

IS SCIENCE MORAL?

by Lawrence C. Becker

It is difficult to discuss the morality of science now without being drawn into something like an adversary proceeding—where the object is more to win than to make sense. On the one side are the rather perverse charges: science “dehumanizes” and destroys the values of the spirit; it is outracing our ability to integrate its findings sanely into our moral life; it is fragmenting society into “two cultures”; it is exaggerated into “the sole source of authentic knowledge.” On the other side are the equally perverse replies: science is and must remain amoral; moral judgment can only be passed on men—in this case scientists—and not on their enterprise itself; it is not the discoveries of science which should be condemned, but how those discoveries are used; scientists usually have little to do with how their discoveries are finally used, so to blame scientists exclusively is to scapegoat: if there is any blame at all it rests on the public in general—of which scientists are of course a part, but only a small part.

As I say, these charges and countercharges miss the point, and the adversary proceedings they generate entrench mistakes on both sides. What follows is intended as a fresh start. If it succeeds it will not only reveal the nature of the mistakes just mentioned but also provide the rudiments of a more pertinent moral critique of science.

Most of the mistakes in the moral appraisal of science begin with the distinction between science and the scientist. It is indeed important, as we are incessantly reminded, to distinguish the question of the morality of scientists from the question of the morality of science. But keeping the questions separate is not important for the reason that science is morally neutral while scientists can be either good or bad; science is not at all morally neutral. Nor is it the case that we should keep the questions separate because they are unrelated. Obviously, if science has a moral value, then it is a matter of moral consequence for the people who engage in it. If science is a moral evil, then the people who engage in it are liable for a similar evaluation of their characters.

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The question of the morality of the scientist must be kept separate from the question of the morality of his science only because an answer to one question, though relevant, will not suffice as a ground for answering the other. If a man is engaged in an immoral activity, he can still escape the judgment that he is an immoral man by presenting some excuse for his activity; so the moral value of science is not conclusive with respect to the corresponding value of the scientist. (And that an immoral man could occasionally engage in a highly moral pursuit is an obvious point.) Yet the questions are closely related, for if a man engages in an immoral activity he does *need* some excuse to escape personal blame. If no excuse exists, then he is, in fact, blameworthy.

So far this no doubt sounds dogmatic, and perhaps a bit as if I were going to argue that science is a moral evil. Nothing could be further from my intent. I merely want to show that science is as vulnerable to moral judgment as any other human endeavor; that the outcome of such judgment affects the outcome of the judgments we pass on scientists; and that the usual characterization of "pure" science makes it needlessly vulnerable to attack. I will argue that pure science is of the highest moral value, and, in passing, I will suggest that the making of moral judgments is more reasonable a procedure than is generally suspected. It is in this last effort that I am apt to appear dogmatic. This is so partly because I can only suggest the lines of the argument I would make on the subject; to do more would require a separate monograph. But we are so accustomed to the notion that moral judgments are, at bottom, matters of attitude, intuition, or personal point of view that we often recoil when anyone says that such and such an act is immoral (and says it as if he really means it). I am convinced, on the contrary, that a good many moral judgments can be rather thoroughly reasoned out—not merely "intuited" or "felt" to be true. The general line of argument I would take on this matter is implied in what follows.

MORAL BEHAVIOR AND REASON

A scientist is a man, and a man is judged to be moral or immoral by reference to his acts and character. Both elements are necessarily included in the evaluation. A moral man is one who acts morally—who does the right things for the right reasons. But it is important to notice that a man's character traits—his dispositions—count just as heavily in the balance. We do not quite want to say of a man that he is "moral" unless we can somehow count on him to act morally most of the time. A man who has to make up his mind afresh each time, to whom

“wrongdoing” is always a very open possibility, but who just “happens” to do the moral thing most of the time, will not quite warrant the description “moral.” In short, the moral man is not only the man who does the right things for the right reasons but the one who is *disposed* to do the right things for the right reasons—one who can be counted on to act morally in most situations. This notion of a disposition is crucial because it is at this point that there is a very complex and subtle relation between science and morality.

Being a scientist involves a disposition too—the disposition to get reasoned understandings of things. To be a scientist is, in part, to be disposed, as a matter of character, to get reasoned understandings of things—to be disposed to find out what can be said about things on the basis of evidence adequate to warrant those statements as valid conclusions. We would not quite want to call a man a scientist if he had no commitment to, no continuing interest in, no disposition to get such understandings.

Now when a man develops a very general, methodological disposition, such as the disposition to deal with problems by reasoning about them (yes, even the disposition to *create* problems to deal with in a reasoned way, e.g., mathematics), it is not always easy for him to stop doing this. In fact, the disposition can become so ingrained, so deeply habitual, so necessary to the personality that the man so disposed cannot ordinarily operate in any other way. So far from actually *wanting* to struggle for reasoned understanding, it is possible for a man to be so thoroughly scientific that he often simply *has* to live this way—simply has to reason things out as a matter of personal necessity. The disposition to reason is an engine with considerable momentum.

The moral question, and a question of some delicacy, is this: Is it always moral to reason about things? To put this more clearly, one only needs to notice the distinction between what is reasoned and what is reasonable. It is not always reasonable to reason things out: in playing a game of tennis, for example, a man can easily be too thoughtful. Deciding what to do by reference to the theory of the game is often an absurd procedure. Playing a bad game of tennis, of course, is rarely a moral offense, but it does not take much imagination to see the analogues which do have moral significance. Senseless reasoned analysis of a person’s motives can be immoral: the hypothesis that my love for my mother is tinged with an incestuous desire may be correct (or, what is more likely, may be useful in explaining and predicting my behavior), but it is not always appropriate, not always moral, to remind me of this when I am writing a letter to my mother.

ZYGON

On a grander scale, if reasoning—that is, especially the *process* of getting a reasoned understanding—vitiates human emotions in the way the evidence from psychology indicates, then in cases where great empathy is required for a person to act morally—in treatment of certain illnesses, for example, or often in the administration of justice—an overemphasis on the reasoned approach can produce a moral offense of some significance. Acting morally is not, one must remember, merely doing the right thing, but doing the right thing for the right reasons. There are some acts, some judgments in the moral life which must proceed, at least in part, from an understanding developed by empathy or imagination rather than “pure” reason. This is why we can with justice disapprove of the physician who has ceased to care in a personal way about his patients, or the judge who is merely a legal calculator. This is why we can with justice rebuke science and philosophy for holding people at arm’s length to scrutinize them—not because such scrutiny is impossible for any aspect of human life (I can think of no such impossibilities) and not because such scrutiny is futile. It is obviously very helpful for some purposes. But it is at times *inappropriate* for the accomplishment of vital human purposes, and thus engaging in it is, at those times and in that sense, immoral.

I hasten to add that the consequences of the disposition to science are in many cases precisely what is needed in order to be moral. So far from always being a hindrance to the moral life, it is often essential to it. If one were talking about the morality of mysticism, he would no doubt concentrate on the moral dangers of not reasoning. One of our philosophical problems here is to lay out in detail the moral limits of reasoning (and the other forms of understanding). Unfortunately, I can at present only point out how it is that science, as an endeavor which becomes dispositional in men, comes to be of moral concern for that very reason.

MORALITY OF PURE VERSUS APPLIED SCIENCE

I want now to turn to the more traditional issue in the discussion of the morality of science: the morality of pure as opposed to applied science. The debate is usually framed as follows: the attack is made on the grounds that pure science cannot be permitted aimlessness with respect to possible immoral uses of its results; that it must choose its tasks not only by considering whether a question represents a genuine intellectual problem but also by considering whether the solution of the problem would be a moral evil or not. The defense has argued that the endeavor to know for its own sake can never be a moral evil;

that the evil is in the misuse of results. The framing of the argument has missed a crucial virtue of pure science and in the process produced an impasse. The remedy requires a careful re-examination of the distinction between pure and applied science.

The distinction between the two forms of science is very hard to make other than by reference to the purposes of the scientists involved. There was a time, I suppose, when a mathematician or a theoretical physicist could be confident that what he was doing would never be of any earthly use (except as a relief from curiosity for those zany enough to be interested). But fantastic developments in application of the most abstruse physical theory and the most esoteric mathematics should by now have destroyed such confidence.

The intentions of people who do science, however, vary significantly in respects that can be described with the terms "pure" and "applied" science. Some men set out to solve specific technological problems: How do you get a man to the moon? How do you build a better bomb? And in order to do these things, they have to engage in activities which are otherwise indistinguishable from what we ordinarily would call pure science. But their intent is to find out what is true in order to do something else with it—in order to apply it. These men are doing "applied" science. There are also scientists (who very often work for large corporations) whose intent is certainly to find something useful (and usually profitable) but who cannot quite be said to be working on a specific technological problem. They are just "looking," but they measure their success partly by whether what they find can be applied. They too are doing applied science.

The man who does pure science is the one who tries to get a reasoned understanding of something just for the purpose of understanding it. And insofar as a man does science for no reason other than to slake his curiosity, or satisfy the momentum of his ingrained disposition to science, he does science pure. (That is, he does it unapplied. It is unfortunate in this context that the "pure" is so honorific; it is not at all clear that from a moral point of view pure science is any more noble than applied.)

What is clear is that pure and applied science present somewhat different problems with regard to moral evaluation. The way one will evaluate applied science is clear: what is the value of the intended application? To the degree that the application is not known, of course, the moral evaluation cannot be made, and it has been frequently argued that the full range of application can very rarely be known in advance. This explains why one is reluctant to say categorically that

the scientist working on germ warfare (leaving aside the issue of defense) is engaged in an immoral activity. We very often have found that an instrument created for immorality can be used for very moral purposes as well. And so we are much safer in placing our moral judgment on the man and his purpose than on his discoveries. But even so, the general principle remains true: insofar as we can know the possible applications, we can give applied science a moral value.

With respect to pure science, however, the temptation is to say that, since the men who are doing pure science are doing it only to learn, only for the purely personal satisfaction of satisfying their curiosity, pure science could not possibly be worse than neutral in moral value. In fact, one is tempted to say that the lack of practical value in pure science, combined with its extreme difficulty, makes it a very *noble* endeavor. It is like the fine arts in this respect: one's struggle is for an incredible excellence for its own sake. Like most temptations, this should not be embraced wholeheartedly. It leaves one vulnerable to a very embarrassing argument (in addition to the usual charge of an evasion of the moral issue).

To explain: every human endeavor is open to the question of its moral value, and at least part of the consideration that goes into deciding its moral worth will have to do with human needs. If the world is burning down, the man who insulates himself against injury and turns his back needs some defense against the charge of immorality—just as much as does the man who fans the flames. Now consider the following argument: Pure science is, in the first place, possible only in a society highly enough organized to permit the scientists freedom from the tasks essential for their personal survival. The more time a man must spend on getting his own food, clothing, and shelter, the less he has to spend on getting a reasoned understanding of things for its own sake. So the man who wishes to be free to pursue pure science must to some degree depend on others. Pure science is thus not possible on any large scale except in a rather thoroughly organized society. Further, pure science is not moral in that society unless that society can afford the drain of men and material from essential tasks that it represents. Learning for the benefit of society is one thing, but learning purely for one's own personal satisfaction cannot be justified if that personal satisfaction wastes needed and essential resources. And now the world is burning. It cannot afford waste at the moment, and thus, unless a scientist's endeavor is useful in this crisis (or unless one can find some excuse for it other than the purely personal satisfaction it brings to the scientist), it is immoral.

The argument I have outlined needs clarification at certain points to be made fully respectable as a philosophical objection to pure science. But enough has been said to have indicated that it is by no means an absurd objection. It is much like what one might expect a Marxist to say, for example. I think the Marxist may err on the side of too narrow a definition of what is of use to society, but I think we tend to ignore the moral importance of usefulness—even when usefulness is very broadly understood. In short, I do not think pure science is in any danger of being found immoral at present or ever, but I base my conclusion on an argument to the effect that it is essential to society, not on the premise (which is true enough, I suppose) that it is a peculiarly noble expression of the human spirit.

My argument for the usefulness of pure science can be put in one rather typically complicated philosopher's sentence (which then requires interminable explanation). The contention is this: pure science (that is, the attempt to get reasoned understandings—an attempt which is generated by nothing more specific than a perpetual, dispositional curiosity) is one of the ways we have of transcending ourselves—of transcending the boundaries defined by our present knowledge and problems and circumstances. Art is another way of doing this, as is philosophy, but those are somewhat different stories.

What I mean is briefly this: when I tackle existing problems, problems which fairly scream for a solution for the good of my fellows, my efforts (because of the urgency involved) are going to be rather well limited to the terms of that specific problem and the materials which are either at hand or foreseeable. The solution one comes up with in such a situation is thus, for the most part, the best he can do for this specific situation with the material at hand. Any wider benefits are a matter of chance; the development of novel materials and tools is not in any way guaranteed. This means that some problems will be solved in a makeshift and semi-successful way, and probably that others will be altogether unsolvable. Some problems are simply unsolvable with the materials at hand and/or when the mind is confined too severely to the class of issues rated as of pressing practical consequence. Some problems, after all, even disappear when one adopts a new viewpoint—when one disengages himself from that specific problem, solves some others, and comes back with new materials and tools. Pure science is one of the best ways we have of escaping the trap of our current expectations, dilemmas, and resources. I am confident that any history of civilization would find it to be an

endeavor of the very highest human importance—and in that sense, an endeavor of the very highest human morality.

In summary, then: while the question of *the morality of pure science* cannot be evaded by claiming an amoral status for it, or by arguing that it is an intrinsically noble endeavor (that is, noble precisely because it is not of practical use), the question can nonetheless be answered in the affirmative with an argument to show that the “detached” nature of the pure scientific activity is of the highest usefulness to society. And the separation of questions here is obvious: it is the *endeavor* which is being judged moral because of its usefulness, not the *man* being judged moral because his motive is to *do* something useful. In a sense, the more a man tries to do something useful, the harder it is for him to do pure science *in the way that we need it done*. This is a curious result, for it seems to say that we need to have people whose actions (in terms of their motives) are at best amoral, but whose endeavor (for which their amoral motives are necessary) is itself highly *moral*. It shows the superficiality of claims to the effect that “only men can be judged moral—and then only on (or primarily on) the basis of their motives.”

Further, *the morality of applied science* depends on the nature of the application; that is an ordinary enough point and true as long as one reflects that judgment can be passed only for the known applications. It is thus best to make these judgments in the form: with respect to all the known and presently foreseeable applications. . . .

Third, *the morality of the disposition to science* has delicate and subtle limits, and the importance of the project of defining those limits should be clear. This is, in a sense, the most intriguing issue with respect to the morality of science, and I suggest that it may be a very fruitful way of dealing with the moral implications of the “two-cultures” allegation. At least it promises to be the badly needed fresh start for that tired horse.

Finally (and unsurprisingly), *the morality of the scientist* depends, as it does for all men, on his deeds and character. This judgment, like the rest of the argument here, gives little more than an indication of where to start with a moral evaluation of science, but I suggest that the analysis as a whole at least provides the ground for something more than a mere adversary proceeding on the issue. It is only a beginning, but a beginning is better than a false start.