while almost all the institutions participating in general extension reported programs of continuing education at technical, professional and postgraduate levels, the catch is that most of them are for public school teachers and administrators who in most states get more pay if they have advanced degrees or have completed certain amounts of work toward them. A large part of the work for other groups is, of course, the short course variety which is likely to be spotty and emphasize immediate answers to pressing problems, rather than the development of broader and deeper understanding and the use of new concepts and techniques.[26]

But if achievements have not been great, concerns on the part of professional schools are emerging clearly, and from those concerns we can infer something about the curricula of the continuing education effort.

[25]Underwood, *The Church, the University, and Social Policy*, Vol. II, pp. 299-307.
[26]Herman R. Allen, *Open Door to Learning* (Urbana: University of Illinois Press, 1963), p. 16, quoting Ralph Tyler.

From engineering comes this prediction:

> It is clear that now and in the future, basic engineering cannot presume to teach students all they need to know. Accordingly, the profession and academic institutions which serve it must look forward to a growing activity in continuing engineering studies as a distinct educational function outside of advanced degree programs. This is not merely a matter of dealing with current obsolescence, retreading, retraining or any of the other popularized versions which have been developed, sometimes almost frantically, to satisfy urgent localized needs. It is rather a matter of establishing an entirely new dimension of personal development throughout the engineer's career. It is a matter of taking a long-range look at the ever increasing rate of technological change, and then deciding what now needs to be done to assure the continuing effectiveness of the profession in the 1970s and beyond. In this sense, the limited activity in educational institutions, even in recent years, under the broad title of continuing education cannot be considered as adequate for the need and service that is being considered today.[27]

And, stressing similar points for theological continuing education, Pusey says:

> We express one particular concern that the education of ministers after ordination be of different type from that now characteristic of the B.D. course. It should not be purely intellectual nor pedantic but take into large account the work of the minister in his particular station and the experience he has had of human hungers and theology's relation to life, and what he has learned in prayer and worship about the deep places of his own and others' innermost hearts. We do not separate intellectual stimulation and spiritual growth. Both are needed. We are concerned for the former, but the non-cerebral factors in education must not be omitted. The Church has an obligation to feed the intellectual fires it has kindled. It must also help a man to grow in the knowledge of what sort of a person he ought to be, and in the ability to practice that which he ought to do.[28]

From legal education comes this criticism and advice:

> There has been a great effort to promote the continuing legal education of lawyers during the past twenty years. Efforts in this direction have gone on much longer than that in certain localities, particularly in some of the larger states and cities; but by and large, nationwide, very little attention has been given to bringing lawyers in practice up to date, particularly the sole practitioner who needs it most.
>
> State administrators of continuing legal education have been appointed in all but nineteen states. Only a few had existed earlier. Much more needs to be done to develop their activities more fully and to raise and maintain the quality of the continuing legal education offered, and to persuade lawyers far more generally to make

[27] *Final Report Goals of Engineering Education*, p. 58.
[28] Pusey and Taylor, *Ministers for Tomorrow*, p. 110.

use of it. Much needs to be done to coordinate continuing legal activities throughout the nation, to make them more efficient and to improve the quality. The instruction should not be limited to how-to-do-it courses for practicing lawyers. There ought to be more emphasis on high level courses and on professional responsibility.[20]

Illustrative Cases

Illustrative of professional schools which have given a great deal of thought to curricular reform are the School of Medicine at Yale, the School of Law at the University of Denver and the School of Architecture at Princeton.

The School of Medicine at Yale is undertaking its first major curricular reform since 1928, when the school shifted from reliance on part-time professors to a large corps of full-time professors. During the decades after that reform, there had been minor tinkering with the curriculum and an occasional adding of something, as when psychiatry was included among the specialties. In 1968 the college conducted a major curricular restudy. It was assumed that whatever evolved would be based on important elements of the Yale system which has traditionally emphasized freedom for students both to attend lectures and seminars as they wish, and freedom to choose from a number of electives. However, this freedom will probably be rearranged to operate at different parts of the medical school program.

Generally, the four years of medical education have now been divided into three approximately equal blocks of time. Students in the first block will receive intensive instruction in basic science, an introduction to clinical medicine which will develop facility in history-taking, methods of physical examination, basic vocabulary and basic diagnostic patterns, so that toward the end of that first block the student can enter some clinical work. During the second block of time, approximately a year and a half, students will be given training in specialities, and this will allow them to concentrate. The final block will return to basic sciences and a great deal of clinical work, with the opportunity for some further electives. In the third year there will be a serious attempt to correlate closely the basic sciences needed for the clinical specialties in which the student is working.

It is hoped that this new arrangement will accomplish several purposes. First, if a student has had some clinical experience before he undertakes work in specialty and basic science courses, it is presumed he will be more highly motivated to get at the scientific roots of problems he has encountered at the bedside. Second, it is hoped that earlier contact with patients will infuse humanism in the curriculum. Since Yale has always emphasized specialization, students have tended to become preoccupied with either a basic science or a disease syndrome and to lose sight of the human being. The new curriculum is designed to bring the patient back into the picture. The success or failure of this particular element of curricular reform is going to rest largely on whether or not

[20]David Haber and Julius Cohen, *The Law School of Tomorrow* (New Brunswick, N.J.: Rutgers University Press, 1968), p. 219.

the faculty will be willing to rearrange time to provide students with the individual supervision they need in the two clinical periods, and whether the faculty will be willing to engage in more conference-style teaching and seminar work in place of the easier lecture. The college anticipates offering five major tracks: clinical medicine, basic science (primarily for those who anticipate specializing in research), health delivery services, psychiatry and the behavioral sciences, and a track for the primary physician who Yale professors feel will begin to act like a specialist.

One change is to draw more heavily on the social and behavioral sciences, particularly to restore humanism to the curriculum. The new structure can allow students to shift in mid-career from an M.D. program to a Ph.D. program without serious loss of time. The approach to the basic sciences will differ substantially from past efforts because of the enormously expanding body of basic science knowledge; only those portions clearly relevant to the physician can be dealt with in courses. This restructuring of course work will be attempted partly in the School of Medicine, but partly through cooperation with the basic science departments in the rest of the university. In the past, in some basic science departments M.D. candidates were second-class citizens. However, because the university has begun to re-emphasize the values of professional education, the time seems ripe for a rapprochement between the medical school and the basic departments. If plans go as hoped, the result might well be single departments in the basic sciences serving both the graduate school and the medical school. Already, three departments have been combined in the medical school, which forces people to talk with each other, discuss common curricular problems and distribute a common budget.

Another important element in the Yale pattern is a fundamental belief that the institution itself should be concerned with the delivery of health services and should sensitize its students to this responsibility. The university plans to establish and conduct community health centers which, after starting off with some mental health services, will move to pediatric, then gynecological and, eventually, surgery and internal medicine services. Medical students, particularly first-year students, will be active in these centers, which should also in time provide important research information about incidence of disease, epidemiology and the like for certain areas in New Haven. These centers also are planned to serve as models for other urban centers and nations.

Especially promising will be the experimentation with group practice which the neighborhood centers will provide. The Yale faculty is convinced that group practice and group delivery of medical service, especially in relationship to government programs, is the path of the future. Student experience and faculty experience in creating and developing the centers should also give medical workers experience in working with laymen in a community.

The medical school has considered other reforms, including the training of nurses to become almost the equivalent of the old-time general practitioner. They believe that a well trained nurse, with the services of the computer and biochemical laboratory, can render more

effective primary medical service than can the M.D. who has gone through intensive specialization training. The university accepts as axiomatic that the computer is an essential part of medical practice. Students will be given training to use the computer and computer-based information.

The dean of the law school of the University of Denver is convinced that lawyers and legal education too often focus on the past, partly because of the law school's preoccupation with precedent as a means of teaching and analysis. Obviously there must be a mix of past, present and future in legal education. But an overemphasis on precedent is unrealistic. So, first, the dean wants the law faculty to start thinking about the present and the future and to engage themselves in research appropriate to those time periods. One focus for this new emphasis very likely will be concentration on policy sciences. Lawyers thoroughly immersed in social and behavioral sciences could become the policy scientists of the future. Such a notion might provide a viable alternative to the preoccupation with precedent. Through use of computer and game theory, for example, lawyers might even instruct judges and practicing lawyers in alternatives to precedent.

In the future, at the University of Denver law school, social and behavioral sciences will play a major part. Six nonlawyers, including one theologian, who already are full-time members of the law school faculty, have had some experience with law but are charged primarily with bringing the insights of their disciplines into the study of the law.

In the past, legal education has attempted to train all candidates in all branches of the law, for the most part because of fear of the bar examinations. The University of Denver adopts the stance that law, as all other professions, is increasingly specialized and that there should be curricular recognition of this fact. Thus it is anticipated that first-year students will study the basic sciences of the law—contracts, torts, constitutional law and so forth—and then spend the next two years electing rather widely from law courses and behavioral science courses which seem appropriate for each individual's specialized needs and aspirations. It is assumed that social and behavioral science materials and specialization can be injected into the law curriculum without a major extension of time by cutting out irrelevant curricular materials and stressing free election of specialized courses.

As Yale has begun to think about nurses, Denver has begun to think about the roles of paraprofessionals in legal work and is seriously considering creating programs leading to the preparation of insurance adjusters, probation officers and estate planners. The bar generally has been somewhat reluctant to see law schools train people other than practicing lawyers, but the need for these paraprofessionals is so great that the law school must meet it.

In the past, schools of law have not conducted much research other than orthodox precedent search. However, increasingly, the law faculty must be led to involve students in research of the policy sort entailing both law and social and behavioral science disciplines in interdisciplinary effort. Law students will have their introduction to applied experience by helping staff community service centers, which should be a

responsibility of law schools. Generally, however, the University of Denver sees practical experience as summer activity not to be injected into the normal academic year, because there is time for practice after leaving school, and the primary mission of the law school is to help students see the full legal system in relation to society.

Two other developments should be mentioned. The university is convinced that continuing legal education has been handled deplorably in the past, concentrating largely on bringing practitioners up to date on specific legal matters. A more broadly conceived continuing education can bring practitioners to view the law in a wider context. Some of this broader retreading of the practitioners can be accomplished in the newly created centers for blending law and the social and behavioral sciences. At present there are four of these centers: Berkeley, Denver, Northwestern and Wisconsin, and at each of them law professors and social and behavioral science professors come together to offer interdisciplinary interpretations of legal matters. The centers which function most effectively are those which are lodged administratively in the law school.

At Princeton School of Architecture, the architectural program has in the past been a monolithic, five-year, for the most part prescribed program leading to a professional degree in architecture. Princeton visualizes architecture in the future consisting of modules, normally of two-year duration. At the end of the second module a student will receive a bachelor's degree and at the end of the third module, his professional degree in architecture. During that second module students can elect appropriate specializations. Thus one student might concentrate on engineering, another on planning, and still another on architecture *per se*. Using these modules and the new flexibility, it is hoped that architecture can make much greater use of social and behavioral sciences than it has in the past. Historically, there has been a good connection between architecture and the technologies and art. But social and behavioral sciences were underutilized. With the present interest in leading architecture toward planning, the time seems right to bring in these people-concerned subjects.

As the school tried to establish a rationale for its new curriculum, its faculty used such ideas as Benjamin S. Bloom's *A Taxonomy of Educational Objectives, the Cognitive Domain,* and the approach to curriculum construction first elaborated by Ralph W. Tyler. These consist of trying to specify the behavioral objectives which people who go into architectural planning or engineering actually need, and then contriving a curriculum appropriate to develop those behaviors.

Urbanism is another element of architecture design that will likely be an important concern of the School of Architecture at Princeton. Already an inter-university committee is set up consisting of the dean of the graduate school and the deans of architecture, engineering, and the Woodrow Wilson School of Public Policy, to create a Center for Urban Studies which will draw on many of the disciplines and the professional fields to reinforce and enrich the preparation of professional students.

Princeton has arranged work-study programs in the summer for most architecture students as an additional way to branch from a common core of educational experience into a specialty. While the biggest effort at curricular reform has dealt with the undergraduate program and the program leading to the first professional degree, there is similar thought of graduate work in architecture. In the past, doctoral students in architecture have concentrated on historical or critical studies. It seems likely in the future that they, too, will be combining architecture, the social and behavioral sciences and real life problems as they prepare themselves for important work in urban design.

chapter 4

MODELS, GUIDELINES AND CRITERIA

There is no common theory of curriculum construction nor any generally accepted model (with the exception of the efforts of professional schools to pattern education after the medical school) for professional education. Nor should there be, because there are essential differences in the professions, and even individual schools serving the same profession have different missions. Stanford's engineering school serves a different clientele than does the school of applied technology of San Jose State College, and the Harvard School of Education conceives itself as different from New England state colleges. But there are common problems and common attempts at reform which suggest principles or ways of conceptualizing the curriculum which could be effective in most of professional education. There have been a few efforts to create generally applicable models or sets of principles.

In a sense the composite of current reforms implies one model, although without including all of the elements required by professional curricula, for example, the proposition that professional schools belong in a university context, and that full professional preparation should include graduate and undergraduate education and some educational experiences in the arts and sciences, the professional sciences and in application.

Because the essence of professional practice consists of decisions about complex human problems which transcend disciplinary boundaries, and because relevant knowledge has grown so enormous that new organization of knowledge is necessary, new courses of an interdisciplinary or interdepartmental character are needed. To teach these appropriately, we need more than the lecture technique to introduce the insights of people from several fields. Seminar, conference or other small group techniques should be used much more frequently. For such joint efforts the traditional division of a university into a school of science and arts and separate professional schools—all divided into discipline or specialty departments—is inadequate. While there is no general agreement about new structures, creating composite departments of several related fields, redeployment of basic science and theory departments into relevant professional schools, and expanding the institute or center into an agency of instruction, are all being tried.

In the past, professional schools accepted the social and behavioral sciences as part of the general education of students. As major institutes of technology (Massachusetts Institute of Technology or California Tech) began to reform in the 1950s, the terms "humanities" and "social sciences" were used almost interchangeably to describe ways to broaden the education of professional students. Current efforts go much further. Law and medicine see the social and behavioral sciences as making direct contributions to the professional competencies of students, as do education, social work, nursing and business. These fields also introduce international dimensions into the curriculum. Comparative studies of culture and psychological interpretations of role and personality lead future practitioners out of a traditional cultural parochialism.

To compensate for the mounting academic and theoretical emphases of professional education during the 1950s and 1960s, and in an effort to restore the human being as the chief focus of professional concerns, we have a renewed interest in clinical or field experience. Safeguards have been set up to prevent the professional school from degenerating to a mere trade school. But early and sustained clinical work is now judged essential as a powerful drive for students subsequently to study basic science and theory. If students are to receive timely clinical experience, the traditional academic calendar may prove inadequate, and new arrangements must be made.

Partly because of student demands for greater freedom, but more because of the realities of specialization, even in those professions which traditionally have produced generalists, there is a loosening of specific course requirements and a widespread reaction against a large core curriculum required of all students. This does not mean that some basic material should not be shared by all practitioners. But greater freedom of election and greater freedom from requirements means that students in most of the fields can spend more time on independent study, research, or developing specific skills through individual effort rather than through formal class instruction. Or, it is noted that the computer offers educational potential as well as utility in practice, so experience and training in computer science and technique are added to the formal curriculum.

Older techniques of socializing future professionals into the ethics of a profession have broken down under the impact of size and numbers. The humanities can contribute to a humanizing of professional education. In addition the half-life of content of professional practice has so decreased that every professional person requires constant upgrading through continuing education. Professional schools should assume responsibility for that retraining—if funding could only be discovered—but as yet actual efforts in this direction are minimal.

If faculties understand the requirements of actual practice, they should be able to list the specific skills and competencies which every graduate needs. The list need not be infinite, and ways of developing these capacities are not beyond the abilities of a school seriously interested in a serviceable curriculum. Somewhat more difficult, but possible, is arranging a variety of experiences to contribute to the development of a professional person. For example, every professional stu-

dent should have clinical or field experience, work with a group of peers on a professional problem, close identification with at least one member of the faculty, observation of practitioners in action, work with people from related professions or exposure to some foreign culture. A program could be devised which would insure that all students would enjoy those experiences.

The humanities, the social sciences, the natural sciences and a working knowledge of communication are all essential to education if life is to be perceived as a whole. Students entering advanced professional work deficient in any of these should be expected to rectify such deficiences. At an elementary level it could be argued that everyone should have been exposed to at least several modes of perceiving reality, from raw empiricism at one extreme to intuition or revelation at the other. Student guidance could insure that each student's total preprofessional and professional curriculum would provide exposure to each. Thus each student, whether in law, medicine, social work or forestry, should be exposed to some statistical quantification, some use of deduction, some direct observation, and some form of approaching truth vicariously.

Organization for balance between general and specialized studies suggests a second model. I have argued that the undergraduate curriculum should consist of at least four components, each demanding about a fourth of a student's time. Certain common learning should be the shared heritage of all and should create a common universe of discourse. Then there should be specialization, requiring no more than a fourth of the student's time lest he become too one-sided in perspective. To enrich specialization, another fourth of the curriculum should directly relate to the field of specialization and should provide a context for it. The last fourth would be intended to insure time for students to broaden themselves, to explore matters which particularly interest them and to achieve greater insight into the more general culture.[1]

This conception will have various applications for different professions. For bachelor's degree engineers it is easy to visualize one fourth of applied engineering courses; one fourth of mathematics, physics and chemistry; one fourth of common studies in humanities and social sciences; and one fourth spread over subjects in business, the arts, or law.

For graduate social work we would put field work in the area of concentration and assign a one-fourth value to it. Contextual studies would be courses in social work theory, with courses in sociology, psychology or anthropology to provide a common background of discourse about the nature of society and of social problems. The fourth allowed for electives might see students taking work in nursing, education, law, the arts, or even in urban design.

Law schools might use slightly different proportions. Thus, one third could be comprised of basic legal science courses, one third of specialized work, and one third contrived to force law students to broaden themselves through instruction outside the law school. I stress, again,

[1]Lewis B. Mayhew, *Contemporary College Students and the Curriculum* (Atlanta: Southern Regional Education Board, 1969).

that such a scheme, which may sound mechanistic, is no absolute model, but just one other way of considering the curriculum.

A third form of model building is the assembling of clusters of rather general principles to be considered in curriculum construction. McGlothlin sees three major problems: (1) curricular content, (2) curricular length and (3) curricular organization.[2] Within each area he seeks to identify the critical issue and then to elaborate principles helpful in resolving it.

Principles for curricular content

1. Obviously content should reflect the aims of professional education, and since those are broader than that of mere technical competence, curricula cannot be governed by job descriptions alone.
2. The professional curriculum should make explicit provisions for developing social understanding, ethical behavior and a lively scholarly interest.
3. The professional curriculum should be considered as the totality of work in the arts and sciences, professional sciences and the arts of application. Thus, the content of undergraduate education is properly a concern of professional education. Cooperation between each school or agency having responsibility for an aspect of the education of professionals is necessary.
4. Professional schools should continuously inventory new knowledge for new insights and theory for professional practice.
5. Professional education should develop in students an understanding upon which specific techniques and methods can be based consistent with the individual's own personal style.
6. The content of the curriculum should be limited so as not to overwhelm students.

Principles for curricular length

1. Since the needs of each profession differ, there should be no attempt to maintain uniform curricular length in each field.
2. The sole criterion for length should be the time an average student requires to master the knowledge and skills necessary for entry into practice and the base for future development. Since new knowledge constantly emerges, the length of the curriculum should never be considered as fixed.

Principles of curricular organization

1. The curriculum should be organized to move from the elementary to the advanced, to move students quickly into practice and integrate different experiences.
2. While early practice is desirable, so is early mastering of fundamental concepts.
3. Closely related courses should parallel each other to enable students to understand the relationships.
4. Problem-solving should be a central focus of the professional curriculum.
5. Integration of knowledge is best achieved through application. Hence every professional school should make some provision for clinical or field experience.
6. Curricular experimentation should be the rule.

[2]McGlothlin, *The Professional Schools*, pp. 32-54.

One more generic way of studying the professional curriculum is illustrated by Tyler's principles of curriculum construction as elaborated by Bloom's studies of educational objectives. The process of Tyler's conception is a laborious one but almost seems the only possible approach if curriculum construction is to be a rational act.

The first step of this approach is to establish educational objectives which are really value statements of broadly held cultural aspirations—for example, to produce lawyers sensitive to rapidly changing social and economic conditions. Ideally, these, of course, are stated as precisely as possible. Then these goals must be converted into descriptions of the actual behavior of a person exemplifying the objective, for example, to produce a lawyer who understands basic economic principles and the relationships among social institutions and who has the ability to acquire and apply new knowledge. These specifications should point to appropriate educational experiences to produce the desired changes in behavior—for example, exposure to a course which develops understanding of statistics, skill in using data from a computer and familiarity with sources of information on changes in society. At the same time, effective specifications of behavior should suggest techniques of evaluation so that the professional school can know how effective its education program is.

Tyler's model has been available for almost forty years, but aside from attempts by nursing educators to apply it to professional curricula, only recently has the professional field become aware of its potential. Whether that potential will be realized depends upon whether professional schools and organizations are willing to devote the enormous amount of time systematic curricular construction requires.

Several criteria should be considered if professional curricula are to be more effective. The first of these is so obvious that one wonders at the rarity of the practice in the past. This is continuous, systematic curricular planning in the professional school. Too frequently courses have reflected chiefly interests of faculty, practices copied from prestige institutions, unverified requirements of the professions or their accrediting bodies or historic institutional emphases and interests. In a rapidly changing and expanding profession these, of course, will not suffice.

Systematic curricular planning requires, first of all, careful attention to the needs of society for professional services and manpower, not only for the moment but for at least several decades in the future. Until rather recently, necessary information on these needs was not available. Presently, however, as the study of manpower is becoming professionalized, there is reasonably reliable data. For example:

> The demand for persons with legal training for the next two decades is likely to be sufficient to absorb all the graduates that law schools can produce.
> [The] principal hope for improving medical sciences in the next decade is the possibility of further increasing physician productivity.
> While enough young people are interested in engineering as a

career, the attrition rate from schools of engineering is so high as to create a shortage of highly capable engineers.
Engineering schools would do well to follow the example of medical schools, which have recently made intensive studies of factors affecting retention of students in their programs.
[During the next decade] the supply [of elementary and secondary school teachers] will not only be equal to the demand for teachers, but also to the projected need, as defined by the National Goals Commission.[3]

Planning also must consider such factors as obsolescence of knowledge and such concepts as the half-life of a curriculum—that time during which half of the content has been replaced by newer knowledge and concepts. Because of the exponential increase in relevant information, the half-life of a number of professional curricula is now about five years. One can argue that as the half-life of a curriculum is approached, major curricular overhaul is needed.

We must carefully study the processes of curricular planning. By 1970 enough institutions had finally begun to examine their curricula so that patterns and principles began to emerge. Dwight Ladd concludes that curricular reform will take place only when a large proportion of the faculty accepts the desirability of change and when there is strong and skilled administrative leadership. He suggests that curricular planning can no longer be conducted by faculties alone as in the past. Some new mode of decision-making may be essential to keep curricula useful and professional schools responsive to the supporting society. It seems logical that greater interdepartmental and interfield work will characterize professional curricula. This in turn will demand planning and decision-making which will transcend the parochial interests of any individual department, school, or faculty. One way may be to develop a system akin to ministerial government in the parliamentary democracies. After appropriate consultation someone must have the power to make decisions.[4]

Virtually every reform effort in the professional field has assumed that in the future social and behavioral sciences will make serious contributions to professional curricula, that these disciplines have matured sufficiently to become full partners in professional education. But there has been little or no evaluation as to whether this hope is warranted. There is some reason to believe that the reverse is more nearly true.

Psychological research, for example, has contributed little of direct application to the practice of teaching. Strong sociology departments active in research claim that sociological theory and research should not be distorted through efforts to apply their findings. Faith in basic or pure research is deeply imbedded in American universities, and the social and behavioral sciences, being most recently accorded academic respectability, are reluctant to contaminate their purity with applica-

[3]John K. Folger, *et al.*, *Human Resources and Higher Education* (New York: Russell Sage Foundation, 1970), pp. 75-146. This book is illustrative of new information now available for planners.
[4]Dwight L. Ladd, *Changes in Educational Policy* (New York: McGraw-Hill Book Company, 1970), p. 215.

tion. Social scientists grant that they can use the professions as objects of study but find it difficult to indicate how they can contribute to the technical skills or cultivation of the professions.[5] Yet cooperation between the professional fields and the social and behavioral sciences seems so necessary and of such value to both that ways must be found to make them more useful to each other.

Several forces have militated against full application of these disciplines; their neutralizations might make realization of the ideal possible. It takes time to integrate new concepts into established social institutions such as the professions. It takes time to develop essential personnel. It takes time for people of different backgrounds to work together long enough for joint accomplishment. Yet the needed time has not been available, nor were there funds within institutions to purchase it.

Also, behavioral scientists and professional educators have had different expectations of cooperative relationships. The practitioner hopes for a behavioral generalization applicable to professionals, while the scientist can only produce an actuarial finding. There is a tendency during the early stages of cooperation to ask for or to promise too much. While some fields have evolved satisfactory working partnerships (e.g., medicine and military science), relationships between most professional faculty and social scientists have been tentative and precariously structured.

This matter of relationship is complicated by problems of role and status. The clinical professions of law, medicine and theology are well established within the university and their professors neither gain nor lose status through ties with the behavioral sciences. But the social scientists do fear loss of prestige with their colleagues if they contaminate their basic research with application.

Then there is the matter of technical language. Every profession has a technical language as well as a system of values and a preferred way of working. These facilitate work within the profession but handicap interdisciplinary communication. For example, different professions use the word "case" or the term "social organization" differently, and until the differences in meaning are clarified, there is confusion.[6]

A last serious obstacle is the matter of the validity of social and behavioral science findings and approaches for the professional fields. Not much attention has been given to the construction of a bridge between research findings and professional problems.

Presently there are no generally validated techniques of using the social and behavioral sciences effectively. However, some suggestions can be advanced. First, adequate time must be provided and paid for. Unless faculties from different fields have time to get to know each other well, explore each other's presuppositions and understand each other's language, they cannot achieve true interdisciplinary work. Further, faculty members must be motivated to take time from their specialized interests to work together. Without faculty willingness to

[5]Bernard Berelson, *The Behavioral Sciences Today* (New York: Basic Books, Inc., 1963), p. 225.
[6]*Ibid.*, pp. 222-31.

explore new concepts, no programs, however elegantly designed, will work.

In the future, people in the specialized disciplines may be willing to take time to serve the professional field, but the pull of disciplinary and departmental interests is still too great to expect widespread crossover. For a time, professional schools would probably be wiser to hire social and behavioral scientists and ask them to construct special courses to serve professional needs. As these social scientists create courses, they should be told precisely what competencies they are expected to develop in professional students. Simply asking an anthropologist to create a course in a law school is not enough. There should be a chance of achieving a course of relevant content if he were told to aim for specific changes in behavior.

Clinical or field experience is judged so important that most professional schools seek to provide it. But with the exceptions of medicine, dentistry and nursing, there is little actual field work for the majority of students. Practice teaching for public school teachers is, of course customary, but critiques of its actual conduct reveal serious flaws. Assuming that clinical work is essential, it is proper to inquire into the necessary conditions for its success in a professional program.

First it must be accepted that clinical experience is expensive and that unless a school is willing to accept the cost, it might better leave clinical training alone. Ideally there should be a place for clinical work (hospital schools, judges' office, welfare agency) and clinical material (patients, clients, students) close enough to the professional school for easy transportation and communication. The hospital or university laboratory school is, of course, the best model. There should be sustained and formal efforts to integrate clinical experiences with theoretical studies. Obviously, both academic and practitioner supervisors should be available to consult with students and to provide security in the uncertainties of inexperience.

Students should have time enough to steep themselves in clinical work until they actually feel like practitioners. The brief day or two of actual teaching which practice teachers are often provided is probably worse than no teaching experience at all. The moot court experience of senior law students probably is too brief and too artificial to be of much value. The optimum time in clinical practice varies from field to field, with medicine requiring the longest; but a three-month period should be the minimum for most fields, with camp for foresters and summer law office work for law students, as examples.

Competent and willing supervisors are essential. While there is value in the internship, which is an on-the-job experience with little or no supervision, or in the paid employment of an aspirant professional during student years, the essence of clinical experience should be close supervision, criticism of practice and relating of practice to theory. Someone must be constantly responsible. One criticism, for example, which practice teachers level against university-based supervisors is that their visits seldom come at the time cadet teachers really need consultation. One major experiment found that making active classroom teachers into supervisors and paying for part of their time from uni-

versity funds solved the problem. When cadet teachers needed to talk over a problem the supervisor was just a few doors away.

There have, of course, been attempts to approximate class supervision when experienced faculty were unavailable. At Michigan State University teaching assistants and video tape provide supervised teaching experience. Once each week the cadet teacher's entire teaching performance is recorded. The cadet teacher reviews the film of himself and selects a portion for replay to a group of other teaching assistants in the same course. Students devote about three hours each week to seeing and criticizing each other's film clips. Results, in the form of cadet teacher satisfaction and demonstrated improvement in teaching performance suggest the system works. But it is still a substitute.

Several other conditions should be mentioned. Supervisors, whether assigned to the professional school or the host institution, should be adequately paid for their supervisory services. Tokenism may produce results for a time, but in the long run if supervision is to be professional it must be well paid. Formal evaluation of clinical work should be made quickly available to the student. This last is all important, yet impossible to accomplish unless the other conditions are met.

No book written in 1970 dealing with curricular problems can ignore relevance. Student activists and their apologists and interpreters have made the term a shorthand criticism of the entire educational system. But to help in serious curricular revision, whether in the undergraduate college or professional school, we must assign precise meaning to the word. Willingham has argued that there are at least four types of "relevance" for higher education: personal, social, educational and economic.[7]

"Higher education has personal relevance," he says, "to the extent that it helps individuals find their roles in society." This means that there must be equal opportunities for people to gain access to professional schools appropriate to their interests and desires. It also means that an effective and humane guidance system and admissions process must facilitate expressions of choice. The major professional schools have been particularly remiss in not providing guidance information which could help students, especially those from minority groups, to aspire to professional careers. But personal relevance also has a qualitative element. Professional education should contribute to the growth of mature, competent adult professionals able to serve society and to understand and defend its basic values. This means that professional schools and their curricula must give close attention to students, their personal interests and their views of the world. Greater freedom of selection, more small group instruction and serious efforts to convey the essence of the humanities can make the curriculum more personally relevant.

The professional curriculum has social relevance to the student in defining social roles and responsibilities and as a pressure release mechanism. The pressure release mechanism works at one time to marshall and apply national resources where they are needed, and

[7]Warren W. Willingham, *Accessibility of Higher Education* (Palo Alto: College Entrance Examination Board, 1970).

at another to assist in readjusting roles across the society. In 1971 an imperative is the enormous task of bringing minority groups into the professional field and supplying cul-de-sac areas with the professional services their people need.

Education and theology have begun programs to interest students and train them for work in ghettos and remote rural areas. Student protests have suggested, however, that much education has not been socially relevant, that the much theoretical, discipline-oriented course work is too far removed from real life. A future pediatrician sees little for him in gross anatomy, and a socially concerned theological student sees preoccupation with the history of theology as not attuned to the times. Then too, as professional schools have tried, especially since the death of Martin Luther King, Jr., to attract minority group students, they have faced but not solved curriculum modifications to meet the needs of these new students. In undergraduate programs the need is expressed in pleas for black studies. But in professional schools newer sorts of experiences are needed as well.

Educational relevance means teaching individuals effective modes of action. And this necessity points straight to the heart of the problem of the professional curriculum: Should the curriculum be broadly theoretical and liberal or highly applied and practical? It may be that this historic dichotomy has become largely immaterial, for the speed of technological change demands that education keep pace but insures that it never really can. Consequently, the professional school must give more attention to retraining and continuing education. This brings a radically different relationship between education and work; the once stable pattern of a single preparation for a profession followed by a lifetime of practice is no longer feasible. The professional schools should realize this and act accordingly.

Professional education has economic relevance in that it produces individual modes of action which are beneficial to society. Professional education must thus be concerned with the development of human resources for the good of society. In 1970 faculty planning is evident in the potential oversupply of Ph.Ds and undersupply of medical doctors. For the future, professions and professional schools must be more precise in estimating manpower needs and must set longer-range goals. This in turn means that training in each professional school must be correlated with development of other schools.

Equally important to relevance is curricular balance. Formal professional curricula consist of many different parts: liberal arts and sciences, professional sciences, applied experiences, experiences to facilitate socialization into a profession. Too much theory leaves the graduate unemployable. Too long a period of preparation, or too much applied experience, reduces his potential for long-range development. To maintain balance we must constantly examine the curriculum and mechanisms for rapid change. There is no easy formula for balance. But there are criteria which may be applied.

One of them is logic. Looking at a total professional curriculum, would a reasonable person judge it to be balanced to achieve its objective? If courses in a professional school of education based on expe-

rimental psychology outnumber all others, this would be imbalance. If a school of nursing demands much basic science and offers only a few courses in nursing practice, a similar judgment can be made. A combined panel of practitioners and theorists in a profession might be expected to have a sense of balance or fitness by which they can judge the curriculum as it appears on the pages of a catalog.

Realism is an important criterion. Is there enough time allowed for a given course or activity? Can a course in statistics offered three hours each week for ten weeks develop the skills necessary for a consumer of statistical data? Are ten hours of required lectures on psychosomatic disease enough to make the future internist sensitive to other than biochemical procedures? Is a survey course on principles of economics adequate for a law curriculum? This criterion can effectively be applied in a commonsense way.

Economic balance is also essential. Schools faced with finite resources must eventually put dollar values on what they do and must weigh anticipated gains from alternative activities in dollars. This process is implicit in the newly popular interest in cost benefit analysis. All reforms in the various professional fields will cost money and compete for money with older elements of the curriculum. Field work or clinical work is expensive. So is interdisciplinary teaching, internationalism and computer-based instruction.

Before adopting an innovation, serious questions should be asked both about immediate cost and long term cost. During the 1960s expansion of professional education was facilitated by expectations of continued extramural support. When those assumptions proved unwarranted, especially in medical schools, entire programs and even schools were jeopardized. A number of questions should have been asked and answered as precisely as possible. What are the relative costs of various program elements? What are the relative benefits? Is there reasonable assurance that the institution can maintain a program once it is initiated? What assumptions about future financing are made and how valid are they?

Curricula must also maintain a psychological balance between the theoretical or academic parameters of the curriculum and the psychological and psysiological needs and aspirations of students. We can argue that part of student protest during the 1960s came from imbalance of curricula and student wants. Undergraduate curricula had become so discipline-oriented that student needs were neglected. The professional faculty can, and frequently have, put together curricula which were elegant in the disciplinary logic they displayed. But if students do not perceive that logic as relevant to what they would need in practice, the curriculum is subverted. Becker shows how this did happen in medical education.[9]

Maintaining psychological balance will create tension, as disciplinary considerations and student demands will frequently be in opposition. Resolving the tension in one direction or another will generally not

[9]Howard S. Becker, *et al., Boys in White,* (Chicago: University of Chicago Press, 1961).

satisfy everybody; hence the quest for balance—some less than rigorous *ad hoc* courses and some highly disciplinary courses.

A last criterion is the relationship between curricular demands and the rewards and life style of the profession. Beyond doubt a richer curriculum for nurses or engineers could be created; but would students tolerate a larger, more expensive program in view of the rewards practice actually provides? Nursing education has been particularly plagued by this problem. Its leaders have seen that longer, more rigorous professional training was desirable. But as long as nursing was ill paid and nurses were regarded by doctors as second class persons, such reform could not be made.

The situation is similar in professional retraining. Sensitive to the fact that even people in professional fields may change careers several times in a lifetime, a few professional schools have created programs for such people (education and business are good examples). But if the length and cost of a retraining program is greater than the anticipated gains to the individual, the program will be neglected or will require extramural financial aid to students to bring cost into line with gains. For example, a forty-five-year-old retired Air Force officer with a master's degree must expect to spend about $40,000, including foregone income, to obtain a doctorate which will enable him to enter college administration. There is serious question as to the worth of the program to such a person. And from the standpoint of society, if the professional curriculum and the life style and rewards of the profession are too divergent, the professional school cannot provide the number of practitioners which are needed.