

The Social Responsibility of the Scientist

I. INTRODUCTION

1. *Galilei* — Since the notorious condemnation of Galilei by the Inquisition in 1633, theologians and scientists have gone their separate ways. However, in November 1979, Pope John Paul II ordered a thorough study of the affair Galilei. Evidently the Pope desired to make amends if those would be called for.

Your kind invitation is a sign that you have forgiven the theologians for the injustice inflicted upon the scientists in the person of Galilei. However, the many centuries in which theologians and scientists have avoided one another's company have made it difficult to come to terms since we no longer speak the same language. Yet Theology and Science rest on a common ground. The constitution *Gaudium et Spes* of the Vatican Council II confirms again that there are two orders of knowledge. It recognizes also the legitimate autonomy of the sciences. Yet the Council declares that the sciences can never truly conflict with the faith if investigation is carried out in a genuinely scientific manner. For "earthly matters and the concerns of faith derive from the same God" (GS 36), the Council says. Whatever it may be, I hope that our meeting will be a true meeting of minds, and that we may find our encounter fruitful.

2. *Rapprochement* — It is necessary that well intentioned men and women get together. With good reason the Constitution Gaudium et Spes states that "the future of the world stands in peril unless wiser men are forthcoming" (GS 15). How would scientists and theologians not get wiser if they put their heads together? We all know the reason for the Church's anxiety about the future of the world. The tremendous leap the sciences and technology have taken in the last century or two has bestowed numerous blessings on modern man, but it has also exposed the world, and mankind itself, to unprecedented dangers that jeopardize our very survival.

3. *Mixed Blessings* — For instance, chemical fertilizers and insecticides have made it possible to increase food production, but, being poisonous, they are also responsible for disturbances in the environment and, possibly, for lasting damage to human health.

The utilization of petroleum has become the foundation of a new civilization, but the motorcar alone was responsible for 33 dead and 250 wounded as a daily average in 1979 in France, and the pollution caused by the exhaust fumes of cars is a problem which no one ignores who lives along España street in Manila.

Improvement of medical care has protected man against a number of diseases which once upon a time were fatal, but it has also created the problem of overpopulation. By the year 2000, the world population may have reached a staggering 6.4 milliards. Is the world capable of providing those masses with adequate food, shelter, education, medical care and employment?

An agonizing problem has been created by the scientific sophistication of modern armaments. It has led to the paradox of an armament race which is intended to prevent war. But this causes expenditures that run to twenty times or more the aid extended to underdeveloped countries. Even the third world is today expending on armament four times what it spent twenty years ago. If ever, God forbid, those huge stockpiles of arms would be used, the world would be blown to pieces.

The huge standing armies cost more than money. In 1981, the world's military consumed twice the gasoline consumed by the

whole continent of Africa, 40% of scientists engaged in research are working for the military, and the expense for military research consumes 275 of the total expenditures for research.

The most frightening aspect of the world which science and technology have built is the reduction of the world's genetic capital. By the year 2000, 500,000 to two million species of plants, insects and animals may have disappeared.

Finally, the possibility of genetic engineering threatens the human species itself with possibly irreversible changes whose consequences cannot yet be overseen.

4. *Not responsible?* — In the light of all these, is it possible to maintain that the scientist is responsible to science alone? The ancient philosophers made a distinction between speculative and practical sciences. Speculative sciences are practiced for the sake of knowledge alone, while the practical sciences are meant to acquire knowledge that can be applied. Today, all scientific discoveries lead sooner or later to technological application. Can the scientist still pretend to be committed to science alone and disclaim to have a share in the responsibility for the atomic bomb, acid rain and the many other calamities which have come in the wake of scientific discoveries?

II. MORAL RESPONSIBILITY WITH RESPECT TO OTHERS

5. *Justice*

5.1. *The Social Virtue* — Whenever our actions involve others, questions of justice arise. Justice is one of the cardinal virtues. It gives a man the correct disposition with respect to the rights of others. Einstein has made the observation that the discovery of atomic energy has changed everything except our way of thinking. Perhaps it is timely to examine in what manner the scientist's way of thinking about his own responsibilities need revision if we look at those responsibilities in the light of the demands of justice.

5.2 *Particular Justice* — Justice is traditionally divided into two kinds: *commutative* justice, which regulates the relationship

between individuals or groups of individuals in matters of exchange, and *distributive* justice, which regulates the relationship between a community and its members in matters of distribution. Commutative justice is the easiest to understand, for what is due in commutative justice is found by the mere comparison of one thing with the other. For instance, the work done and the salary paid in exchange. In distributive justice, it is more difficult to determine what is due, since a fair distribution of things is made according to a proportionate equality which takes into consideration the order which exists between the members of a community with respect to a particular standard of comparison. For instance, the wealth created by the nation ought to be distributed justly. This would be the case if each one (individuals or groups of individuals) would receive a share that is commensurate to his contribution towards the creation of that very wealth or, and this would reverse the order, according to the urgency of his needs.

5.3. *General Justice* — St. Thomas Aquinas, taking his inspiration from Aristotle, speaks also of a form of justice which he calls general justice. General justice stands apart from the other virtues. It is wider in scope. It gives us the disposition to bear in mind, in all our actions, the fact that we are, as members of society, always under obligation to the community of which we are part. General justice makes us take into account what we owe to the community, and disposes us to give what is due to the common good.

5.4. *Social Responsibility* — The extreme individualism of the 19th century has obscured the fact that all our actions have a social dimension. Although, as human persons, we enjoy a superior dignity which society has to respect, we cannot deny that we are unable to realize ourselves as human persons unless we live in society and receive its support. We are therefore in every aspect of our lives under the obligation to take into consideration the good of the community. In all our actions, we must be open to the impact that our acts may have on the common good, and we are morally obliged to regulate our behaviour accordingly.

5.5. *The Common Good* — Moral philosophers and moral theologians have lengthily discussed the nature of the common

good. Pope John XXIII described the idea as follows: "the common good embraces the sum of those conditions of social life by which individuals, families, and groups can achieve their own fulfillment in a relatively thorough and ready way". This description was taken over by the Vatican Council II in the Constitution *Gaudium et Spes* (74). The fulfillment of which mention is made is the fulfillment of man as a human being, the fulfillment of the family as a human family, and of groups as they are groups of human individuals. The ultimate criterium of determining what is the common good is therefore always what is the good of man as man. We frequently use today the expression, the dignity of man. Rephrasing the theory on the common good, we could say: what enhances the dignity of man enhances the common good; what diminishes the dignity of man, imperils the common good.

5.6. *Man and Society* — In this perspective it is inconceivable to maintain that the common good could ever be achieved at the sacrifice of the rights or the human dignity of a particular person. The common good is, as the name says, the good of all, not of all minus one. If however, as happens in totalitarian states, an ideology attributes to the state or to society an existence independent of its members, and if the state or society are invested with a dignity that is superior to the dignity of its members, it follows logically that a situation may arise in which the part could possibly be sacrificed for the good of the whole, or in other words, in which the dignity of the human person could be compromised for the supposed benefit of the community of which he is a member.

6. *Prudence*

6.1. *The Situation and Morality* — Before applying the Thomistic theory on justice to the scientist-at-work, I would like also to explain briefly what in Thomistic moral doctrine is understood by prudence. Like general justice, prudence is a largely forgotten or misinterpreted virtue. In the understanding of the classics, it is the disposition which opens our intellect to the moral demands of a particular situation inasmuch as those demands ought to be counted within our decision making. We live in an ever changing world, and each of us, called to assert his unique personality, carries a moral responsibility which is not deter-

mined exclusively by the objective moral law, but also by the contingent circumstances in which he finds himself here and now. Prudence facilitates the guidance which the intellect should give us in assessing the situation as it plays a role in the moral judgement which ought to precede our actions.

6.2. *Prudence and the Common Good* — Prudence is particularly important, I believe, in the practice of general justice, for what the common good demands of one here and now, is often a prudential judgement.

The moralists distinguish the prudence needed by the jurist (jurisprudence), the prudence needed by the legislator (*prudencia legislativa*), by the man of government (*prudencia gubernativa*), etc. I should like to introduce also the prudence needed by the modern scientist: the prudence of the scientist.

III. SOCIAL RESPONSIBILITY OF THE SCIENTIST

7. *Financed Research*

7.1. *Commutative Justice* — If we apply the various concepts explained above with respect to the scientist, light may be thrown on the scientist's moral responsibility. For instance: To-day the scientist is rarely, if ever, a man who enjoys the privileges of the liberal professions. He is powerless without sophisticated equipment and extensive laboratory facilities. The scientist is therefore, *de facto*, undertaking scientific research in the service of an institution, whether governmental or private. The institution provides him with the necessary tools and pays him a monetary compensation. In exchange he works for it on a permanent or a temporary basis. But this means, that the fruit of the scientist's work belongs to the agency who finances his research. Most of modern research is financed by the military, by government or by big business. In the perspective of commutative justice, it is up to them what use will be made of the scientist's work.

7.2. *General Justice* — The picture changes if we look at the work of the scientist from the angle of general justice. As a free man, the scientist remains responsible for his actions as

they affect the common good. General justice invites the scientist to consider whether his research is going to contribute to the good of society or not, and in last analysis, whether his research will enhance human dignity or not. If a scientist would know that his research will be used to destroy the environment, or to kill people, it is definitely not going to contribute to the common good. In that case, his research work would be immoral, inasmuch as it would be contrary to general justice, a virtue which governs all one's acts.

The objection may be made that the scientist is not necessarily himself involved in the technical application of his invention, and still less in the actual destruction which his invention may make possible. However, a bad effect which is foreseen, is indirectly willed and is as such part of our responsibility.

8. *Research Subject*

8.1. *Commutative Justice* — There is another aspect of the scientist's work which can be considered from the perspective of commutative justice, namely, the relation of the scientist to the human subjects who are involved in his research, whether the research is medical or behavioral. The researcher owes it to the subjects participating in a research project that their rights and human dignity be respected. He is, therefore, morally obliged to seek their informed consent, which means that he should enable them to evaluate the research project and their role in it.

8.2. *General Justice* — With respect to the obligation of the scientist towards the subjects cooperating in his research, the adherents of an ideology which reduces man to a mere part of society while considering society itself as a superior being, may justify the sacrifice of a part for the sake of the whole. A totalitarian state like Hitler's Germany actually sacrificed the health and life of countless supposedly inferior individuals for the sake of the "common good". In Germany's case, the whole world has rejected Hitler's application of the principle of General Justice as abhorrently wrong. But the temptation arises again and again, in various other ways, to manipulate the individual, often the one in a socially weak position, for a supposedly superior good. In the Thomistic concept, General Justice is never served at the ex-

pense of an individual or a group of individuals, considering that the common good is the good of all without exception. Concretely, the researcher may, therefore, never "use" individuals in order to obtain a benefit for the community at large.

9. *Publication of Research Results.*

9.1. *Prudence* — The determination of what the common good would demand in a particular situation, is largely a matter of prudence. For instance, the American government does not think it opportune to let the Russians share in all the scientific discoveries made in the States. It prohibits and prevents the publication of the results of scientific research in areas which it considers of strategic importance. The measure is obviously taken in the supposition that the interest of the United States ought to prevail over the interest of the scientific community which would wish to publish the results of its work. But one may also argue that the interest of mankind prevails over the interest of a particular nation, and maintain that for the good of mankind and world peace it would be opportune that scientific discoveries are shared by all.

10. *Underdeveloped Countries*

10.1. *Distributive Justice* — What about distributive justice, are there aspects of the scientist's work that are governed by this particular kind of justice? There certainly are. If we think of the results of scientific work, it is evident that many countries in the world are doomed to remain behind because of their lack of technical know-how and because of their inability to undertake scientific research. Brains may not be lacking, but the costly equipment and huge investments which make modern research possible may not be available at all. In terms of commutative justice, the underdeveloped nations would have nothing to complain. Rightly the fruit of scientific research would belong to those who undertook research, namely, the countries of the Western world. But we have every reason to think of the world as one, and to wish that mankind share this world as the common home of one family. In a family, the principle of distributive justice applies. Equality is preserved, not by having each one

hang on to what in commutative justice might be called his, but by pooling the resources of the family as a whole, making them serve all the members, beginning with those in greater need.

IV. CONCLUSION

11. *Obligation Towards Society* — I believe that the classical definitions of justice and prudence can be useful in determining the social responsibility of the scientist. That the scientist has a responsibility towards society is generally recognized today. How could it be otherwise, since he can work only inasmuch as he is made heir of the scientific patrimony which past generations of scientists and researchers have left us. But he has a social responsibility in particular inasmuch as his work may lead to applications that may be beneficial or harmful to society. Can he claim that science itself is as such morally "indifferent" neither good or bad, and that it depends on the one who applies scientific discoveries for a particular purpose whether science leads to good or evil? General justice would prevent the scientist from becoming a mere tool in the service of political, military or commercial interests.

12. *Obligation Towards Research Subjects* — Another point that I have raised is the responsibility of the scientist towards the human subjects who make themselves available for research. It is clear, I think, that justice forbids that the subjects of research be manipulated or used at the price of physical or moral damage and that their informed consent is always necessary, even if the objective of the research is to obtain a good that will serve the community at large, including those very subjects.

13. *Publication of Research* — I have also pointed out that prudence plays a role in determining what may be required in general justice by the common good. I have mentioned in particular the question whether it is opportune that the results of all scientific research be made common property, or whether circumstances may require discretion or even secrecy.

14. *A Common Heritage* — Finally, I have drawn attention to the fact that from the perspective of distributive justice it may

well be unfair and unjust that the patrimony of man's scientific discoveries and technical know-how is jealously guarded by the advanced nations as a private treasure which they can exploit to their own advantage. If we believe that there is reason to speak of the family of mankind and of one world, then logically, the underdeveloped and developing nations should be given a fair share in the knowledge and know-how which man was able to gather, not on the basis of particular racial or national virtues, but because God made him intelligent and provident for himself.

V. POSTSCRIPT

A last point. The question has been raised to what extent the sciences have changed or undermined human values. A sociologist would be in a better position than I to answer that question. But perhaps I could advance the guess that the sciences have radically changed man's vision of himself, and have thereby shaken his sense of values. To paraphrase an expression which was originally used in another context: The scientists opened up the doors of the world for us, but they closed up the heavens, morally speaking that is. It was this fear which motivated the mistaken censure of Galilei by the Inquisition. The Church is no longer afraid that the sciences would cut man off from God. But one cannot deny that in practice the so-called scientific mentality has confused man's understanding of himself as a spiritual being who is the unique creature of a wise and loving God. The sciences have renewed the temptation of Paradise: man's ambition to run the world and his life without concern of God. But a world which forsakes God becomes a God-forsaken world. Man has been tempted to believe that he could create Paradise on earth without God's help. So far, he has destroyed much of the paradisiacal riches of nature, and he has turned the world into hell for a very large segment of his own kind. Perhaps it is time for the scientists to make amends, and to recognize on their part that science and faith rest indeed on the same ground. They could do this by pursuing their investigation

of man's origin and spiritual nature to their ultimate ground which cannot but be the ground of all being. If the heavens remained closed to man, if he remains the prisoner of this earth without being able to soar above it, he may be doomed to live as Prometheus bound, the victim of his own genius.

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