Spanish (Portuguese) or Russian or both for one or both of the members of the traditional German-French requirement.

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THE THREAT TO PURE SCIENCE[1]

AT a time when the allied victory for the cause of freedom is not far away, there is a growing danger to intellectual freedom throughout the civilized world. Although the activities of most of mankind are such that intellectual freedom is but an abstraction to them, nevertheless it must be remembered that freedom, like peace, is indivisible and that ultimately even the four freedoms would be endangered were intellectual freedom to go. Specifically, it is the danger to freedom in science that I write of. This danger arises from the totalization and socialization of science which is growing throughout the entire world. In Russia, it has already been achieved by the State; in England, the movement is strong—possibly due to the intellectual consciousness of the English Labor Party and Socialist societies—and in this country, paradoxically enough, it is the ever-increasing employment and importance of physicists in industry—the professionalization of physics—that will ultimately destroy freedom in science. A society founded on technology, and free from want, may be able to give comfort and satisfaction to its citizenry, but it would lack those distinguishing qualities that go to make a civilized and cultured society.

There is a good chance in the near future for some governmental control in science. Only the great industrial nations will be able to wage war in the future, since industrial advancement as well as advancement in the machines and instruments of war depend, in the main, on directed research. The profession of medicine is already well on the way toward socialization.

The socialization of medicine offers no direct danger to intellectual freedom since the great majority of practitioners, being professional men, have neither time nor inclination to engage in research. Furthermore, as professional men they have no interest in pure science. Not until a scientific discovery or advance has gotten to the stage where they can use it, does it concern them. And then they are only concerned with its use and not with the scientific principles involved. However, it is different in physics. Here the industrial or professional physicists employed by corporations do pursue research in physics. But their research is directed toward technological achievement. The basic science of physics is becoming a servant of the industrial corporation and society. Already the American Institute of Physics is seeking to define "the profession of physics" and it is this professionalization which is inviting government control. As long as physics was confined to the university there was no danger of this. The average teacher of physics at a college or a university, though not necessarily a research scientist, has felt, on the whole, a moral responsibility to uphold pure science. But I doubt whether the majority of the industrial physicists, not being in a university environment nor under the influence of the traditions of a university, feel that way. The interests of the industrial—the professional—physicists may not always be the same as those who consider the freedom and autonomy of pure science paramount.

The ever-increasing employment of physicists by the industrial corporations of this country accelerates the social impact of the physical sciences, and society begins to look around for some social control. The technological aspect of physics looms to undue importance before the public.

An eminent English economist has recently said that "the man of science should be on tap but not on top." This statement sums up the totalitarian view very nicely, as it does the position of the professional physicist in society. It looks upon the great man of science not as a creative spirit who achieves those virtues unique with man—reason, detachment and understanding—but as somebody to be used by society when the need suggests it.

Science is an intellectual activity—its very nature is not practical. It has an intrinsic goodness, for it brings us an enrichment of living and gives us a glimpse of the infinite complexity and fascination of the universe. Because the pursuit of truth and the passion for understanding give a dignity and nobility to man, its value can not be measured by any material standard. If man is not to live by bread alone, pure science must remain free, autonomous and supported for its own sake.

ALEXANDER W. STERN

A PLEA TO RAMAN SPECTROSCOPISTS

IN abstracting Raman data for the "Annual Tables of Physical Constants" it is necessary for the abstractor to have for each compound the empirical formula, the Geneva name—if it is an organic compound—and information as to whether the spectrum was obtained with the sample in the solid, liquid, or gaseous state; or in solution in a given solvent at a given concentration.

Frequently this information is either not given in the paper or is given in such a manner that consider-

1 See address by Professor P. W. Bridgman, SCIENCE, February 12, 1943, and his article on "The British Society for Freedom in Science," in SCIENCE, July 21, 1944.