

## Is There Any Knowledge That a Man *Must* Have?

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1. Everyone lives on the assumption that a great deal of knowledge is not worth bothering about; though we all know that what looks trivial in one man's hands may turn out to be earth-shaking in another's, we simply cannot know very much, compared with what might be known, and we must therefore choose. What is shocking is not the act of choice which we all commit openly but the claim that some choices are wrong. Especially shocking is the claim implied by my title: There is some knowledge that a man *must* have.
2. There clearly is no such thing, if by knowledge we mean mere acquaintance with this or that thing, fact, concept, literary work, or scientific law. When C. P. Snow and F. R. Leavis exchanged blows on whether knowledge of Shakespeare is more important than knowledge of the second law of thermodynamics, they were both, it seemed to me, much too ready to assume as indispensable what a great many wise and good men have quite obviously got along without. And it is not only nonprofessionals who can survive in happy ignorance of this or that bit of lore. I suspect that many successful scientists (in biology, say) have lost whatever hold they might once have had on the second law. I know that a great many literary scholars survive and even flourish without knowing certain "indispensable" classics. We all get along without vast loads of learning that other men take as necessary marks of an educated man. If we once begin to "reason the need" we will find, like Lear, that "our basest beggars/Are in the poorest thing superfluous." Indeed, we can survive, in a manner of speaking, even in the modern world, with little more than the bare literacy necessary to tell the "off" buttons from the "on."
3. Herbert Spencer would remind us at this point that we are interpreting need as if it were entirely a question of private survival. Though he talks about what a man must know to stay alive, he is more interested, in his defense of science, in what a *society* must know to survive: "Is there any knowledge that *man* must have?"—not a man; but *man*. This question is put to us much more acutely in our time than it was in Spencer's, and it is by no means as easy to argue now as it was then that the knowledge needed for man's survival is scientific knowledge. The threats of atomic annihilation, of engulfing population growth, of depleted air, water, and food must obviously be met, if man is to survive, and in meeting them man will, it is true, need more and more scientific knowledge; but it is not at all clear that more and more scientific knowledge will by itself suffice. Even so, a modern Herbert Spencer might well argue that a conference like this one, with its emphasis on the individual and his cognitive needs, is simply repeating the mistakes of the classical tradition. The knowledge most worth having would be, from his point of view, that of how to pull mankind through the next century or so without absolute self-destruction. The precise proportions of different kinds of knowledge—physical, biological, political, ethical, psychological, historical, or whatever—would be different from those prescribed in Spencer's essay, but the nature of the search would be precisely the same.
4. We can admit the relevance of this emphasis on social utility and at the same time argue that our business here is with other matters entirely. If the only knowledge a man *must* have is how to cross the street without getting knocked down or, in other words, how to navigate the centuries without blowing himself up—then we may as well close the conference and go home. We may as well also roll up the college and mail it to a research institute, because almost any place that is not cluttered up with notions of liberal education will be able to discover and transmit practical bits of survival-lore better than we can. Our problem of survival is a rather different one, thrust at us as soon as we change our title slightly once again to "Is there any knowledge (other than the knowledge for survival) that a man must have?" That slight shift opens a new perspective on the problem, because the question of what it is to be a man, of what it is to be fully human, is the question at the heart of liberal education.
5. To be human, to be human, to be fully human. What does it mean? What is required? Immediately, we start feeling nervous again. Is the speaker suggesting that some of us are

not fully human yet? Here come those hierarchies again. Surely in our pluralistic society we can admit an unlimited number of legitimate ways to be a man, without prescribing some out-moded aristocratic code!

6. Who—or what—is the creature we would educate? Our answer will determine our answers to educational questions, and it is therefore, I think, worth far more vigorous effort than it usually receives. I find it convenient, and only slightly unfair, to classify the educational talk I encounter these days under four notions of man, three of them metaphorical, only one literal. Though nobody's position, I suppose, fits my types neatly, some educators talk as if they were programming machines, some talk as if they were conditioning rats, some talk as if they were training ants to take a position in the anthill, and some—precious few—talk as if they thought of themselves as men dealing with men.
7. One traditional division of the human soul, you will remember, was into three parts: the vegetable, the animal, and the rational. Nobody, so far as I know, has devised an educational program treating students as vegetables, though one runs into the analogy used negatively in academic sermons from time to time. Similarly, no one ever really says that men are ants, though there is a marvelous passage in Kwame Nkrumah's<sup>1</sup> autobiography in which he meditates longingly on the order and pure functionality of an anthill. Educators do talk of men as machines or as animals, but of course they always point out that men are much more complicated than any other known animals or machines. My point here is not so much to attack any one of these metaphors—dangerous as I think they are—but to describe briefly what answers to our question each of them might suggest.
8. Ever since Descartes, La Mettrie,<sup>2</sup> and others explicitly called a man a machine, the metaphor has been a dominant one in educational thinking. Some have thought of man as a very complex machine, needing very elaborate programming; others have thought of him as a very simple machine, requiring little more than a systematic pattern of stimuli to reduce foretellable responses. I heard a psychologist recently repeat the old behaviorist claim (first made by John B. Watson, I believe) that if you would give him complete control over any normal child's life from birth, he could turn that child into a great musician or a great mathematician or a great poet—you name it and he could produce it. On being pressed, the professor admitted that this claim was only “in theory,” because we don't yet have the necessary knowledge. When I pushed further by asking why he was so confident in advance of experimental proof, it became clear that his faith in the fundamental metaphor of man as a programmable machine was unshakable.
9. When the notion of man as machine was first advanced, the machine was a very simple collection of pulleys and billiard balls and levers. Such original simplicities have been badly battered by our growing awareness both of how complex real machines can be and of how much more complex man is than any known machine. Modern notions of stimulus response patterns are immeasurably more complicated than anything Descartes imagined, because we are now aware of the fantastic variety of stimuli that the man-machine is subject to and of the even more fantastic complexity of the responding circuits.
10. But whether the machine is simple or complex, the educational task for those who think of man under this metaphor is to program the mechanism so that it will produce the results that we have foreordained. We do not simply fill the little pitchers, like Mr. Gradgrind in Dickens' *Hard Times*;<sup>3</sup> we are much too sophisticated to want only undigested “pour-back,” as he might have called his product. But we still program the information channels so that the proper if-loops and do-loops will be followed and the right feedback produced. The “programming” can be done by human teachers, of course, and not only by machines; but it

<sup>1</sup> Nkrumah was the first premier of the African Republic of Ghana; he was ultimately deposed in a coup and went to live in China.

<sup>2</sup> Rene Descartes (1596-1650), French philosopher and mathematician; Julian Offray de La Mettrie (1709-1751), French physician and philosopher.

<sup>3</sup> Thomas Gradgrind thought of his pupils as “little pitchers. . . who were to be filled so full of facts.”

is not surprising that those whose thinking is dominated by this metaphor tend to discover that machines are better teachers than men. The more ambitious programmers do not hesitate to claim that they can teach both thought and creativity in this way. But I have yet to see a program that can deal effectively with any subject that cannot be reduced to simple yes and no answers, that is, to answers that are known in advance by the programmer and can thus be fixed for all time.

11. We can assume that subtler machines will be invented that can engage in simulated dialogue with the pupil, and perhaps even recognize when a particularly bright pupil has discovered something new that refutes the program. But even the subtlest teaching machine imaginable will still be subject, one must assume, to a final limitation: it can teach only what a machine can “learn.” For those who believe that man is literally nothing but a very complicated machine, this is not in fact a limitation; machines will ultimately be able to duplicate all mental processes, thus “learning” everything learnable, and they will be able in consequence to teach everything.
12. I doubt this claim for many reasons, and I am glad to find the testimony of Norbert Wiener, the first and best known cyberneticist, to the effect that there will always remain a radical gap between computers and the human mind. But “ultimately” is a long way off, and I am not so much concerned with whether ultimately man’s mind will closely resemble some ultimately inventable machine as I am with the effects, here and now, of thinking about men under the analogy with machines of today. Let me simply close this section with an illustration of how the mechanistic model can permeate our thought in destructive ways. Ask yourselves what picture of creature-to-be-educated emerges from this professor of teacher education:
  - 12.1. To implement the TEAM Project new curriculum proposal ... our first concerns are with instructional systems, materials to feed the system, and personnel to operate the system. We have defined an instructional system as the optimal blending of the demands of content, communication, and learning. While numerous models have been developed, our simplified model of an instructional system would look like Figure 2.... We look at the process of communication—communicating content to produce learning—as something involving the senses: ... [aural, oral, tactile, visual]. And I think in teacher education we had better think of the communications aspect of the instructional system as a package that includes the teacher, textbook, new media, classroom, and environment. To integrate these elements to more effectively transmit content into permanent learning, new and better instructional materials are needed and a new focus on the teacher of teachers is required. The teacher of teachers must: (1) examine critically the content of traditional courses in relation to desired behavioral outcomes; (2) become more sophisticated in the techniques of communicating course content; and (3) learn to work in concert with media specialists to develop the materials and procedures requisite to the efficient instructional system. And if the media specialist were to be charged with the efficient operation of the system, his upgrading would demand a broad-based “media generalist” orientation
13. I submit that the author of this passage was thinking of human beings as stimulus-response systems on the simplest possible model, and that he was thinking of the purpose of education as the transfer of information from one machine to another. Though he would certainly deny it if we asked him, he has come to think about the human mind so habitually in the mechanistic mode that he doesn’t even know he’s doing it.<sup>4</sup>
14. But it is time to move from the machine metaphor to animal metaphors. They are closely related, of course, because everybody who believes that man is a machine also believes that animals are machines, only simpler ones. But many people who would resist the word “machine” do tend to analogize man to one or another characteristic of animals. Since man is obviously an animal in one sense, he can be studied as an animal, and he can be taught as an animal is taught. Most of the fundamental research in learning theory underlying the use of

<sup>4</sup>I am not of course suggesting that any use of teaching machines implies a mechanistic reduction of persons to machines; programmers rightly point out that machines can free teachers from the mechanical and save time for the personal [Booth’s note]

teaching machines has been done, in fact, on animals like rats and pigeons. You can teach pigeons to play Ping-Pong rather quickly by rewarding every gesture they make that moves them toward success in the game and refusing to reward those gestures that you want to efface. Though everybody admits that human beings are more complicated than rats and pigeons, just as everyone admits that human beings are more complicated than computers, the basic picture of the animal as a collection of drives or instincts, “conditioned” to learn according to rewards or punishments, has underlain much modern educational theory.

15. The notion of the human being as a collection of drives different from animal drives only in being more complex carries with it implications for education planners. If you and I are motivated only by sex or hunger or more complex drives like desire for power or for ego-satisfaction, then of course all education depends on the provision of satisfactions along our route to knowledge. If our teachers can just program carrots along the path at the proper distance, we donkey-headed students will plod along the path from carrot to carrot and end up as educated men.
16. I cannot take time here to deal with this view adequately, but it seems to me that it is highly questionable even about animals themselves. What kind of thing, really, is a rat or a monkey? The question of whether animals have souls has been debated actively for at least nine centuries; now psychologists find themselves dealing with the same question under another guise: What *are* these little creatures that we kill so blithely for the sake of knowledge? What *are* these strangely resistant little bundles of energy that will prefer—as experiments with rats have shown—a complicated interesting maze without food to a dull one *with* food?
17. There are, in fact, many experiments by now showing that at the very least we must postulate, for animals, a strong independent drive for mastery of the environment or satisfaction of curiosity about it. All the more advanced animals will learn to push levers that produce interesting results—clicks or bells or flashing lights or sliding panels—when no other reward is offered. It seems clear that even to be a fulfilled animal, as it were, something more than “animal satisfaction” is needed!
18. I am reminded here of the experiments on mother-love in monkeys reported by Harry F. Harlow in the *Scientific American* some years ago. Harlow called his article “Love in Infant Monkeys,” and the subtitle of his article read, “Affection in infants was long thought to be generated by the satisfactions of feeding. Studies of young rhesus monkeys now indicate that love derives mainly from close bodily contact.” The experiment consisted of giving infant monkeys a choice between a plain wire figure that offered the infant milk and a terry-cloth covered figure without milk. There was a pathetic picture of an infant clinging to the terry-cloth figure, and a caption that read “The infants spent most of their time clinging to the soft cloth ‘mother’ even when nursing bottles were attached to the wire mother.” The article concluded—rather prematurely, I thought—that “contact comfort” had been shown to be a “prime requisite in the formation of an infant’s love for its mother,” that the act of nursing had been shown to be unimportant if not totally irrelevant in forming such love (though it was evident to any reader, even at the time, that no genuine “act of nursing” had figured in the experiment at all), and that “our investigations have established a secure experimental approach to this realm of dramatic and subtle emotional relationships.” The only real problem, Harlow said, was the availability of enough infant monkeys for experiment.
19. Now I would not want to underrate the importance of Harlow’s demonstration to the scientific community that monkeys do not live by bread alone. But I think that most scientists and humanists reading the article would have been struck by two things. The first is the automatic assumption that the way to study a subject like love is to break it down into its component parts; nobody looking at that little monkey clinging to the terry-cloth could possibly have said, “This is love,” unless he had been blinded by a hidden conviction that love in animals is—must be—a mere cumulative result of a collection of drive satisfactions. This assumption is given quite plainly in Harlow’s concluding sentence: “Finally with such techniques established, there appears to be no reason why we cannot at some future time investi-

gate the fundamental neurophysiological and biochemical variables underlying affection and love.” For Harlow monkeys (and people) seem to be mere collections of neurophysiological and biochemical variables, and love will be best explained when we can explain the genesis of each of its parts. The second striking point is that for Harlow animals do not matter, except as they are useful for experiment. If he had felt that they mattered, he might have noticed the look on his infant’s face—a look that predicted for me, and for other readers of the *Scientific American* I’ve talked with, that these monkeys were doomed.

20. And indeed they were. A year or so later another article appeared, reporting Harlow’s astonished discovery that all of the little monkeys on which he had earlier experimented had turned out to be incurably psychotic. Not a single monkey could mate, not a single monkey could play, not a single monkey could in fact become anything more than the twisted half-creatures that Harlow’s deprivations had made of them. Harlow’s new discovery was that monkeys needed close association with their peers during infancy and that such association was even more important to their development than genuine mothering. There was no sign that Harlow had learned any fundamental lessons from his earlier gross mistakes; he had landed nicely on his feet, still convinced that the way to study love is to break it down into its component parts and that the way to study animals is to maim them or reduce them to something less than themselves. As Robert White says, summarizing his reasons for rejecting similar methods in studying human infancy, it is too often assumed that the scientific way is to analyze behavior until one can find a small enough unit to allow for detailed research, but in the process “very vital common properties” are lost from view.
21. I cite Harlow’s two reports not, of course, to attack animal experimentation— though I must confess that I am horrified by much that goes on in its name—nor to claim that animals are more like human beings than they are. Rather, I want simply to suggest that the danger of thinking of men as animals is heightened if the animals we think of are reduced to machines on a simple model.
22. The effects of reducing education to conditioning can be seen throughout America today. Usually they appear in subtle forms, disguised with the language of personalism; you will look a long time before you find anyone (except a very few Skinnerians) saying that he thinks of education as exactly like conditioning pigeons. But there are plenty of honest, blunt folk around to let the cat out of the bag—like the author of an article this year in *College Composition and Communications*, “The Use of a Multiple Response Device in the Teaching of Remedial English.” The author claimed to have evidence that if you give each student four buttons to be pushed on multiple-choice questions, with all the buttons wired into a lighted grid at the front of the room, the resulting “instantaneous feedback”—every child learning immediately whether he agrees with the rest of the class—speeds up the learning of grammatical rules considerably over the usual workbook procedures. I daresay it does—but meanwhile what has happened to education? Or take the author of an article on “Procedures and Techniques of Teaching,” who wrote as follows: “if we expect students to learn skills, they have to practice, but practice doesn’t make perfect. Practice works if the learner *learns the results* of his practice, i.e., if he receives feedback. Feedback is most effective when it is contiguous to the response being learned. One of the chief advantages of teaching machines is that the learner finds out quickly whether his response is right or wrong . . . [Pressey] has published the results of an extensive program of research with tests that students score for themselves by punching alternatives until they hit the correct one.... [Thus] teaching machines or workbooks have many theoretical advantages over lecturing or other conventional methods of instruction.” But according to what theory, one must ask, *do* systematic feedback mechanisms, perfected to whatever degree, have “theoretical advantages” over human contact? Whatever else can be said for such a theory, it will be based on the simplest of comparisons with animal learning. Unfortunately, the author goes on, experimental evidence is on the whole rather discouraging: “Experiments at the Systems Development Corporation ... suggest that teaching incorporating . . . human characteristics is more effective than the typical fixed sequence ma-

chines. (In this experiment instead of using teaching machines to simulate human teachers, the experimenters used humans to simulate teaching machines.)”

23. So far I have dealt with analogies for man that apply only to individuals. My third analogy turns to the picture of men in groups, and it is given to me partly by discussions of education, like those of Admiral Rickover, that see it simply as filling society's needs. I know of only one prominent educator who has publicly praised the anthill as a model for the kind of society a university should serve—a society of specialists each trained to do his part. But the notion pervades many of the defenses of the emerging multiversities.<sup>5</sup>
24. If knowledge is needed to enable men to function as units in society, and if the health of society is taken as the purpose of their existence, then there is nothing wrong in training the ants to fill their niches; it would be wrong not to. “Education is our first line of defense—make it strong,” so reads the title of the first chapter of Admiral Rickover's book, *Education and Freedom* (New York: Dutton, 1959). “We must upgrade our schools” in order to “guarantee the future prosperity and freedom of the Republic.” You can tell whether the ant-analogy is dominating a man's thinking by a simple test of how he orders his ends and means. In Admiral Rickover's statement, the schools must be upgraded in order to guarantee future prosperity, that is, we improve education for the sake of some presumed social good.
25. I seldom find anyone putting it the other way round: we must guarantee prosperity so that we can improve the schools, and the reason we want to improve the schools is that we want to insure the development of certain kinds of persons, both as teachers and as students. You cannot even say what I just said so long as you are really thinking of ants and anthills. Ants are not ends in themselves, ultimately more valuable than the hills they live in (*I think* they are not; maybe to themselves, or in the eyes of God, even ants are ultimate, self-justifying ends). At least from our point of view, ants are expendable, or to put it another way, their society is more beautiful, more interesting, more admirable than they are. And I would want to argue that too many people think of human beings in the same way when they think of educating them. The Communists make this quite explicit: the ends of Communist society justify whatever distortion or destruction of individual purposes is necessary to achieve them; men are educated for the state, not for their own well-being. They are basically political animals, not in the Aristotelian sense that they require society if they are to achieve their full natures and thus their own special, human kind of happiness, but in the sense that they exist, like ants, for the sake of the body politic.
26. If the social order is the final justification of what we do in education, then a certain attitude toward teaching and research will result: all of us little workmen, down inside the anthill, will go on happily contributing our tiny bit to the total scheme without worrying much about larger questions of the why and wherefore. I know a graduate student who says that she sometimes sees her graduate professors as an army of tiny industrious miners at the bottom of a vast mine, chipping away at the edges and shipping their bits of knowledge up to the surface, blindly hoping that someone up there will know what to do with it all. An order is received for such-and-such new organic compounds; society needs them. Another order is received for an atomic bomb; it is needed, and it is therefore produced. Often no orders come down, but the chipping goes on anyway, and the shipments are made, because everyone knows that the health of the mine depends on a certain tonnage of specialized knowledge each working day.
27. We have learned lately that “they” are going to establish a great new atom-smasher, perhaps near Chicago. The atom-smasher will employ two thousand scientists and technicians. I look out at you here, knowing that some of you are physics majors, and I wonder whether any of you will ultimately be employed in that new installation, and if you are, whether it will be as an ant or as a human being. Which it will be must depend not on your ultimate employers but on yourself and on what happens to your education between now and then: if you have been given nothing but training to be that ultimate unit in that ultimate sys-

<sup>5</sup> A 1960's term for the gargantuan universities which often set government and corporate research, and the training of graduate students to do that research, above undergraduate education.

tem, only a miracle can save you from formic dissolution of your human lineaments.

28. But it is long past time for me to turn from these negative, truncated portraits of what man really is not and attempt to say what he is. And here we encounter a difficulty that I find very curious. You will note that each of these metaphors has reduced man to something less than man, or at least to a partial aspect of man. It is easy to say that man is not a machine, though he is in some limited respects organized like a machine and even to some degree “programmable.” It is also easy to say that man is not simply a complicated rat or monkey, though he is in some ways like rats and monkeys. Nor is man an ant, though he lives and must function in a complicated social milieu. All these metaphors break down not because they are flatly false but because they are metaphors, and any metaphorical definition is inevitably misleading. The ones I have been dealing with are especially misleading, because in every case they have reduced something more complex to something much less complex. But even if we were to analogize man to something more complex, say, the universe, we would be dissatisfied. What we want is some notion of what man really is, so that we will know what or whom we are trying to educate.
29. And here it is that we discover something very important about man, something that even the least religious person must find himself mystified by: man is the one “thing” we know that is completely resistant to our efforts at metaphor or analogy or image-making. What seems to be the most important literal characteristic of man is his resistance to definitions in terms of anything else. If you call me a machine, even a very complicated machine, I know that you deny what I care most about, my selfhood, my sense of being a person, my consciousness, my conviction of freedom and dignity, my awareness of love, my laughter. Machines have none of these things, and even if we were generous to their prospects, and imagined machines immeasurably superior to the most complicated ones now in existence, we would still feel an infinite gap between them and what we know to be a basic truth about ourselves: machines are expendable, ultimately expendable, and men are mysteriously ends in themselves.
30. I hear people deny this, but when they do they always argue for their position by claiming marvelous feats of super-machine calculation that machines can now do or will someday be able to do. But that is not the point; of course machines can outcalculate us. The question to ask is entirely a different one: Will they ever outlove us, outlive us, outvalue us? Do we build machines because machines are good things in themselves? Do we nurture them for their own good, as we nurture our children? An obvious way to test our sense of worth in men and machines is to ask ourselves whether we would ever campaign to liberate the poor downtrodden machines who have been enslaved. Shall we form a National Association for the Advancement of Machinery? Will anyone ever feel a smidgen of moral indignation because this or that piece of machinery is not given equal rights before the law? Or put it another way: Does anyone value Gemini<sup>6</sup> more than the twins? There may be men now alive who would rather “destruct,” as we say, the pilot than the experimental rocket, but most of us still believe that the human being in the space ship is more important than the space ship.
31. When college students protest the so-called depersonalization of education, what they mean, finally, is not simply that they want to meet their professors socially or that they want small classes or that they do not want to be dealt with by IBM machines. All these things are but symptoms of a deeper sense of a violation of their literal reality as persons, ends in themselves rather than mere expendable things. Similarly, the current deep-spirited revolt against racial and economic injustice seems to me best explained as a sudden assertion that people, of whatever color or class, are not reducible to social conveniences. When you organize your labor force or your educational system as if men were mere social conveniences, “human resources,” as we say, contributors to the gross national product, you violate something that

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<sup>6</sup> Here Booth is referring not to the astrological sign but to the space ship.

we all know, in a form of knowledge much deeper than our knowledge of the times tables or the second law of thermodynamics: those field hands, those children crowded into the deadening classroom, those men laboring without dignity in the city anthills are men, creatures whose worth is mysteriously more than any description of it we might make in justifying what we do to them.

32. Ants, rats, and machines can all learn a great deal. Taken together, they “know” a very great part of what our schools and colleges are now designed to teach. But is there any kind of knowledge that a creature must have to qualify as a man? Is there any part of the educational task that is demanded of us by virtue of our claim to educate this curious entity, this *person* that cannot be reduced to mechanism or animality alone?
33. You will not be surprised, by now, to have me sound, in my answer, terribly traditional, not to say square: the education that a man must have is what has traditionally been called liberal education. The knowledge it yields is the knowledge or capacity or power of how to act freely as a man. That's why we call liberal education liberal: it is intended to liberate from whatever it is that makes animals act like animals and machines act like machines.
34. I'll return in a moment to what it means to act freely as a man. But we are already in a position to say something about what knowledge a man must have—he must first of all be able to learn for himself. If he cannot learn for himself, he is enslaved by his teachers' ideas, or by the ideas of his more persuasive contemporaries, or by machines programmed by other men. He may have what we call a good formal education, yet still be totally bound by whatever opinions happen to have come his way in attractive garb. One wonders how many of our graduates have learned how to take hold of a subject and “work it up,” so that they can make themselves experts on what other men have concluded. In some ways this is not a very demanding goal, and it is certainly not very exciting. It says nothing about that popular concept, creativity, or about imagination or originality. All it says is that anyone who is dependent on his teachers is dependent, not free, and that anyone who knows how to learn for himself is less like animals and machines than anyone who does not know how to learn for himself.
35. We see already that a college is not being merely capricious or arbitrary when it insists that some kinds of learning are more important than some others. The world is overflowing with interesting subjects and valuable skills, but surely any college worth the name will put first things first: it will try to insure, as one inescapable goal, that every graduate can dig out from the printed page what he needs to know. And it will not let the desire to tamp in additional tidbits of knowledge, however delicious, interfere with training minds for whom a formal teacher is no longer required.
36. To put our first goal in this way raises some real problems that we cannot solve. Obviously no college can produce self-learners in very many subjects. Are we not lucky if a graduate can learn for himself even in one field, now that knowledge in all areas has advanced as far as it has? Surely we cannot expect our graduates to reach a stage of independence in mathematics and physics, in political science and psychology, in philosophy and English, *and* in all the other nice subjects that one would like to master.
37. Rather than answer this objection right away, let me make things even more difficult by saying that it is not enough to learn how to learn. The man who cannot *think* for himself, going beyond what other men have learned or thought, is still enslaved to other men's ideas. Obviously the goal of learning to think is even more difficult than the goal of learning to learn. But difficult as it is we must add it to our list. It is simply not enough to be able to get up a subject on one's own, like a good encyclopedia employee, even though any college would take pride if all its graduates could do so. To be fully human means in part to think one's own thoughts, to reach a point at which, whether one's ideas are different from or similar to other men's, they are truly one's own.

38. The art of asking oneself critical questions that lead either to new answers or to genuine revitalizing of old answers, the art of making thought live anew in each new generation, may not be entirely amenable to instruction. But it is a necessary art nonetheless, for any man who wants to be free. It is an art that all philosophers have tried to pursue, and many of them have given direct guidance in how to pursue it. Needless to say, it is an art the pursuit of which is never fully completed. No one thinks for himself very much of the time or in very many subjects. Yet the habitual effort to ask the right critical questions and to apply rigorous tests to our hunches is a clearer mark than any other of an educated man.
39. But again we stumble upon the question, “Learn to think about *what?*” The modern world presents us with innumerable subjects to think about. Does it matter whether anyone achieves this rare and difficult point in more than one subject? And if not, won't the best education simply be the one that brings a man into mastery of a narrow specialty as soon as possible, so that he can learn to think for himself as soon as possible? Even at best most of us are enslaved to opinions provided for us by experts in most fields. So far, it might be argued, I still have not shown that there is any kind of knowledge that a man must have, only that there are certain skills that he must be able to exercise in at least one field.
40. To provide a proper grounding for my answer to that objection would require far more time than I have left, and I'm not at all sure that I could do so even with all the time in the world. The question of whether it is possible to maintain a human stance toward any more than a tiny fraction of modern knowledge is not clearly answerable at this stage in our history. It will be answered, if at all, only when men have learned how to store and retrieve all “machinable” knowledge, freeing themselves for distinctively human tasks. But in the meantime, I find myself unable to surrender, as it were, three distinct kinds of knowledge that seem to me indispensable to being human.
41. To be a man, a man must first know something about his own nature and his place in Nature, with a capital N—something about the truth of things, as men used to say in the old-fashioned days before the word “truth” was banned from academia. Machines are not curious, so far as I can judge; animals are, but presumably they never go, in their philosophies, even at the furthest, beyond a kind of solipsistic existentialism. But in science, in philosophy (ancient and modern), in theology, in psychology and anthropology, and in literature (of some kinds), we are presented with accounts of our universe and of our place in it that as men we can respond to in only one manly way: by thinking about them, speculating and testing our speculations.
42. We know before we start that our thought is doomed to incompleteness and error and downright chanciness. Even the most rigorously scientific view will be changed, we know, within a decade, or perhaps even by tomorrow. But to refuse the effort to understand is to resign from the human race; the unexamined life can no doubt be worth living in other respects—after all, it is no mean thing to be a vegetable, an oak tree, an elephant, or a lion.<sup>7</sup> But a man, a man will want to see, in this speculative domain, beyond his next dinner.
43. By putting it in this way, I think we can avoid the claim that to be a man I must have studied any one field—philosophy, science, theology. But to be a man, *I must speculate*, and I must learn how to test my speculations so that they are not simply capricious, unchecked by other men's speculations. A college education, surely, should throw every student into a regular torrent of speculation, and it should school him to recognize the different standards of validation proper to different kinds of claims to truth. You cannot distinguish a man who in this respect is educated from other men by whether or not he believes in God, or in UFO'S. But you can tell an educated man by the way he takes hold of the question of whether God exists, or whether UFO's are from Mars. Do you know your own reasons for your beliefs, or do you absorb your beliefs from whatever happens to be in your environment, like plankton taking in nourishment?
44. Second, the man who has not learned how to make the great human achievements in the

<sup>7</sup>Here Booth echoes the assertion of Socrates, defending his practice of probing students' conventional beliefs, that the unexamined life is not worth living.

arts his own, who does not know what it means to earn a great novel or symphony or painting for himself, is enslaved either to caprice or to other men's testimony or to a life of ugliness. You will notice that as I turn thus to "beauty"—another old-fashioned term—I do not say that a man must know how to prove what is beautiful or how to discourse on aesthetics. Such speculative activities are pleasant and worthwhile in themselves, but they belong in my first domain. Here we are asking that a man be educated to the experience of beauty; speculation about it can then follow. My point is simply that a man is less than a man if he cannot respond to the art made by his fellow man.

45. Again I have tried to put the standard in a way that allows for the impossibility of any one man's achieving independent responses in very many arts. Some would argue that education should insure some minimal human competence in all of the arts, or at least in music, painting, and literature. I suppose I would be satisfied if all of our graduates had been "hooked" by at least one art, hooked so deeply that they could never get free. As in the domain of speculation, we could say that the more types of distinctively human activity a man can master, the better, but we are today talking about floors, not ceilings, and I shall simply rest content with saying that to be a man, a man must know artistic beauty, in some form, and know it in the way that beauty can be known. (The distinction between natural and man-made beauty might give me trouble if you pushed me on it here, but let me just say, dogmatically, that I would not be satisfied simply to know natural beauty—women and sunsets, say—as a substitute for art.)
46. Finally, the man who has not learned anything about how to understand his own intentions and to make them effective in the world, who has not, through experience and books, learned something about what is possible and what impossible, what desirable and what undesirable, will be enslaved by the political and social intentions of other men, benign or malign. The domain of practical wisdom is at least as complex and troublesome as the other two, and at the same time it is even more self-evidently indispensable. How should a man live? How should a society be run? What direction should a university take in 1966? For that matter what should be the proportion, in a good university, of inquiry into truth, beauty, and "goodness"? What kind of knowledge of self or of society is pertinent to living the life proper to a man? In short, the very question of this conference falls within this final domain: What knowledge, if any, is most worthy of pursuit? You cannot distinguish the men from the boys according to any one set of conclusions, but you *can* recognize a man, in this domain, simply by discovering whether he can think for himself about practical questions, with some degree of freedom from blind psychological or political or economic compulsions. Ernest Hemingway tells somewhere of a man who had "moved one dollar's width to the [political] right for every dollar that he'd ever earned." Perhaps no man ever achieves the opposite extreme, complete freedom in his choices from irrelevant compulsions. But all of us who believe in education believe that it is possible for any man, through study and conscientious thought, to school his choices—that is, to free them through coming to understand the forces working on them.
47. Even from this brief discussion of the three domains, I think we are put in a position to see how it can be said that there is some knowledge that a man must have. The line I have been pursuing will not lead to a list of great hooks, or even to a list of indispensable departments in a university. Nor will it lead in any clear-cut fashion, to a pattern of requirements in each of the divisions. Truth, beauty, and goodness (or "right choice") are relevant to study in every division within the university; the humanities, for example, have no corner on beauty or imagination or art, and the sciences have no corner on speculative truth. What is more, a man can be ignorant even of Shakespeare, Aristotle, Beethoven, and Einstein, and be a man for a' that—if he has learned how to think his own thoughts, experience beauty for himself, and choose his own actions.
48. It is not the business of a college to determine or limit what a man will know; if it tries to, he will properly resent its impositions, perhaps immediately, perhaps ten years later when the

imposed information is outmoded. But I think that it is the business of a college to help teach a man how to use his mind for himself, in at least the three directions I have suggested. \* \* \* To think for oneself is, as we all know, hard enough. To design a program and assemble faculty to assist rather than hinder students in their efforts to think for themselves is even harder. But in an age that is oppressed by huge accumulations of unassimilated knowledge, the task of discovering what it means to educate a man is perhaps more important than ever before.

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