N HIS ADDRESS AS RETIRING PRESIDENT of the American Association for the Advancement of Science (Science, January 23, pp. 77–83), Dr. James Conant saw fit to deal at length with the social sciences. It is probable that many of his confreres could find little point to his musings about the present status and future prospects of economics, sociology, or government. Did he not admit that these several disciplines suffered from an absence of standards? What better proof is required that nuclear physics and biochemistry have little or nothing in common with the social disciplines?

True, Dr. Conant was very guarded in his appraisal of contemporary social science. But, for all of his caution, his optimism was considerable. He talked with warmth about the younger men and what the future held in store for them. He felt convinced that the social sciences stood on the threshold of a new and highly productive era, similar in many respects to the position in which the natural sciences found themselves at the end of the 18th Century.

There is little point in speculating whether Dr. Conant's optimism will be justified by future performance, but there is every point in considering how the social sciences are developing in the United States and what this development implies for their present and future performance.

The belief is widespread, both among the sophisticated and the naive, that the persistence of serious social conflict is proof of the immaturity—nay, failure—of the social sciences. This belief is strengthened when one compares the significant advances that the natural scientists have made in gaining control over their materials with the unsatisfactory progress of social scientists in finding answers to the political, social, and economic conflicts of our times.

This comparison is truly invidious. It fails to appreciate that, when a chemist seeks to synthesize certain elements, he can isolate his materials, submit them to a wide range of treatment, and repeat his experiment until he has confirmed his findings. Moreover, the value of his discovery will usually be self-evident.

How different with the social investigator who studies the problem of divorce! The environment in which the phenomenon occurs is constantly changing, and he is unable to stabilize any of the elements. He can present such findings as emerge only as probabil-

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ities. The implications of his research will assuredly be differently appraised by people who hold different value schemes.

One is reminded of the story of Max Planck, the famous German physicist who, at the beginning of his university studies, was undecided whether to take up economics or physics and finally chose physics because it was the easier subject! No better proof of the soundness of Planck's view need be offered than the continuing disagreements among social scientists about method. Men who remain in conflict about the nature of their subject matter and the relevance of various approaches are men who have not yet discovered how to work with assurance.

To understand how the social sciences operate and to explore the factors which contribute or deflect from their progress, one must focus attention on the environment in which they work. Wesley Clair Mitchell once defined economics as "what economists do." What economists do depends on the kind of people economists are and the kind of life they lead.

There are many economists in the employ of business and government, but it is the academic economist who invites particular attention, for even those who go out into the world have been trained in universities. And it is the university economist who remains largely responsible for the development of the discipline.

It is surprising, yet understandable, that while universities have supported the study of every branch of knowledge, ancient and modern, natural and social, they have conspicuously neglected to study themselves. This omission has many implications, but none more significant than for the social sciences. For the social sciences are a product of universities; the men who work in the social sciences are university trained, university sponsored, university supported.

The university impinges directly on the social sciences in five distinct, yet related, areas—by the selection of the student body, by its sanctification of scientific method, by the extreme specialization of its curriculum, by the appointment and promotion of staff, and, finally, by its relations to the outside world. In each of these areas the influences exerted by the university are substantial; the combined impress of these forces is overwhelming. To appraise the social sciences without appraising the influence of the university on their development is comparable to analyzing the position of contemporary labor without reference to trade unions.

Until recently, the impression was widespread that schooling in the United States was free, that he who wanted to learn and was capable of learning could gain admission either to a tax-supported institution or to a private institution which provided scholarships for the poor. In the face of the report of the President's Commission on Higher Education, this particular illusion can no longer be maintained, Students of the subject have long been aware that, although the United States was in the vanguard of the free education movement, the path that it still has to tread is almost as long and surely as difficult as the ground which it has already covered.

In pursuing this analysis of the social sciences we will concentrate on the large private universities on the eastern seaboard. They are the leaders—surely they have been the leaders—in setting standards and in training research personnel. They are doubtless losing ground to the more important institutions in the Midwest, the Far West, and the South, but theirs is still a strategic position.

It is a striking fact, though one seldom appreciated, that these large eastern universities draw their students from a remarkably limited stratum of society. How limited can best be gauged by considering the excluded groups.

The southern point of view is not represented; yet there are more than 30,000,000 whites who live in the South. Only an occasional Negro is found among the student body; yet there are 13,000,000 Negroes. Only a stray lad from a midwestern or far western farm ever finds his way to an eastern university; yet there are 25,000,000 people who live in rural areas west of the Alleghenies. In these same wide open spaces are at least another 15,000,000 urbanites whose economic and social status utterly precludes their sending their children to a large eastern university. Nor must one overlook the fact that only a rare Catholic family sends its offspring to secular universities; the Catholic population of this country approximates 25,000,000.

Who remains? About 25,000,000 who live along the Atlantic seaboard. Surely, 50% of this group is too impoverished to send their children to college, especially to one of the more expensive private institutions. In short, the large eastern universities draw their students from some 12,000,000 of the population who live in New England and the Middle Atlantic States and from a very few upper class families resident in other sections of the country.

It is possible to deal with contemporary social problems without intimate acquaintance with the value schemes of the South, the Negro, the Catholic Church, the farm community, and industrial labor—not only is it possible, but it is being done every day of the week. But at what a price! We must not lose sight of the fact that today's student body—so largely a composite of Protestant, urban, middle-class society is tomorrow's faculty. And the occasional individual who comes out of a different environment is more likely than not to seek peace and security by assimilating himself into the "dominant group."

The point to remember is that the composition of the student body and the faculty inevitably tends to exclude serious consideration of many important value schemes in our society. Yankees are not the best interpreters of southern tradition, nor Protestants of the aims of the Catholic Church, nor bankers' sons of the aspirations of labor, nor urbanites of the values of farm life.

Not only are very important values excluded from the purview of American social scientists, but even those which worm their way in are given short shrift. There is a tradition abroad in American social science that the student must be on constant guard to be "objective." He has to concern himself with the evidence, not with the implications thereof. He must collect the facts, organize them, and present them "in a scientific and impartial manner... as to make the findings carry conviction to Liberal and Conservative alike." That every research investigator has an obligation to deal honestly with his materials is implicit in our adherence to the principle that "the truth will make you free."

The stress on objectivity is commendable as long as it does not become exaggerated. Objectivity is relevant in appraising how a man works, not in estimating the value of the problems on which he works. Objectivity relates to techniques, never to premises. Yet the heart of the difficulties in the social sciences is in the selection of meaningful problems. There is much knowledge that is interesting but only some knowledge that is pertinent. There are many problems which can be solved, but there are only a few that are worth solving.

The most "objective" work in the social sciences will be stillborn unless it can be related to the values that men have and the values which they seek. Mountains of facts and elegant speculations have no chance of survival unless they bear on problems of import to society. The citizen is more "objective" than the scientist, for he knows that time is short and the good, elusive. He may indulge the scholar, but he will not respect him—for how can one respect a man who has denied his responsibilities (3)?

So the academic tradition, in a faulty imitation of the natural sciences, has compounded the difficulties inherent in the development of a virile social science by deflecting concern away from all "value problems." In fact, such action has inevitably helped to buttress the status quo, for what escapes study escapes censure (2).

There has been a trend afoot these last decades which has reinforced these tendencies to deflect attention from the major problems which are charged with conflict in favor of the accretion of ever larger bodies of specialized and uncorrelated knowledge. The universities have grown very rapidly, an expansion that has been particularly marked in the social sciences. The vastly increased student body could not be cared for by the existing faculty. The number of instructors had to be doubled and then doubled again.

It was impossible for the universities to add mature men to their staffs. Mature men are always scarce, and their numbers were hopelessly inadequate to meet the demands of the rapidly expanding market. Borrowing a leaf from industry, the universities sought a way out by adopting an intense division of labor in academic parlance, by specialization.

Although it was clearly impossible to find men competent in the broad field of social science or even in all phases of one of the social sciences, it was possible to train experts in one branch of one discipline. The curriculum facilitated this solution. No longer did an embryonic economist pursue studies in philosophy, history, and anthropology; instead, he was exposed to the presentation of highly specialized facts about money and banking, international trade, labor problems—as if such subjects had a reality outside the curriculum or could possibly be treated intelligently except against a broad background of the major forces at work in the world (1).

The intense specialization was a way out of the serious dilemma of how to care for the vastly expanded student body. But instead of viewing this approach as an unfortunate makeshift, from which escape at the earliest possible moment was desirable, specialization was not only legitimized, it was exalted. Again, the tradition of "objectivity" played an important part. Under its protecting arm "good work" came to imply a thorough and complete knowledge of one specialized branch, no matter how small a branch. The search for objectivity soon became a search for perfection. Then the specialist came into control, for he could intimidate all others. Only a rare investigator would venture to grapple with a large problem where he might easily err, either in omission or commission, when he knew that he would have to run the gamut of the specialists' criticisms.

Control by specialists was not confined to intimidation. They gained secure majorities on all the faculties. Thus, not only were incoming generations of students taught by specialists, but all additions to the teaching staff were in their hands. Before long they

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had a strangle hold over research. In fact, they were soon in unchallenged control of the entire field.

Self-protection is the first principle of organized groups. The specialists tended to appoint only "safe" individuals to the faculty. It was so easy to rationalize one's prejudices. The question was always raised whether the prospective appointee would "fit in." Hence, the young man who showed some particular skills in one of the specialized areas had the best chance to be chosen. Of course, he had to be socially acceptable, for he and his family would become members of the community, and, of course, he had to be emotionally balanced and mature. If he were seriously concerned about social values, he could look elsewhere. The university was a home for scholars, not reformers (4)!

Such was the method of handling appointments. Promotions were even more closely guarded. He who would not conform could not survive. Every deviation from the norm was carefully noted and weighed by the senior staff. One is reminded of the recent action of a leading institution which, when forced to choose between two younger men, passed one by on the score that he was "erratic." As an informed observer commented, "Sure, X is erratic—he fluctuates between 85 and 95 percent efficiency; Y, whom the university selected is steady—a steady 30 percenter!"

Efforts to control competition and keep the situation stable are typical of all well-established organizations. Universities are no different. But these efforts have major significance for the development of the social sciences. It is axiomatic that good social science must be, if not revolutionary, at least nonconforming. The currently available body of theory, facts, and techniques is inadequate to cope satisfactorily with current problems. Only the new, the different, the unconventional, hold promise. Yet the system operates to place the greatest hurdles in the path of the emergence of the new.

In other fields of endeavor, the institution in search of monopoly power is forced to struggle in the public arena; although it may succeed in its efforts, the odds are that it will be checked by those who fear the concentration of unbridled power. But universities are the sacred cows of our society. They need not prove themselves. All they need do is to keep clear of challenging the prejudices of important political groups. Most Americans consider the academic queer and incompetent, a man who confuses words with lifeafter all, what kind of man can he be if he earns but \$5,000 or, at most, \$10,000 a year? Let him teach the young, but let him keep out of affairs! This is the dominant note, but there is also an undertone. Why are the social sciences not more helpful in the solution of current issues?

The academics, with few exceptions, are willing to forego the challenge of the political arena as a price for control of the campus. They are willing to teach the young and leave the management of affairs to others. They consider themselves members of a fraternal order; they write for one another; but they have little interest in the groups outside, either in the educated man or in the masses.

So strong are their exclusionist tendencies that they look with suspicion, if not with disapproval, on such of their confreres who write so that the uninitiated can understand. They fear to expose themselves to the criticism of the world outside-an understandable fear but hardly rational in a democratic society. We -cannot afford the luxury of specialization in thinking -where a small minority has the responsibility to evaluate the alternatives, and the masses are forced to follow. The solution of our problems necessitates the active participation of all major groups. In social affairs, knowledge, to be useful, must ultimately be acceptable. There is no quicker road to sterility for the social sciences than the one now being pursued in which the academics have sought to protect their entrenched position by adopting a policy of splendid isolation (5)!

The burden of the evidence is clear. For a variety of reasons the university environment exercises a most restrictive influence on the development of the social sciences. The fact is worth stressing that this condition is not new but has been present since the birth of the social sciences. The history of economics is particularly illuminating: Its founder, Adam Smith, jumped at the opportunity to leave academic life never to return; David Ricardo, from whom most classical theory derives, never had any university connections; Karl Marx, politically suspect, could not acquire academic status; Thorsten Veblen never managed to advance beyond the grade of assistant professor!

There is no formula, simple or complex, for the production of the genius. By definition, the genius is a sport. But social science, if it must wait on the genius for its major advances, can still profit greatly from the work of talented investigators.

Unfortunately, the university is so structured that it places major, if not insuperable, handicaps in the path of progress. By failing to admit large numbers of students from the less favored classes (in part the responsibility of our inadequate secondary school system), the university suffers a double loss. The largest part of the superior brain power of the country goes to waste; the emotional drive to seek new solutions for pressing social problems is deflected. All science and scholarship suffers from this loss of brain power, but the social sciences are the particular victims of this loss of constructive social energy. People who are content with the status quo are people who can contribute little or nothing to the progress of the social sciences. Their eyes are blind to what is wrong; their ears are deaf to the sounds of dissonance; they can therefore wax warm in their praise of the present.

Those whom it admits the university trains for technical competence, not intellectual leadership. Emphasis is placed on method and technique; the values inherent in the formulation and solution of major social problems are neither recognized nor analyzed. The student is warned that it is his responsibility as a budding scientist to eschew that which cannot be measured and tested. He is trained how to work but not on what to work—and such guidance as he may receive warns him about the dangers of dealing with contentious issues whose solution is a matter of values, not facts!

Finally, the university replenishes its teaching staffs from among those students who conform most closely to prevailing standards. The best students are those who do best what their teachers do. For the nonconformer, the innovator, the challenger, there is neither tolerance nor support (6).

There is no easy escape for the social sciences from the strangle hold of the universities; perhaps there is no escape at all. But if they are to escape, they must receive substantial assistance. The student body must become much more representative of the body politic. Liberal subsidization of the able student is a first prerequisite. The crippling effects of specialization must be checkmated by the establishment of an educational policy that recognizes and encourages the future social scientist to go afield and to become well versed in history, psychology, the law, and, above all, in affairs, rather than to accumulate ever larger bodies of factual information in the narrow field of his concentration. Only such a policy can contribute toward the shift of current emphasis from an excessive preoccupation with technique to a more mature comprehension of the basic forces in social change.

The wise administrator and the benevolent foundation must use their power and prestige on behalf of the imaginative interloper. The best cure for monopoly is effective competition. Much capital will have to be risked before large profits can be made, but the alternative to risk is stagnation.

If the admission policies are altered, if control is wrested from the specialists, if the younger men with nonconforming ideas are encouraged—if all these things come to pass, and only to the extent that they do come to pass—the optimism of Dr. Conant about the future of the social sciences may have a prospect of being fulfilled.

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Obituary

Simon Flexner and Medical Discovery

The gains which enlarge the life of man soon seem to him to have existed always. So it is already with those he owes to Simon Flexner. During Flexner's lifetime a fresh age of medical endeavor came in—an age in which experiment largely took over from observation. This change did not happen as matter of course—it was achieved; and in the achievement Simon Flexner played a trenchant part.

Flexner's great good fortune was to be born into his family. His German father and Alsatian mother had not long previously come to Kentucky, and he was one of 9 enterprising and gifted children, who soon had poverty to spur them on-for their father died young. Close-knit in sympathies, they helped one another toward educations worth while. The eldest son, Jacob, in time a physician, was a pharmacist first, and Simon clerked for him, becoming a pharmacist too. Then and soon after, as a medical graduate of the University of Louisville, he examined specimens from the sick and became convinced of the worth of the laboratory for medical practice, as was no one about him; for the science of medicine was at a deep ebb throughout America. He set himself to learn pathology from the meager books available, read what French and German articles he could lay hands on. heard of the graduate course started by Welch at the Johns Hopkins Hospital, and, on a family decision underwritten with the earnings of his younger brother, Abraham, went to Baltimore to learn more. He was 27 years old. Welch was already aware of him through a correspondence about tumors.

It was by now 1890 and all was astir at the "Hopkins." New ideas and new methods were to be tried out, and this in a period when resounding discoveries were announced almost weekly from Europe. For a while Flexner went about the laboratory scarcely noticed, but he felt the intellectual rapture of the time, and his curiosity and his labors were alike prodigious. Before long he gained Welch's attention in the most telling of ways—by making a find—and within a year

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he was appointed fellow in pathology. Welch soon placed challenging responsibilities upon him, and he grew with the growing sciences of experimental pathology, bacteriology, and immunology. After only three years he was sent off to look into an outbreak of cerebrospinal meningitis in Marvland, and after another five he headed a commission sent to learn what diseases existed in the Philippines. Through both tasks he was prepared as if by prescience for later needs. In less than 10 years Johns Hopkins made him professor of pathological anatomy. But best of all, long before then he and Welch had entered upon a friendship of admiration and trust such as now and again shines in the history of science. Throughout their lives each turned toward the other. The bond between them proved of first moment to the advance of medicine.

In 1900 Flexner went to the University of Pennsylvania as head of the Department of Pathology. Here he was pitted against heavy routine duties, but he administered so ably that they did not balk his researches. These were continually of wider scope, for he would not limit his thought to any theme, however rewarding, but at 40 kept himself still an apprentice to knowledge. The Federal Government called on him to go to California and decide whether the plague had entered from China. He had studied the disease at first hand on his way to the Philippines and now in short order disclosed its existence in San Francisco. But this he regarded as a mere aside, going back to his researches.

Medical science had meanwhile been coming into its own: after nearly 200 years of metaphysics the "experimental philosophy" had reasserted itself. In 1901 The Rockefeller Institute for Medical Research was founded. Though the idea for it was one man's, though it was made real through the beneficence of another, though its form was determined by physicians who were scientists as well, it yet must be deemed a folk expression. For it was what Americans wanted, as they were quick to realize; since pio-