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## The Impact of Auschwitz and Hiroshima on Scientific Culture<sup>1</sup>

The idea that science is value-free is often voiced and at times opposed; it is seldom explained. Let me try. In my view the traditional discussion of this matter collapses in the light of modern cataclysms so that the question of values in social science invites serious rethinking.

### 1. Value-neutrality in Social Science

The literature on the matter ascribes the introduction of the very concept of value-freedom, of freedom from value, to Max Weber (around the year 1900). He is also known as one of the fathers of modern sociology. He did not suggest that sociological theory is devoid of moral judgment, nor that it should or could ignore values. Rather, he made explicit the rather standard suggestion that sociological theory should explain action by ascribing values to actors. The novelty of his idea was in his proposal that sociological explanation should ascribe values regardless of whether these are right or not. Moreover, when theoreticians explain actions by ascribing values that they share, they should be careful not to confuse their own adherence to these values with that of the people whose actions they explain. At about the same time Ludwig von Mises suggested the same idea. He was a leading advocate of pure market economics and belonged to the next, inter-war generation. He stresses that the value-free attitude is not amoral; rather, it is a special moral attitude known as liberalism, as recognizing (and thus tolerating) the different value systems that different people adhere to.

This was contested. The implication that people are entitled to any value system is moral relativism, the idea that there is no single, absolutely valid, final moral system. Bertrand Russell, the leading twentieth-century philosopher, confessed all his life that he was unable to resolve the dilemma of the choice between absolutism and relativism. He saw moral relativism as amoral, as the absence of a commitment to any specific moral system, and so as condoning, however reluctantly, even the Nazi system. He considered this immoral. He found the opposite moral position also distasteful, since it is, he said, high-handed and thus dogmatic. He admitted that he was badly stuck. Now, the commonsense answer to Russell's dilemma is the advocacy of moral liberalism as von Mises understood it. This is not good enough: whether moral liberalism is relativist or not, clearly, unqualified, it tolerates also Nazi morality, which is clearly morally intolerable. Hence, unqualified moral liberalism, it seems, is inadvertently amoral.

Possibly value-free sociology should not be as liberal as possibly von Mises suggested: value-free explanation of Nazi conduct should refer to Nazi values while repudiating them. For example, the playwright Carl Zuckmeyer explained (*The Devil's General*) Nazi conduct by reference to the disintegration of Nazi society, which disintegration he explained as rooted in the Nazi approval of treachery as a legitimate part of power struggle, as Nazi morality considers most valuable the very possession of power. This way Zuckmeyer presented liberalism as much less tolerant than Mises has pre-

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sented it. It is strange that he did not sufficiently clarify his position though his major book on the matter, *Theory and History*, was published in 1957, well after the Nazi era. I can scarcely explain this, except by the observation that clarifying this renders value-free social science problematic. The ease is amazing with which his view was advocated in the fifties, and the ease with which I myself had endorsed it at the time as if it were unproblematic.

The situation does not invite much concern, however, as it is very simple. Science aims at describing and explaining facts as accurately and truthfully as possible. Hence, whatever values people adhere to, their correct description must include correct descriptions of their values – regardless of whether these are correct. Science describe sickness and health, wisdom and folly, good and evil, hopefully as they are found, and then the question arises, how correct given descriptions are. Proper description of evil is not any subscription to it. This renders trivial all value-neutrality – Weber's, von Mises', or anyone else's. It is thus morally irrelevant, not liberal. (Hence, von Mises was in error after all.) There is nothing more to it; writers on the matter who do not consider it trivial are mistaken or confused.

This raises a historical question: if the doctrine is trivial, what is the source of the great interest in it? This is always a good question, as it rests on the supposition that, if our predecessors found non-trivial what we find trivial, then they had met an obstacle that we have lost the sight of. (I have illustrated all this in some detail in my *Towards an Historiography of Science*, 1963, 2008, and discussed there the advantage of avoiding being wise after the event.) I will return to this historical matter later and now only hint at my answer: traditionally, social science tended to describe actions as utterly rational and so as ideal; it was thus willy-nilly utopian, and so it repeatedly ignored conduct that is not perfectly rational. Before elaborating on this let me discuss the concept of value-free natural science.

## **2. Value-neutrality of Natural Science**

The discussion thus far scarcely pertains to the natural sciences. No moral attitude can be endorsed by the objects studied by physics, biology, and much medical research, and so value-freedom in the original Weberian sense is out of question there. Nevertheless, soon after World War II the slogan that all science is value-free gained popularity, especially in physics.

Perhaps the view in question pertains not to pure science but to applied science, to science-based technology, such as the technology that is engaged in the production of nuclear weapons, and even the manufacture of plain old conventional weapon that may be science-based, namely, that may involve science significantly – sophisticated ballistics, metallurgy, and the chemistry of unstable compounds. Should science be involved in military technology? Should physicists work in the service of the military? Can science avoid such involvement? Can scientists? At what cost? These are concrete questions, and they engaged physicists after World War II. Let us glance at the philosophical basis of these discussions.

The outcome of research is impossible to predict, much less its practical uses. This is particularly obvious in cases – and these are quite frequent – in which technology applies ideas that are inaugurated in different fields, scientific and mathematical, advanced by people in different times and places, who share little concerns and background knowledge. The outcome is likewise unpredictable of the proposal to apply the suggestion for science to avoid assisting military technology; this holds even for the outcome of this proposal for military technology. Hence, it is self-defeating.

Traditional science fiction repeated this suggestion in the form of a proposal for severe restrictions on research. The first to voice this idea – already in the early nineteenth century – was Mary Wollstonecraft Shelley, in her famous *Frankenstein, the Modern Prometheus* (1818). She said there, humans should not attempt to imitate God. A more secular and a much more detailed version of this same message is the running theme of Samuel Butler's *Erewhon* (1872). Cohorts of later, less classical, science-fiction works, including movies, followed it. The closest to the original message is the 1984 movie *The Terminator*, claimed to be one of the most influential films of the 1980's (screen-writers Gale Anne Hurd and James Cameron, who was also its director).

The proposal to restrict research, however, even if the restriction is meant to be minimal, must soon expand, Samuel Butler has argued, so that it leads to unmitigated obscurantism. It is thus quite impracticable. Obviously, to have any success, its implementation must be global, to forbid all research everywhere on Earth. Permitting any research – practical or theoretical – anywhere, then its outcome is unforeseeable. If the restriction is to be only locally implemented, then it will become powerful and spread the poison that it will produce. Thus, the excuse for nuclear research and testing during the cold war was that it was done defensively, since the other side cannot be permitted to have a military advantage over our side by pursuing research unilaterally.

As this discussion has moved from theory to application, we should have asked, can theory be allowed to develop while its deadly applications are banned? Can theoretical physics develop without testing nuclear weapons? This is a difficult question, as it involves willful confusions and genuinely controversial matters. Nuclear tests were mostly acts of muscle flexing and tests of muscles. The aptitude for flexing muscles causes temptations hard to resist, so that even poor countries, like India and Pakistan and China, engaged in tests of nuclear weapons at high cost with no returns. When, on a rare occasion, testing nuclear weapons included tests of theories, these were replaceable by lab tests. Some scientific information was accrued by observations of nuclear explosions; whether or not it could be acquired otherwise is not agreed upon. Perhaps this dispute remains open for good.

The claim that science is value-free takes science and technology as one; this is justifiable despite its inaccuracy. It matters little for the discussion of the unwelcome side-effects of science-based technology, that some technology is scarcely science-based and that some science is (as yet) utterly inapplicable. For, our concern here is with the public responsibility of researchers regarding the results of their researches – scientific or technological – and with the use of these results – by themselves or by others. Should researchers take a special responsibility for the unwelcome side-effects of science? This is too much to expect, especially unprepared. Yet Robert J. Oppenheimer did expect that much when he expressed his judgment on the physicists of the time, himself included: he did so when he crafted his famous, cryptic aphorism, “In some sort of crude sense which no vulgarity, no humor, no overstatements can quite extinguish, the physicists have known sin; and this is a knowledge which they cannot lose.”

This raises a historical question: what made him confess to guilt when the event he regretted was beyond his power? It is well known that President Truman denied that he, Oppenheimer, had dropped the bomb. Why did he insist on taking the blame on himself? I will return to this historical matter later; I will now only hint at my answer: traditionally philosophy tended to describe science as utterly rational and so as ideal; it was thus willy-nilly utopian, and so it repeatedly ignored the aspect of science that renders it not perfectly rational. This tradition naturally invites explicit attention to the possibility of describing an idea as scientific without supporting it. Before elaborating on this let me continue with the central aspect of the present discussion, which is the concept of value-free science.

### ***3. The limited Responsibility of Researchers***

Oppenheimer’s aphorism, “the physicists have known sin”, was firmly rejected by the Establishment of physics at once, although not explicitly. The logic of this rejection is simple and straight forward. They said, as far as physics is concerned, they are the experts and they are willing to be heard and to take responsibility for what they say; politics, however, is not their specialty, and so, politically speaking, in a democracy their responsibility is no more nor less than that of other citizens. Hence, they are no more and no less guilty than other citizens.

Is this argument valid? The leading scientists said, yes; they argue against Oppenheimer, insisting that science is value-free. It is not the merit nor the fault of the producer of weapons, they argued, that it was used by the police or by the criminals. Its use by the one it is as good as its use by the other is evil; hence, in itself, independently of specific social conditions, the weapon is neither good nor evil. This is the claim in question: science-based technology is morally neutral, like all technolo-

gy, even though, admittedly, like any human action, the application of any science-based technology is usually not morally neutral in the least, and is good or evil depending on the specific aspects of the case of the application under discussion.

This is a very interesting situation. The argument is so strong and clear that it looks as if the thesis it comes to support is trivially true and unassailable. Yet, it looks also, and no less forcefully, that the discussion is not closed. There is here a sense of frustration, of being forced by logic to take as settled a matter that looks unsettled. This happens often, as often as a strong argument seems to defend a weak thesis: one has to be careful not to be bullied to endorse a questionable thesis, even if the bully uses a strong argument with what looks like clean logic. In such cases one may always suspect logical errors. The strong argument may easily defend not the thesis that it comes to defend and that we are bullied to endorse in the name of logic; it may defend another thesis, a very similar one, so that the exercise amounts to an intellectual sleight of hand. The matter at hand is an example for this in the following way.

The concern with the moral value of advanced technology is not a concern with any specific item, be it a plough or a gun, a tractor or a bomb, and not with its use by the good guys or by the bad guys. The argument itself is valid: undeniably, the possession of a tool by good guys is good, and its possession by bad guys is evil. The concern discussed here, however, is not tools but their introduction, be they tractors or ploughs, be they bombs or lancets. Nor is it their use. It is their very introduction: was it good or evil? Do the police function better if both they and the urban gangs possess handguns or heavier weapons, or can the police fight the evils perpetrated by the urban gangs if both sides tacitly agreed not to use firearms? This is no idle question. Philosophical though it is, it is also a matter of practical policy. The London Police had a long standing truce with the criminal world: they should both bear no firearms. There is no way to force the criminals to avoid shooting the police, except their knowledge that the police will arm if the ban on shooting them is relaxed beyond a certain point, and that in any case any assault on the police is taken seriously by the whole force which takes then particular vigilance to bring the criminals to justice. This shows that according to both the London Police and the London outlaws, firearms are inherently evil: they are better unused by all parties, the good guys and the bad guys alike.

Some say, weapons are so evil that they disable good intentions and rational thinking. Arming honest people with firearms, they say, tempts them irresistibly to wish to dominate others by force. They conclude that the production of military technology is better banned, and that therefore military scientific research is better avoided. Their logic is defective: if it is impossible to stop people in possession of firearms from using them improperly, how is it possible to stop people in possession of research labs from doing the same? Realizing this leads to a tolerant attitude to research, to an attempt to cooperate with researchers. The people who hope to influence researchers and lead them to ban military research, appeal to their sense of proportion; researchers are supposed to excel in it. They say, as Arthur Koestler did, we have invested relatively little in moral research, so that now moral research should take priority over research in the natural sciences, let alone military research. With all of his savvy, Koestler was still utopian when it came to an appeal to the sense of proportion of scientists.

#### **4. Friends and Foes of Science**

Natural scientists are not moved by arguments like the one presented here. Do they find it unconvincing or have they lost their sense of proportion? Neither. They cannot handle the situation, but they know what they are good at: they are good at the study of things, not of souls. Should we then alter the curriculum? Should we alter the sets of incentives so that Indian and Pakistani students going west should want to study there ethics rather than nuclear physics? Clearly, this is a major step in the redesign of research strategies, education strategies, and even social and political structures. Yet only the lack of a minimal sense of proportion will allow people to embark on so huge a project on the basis of no more than the speculative idea of Koestler and its likes. What then is to be done?

Koestler's appeal is not against science but for a change of emphasis in research. He thus took it as unquestionable that science is inherently good, and that it has as an evil by-product the danger of the very survival of humanity. And on this he is perfectly in the right.

The proposal to suppress science-based technology is not serious. Not only is it impossible; the use of technology to the good is obligatory: the obligation should be taken for granted to use all the tools at our disposal to perform our duties, and the most powerful tool at our disposal is our brains: science is the most powerful means with which to fight evil. It is just as obvious, however, that science and only science produced the power to destroy humanity (and even life on Earth). There are four great interlocked risks for survival, the four P's, Population explosion, Poverty, Pollution and the Proliferation of weapons of mass destruction. They are interlocked, and their very presence is due to the rise of science-based technology. That they are interlocked is obvious, as the risk due to proliferation is now, since the collapse of the Soviet Union, the most urgent problem, and it is so great because poor countries suffer untold pains due to modernization. If we overcome the current major difficulties, then science and science-based technology will be judged as assets, not otherwise. This was Russell's view: now, and only now, are we forced to choose between the extreme options that were only yesterday still unimaginable: we must now choose between utopia and hell on Earth, he said. Russell's view of science as forcing upon us the choice between extreme good and evil is reasonable. Can it be taken as supporting the theory that science is value-neutral? If so, then there can be hardly any moral objection to it. But, to repeat, this is not what was meant by the advocates of the view that science is value-neutral. Hence, the assumption that Russell was right keeps the question undecided (as yet).

The debate around the value-neutrality of science is still popular. For a few decades now the friends and the enemies of science disagree about the right attitude that science should take towards values. The friends of science say, science is and should be value-neutral; the enemies of science say, value-neutrality leads to Auschwitz. The friends of science are largely scientists and philosophers of science. Now the philosophy of science is a subject in the curriculum, not a party, but unfortunately it is almost invariably taught by friends of science. This is a part of a general defect of the academic system. Quite generally, the academic system prides itself on objectivity, and therefore it contrasts itself with the religious seminary, where the orthodoxy of some faith is taught, unlike the university, which is neither sectarian, nor doctrinaire. Not so: the system works incongruously, and generally Jewish philosophy is taught by Jews, Marxism by Marxists, psychoanalysis by Freudians, and so on. The enemies of science, phenomenologists and existentialists and post-modernists and all sorts of writers who spout anti-rationalism, they all have their own philosophies of science, that is to say their philosophies in general include views about science. These are not taught in courses on the philosophy of science any more than the views of behaviorist psychologists on psychoanalysis are taught in courses on it, or Freudian views on behavior therapy are taught in courses on that brand of therapy. The friends of science have a monopoly over the philosophy of science; this should not be clouded by their having a monopoly over courses in the philosophy of science.

Nor is this the whole story. The tendency among scientists is to allow only friends of science to speak about science and to ignore the enemies of science. Paul Feyerabend went even further and said, neutrality allows the choice between science and magic, whereas scientists and official philosophers of science do not argue about it: they call magic names, insult its practitioners, and deny them academic jobs. Feyerabend thus transferred the debate to the political arena: value freedom is allowing for no advantage for science over magic.

## 5. Science as Politics

The context for the discourse on value-neutrality was initially moral rather than political. Yet from the start it came to serve a political end, and so at least by intended implication it was political too. Whereas the idea that the social sciences are value-free is a century old, the idea that the natural sciences are value-free is half-a-century old. In the interim, in the inter-war period, the views current

among philosophers of science was the one which many of the leading speakers of their profession held, in particular those philosophers known as the logical positivists. They used to say that there can be no rational debate about values, since they are meaningless or at least subjective. After the war, after Auschwitz and Hiroshima, it became harder to say this, since the denunciations of Auschwitz and of Hiroshima were public and very loud. In 1950 a then famous English philosopher, C. M. Joad, published a book called *Positivism*, in which he said that positivism leads to fascism. He was severely censured, and on the ground that positivists were usually good guys, but his condemnation had a very strong effect all the same: the positivists changed their tune, and then they said that science is value-free, meaning, the scientists just offer weapons, not any proposal as to their use.

The historical situation is much more complex than its intellectual counterpart: even before the tragedies of Auschwitz and Hiroshima occurred, the logical positivist view of values, if taken literally and at face value, was not serious. The evidence that many leading philosophers endorsed this view does not make it less puzzling that they endorsed it, as evident from the fact that the whole thrust of their own philosophy was their advocacy of logic and clarity and their claim that laudable science is the paradigm of logic and of clarity, unlike abject theology that is the opposite. (Friedrich Waismann made repeatedly the vain claim that these qualities made logical positivism anathema to the Nazis.) Basing one's philosophy on the value of logic and of clarity, and hence of science, and then dismissing values as unscientific, is not just a minor failing of some philosophers. It was the tenor of the philosophy of (young) Ludwig Wittgenstein and it was so understood and endorsed by his many fans, especially the logical positivists among them. In his later writings he ignored science as best he could, and this gained him even more disciples. For, his early and late positions shared the defense of the *status quo*, and in his society that meant the admission of science as it is, even if reluctantly. The epitome of this admission of science finally entered the mainstream of the philosophy of science. A leading expert in the field, one Larry Laudan, has recently written (in the Adolf Grünbaum *Festschrift*) that Popper's demarcation of science is silly, as it speaks of the refutability of theories, not of acceptability; even the acceptability of this or that theory will not satisfy him: he discusses the acceptability of science as such: the right problem, says Laudan, is not just, what theory is scientific so that we should believe it, but, why should I believe my colleague the physicist down the corridor that Einstein, or whoever it is, is now the leading scientist? It is hard to understand how one can believe Einstein without knowing what theory Einstein stands for: if one only knows the name as that of a celebrity, then it really does not matter if the name is Einstein or Bohr or whatever else it is. The ability of a leading philosopher of science to generate such a frivolity rests on the transformation of stark admiration of science to power worship expressed as a respected academic exercise.

After Hiroshima this is a very widespread phenomenon: the advocacy of science as power, the defense of the modern physics that is the best achievement of our culture, for the worst reasons ever, for the ability to use it to cause mega-deaths. And all philosophers in the post-war period were judged not so much by their wisdom or common sense but by their advocacy of science or distaste for it. And positivism was at first pro-science as logical and then in its general defense of common sense and the *status quo*. The defense of the *status quo* seemed a matter of the local culture but was a matter of local politics, and not even a particularly intelligent one at that. It is therefore not possible to do justice to the slogan that science is value-neutral without some discussion of the politics of science, since the political value of slogans may differ from their intrinsic value.

The use of science by society inherently differs from its use by governments, especially by the military. However different Auschwitz and Hiroshima were, they share the quality of being in the political sphere, not in the social sphere. It is hard to defend any answer to the question, was it right to bomb Hiroshima? It is even harder to answer the same question concerning Nagasaki. Nevertheless, it is impossible to compare these with the barbarism that the Holocaust was. Yet, however barbarian the Holocaust was, some philosophers and historians declare it much less of a special case than the use made of nuclear weapons. This flared a huge debate, the debate over the uniqueness of the Holocaust.

Let me dispose of the philosophical side of this debate at once. The philosophers who deny that the Holocaust is unique, such as Hannah Arendt and Paul Feyerabend and the cohorts of their German followers, speak of ‘the banality of evil’: evil is commonplace and boring. This is trivially true, since we do not live in Utopia, and indeed, the yellow press that reports chiefly cases of violence is really boring reading. But there are specific evils that, boring or not, require special attention, analysis and struggle.

## **6. The Debate on the Holocaust**

The claim that the Holocaust is unique is usually based on the claim, very often made in Israel, that it was unique as genocide. This, in its turn, is unthinkable, as genocide is, alas, prevalent, from antiquity to this very day. It is mentioned in the Bible, and is even advocated there concerning one particularly pernicious tribe of marauders, the Amalekites. Another commonly asserted reason for the uniqueness of the Holocaust is the number of individuals killed in the gas chambers. That number can be compared with the number of the murders committed in the Gulag, they say, I cannot judge how adequately. But, surely, the size of a catastrophe is a relative matter, and the contribution of sheer numbers to evil is hard to judge, considering that any brutal murder of any innocent child, no matter how frequent, is intolerably atrocious.

The Holocaust is unique and uniquely disturbing much more than the idea of genocide and of the murder of large numbers of innocent children, although, God knows, this is disturbing enough. Great natural disasters, Bernard Shaw noted (Preface to *St. Joan*), are catastrophes, but they are morally neutral; they cause great grief, but they also cause much less shock and indignation than the burning of one single person at the stake, which is particularly atrocious, he added, when performed by people of good will.

The atrocity of the burning of heretics on the stake differs from other killings. Consider the murder of eight Israeli athletes in the Munich Olympic Games. Certainly it aroused more anger and consternation than any other terrorist act against Israel in that era, including a terrorist act that killed quite a few Israeli school-children. The reason is in the demand that the separation of sports from politics should be respected even by terrorists. This sounds puzzling, in view of the fact that terrorists display defiant contempt for public morality. But the reasoning behind it is no more puzzling than the one behind the partial truce in London between the police and the underworld. Moreover, when terror succeeds, and at times it does, it does so only because it mobilizes public support for its cause: terror that is not intended to mobilize sympathy can succeed only as guerilla warfare proper, not as the sporadic acts of political terror proper. And so the fact that the Munich murder aroused hostility told the terrorists to desist.

What is shocking about the terror in the Munich Olympic Games may be more complex than presented here, yet it is mentioned here only to illustrate that what we take as shocking depends on context. We find mass murder horrendous first of all because any murder is horrendous. Mass murder is also another crime, not because of the number of people killed, but because it is a political crime, a crime against humanity. And we do not have as yet a clear view of political ethics. We are still moved when we see Euripides’ *The Women of Troy*, where the soldiers kill a boy because he is the heir of a throne and they have to prevent an insurrection, whereas the women view the killing morally and are appalled by it as murder plain and simple. We still view some political killing in different categories from murder, and not only on the battlefield. The reason for this is complex, but it can be greatly simplified by reference to philosophy: some philosophers took politics to be a branch of ethics and others went the other way around. The view of ethics as a part of politics was presented by Plato early in his *Republic*, in the hope that the service of the individual for the state will improve both individual and society. In modern times it was the tool for the dismissal of individual ethics and the advocacy of the idea that even the most horrendous act, such as mass murder, is good if and when and to the extent that it serves the state. The idea of crimes against humanity came to combat

this beastly philosophy, and it is so novel that it still lacks firm philosophical foundations, much less a clear intuitive appeal.

What are crimes against humanity is so unclear that many identify them as mega-killings. When Nazism was at the peak of its popularity in Germany, it was very difficult to condemn the mass killing of Jews, especially in public. The popular response to those who condemned the Holocaust in West Germany in public was for decades met with a counter-attack: the expressions of hostility to the Holocaust are masked excuses for the use of nuclear weapons on Hiroshima and Nagasaki and the use of napalm against Vietnam. In other words, the defenders of Nazism during the peak of its popularity in Germany, in the fifties, implied that the Hiroshima and Nagasaki killing is much worse than the killing of Jews.

The reason that the Holocaust is still shocking for any decent human being, then, is neither its genocide nor the large numbers that it killed, nor even its level of cruelty. It was the fact that it took place in Germany, in the center of civilized Europe, the country that took pride in its cultural and scientific advantages, the country that had put these to a systematic use in the service of the death-machine. It is the case of the support which science had lent to the devil. The horror of Hiroshima and Nagasaki are not comparable with those of Auschwitz. The military use of nuclear weapons, like the military use of any other science-based technology, is clearly a case of science in the service of the devil, so that there is little difference between the attacks on Hiroshima and Nagasaki and that on Dresden. These attacks are particularly horrible in the light of the suggestion, which is probably true, that they were hardly justified in the strict militarily sense. Yet they were justifiable in a broader military sense, and certainly incomparably less objectionable than the use of the gas chambers. This last sentence was repeatedly contested. It could be contested because political morality is very underdeveloped and the judgment that Hiroshima is less reprehensible than Auschwitz is a matter of political morality. The destruction of Hiroshima and Nagasaki is most regrettable in any case, yet the conduct of the people involved, the President of the United States, the research scientists and the air force alike, cannot possibly be compared with that of the people involved in the Nazi death machine. Yet, had the death machine nothing to do with the advancement of learning and of culture, it would be viewed as less shocking, much more akin to natural disaster. Though the Nazi brutes were uneducated monsters, it was their being Germans that counted, since Germany was supposed to be a cultured country immune to such atrocities.

The uniqueness of the Holocaust as the mixture of barbarism and culture is a matter that invites much discussion, especially since it puts a great burden of responsibility on German philosophy, chiefly the works of its early phase in the early nineteenth century, mainly the works of Fichte and of Hegel, but also those of its latest phase, up to and including those of Heidegger. But these are only links, means for the explosive mixture of science with barbarism. It was the mixture itself that made the three important contributions: (1) to the rise of Nazism and all that, (2) to the development of science-based death machine that was the Holocaust, and (3) to the overthrow of the claim that the impact of science on society is inherently good. (See Appendix.)

Consider then the view that the Holocaust is not unique as it is comparable, point-by-point, with Stalin's atrocities. Let us not question the detailed information about the cruelty of the Stalinist regime and of the number of cruel deaths it has inflicted. Was all this helped by the progress of the sciences and the arts? To the extent that it was it does render the cruelty shocking. This is why some take refuge in the view that Stalinism is not Marxist, and others in the view that Marxism is not scientific (but pseudo-scientific). It is hard to admit that science and culture had as side-effects the horrors of Auschwitz, Hiroshima, and the Gulag. But on this we are in error. Already Sir Francis Bacon said, science is power, and already Lord Acton said, power corrupts. The conclusion is obvious: science corrupts. This should not be read as anti-science, however, only as a desperate attempt to retain some sense of proportion.

## **7. Hiroshima as the End of Scientific Utopianism**

Saying that science corrupts sounds like an expression of hostility to it. For the friends of science speak only well of it and the enemies of science speak only ill of it. This is intolerable one-sidedness, which is tolerated only because historically we were desensitized to it by being reminded that science was under attack and because it became tradition to view science as nothing but good. Almost any group of people includes good and bad people, professing good and bad ideas, performing good and bad deeds. The classical exception are Scriptures which, being the Word of God, are perfect, yet as the Devil quotes Scriptures, the quoting itself can be good but can also be evil. Science replaced Scriptures for many people. As long as Newtonian optics was deemed perfect, it was science. The moment it was found defective it became pseudo-science, and different people tried to prove, by all sorts of maneuvers, that Newton himself did not advocate it. When Newtonian mechanics was superseded, this fact was denied, with the aid of an excuse called ‘the doctrine of incommensurability’, and advocated by Pierre Duhem, Sir Edward Evans-Pritchard, Thomas S. Kuhn and Paul Feyerabend. It is popular not because it has merit, and despite its obvious falsity, because it is the denial that Newtonian mechanics was ever superseded. Kuhn is a leading historian of science who overlooks the historical fact that all leading physicists, scientists and philosophers of science of the eighteenth and nineteenth centuries clearly declared Newtonian mechanics perfect. Even the greatest skeptic, David Hume, declared that theory probably incapable of being superseded. It was.

The claim that Newtonian mechanics is perfect, absolutely true, never to be surpassed, may seem a bit disappointing. After all, it means that finality within science is accessible, so that soon there will be no more possibility of scientific theoretical research, only the development of funds of information and of technology. For some people this idea is exciting. What they find exciting in it is the same as what is found exciting in many other visions, social or religious, in visions of harmony, of human perfection, of Heaven on Earth. This is scientific millenarism. Millenarism was taken in the seventeenth century for granted and it was transformed in the nineteenth century into progressivism. The millenarian aspects of the seventeenth-century scientific revolution was forgotten or suppressed in the nineteenth century and rediscovered by a number of historians in the twentieth century. One of these, Richard Popkin, planned to publish the collected Works of Sir Isaac Newton. The official Newton scholars prevented this effectively, as they still do not allow the public to see Newton as a millenarist, even though it is no secret that he was. The nineteenth-century idea of progress seemed less millenarian because the terminology in which it was expressed is not religious but scientific. Yet the faith in progress is what permitted the imperialism of the turn of the century that led to World War I, World War II, and the Holocaust.

Amoral by-products of science were always known. Science was always mobilized to build war machines. But it was taken for granted that the ills that science causes are greatly outweighed by the good it causes and that as science is the best means to fight all ills, it will also effectively rectify the ills it itself brings about.

This view is reasonable and comforting, but it is false: science has created the first means by which humanity can be destroyed; science can cause Auschwitz and Hiroshima; science must be watched so as to prevent its corruption. Lord Acton was right when he said, power corrupts, and absolute power corrupts absolutely. This adage is seldom understood in the manner it was intended. He was a great liberal and a Roman Catholic. He was greatly upset by the corruption that as a historian he found in the Church of Rome, and he explained it as the result of power. What is to be done against the corruption of power? Some say, abolish power. They are utopian dreamers. Others become power worshippers. They are corrupt. The proper way to treat power is to control it democratically. But this requires as a prerequisite an admission that science, as a human phenomenon, is imperfect and dangerous. Our views of science and of its impact on other aspects of human culture will then alter radically.

This raises new problems. The problem of the demarcation of science, for example, that is central in the philosophy of science today, will shift radically. So far all solutions with almost no excep-

tions presented science as perfect and translated the problem of the demarcation of science to the problem of the demarcation of perfect ideas. The ones, especially Karl Popper, who presented science as the best but not perfect, still take science to be as near-perfect as possible. Popper demoted every idea that turned out to be even less perfect than science. This must be stopped. If we have good art and poor, good religions and poor, why not also poor science? The problem of demarcation will then be, what about science make us admire it? What is good about good science? We have this problem then in parallel with art and religion and any other human product: what is good about this or that good human product, not what makes one sort of a human product best. At the very least it must be admitted that the ill side-effects of science prevent it from being the best, and then the view of science as morally neutral will lose its attraction at once. But science can do worse than have ill side-effects. It can be conducive to a vision of hubris and so to dictatorships that are intelligent and cruel at one and the same time. Those who see in this vision too much of a deviation from the profound admiration for science still live in a fairyland where science is the kingdom of good and scientists are the good guys. This image of science is obsolete, and it persists because many of its by-products survive, and they do because it is hard to see them as the by-products that they are. This, then, is a new, long-term field of study: look at every aspect of science as imperfect and find how the application of a sense of balance to it improves our picture of science as a whole and even of our culture as a whole. Then we will have drawn some lesson from the horror that is the Holocaust.

## **Appendix**

The literature concerning the ascription of guilt to German philosophy is enormous. The following works are mentioned as important contributions to the ascription written before the dreadful events were predicted or known. The first is George Santayana, *Egotism in German Philosophy*, 1916, 1939 (new edition, *The German Mind*, 1968), where the aestheticism of Nietzsche is declared dangerous for the neighbors of his followers, as it might make them wish to destroy their neighbors who offend their aesthetic sense. The second is A. Kolnai, *The War Against the West*, 1938, discussed in the third and the most important item, Karl Popper's *The Open Society and Its Enemies*, 1945, where the irrationalism, the collectivism and the intentionally obscure prose of the German romantics is blamed for having facilitated the rise of Nazism. In line with this attitude Martin Buber said soon after the Holocaust that had the German universities gone into a strike after the Nazi brutalities were made clear, already in 1933, then the regime might have collapsed; that in 1938 it was possible to mobilize them to act this way but by then it would be too late. Even great scientists whose humanism is beyond reproach, such as Max Planck, were ready in 1933 to see something of value in the Nazi party in the hope that in time they would learn to be responsible. And Karl Jaspers, it is well-known, found something valuable in Heidegger's famous Nazi speech that he delivered in 1935 as he became the first Nazi rector of a university. This Jaspers does not mention in his famous *On the Question of German Guilt* of 1946. The idea of the book, that guilt is inborn, is neither here nor there, yet at the time its very appearance was a sensation of sorts. His *The Future of Mankind* (1958, University of Chicago Press, 1961) is devoted to nuclear armament, as is most of Russell's work in the evening of his active life. The lesson from Auschwitz was put aside during the cold war.

It is now clear that the bomb poses only one danger: there are now four intertwining risks of self-destruction (the four P's): **P**roliferation of weapons of mass destruction, **P**opulation explosion, **P**overty and **P**ollution. Yet the most dangerous one is still the repetition of the Holocaust, which is the mobilization of science and culture and even religion for murderous political causes.

The most perspicuous contribution to the study of the dangerous contribution of scientists to the rise of Nazism was the contribution to the discussion due to Uriel Tal, *Christians and Jews in Germany: Religion, Politics and Ideology in the Second Reich, 1870-1914* (Cornell UP, 1975). He said, the contribution to the rise of the Third Reich during the Second Reich was the readiness of German scientists to combine their rationalist attitude towards nature with an irrationalist attitude towards humanity. One

of the least important yet most indicative expressions of this, he observed, is the suggestion, made by ex-Christian German scientists to their ex-Jewish colleagues, to baptize in the name of national uniformity. The demand for uniformity is ubiquitous; its endorsement by the scientific community is deadly everywhere; in Germany it was particularly dangerous. (Einstein never returned to Germany because, he said, even after the collapse of the Nazi regime they did not take stock and made no efforts at reparation. This seems to be an outstanding agenda, of the German scientific community and the international scientific community as well.) The unique to the Holocaust is the mix of science with barbarism, not barbarism by itself (as it is alas too common for that).