

THE AMBIGUITY OF SCIENCE

IN *Science* for July 11, Robert S. Morison, head of the division of biological sciences at Cornell University, discusses the changing attitudes toward science among students and others, and considers what may lie behind this obvious and growing distrust. He begins with the observation that—

large numbers of people in various parts of the world—including, perhaps most significantly, the advanced parts—are less happy about science and technology than they once were. The evidence is of various kinds. Perhaps the most quantitative is provided in the United States by the relative decline in students entering the sciences and the scientifically based professions. In some instances, such as engineering, the numbers have fallen absolutely in the face of a steady increase in the total number of potential students in each age class. Even more quantitative, and certainly more compelling to the individual scientist, is the evidence provided by the slowdown in appropriations for science. Third, one may cite the intuitions and reflections of thoughtful social clinicians like René Dubos who has so courageously summarized the shortcomings of scientific approaches to human problems. True enough, he finally draws the conclusion that what we need is not less science but more. Nevertheless, the argument depends on a careful demonstration that science raises new problems of increasing complexity as it continues to solve the older and simpler ones.

Dr. Morison's article is long and, considering the terms of its inquiry, thorough. In the main he is concerned with two problems. One is the unanticipated anti-human effects of many of the technological applications of science. The other is the apparent inability of most of the people in the world, and also most college students, to grasp the essentials of the scientific point of view. It is plain, however, that no more than Dr. Dubos is he discouraged or disillusioned with science itself.

How can this attitude be explained? Our title is intended to represent what seems the most reasonable explanation. The meaning of "science"

is ambiguous. Science is almost as ambiguous as "religion." In Western thought, science originally meant the will to discover the truth about the facts and laws of nature, independent of the claims of hearsay and tradition. The idea of "truth" was primary in this early conception of science, whose first practitioners called themselves "natural philosophers." These pioneers were far from being what we now term "materialists." Nor were they irreligious, although their conception of how truth is verified had a purifying effect on their religious thinking. How does it happen, then, that scientific inquiry is almost completely identified with discoveries concerned with the nature of the physical world? This, we could say, is partly an accident of history. There had been not only an incredible neglect of the order governing the physical world, but also an oppressive rule of theological authority which enforced this neglect. All sorts of *existential* reasons, you could say, urged the awakening European mind to inquire into the principles and processes of natural events. Science, it seemed, was a way of giving philosophy some muscle, some *real* authority, instead of the pretended and often ridiculous authority of traditional religious institutions.

At its beginnings, then, science was not the enemy of true religion, but its ally. One has only to read Frank Manuel's *Portrait of Isaac Newton* (Harvard University Press, 1968) to see that for Newton and most of his scientific contemporaries, science was understood as a wonderful branch of religious truth having the fascinating attraction that its affirmations could be *proved*. They saw nothing objectionable in the idea that scientific demonstrations were a sort of religious testimony. Newton in particular went to great lengths to rationalize this conception of his scientific activity to his own satisfaction.

But by the middle of the nineteenth century, when David Brewster published his "official portrait of Isaac Newton of heroic dimensions" (1855), the ambiguity of the meaning of science was well on the way to being institutionalized. Brewster did his best to suppress or make light of Newton's religious interpretations and other extravagances (such as alchemy), endeavoring to present him as the proper pioneer of what science was conceived to be in the nineteenth century. Manuel calls such historians of science "bowdlerizing rationalists," and through them and other popularizers the orthodox conception of science came into being. Newton had believed that "all great truths about nature had been recorded somewhere by the ancients," but the new champions of science believed in the mechanical explanation as the key that would unlock the secrets of nature and they were impatient and even contemptuous of "mystical" notions. Science was a Method, and truth was whatever that method could disclose. Nothing else was included in natural reality. Metaphysics was less valuable, if possible, than poetry, and the business of science was to investigate nature in order to command its powers and resources—an entirely practical undertaking. The old idea of science as the search for Truth was not abandoned or sneered at, however, until the positivists gained control of the philosophy of science in the twentieth century, but its meaning had meanwhile been reduced to a ghostly abstraction—truth was what was left after total submission of the fruits of research to pragmatic meanings and values.

Hence the ambiguity of science. There is the ennobling idea of the quest for truth, and there is its reduced and tattered remnant in modern practice, lending a faintly priestly authority to the imperatives of scientific technology, with the result that men engaged in nuclear weaponry or research for biological and chemical warfare are able to think of themselves as continuing the tradition of Copernicus, Galileo, and Newton.

How do you dispel the confusion caused by this ambiguity, today, when people speak of science? Well, it is by no means easy. One way to articulate the issue would be to find a file of the magazine to which Dr. Morison contributed his discussion and begin to read the articles with a philosophical coloring which have appeared, starting, say, with the report of the one hundred and first meeting of the American Association for the Advancement of Science which ended on Jan. 1, 1938. That was the meeting in which the Council passed a resolution making one of the Association's objectives "an examination of the profound effects of science on society." It was also the meeting at which Dr. Edwin Grant Conklin, a biologist, gave an epoch-making address on "Science and Ethics." If one were to take the spirit of Dr. Conklin's address as a model, and then look for similar discussions of the purposes, meaning, and possibilities of science, a practical canon for eliminating the ambiguity in writing about science and for restoring its original inspiration would almost certainly result. They would be articles sometimes speaking of failures in scientific education, sometimes denouncing indifference to social responsibility, and frequently attempts to restore the high dignity of the original scientific calling. Unfortunately, or perhaps fortunately, the techniques of indexing or cataloging lend themselves only vaguely to the isolation of these qualities of discussion by scientists. These qualities are, in fact, *prior* to the practice of science, constituting its humanist inspiration, and have no technical (classifiable or indexable) standing at all. But if one wishes to understand the ambiguity of science and to distinguish between its greatness and qualities of a very different sort, this kind of investigation is surely necessary.

In these terms, Dr. Morison's allegiance soon becomes plain. In his paper in *Science*, he gives seven reasons for the decline of respect for the practice of science. All these reasons grow out of a concern for human welfare. We shall try to summarize them briefly.

First comes evaluation of science as skill in the "manipulation of the material world." There is no longer any reason to think, he says, that the capacity to manipulate the world means that "it will be manipulated for the net benefit of mankind." Science once had the respect of many men for providing weapons against a grave threat to the "free world." However—

The oncoming generation views the situation in quite a different way. To them the obvious alliance between the scientific community and the military is an evil thing: far from making the world more secure, it has produced an uneasy balance of terror, with the weight so great on both sides that any slight shift may lead to unimaginable catastrophe. . . . Those who come upon the situation for the first time . . . see almost nothing but a conspiracy between the best brains of the country and the unenlightened military. In any case, it must be admitted that science and technology appear to contribute disproportionately to the more fiendish aspects of an evil business—the defoliation of rice fields, the burning of children with napalm, and the invention of new and more devastating plagues.

The second reason concerns the failure of scientific technology to extend and spread its advances in industry and agriculture to the general benefit of the rest of the world. It is already evident, he says, that people in the undeveloped countries are "worse off than they were before; and, indeed, the large majority of them are hastening into the cities where they create problems which have so far proved insoluble." Third on his list is the failure of medicine, despite dramatic progress on some fronts, to better the health of "large numbers of people who suffer from conditions just as fatal but far less interesting." Dr. Morison notes in passing that "the United States, which used to be a world leader in reducing infant mortality rates, has now fallen to 15th place."

Fourth is the ominous development of manipulative techniques in the biological sciences:

Perhaps more immediately threatening is the fact that science puts power to control one's behavior in the hands of other people. Intelligence and personality tests place a label on one's capacity which

is used from then on by those who make decisions affecting one's educational and employment opportunities. New methods of conditioning and teaching threaten to shape one's behavior in ways which *someone else* decides are good. Drugs of many kinds are available for changing one's mood or outlook on life, for reducing or increasing aggressive behavior, and so on. So far, these drugs are usually given with the cooperation of the individual himself, except in cases where severely deviant behavior is involved, but the potential for mass control is there. Indeed, there is already serious discussion about the ineffectiveness of family planning as a means of controlling the world's population, and suggestions are made for introduction, into food or water supplies, of drugs that will reduce fertility on a mass basis.

As if these assaults on individuality are not enough, some biologists are proposing to reproduce standard human beings, not by the usual complicated and uncertain methods involving genetic recombination, but by vegetative cloning from stocks of somatic cells. In the face of all this, can we blame the great majority of ordinary men for feeling that science is not greatly interested in human individuality and freedom?

Reasons five and six have to do with the elaborate specialization of science, with consequent loss of wholeness in any branch and diminishing appeal to thoughtful students; with which is linked the obvious difficulties of teaching such constantly proliferating disciplines. Under six there is also a somewhat Ellulian critique, suggesting that the scientific institution, once it gets its head, rushes off in its own direction:

It follows that the progress of pure science, at least, is determined by the internal dynamics of the process and by the opening of new leads rather than by public demand to meet new needs. The practical applications to human welfare when looked at in this philosophical framework, become accidental bits of fallout. . . .

Item seven follows logically:

The continuing momentum of science towards goals of its own choosing appears to be coupled ever less closely to solving problems of clear and pressing consequence to human welfare.

The rest of Dr. Morison's article is equally searching and deserves to be read, since he

examines the possibilities of emotional reaction against both science and rationality, unless radical changes in direction are introduced. Here, however, we should like to return to his concern with the failure of general scientific education, leading him to suspect that "the metaphysical outlook of most people, even in the United States, is more influenced by Plato and Aristotle than by Galileo and Hume."

Since this suspicion is doubtless correct, although the Platonism of all these people is surely in a sadly undeveloped state, it seems in order to propose a basic correction in the *idea of knowledge*.

Why, for example, should it be assumed that the kind of knowledge which leads to skillful manipulation of both nature and people is indeed the only "real" knowledge, or the most desirable sort? Only a small proportion of the population is fitted for acquiring these skills, and the institution of science, which results from their excessive development, seems uncontrollable in its tendencies, even if the talented individuals active in this work often have better intentions and higher longings than their organized efforts will permit them to express. Science in this sense, then, should be defined as a technical specialty; it should no longer be glorified by attributing to it what the great founders of the scientific movement of three hundred years ago thought and felt. This sort of science is *not* a search for "truth." It has no built-in ethical sanction. The science which begins with an ethical stance had better be called Para-Science, or something else, at least until this terrible ambiguity gets straightened out.

No sensible man of today identifies the spirit of religion with the hoary, conventionalized, power-playing religious institutions of history. He knows better. The same distinction must be made as to science. Love of truth and search for truth is one thing; the body of science and its conventional practice is another. This distinction is well made by Ortega in *Mission of the University* (Norton

paperback), a practical book about education. Instead of calling the search for truth "science," he calls it Culture. Then he says:

Culture . . . borrows from science what is vitally necessary for the interpretation of our existence. There are entire portions of science which are not culture, but pure scientific technique. And vice versa, culture requires that we possess a complete concept of the world and of man; it is not for culture to stop, with science, at the point where the methods of absolute theoretic rigor happen to end. Life cannot wait until the sciences may have explained the universe scientifically. We cannot put off living until we are ready. . . .

This sharpens the distinction between culture and the sciences. Science is not something by which we live. If the physicist had to live by the ideas of his science, you may rest assured that he would not be so finicky as to wait for some other investigator to complete his research a century or so later. He would renounce hope of a complete scientific solution, and fill in, with approximate or probable anticipations, what the rigorous corpus of physical doctrine lacks at present, and in part, always will lack.

The internal conduct of science is not a *vital* concern; that of culture is. Science is indifferent to the exigencies of our life, and follows its own necessities. Accordingly, science grows constantly more diversified and specialized without limit, and is never completed. But culture is subservient to our life here and now, and is required to be, at every instant a complete, unified, coherent system—the plan of life, the path leading through the forest of existence.

There is some clarity, here, and it is wholly consistent with Dr. Morison's conclusions. We don't have much of the kind of "culture" Ortega is talking about, but there is at least a chance that we can get it; and far less chance of getting into irremediable trouble if we recognize the ambiguity of science and make the separation between what is vital to our daily lives and what is not.

Mistaking elaborate technique for natural truth seems to be our chief difficulty—an identification which has confronted education, especially scientific education, with impossible tasks. To oblige all undergraduates to take on a "chase" most of them can never complete—to try to learn to behave like scientific specialists—

seems completely ridiculous. Why should this be an educational ideal? Look where it has brought us, even with our obvious inefficiencies!

If we are all, or nearly all, Platonists, anyhow, why not become *good* Platonists, and take our theory of knowledge from Socrates instead of Francis Bacon? Dr. Morison shows quite clearly that the Baconian theory leads to a kind of mania—the mania he has placed under diagnosis. He says:

We, who have grown up rejoicing in science, were confident in our acceptance of Sir Francis Bacon's aphorism that we cannot command nature except by obeying her. We did not really mind obeying as long as we knew that we would ultimately command. But now the empirical evidence may be turning to support those who feel that science is in some sense in the grip of natural forces which it does not command. . . . Our rationalized systems do, indeed, seem to have developed the capacity to live lives of their own, so that mere men are compelled, against their will, to follow where the logical process leads. . . . the medical profession is following in the footsteps of its dynamic research program and undertakes to perform heart transplants, at great expense, largely because it has found out how to do them. In the same way, we devote several billions of dollars each year in going to the moon, because it is *there* (and, again, because we know how to do it). Everyone who has done much science on his own knows that the next step he takes is determined in large part by the steps that have gone before.

No one, obviously, can tell us how to retrace those steps, no matter how much we dislike them; more important is figuring out how to regain control of where we are going. Becoming aware of the fateful ambiguity in the word "science" is surely among the first things to do.

REVIEW

IN BOSTON LAST SUMMER

WHAT is the lesson of the trial and conviction of Dr. Benjamin Spock and his three co-defendants, Dr. William Sloane Coffin, Jr., Michael Ferber, and Mitchell Goodman, last summer, on charges of conspiring to counsel, aid and abet violations of the Selective Service Act? (A fifth defendant, Marcus Raskin, was found not guilty.) The study of this case should be a "core" project for every American citizen who has a serious concern about the future of democratic society. (Reversal of the conviction of Spock and Ferber by the U.S. Court of Appeals and the order of a new trial for Coffin and Goodman, last July, in no way diminish the importance of this study.)

Initial research materials are all assembled by Jessica Mitford in her article, "Guilty as Charged by the Judge," in the August *Atlantic*. There really aren't any villains in this story. At least, everybody involved seemed to think he was doing the "right thing," including the five accused, the prosecuting attorney, and the members of an apparently intelligent and conscientious jury. Yet Miss Mitford and the editors of the *Atlantic* seem to think that the trial of these men made a fiasco out of the judicial process in the United States.

Many lines of inquiry open up. There is, for example, the origin of the "conspiracy" charge in English law, and how it has been used in American history. There is the matter of popular attitudes—which in this case must be called "illusions"—concerning the political usage of a system of law. Even experienced newspapermen, Miss Mitford shows, are confused about this. But back of all these conceptions are unquestioned assumptions about the necessity, if not the virtue, of political power—that we couldn't possibly do without it, that somehow we must have it and make it work, that when it works poorly or disgracefully, it must still be preserved, even at the cost of justice and common sense.

Miss Mitford takes up one by one the matters that lead, directly or deviously, to the issue of political power. First she considers the common idea that the courts are a place where there can be public testing of great moral issues of concern to the nation, such as the war in Vietnam. Dr. Spock, for one, had said, "I'd be *delighted* if the government would prosecute me!" When, during the trial, he was asked what he had meant by this, he explained: "I meant that if the government chose to prosecute me, I would have this opportunity to prove that we were right."

It didn't turn out that way. Choice by the prosecution of a conspiracy charge prevented the issue of the war from even marginal argument. Why would the government not want this issue to come up in court? From Miss Mitford's discussion, it becomes clear that the smooth exercise of political power was the government's objective in causing the trial. The presumed guilt or innocence and possible need for punishment of Dr. Spock and his co-defendants had little to do with the reason for trying them. These men were by accident of history "eminent," and served the purposes of the prosecution. Technically, as interviews with the federal prosecutor disclosed, practically millions of people were guilty of the kind of "conspiracy" that four of the accused were convicted of, and ease of prosecution and public relations considerations determined choice of the defendants. Conviction was from the beginning apparently a sure thing. The evidence that the four convicted men did what the case for conspiracy required was on miles of television tape. Short of an actual revolt of the jury against the conspiracy charge, there was no possibility of them being found innocent. Calling the traditional "presumption of innocence" before the court a "chilly and threadbare piece of costumery," Miss Mitford explains:

For the prosecutor has what film folk call "creative control," as producer, scenario writer, and casting director. He puts the package together (after consultation with his backers, or promoters, in Congress and the Administration), giving careful

consideration to what kind of production will best please this year's public taste. It is the prosecutor who diagrams the action by deciding which laws to enforce and what offenses to charge, for the law is a Pandora's box which in political cases the prosecutor can open or close at will. He rejects many a script, for often he finds it expedient not to prosecute.

In going after war protectors, prosecutors have at their disposal an assortment of federal statutes, state laws, city ordinances that they can invoke: shall the charge be violation of the draft law? Or counseling, aiding, and abetting violations? Or conspiring to counsel, aid, abet? Or trespass (blocking the sidewalk during a demonstration)? Or disorderly conduct? Or shall it be a violation of the Espionage Act of 1917 which makes it illegal to interfere with recruitment and enlistment into the armed forces?

As for who shall be cast in the leading role as defendant, the choice is vast, for (as I discovered during the Boston trial) a successful prosecution can be brought under one or another of these laws against just about anybody who has expressed himself against the war by participating in a demonstration, signing a statement in favor of draft resistance, or even attending a public meeting at which the speakers advocated draft resistance.

Why did the Government decide to put on this trial? Apparently, it seemed like a good thing to do at the time. The prosecutor, John Van de Kamp, in charge of a special unit in the Justice Department created to speed up investigations and prosecutions of Selective Service Act violations, showed no reluctance to explain to Miss Mitford why they prosecuted Dr. Spock. General Hershey had made a mess of things in instructing draft boards to punish young men who participated in "illegal demonstrations" by drafting them without delay. The public outcry was furious and embarrassing, and the prosecution of five notable men for "conspiring" to counsel, aid, and abet violations of the draft act "was thought to be a good way out—it was done to provide a graceful way out for General Hershey."

Evidently, men who work for the Government become devoted to practical considerations. It is their job to make things run efficiently, and they do what they think they must

for this purpose. Push them in argument, and they might ask, "Do you really want to abolish the Army, abandon our national defense?" It is a rare man who will say yes. So the administrators of the necessities of national survival believe, with some reason, that they have the country behind them in a tacit, common sense way, if not in terms of particular policies which have now and then to be explained—more or less as Mr. Van de Kamp explained the reason for the trial to Miss Mitford. The prosecutor was no villain. Miss Mitford found him "mild-mannered and outgoing, a good public relations man, concerned with the 'image' of the Justice Department." Such a man might say that if you are going to maintain political order and exercise power for the general good, certain things must get done—that is the way it has to be. History can be read as supporting him. That is, the maintenance of power comes to be regarded by even good men active in its exercise as essential to national survival, whether you take as example the Alien and Sedition acts of a very young country (the United States in 1798), or the prosecution of Dr. Spock and his co-defendants in 1968.

So the courts did not provide these defendants with an opportunity to challenge either the immorality or the illegality of the war in Vietnam. As Miss Mitford says:

The government never intended that there should be a "reassessment of the Vietnam war" or a "legal challenge to the draft and the war"; it took care to avoid bringing "the fundamental philosophical issue of the Vietnam war into the courts"; the indictment is specifically tailored to avoid "the basic question: Is the war not only legally but morally right?"

These phrases quoted by Miss Mitford, which have no application, are characterizations of the proceedings by the nation's leading newspapers—all "dead wrong," as she says.

Much of her article is given to pursuing the almost indefinable meaning of "conspiracy," which enabled the prosecution to convict four of the five of a felony without proving them guilty of any

overt acts, or even showing that they knew one another. As a matter of fact, they were barely acquainted, and were first really introduced to one another when they met in the home of their defense attorney after the indictment. The charge of conspiracy—"the shabbiest weapon in the prosecutor's arsenal"—is a catch-all which "relieves the prosecutor of the necessity of proving any actual wrongdoing by the defendant." Originating in the Middle Ages and reaching a peak of arbitrary power in the seventeenth-century Court of the Star Chamber, the conspiracy charge, Miss Mitford says, "has long been favored by prosecutors as a means to convict union organizers, radicals, political dissenters, opponents of government policies, and other troublesome individuals who could not otherwise be put behind bars."

In evidence of the inability of the ordinary person to grasp the "guilt" of conspiracy, at least in the instance of this trial, what three of the jurors told Miss Mitford after the trial makes it plain that the unanimity of the verdict reflected the instructions of the judge. One of the jurors said: "The government didn't have a strong case. Up to the judge's charge, I would have found them not guilty." Given the meaning of "conspiracy" as both the prosecution and the judge defined it, the jurors felt that they had no choice. Yet the three jurors interviewed "were strongly opposed to the Vietnam war, all expressed the highest regard for the defendants as individuals and for what they were trying to accomplish." But following the judge's charge that they must refuse to allow people to break the law, they voted "guilty" to avoid bringing chaos and anarchy down upon the United States!

Well, this is in bare summary of a remarkably clear account of what happened in Boston last summer. Miss Mitford adds a discussion of what the jury *might* have done to challenge the judge's charge, based on no less an authority than John Adams, but she wonders about the ability of ordinary folk to exercise this prerogative. We do

too. Meanwhile, it was faith in the necessity—and therefore the righteousness—of power that convicted Dr. Spock.

COMMENTARY
"IN SEARCH OF A FUTURE"

ON March 4, 1969, students and faculty at the Massachusetts Institute of Technology combined in a "research strike" to protest the "misuse of scientific and technical knowledge." Probably the most dramatic event of the day was an extemporaneous speech by George Wald, Harvard biologist and 1968 Nobel Prize winner. His talk was taped and printed by the *Boston Globe* (March 8) and the *New Yorker* (March 22). Dr. Wald finds the recent history of the United States darkened by war crimes:

The concept of war crimes is an American invention. We've committed many war crimes in Vietnam—but I'll tell you something interesting about that. We were committing war crimes in World War II, before the Nuremberg trials were held and the principle of war crimes was stated. The saturation bombing of German cities was a war crime. Dropping those atomic bombs on Hiroshima and Nagasaki was a war crime. If we had lost the war, it might have been *our* leaders who had to answer for such actions. I've gone through all that history lately, and I find that there's a gimmick in it. It isn't written out, but I think we established it by precedent. That gimmick is that if one can allege that one is repelling or retaliating for an aggression, after that everything goes.

And, you see, we are living in a world in which all wars are wars of defense. . . .

Like Dr. Morison, biologist at Cornell (see lead article), Dr. Wald contrasts the ways in which older people and the coming generation see the world. Present-day students "in search of a future" were born since World War II and know only an abnormally changed America. Before that war the United States Army, including the Air Corps, numbered only a hundred and thirty-nine thousand men:

Now we have three and a half million men under arms; about six hundred thousand in Vietnam, about three hundred thousand more in "support areas" elsewhere in the Pacific, about two hundred and fifty thousand in Germany. And there are a lot at home. Some months ago, we were told that three hundred

thousand National Guardsmen and two hundred thousand reservists—so half a million men—had been specially trained for riot duty in the cities. . . .

I don't think that there are problems of youth, or student problems. All the real problems I know about are grown-up problems.

His recommendations: "The thing to do about the draft is not to reform it but get rid of it." And: "We have to get rid of those nuclear weapons. . . . Nuclear weapons offer us nothing but a balance of terror, and a balance of terror is still terror. . . . We cannot live with them."

CHILDREN ... and Ourselves

EDUCATION AND THE IRRELEVANCE OF BEING HUMAN

I

MOST college teachers do not see themselves as teachers. Teachers are for grammar school. We who preside over the classrooms of colleges and universities are professional representatives of the arts, humanities, and sciences. A college becomes a set of unrelated guilds, each preoccupied with its own way of laying bricks and smearing mortar. Although this kind of organization serves the needs neither of students nor of institutions, it does give administrators clearer standards for hiring, promoting, and firing than does that vague criterion, ability as a teacher.

Several fragmentations result from this self-definition. Commencement oratory and curriculum discussions say much about the educated man and his well-roundedness, as if all our choices are inspired by a picture of human wholeness. Looked at closely, however, the talk resolves itself into an argument about how many fragments, and precisely which ones, are necessary for an education. The central question—in what ways these fragments may fall together in the life of an educated person—is left for the student to answer in his spare time. We do not have a Department of Synthesis clamoring for its share of the budget.

Fragmentation of disciplines becomes fragmentation of personality, of experience—for both teacher and student. Walk down the corridor of a classroom building while classes are going on. As you pass one open door, you hear a teacher talking about world history. Generalizations of vast scope swell and die down as you move along the corridor to the next open door where a professor grows enthusiastic about the sewage problems of municipal governments. The sewers of our cities flood, recede, and gradually give way to an erudite, comparative-anthropological review

of hostility and the territorial imperative. You wander back to your office wondering, Why this emphasis on talk, on discourse? We are not assuming that all teachers believe in lectures. Yet most teachers do operate on the assumption that there is only one way in which to influence students, and that is by means of rational discussion, through the highest reaches of the brain. It is as if teachers disdained any but the most lofty access to another mind.

We give laborious attention to curricula, classroom arrangements, and "student-teacher contact hours" while ignoring the circumstances of student life outside the classroom. We are far more stupid than Penelope in that we are not aware that night may be unraveling everything we do by day (this assumes that we do achieve something during the day). Under these circumstances, to insist, in the name of excellence, upon the highest standards of technical rigor is ludicrously simple-minded.

Even those disciplines (etymologically, this word means whip) which, by their nature, involve the whole personality, organize their efforts as if discourse were the whole of life. We are thinking particularly of religion, literature, and art. As these are taught in most colleges, religion is reduced to theology, literature becomes literary technique and criticism, art becomes art history, and art history becomes an accumulation of painters' names and dates.

Fragmentation also results from the way the roles of teacher and student are defined. The teacher's role centers on mastery of his craft. In effect, the teacher says to the student, "I'm a human being with problems, you're a human being with problems, but that's not why we're here. We're here because we both have jobs to do. You have your job and I have my job. Let's do the best we can with both. That way we shall get through the four years with a minimum of fuss." Roles are not to be done away with. What is in question is the complacent assumption that if you ignore the

human being part of teacher and student, that problem will go away.

Most of us attempt to define our roles to our advantage, tightening up the specifications here, relaxing them there. How does a teacher manipulate his role to his advantage? To prevent students as human beings from getting too close, he can insist on drawing lines with the utmost clarity. At other times, he can don a halo of mysterious ineffability. From time to time the suggestion is made that there ought to be machinery for reviewing a teacher's grades should the interests of justice require it. This suggestion is apt to be met with splutterings which, once deciphered, seek to put a teacher's work beyond all criticism by others. The decisions of most human beings are subject to review, why not a teacher's? This picture of ourselves as trafficking in realms beyond the reach of ordinary mortals is especially strange since most of us have no special qualifications as teachers. A Ph.D. does not suffice. It will be asked: How are you going to teach people how to teach? You can't teach people how to teach any more than you can teach people how to paint. Yet has the fact that you cannot teach people how to paint put an end to schools of painting? You can teach people how to stretch canvases, mix paints, and care for brushes. So too you *can* teach teachers a thing or two about their students, what their problems are, what college means to them, what happens to them while they are here, and how they learn—and do this without making it just another specialty. Will the time come when a teacher is required to establish, not only that he is a craftsman in some specialty, but also that he has craft as a teacher?

Teachers ignore all but a student's intellect until the student angers them. It is surprising then how many aspects of the student's life become relevant to the educational process. When angry, a teacher is willing to treat a student as a human being.

Due to confusion between the teacher's role as specialist and his role as teacher, the merit which we grant him as specialist bleeds into his role as teacher. It may be said that of course a good physicist is not necessarily a good teacher of physics. This is a platitude, and one blushes at having said a platitude. It may never become clear that what is platitudinous here is really a problem. A platitudinous problem indicates neglect or ignorance or both.

A teacher's view of students harmonizes with his view of himself. How should the master of a craft regard his apprentice except as an empty receptacle that must be poured full, a blank tablet that must be written on, a raw material that must be molded? The teacher is to take the initiative. When it comes to learning, the student's task is to react. Learning is a passive verb. Here the age difference between teachers and students has an effect. Teachers often behave as tribal elders equipped with souped-up terminology. When we speak of students as becoming mature and accepting the reality principle, we usually mean, "You take my word for it, boy." A teacher's troubles with his own offspring, recalcitrant exponents of the modern, often qualify his view of students.

Administrations can reinforce the timidity of teachers. And do. Any psychologist will tell you that learning involves choices, therefore opportunities to make real mistakes. Administrations are apt to regard experiments with mistake-making as dangerous. Students make enough mistakes without encouragement.

A teacher's attitude toward students may crystallize around grades. The assumption lying behind a grade-system is that all human beings can be scaled objectively on a common scale or ordering by rank. The conjunction of this assumption with the ideal of liberal education is a feat of cultural legerdemain. Some teachers feel confident that they can scale student performances from zero to one hundred. Even if there exist objective answers for which such a scale might be

appropriate, education has less to do with answers than with the thinking that goes into them. Thinking is never objective in the grade-scale's meaning of the term.

Grades have two meanings. First, they represent a teacher's judgment about a student's standing in his craft. Second, they mean whatever consequences follow from the student's discovery that his rank is such-and-such. Teachers are rarely concerned about the effect which their decision has upon the student. If the grade is a good one, the student deserves it. If it is a poor one, it is the student's fault. If one calls upon his reserves of naïveté, perplexity results. How can a teacher be concerned about the education of his students and not be concerned about the personal consequences of the grades he gives? First, after a term of helping students grasp important but elusive meanings, you turn around and rank them like blocks upon a table. Students may decide your show of humanness was phoney. Second, some students equate academic standing with personal worth. Third, others know that what counts outside of college is neither grades nor training of the mind, but the degree. In any event, grades do more than rank students. They also affect student attitudes toward themselves and their work. These attitudes in turn may be decisive for the attainment of a teacher's own ends. Years later the teacher has forgotten how he reached those grades, and the student's pathos of the moment has passed, but the transcript of the student's grades, beautiful in its vacuous precision, continues to live on and do its strange work.

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(To be continued)

FRONTIERS

Social Science Without Vengeance

ANY sustained reading in social science is likely to produce uneasiness and perhaps some *malaise* in the humanistically inclined reader, since he senses the futility in unrelieved description of people as "objects." Even reformist social science relies upon the persuasions of "objectivity," and the reader able to imagine himself a member of a minority group has no difficulty in recognizing that *they* know that *they* are not being addressed in such studies; they are being talked about. And what is said about them is said to other people.

Yet it would be pointless to declare that the statistics of social conditions and population groups have no value. Such facts have developed a special sort of self-consciousness in Western man, and have imposed a kind of responsibility that probably could not have been acquired in any other way. What then would be a *balanced* sort of social science? In what, recalling Henry Anderson's phrase, would "a Sociology of Being" consist?

An article in the Summer *American Scholar* by Joseph Whitehill, "The Convict and the Burger—A Case Study of Communication and Crime," seems a precise answer to this question. It also improves on conventional sociology by being intensely interesting. As a novelist in search of pleasant isolation, Mr. Whitehill had holed up in a small town in Maryland. Then, left without other excuses, he escaped from getting down to business by being chosen to serve on the local grand jury. Included in the duties of the grand jury, he found, were visits to public facilities like the dog pound, the air raid shelter, and the jail. The jail, it developed, was a dreadful place, with people in it who shouldn't have been there at all; and Mr. Whitehill seems to have had little difficulty in getting them out, at least in several instances.

The real communication of this report, however, has to do with a man named Kirk Davis

who, after being convicted of second-degree murder, was found to be a "defective delinquent" and committed to a place called Patuxent Institution, of which Mr. Whitehill has only good to say. He began a correspondence with Davis and learned after a while that his letters were being shared with ten to twenty other inmates of the prison. The correspondence went on:

In another letter, Kirk described the formation, by a small group of inmates, of a Great Books Class loosely organized around Mortimer Adler's Syntopicon. The men did extensive independent reading and met together five nights a week for two hours of talk. (How many of you teachers would dare ask of your students such a seminar and reading load? My own students at Johns Hopkins would flee in a body.) This group was inmate-run and inmate-organized, without the presence of either custodial or school staff. It was something of their own, and they guarded it with astonishing proprietary jealousy. Admission to the group was carefully controlled, lest incoming opportunists wreck it in some way. The class is now in its third year. A measure of its value to the men is this: Not once since the class began has any member of the class received a ticket or incident report because of an infraction of the rules of the institution. No other inmate group has anything like this record.

Still fumbling, still groping for some way to do more, I accepted Kirk's invitation to visit the Great Books Class in session. That was two years ago—a one-time invitation. It grew to my spending every Thursday night of the school year with the men. I had little to teach and much to learn. After getting over the first shock—the sound of these men, none with more than a high school education, moving easily among Kierkegaard, Sartre, Camus, Saint Thomas Aquinas, Hobbes and Saint Augustine—I was able to make a number of curious observations: All these men had I.Q.'s upward of 125; two scored more than 140. All by their histories given to action first and reflection later, they sat in the room with quiet poise, with none of the body movements that normally indicate a restless testing of kinesthesia. They showed acute interest in me—the man with the tie on—studying me carefully for hypocrisy.

One thing led to another. Mr. Whitehill got a large portion of the Baltimore membership of Mensa—a club of the very bright and too often a mutual admiration society—to correspond with

Patuxent inmates. Then, in hopes of finding ways to bring the vocabulary resources of the seminar participants at Patuxent up to the level of their intelligence, he consulted a psychologist at Washington University. This man, Roger Petersen, who has been blind from birth, listened to Whitehill's plans, which included the use of tape-recorders to enable the inmates to listen to themselves reading and talking. Then he said:

"Whitehill, for an intelligent man, you sure can be stupid at times. . . . If you're going to have these men reading aloud onto tapes, why in plain hell not have them record books for the blind?"

So now that idea is in operation, too. Only at the end of his story does Mr. Whitehill revert to conventional sociology, which he then uses simply to show why something very different must be done:

We know that fixed time sentences for criminals have neither deterrent nor rehabilitative effect. . . . We know that the *lex talionis* of the Old Testament was wisely refuted by Jesus Christ. We believe, O Lord, but You surely take Your own sweet time in helping us in our unbelief.

We know that the longer a man spends in prison, the less likely he is to rejoin what for some of us is a highly interesting and various society; he rejoins a highly interesting and various contrasociety—and ends up back in the joint.

We know that, besides *out*, the man inside wants, more than anything else but sex, communication with people in square society who are getting away with having fun.

We know that recidivism now stands at sixty to seventy-five per cent—a success average that would get any businessman fired in a week.

We know that the proper use of prison is to detain persons who have committed acts that are called crimes, but which really are mere acts of self-identification of persons needing help. We know the full battery of psychological diagnostic tests ought to be administered to every entrant.

We know that every sentence, for whatever crime, must be indeterminate; those who can go back quickly ought to be got out as quickly as possible; those whose offenses may be minor but who show the

pathology of danger to themselves or others must be detained indefinitely. . . .

And, finally, from the kind of personal experience Mr. Whitehill reports—

. . . we know that those other things we know all stem from this: Every person taken into custody must be attached as soon as possible to someone of similar makeup on the outside, someone who has a job, and perhaps a family and certainly some fun out of life—someone who will demonstrate not by precept but by example that there is a vast congeries of ways of doing things that do not attract the attention of the men in blue.

And we know from that that this office cannot be official. You cannot hire someone to be human.

This last sentence by Mr. Whitehill is probably the first law of the Sociology of Being.