to avoid the issue. But secrecy provides little practical protection. The widespread questioning of scientists by the CIA is now so well known that it is no longer possible to hide its general existence. The specific information handed over may, indeed, remain secret, but the needs of society change, and we have all seen yesterday's secret files become today's subpoenaed public evidence. Kingsley's second answer to the issue suggests that the problem of personal responsibility no longer exists. I am relieved to learn that, because others are willing to hand on information, it is therefore all right for me to do so. It is ironical that Kingsley should write his letter on Patriots' Day, since now, as in that celebrated time, a man must examine his conscience when asked to become an informer.

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Standards of Conduct

A recent issue of *Science* [**135** (16 Mar. 1962)] came to my notice during the week that the United States, in collaboration with Great Britain, resumed the testing of atomic weapons in the atmosphere. The letters from Wittenberg and Kaplan [*Science* **135**, 997 (1962)] therefore seemed particularly relevant and worthy of further comment.

Wittenberg appealed for scientists as a body to make ethical judgments regarding whom they will accept into their company, and to make a clear distinction between the "scientist who cures cancer and the one who willfully induces it through nuclear fall-out." Kaplan, in order to give weight to such a judgment, refused to attend the International Cancer Congress in Moscow. I am in sympathy with much of the content of these two letters, which were inspired by the last Russian series of bomb tests, but I now find myself wondering whether Wittenberg and Kaplan will follow out the logic of the position they have adopted and apply their ethical strictures to the American and British scientists working on atomic weapons. I am sure they do not think that only Russian tests "cause the premature and unnecessary death of at least a few individuals in the world. . . ."

It does not require a great stretch of the imagination to realize that the

motives prompting Russian scientists who work on Defense contracts are similar to those of their opposite numbers in the West, and that Soviet and Western scientists would try to justify their actions in almost identical terms. An International Conference of Atomic Weapon Scientists would, I am sure, be a great success if freed from the restraints of national security, and Kaplan would find himself far less at home in such a gathering than he would at the Moscow Cancer Congress.

All this only goes to show that the problem of introducing ethical judgments into the practice of science is by no means simple. Nevertheless, the problem cannot be ignored unless we are content to have scientists cast permanently in the role of back-room boys whose services will always be available to the highest bidder. Bronowski [*Science and Human Values* (Hutchinson, London, 1961)] has tried to show that certain human values follow inevitably from the practice of science. Even if we agree with him that this is so, the impressive list of values he deduces—namely, truth to fact, freedom of thought and speech, tolerance, dissent, justice, honor, human dignity and self-respect—can only give limited guidance in the field of action. Scientists on both sides of the iron curtain might assent to these values but interpret them in different ways and differ completely as to the form of society that best promotes their growth. Amongst ourselves in the West we may also be in profound disagreement as to the means by which these values are to be preserved, and it is, I submit, on this crucial question of means that science can have little to offer in the way of ethical guidance. Science is helpless because its most powerful tool, the series of experiments under controlled conditions, is no longer usable. If, for example, the present experiment of mutual deterrence by ever more efficient weapon systems fails to keep the peace, then we shall not subsequently be in a position to try out an alternative policy, such as, for instance, unilateral disarmament.

To acknowledge thus the limitations of science does not, however, absolve the individual scientist from the necessity of making ethical judgments regarding the way his talents should be employed. We do not, for example, consider a doctor free to obtain scientific information, however important it might be for the general welfare, by experiments that subject patients to un-

necessary risk. In making this decision, scientific ends take second place to faith in a dogma (or perhaps we should prefer to call it a working hypothesis) concerning the value of the individual person in relation to the community. It is this same article of faith, together with a second about the power of love in the world, that causes many, like myself, to feel that we cannot allow our scientific abilities to be harnessed to the production of weapons of war. We are aware however that, although we try to apply dispassionate reasoning to the evaluation of all the available evidence, our attitude is based ultimately on faith, and that we therefore cannot ask the scientific world, just because it is *scientific*, to share our views and pass ethical judgments on scientists who act otherwise. What we can ask is that every individual scientist should critically examine what he is engaged upon in the light of such faith as he professes, and satisfy himself that the two are not incompatible. At this particular stage in human history the responsibility for making such a critical comparison may well lie heavier on the scientist than upon the majority of his fellow citizens.

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Rats for Research

I have about 40 unique male rats which I would like to offer to research institutions. These male breeders are heterozygous for the gene that allows expression of color. When they are mated with a homozygous female albino, the resultant litter is half pigmented and half albino, but otherwise the genetic composition is random. Hence, all the pups have the same father and mother, the same intrauterine environment, and the same postparturition environment. Differences ought to be attributable to pigmentation. Although I think the rats will be useful primarily in studies of visual acuity (eye pigmentation is black for pigmented, pink for albino) and light aversion, quite possibly other minds will see other uses.

These animals are offered free via freight collect. They will be available through July.

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