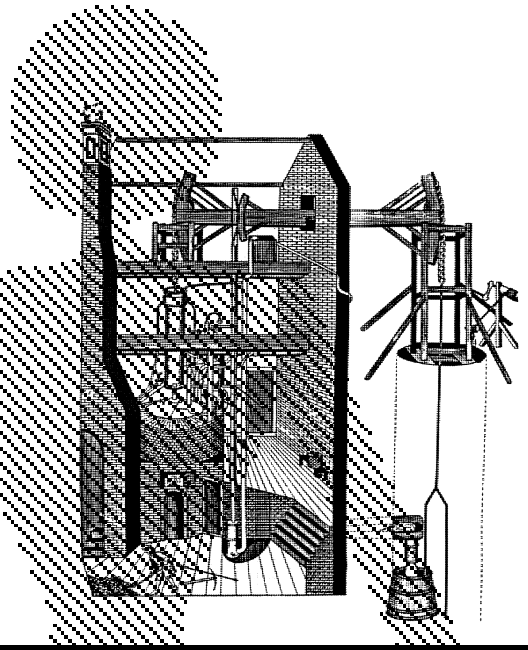


SOCIAL ENGINEERING:

STATE MONOPOLY VERSUS MARKET PLURALISM

INGEMAR NORDIN



The traditional view of science and technology has been thoroughly revised by the philosophers during the 20th century. It is now time to draw some conclusions about the mistaken idea of political social engineering as a rational and scientific way to deal with economic and social problems. I will argue that the Baconian, assembly-line model of the connection between science and technology is misleading, and that this model is much to blame for the existence of the welfare state monsters of today. I will also argue that science and technology are of different natures and that each enterprise has to be respected on its own terms. However this generates further questions, to some of which I will try to give tentative answers: How can the two cultures of science and technology meet without giving rise to either state welfareism or anti-intellectualism? How can social engineering be rationally implemented, i.e. be useful, in a civil society, without the state meddling in its affairs?

THE EXAMPLE OF SWEDEN

The Swedish welfare state is slowly falling apart. We have lost our position among the richest nations of the world and are tumbling down the list towards the second or third division. Unemployment is rising fast, the value of the Swedish crown has fallen by 25%, the public sector is building up huge debts and, except for export, the industrial sector is vanishing. The largest part of the state's expenditure is for paying interest on the money the politicians have spent already. And when the creditors one day say "no more!" and come to collect, I frankly don't know what will happen.

How can this be? In the larger economic perspective the answer is simple enough: the country built up its wealth between 1870 and

1970. During that period we had a moderately capitalistic system and a growth rate comparable to what Japan, Hong Kong, Taiwan and South Korea have today. Then, during the 1970s and 80s the welfare state was built. The long term growth rate fell, and is now negative.

I will not go into any detail concerning the economic side of the problem. Instead I will discuss some aspects of the ideology that *motivated* and *justified* the welfare state in the first place. How come such a state seemed — and unfortunately, in most quarters, still seems — so attractive to politicians and intellectuals? The question could be asked, not only for Sweden, but for the West in general, since in order to find one important answer to that question, I think we have to go back to the Enlightenment in the western cultural tradition.

SCIENCE

The Enlightenment is a child of the scientific revolution of the 17th century. One of the propagandists of that revolution was Francis Bacon, who formulated a militant empiricist methodology for the new sciences. This methodology also became the dominant philosophy for The Enlightenment in general. It was vigorously defended in the 19th century by August Comte, the ideologist of positivist social science and social engineering.

According to the traditional empiricist view science is based on an inductive method, which generates scientific theories from observational data. There is no place for metaphysics and idle speculation in science. Nor can we gain any new knowledge about the outer world through pure mathematics or logic. The certainty, or high probability, of scientific theories is obtained through impec-

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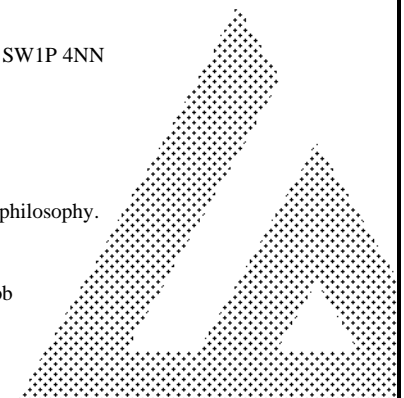
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cable observations and careful generalisations. In this way science is able to cover one area after another, and grow.

The empiricist view implies that there is an automatic method — an algorithm — which can be used to produce dependable knowledge. At one end all that is needed is work; work in gathering, experimenting, observing and categorizing data. At the other end we get certain — or highly probable — scientific theories. The more work we do, the more dependable is the knowledge we obtain. Success is guaranteed.

As has been pointed out by Joseph Agassi,¹ this algorithm takes all adventure out of science. There is really no need for imagination, creative thinking or human intelligence in the empiricist scientific model, just hard work and a computer. All success stories, such as Galileo's or Newton's, must be explained in terms of carefulness and long working hours. But no one *really* believes that the only difference between Newton and other not so successful scientists is mere diligence. So there must be something wrong with this empiricist model.

For a long time there have been critics among the philosophers of science. They have pointed to two main problems with the empiricist view. First, there is the problem of induction: there is no way in which one can rationally justify the use of the inductive principle to infer true, or highly probable, generalizations from empirical data. Not by logic, nor by experience. Secondly, there is the problem of observation: All observational statements involve theoretical assumptions, i.e. generalisations, and cannot be certain unless the theories involved are certain, which bring us right back to the problem of induction. The consequence of this criticism is that there is simply no justifiable method of the kind envisioned by the empiricists.

There is more to science than just hard work. Call it intuition, or imagination, or scientific intelligence. Call it adventure, frivolous speculation or just smart conjectures. But the price we have to pay for not having an automatic algorithm is that *all science is fallible*. This should come as no surprise. As history has shown us again and again, scientific theories are constantly reformulated, modified and quite often rejected altogether. Even the best among them, such as Newton's mechanics which was a complete success for more than two hundred years, had to be given up to make room for the theory of relativity and quantum mechanics.

THE SCIENTISTIC VISION

That all science, including the social sciences, is fallible has had some important implications for modern political philosophy. I am of course referring to Karl Popper and his critique of utopian scientism.²

Utopian scientism became fashionable during the 19th century when spirits were high, and when August Comte, inspired by his teacher Saint Simone, envisioned a social engineering analogous to the successful physical engineering. The new social science — called "social physics" by Comte — was to be based purely on measurable and observable entities. Its aim was to find the complex differential equations that could describe objective social change. Armed with these equations, the social engineers would then be able to apply them in solving social problems and mould society as a whole in an utopian fashion. In this technocratic vision the scientist-expert is the king.

Popper points out the similarities between this modern scientific political program and Plato's. The difference is the scientific method involved. But both the rationalistic Plato and the empiricists claim to have a method which justifies belief in the theories produced by it. Both claim that only the true scientist-philosopher can obtain certain, or at least very probable, knowledge. Hence, the conclusion is that scientist-philosophers are the only true authorities in society, and that all criticism against their rule must be based on nothing but guesswork or superstition. But the scientific vision crumbles as soon as we realise that there cannot be any certain, or even highly probable, knowledge. Popper is the philosopher who has argued this most convincingly.

Popper's criticism defeats the totalitarian version of social engineering. Because scientific theories are fallible, there is no dependable "scientific" way to rule a society. Science is not a machine that produces truths. Rather, science is a continuously ongoing discussion that produces conjectures, arguments and rejections. There are no final products. There are thus no final blueprints on which to base the ideal society.

THE LIMITATIONS OF DEMOCRATIC SOCIAL ENGINEERING

But Popper does not reject *all* kinds of politically controlled social engineering. Rather is he the champion of *democratic* social engineering, i.e. the kind of policy which is intrinsic to the modern welfare state. In the democratic society criticism is possible. The role of the expert is to make social experiments, to plan and to execute social reforms. The role of the citizen is to complain, and ultimately to reject one reform in favour of another. It is an open ended, ever changing, utopia with no final steady state. But unfortunately there are also huge problems with this kind of society.

We who live in the welfare state of Sweden are tired of being guinea-pigs. The social experiments are nationwide, monopolistic and obligatory. The only way that ordinary citizens can express their views about them is through general elections every third year, and then only by choosing between parties, not between individual reforms.

When we are sick, there is just one kind of health care to turn to. The Swedish health care system is very expensive, yet still it cannot offer doctors who will make home visits. Sometimes people have to travel for hours to get to a doctor, or they will have to wait until Monday between 10am and 11.45am. For serious medical problems that involve operations, people are put on a waiting list. God only knows how many have died during the long and painful months of waiting. Maltreatment is usually not compensated.

When parents send their children to school, there is just one kind of school to send them to. The Swedish school system is very expensive, yet up to 10% of the pupils that it produces cannot read or write after nine years in school. The quality of the students that come to the universities is lower each year, and more and more of our time there has to be spent on teaching them what they should have been taught at school.

People live and die with the obligatory and tax-financed social security system, because no one can afford private insurance. We all have to adjust our lives to the security system. Get employed, preferably within the public sector, and for life. But, do not move around from one community to another to get more experience since that will mean higher taxes and lower job security. Have your children when you are employed, and have them regularly, one every two years. Do not forget to use your right to child care. Get sick, but not for too long. Do not forget to use your right to stay at home for the care of your "sick" child. Do not show too much initiative, do not start your own firm, do not educate yourself too much — let the "society" take care of you, or you will be hunted by bureaucrats and tax-collectors for the rest of your life. And when the national economy of the state falls apart — as it is now doing — then the individual stands naked, without any economic safety net at all.

THE DIFFERENCE BETWEEN SCIENCE AND TECHNOLOGY

So, even in an open and democratic society social engineering does not work very well. It produces heavy bureaucracy, inflexible systems, low quality — sometimes inhumane — service, illusions of security, standardised and boxed-in lives and sky high taxes.

Popper did not go far enough in his analysis of the role of science and technology in society. His philosophy of science must be complemented with a philosophy of technology. First, Popper seems to accept much of the Baconian view of the relationship between science and technology. Second, Popper ignores the role of plu-

ralism and competition in the advancement and improvement of all technology.

Francis Bacon said that rational technology was the application of science to practical problems. First come the scientists, who map and describe the world. Then come the practitioners, who simply *apply* the theories. The paradigm case is when Thomas Edison employed a scientist to calculate how much copper he needed in order to make his electric lightning system in New York work: Ohm's law was applied to a practical problem.³

But the problem with this view is that technology is so much more than just applied science, and sometimes it is not even that. It was Edison who was the technologist, not his scientist helper. The application of science is a fairly routine job, namely finding suitable initial values for the equation to get the wanted result. But the identification of needs, the ingenious inventions and the laborious development and adaptation of these was done by Edison. Surely there is a place for scientific knowledge in technology, but that kind of knowledge is far from sufficient.

Popper claimed that since science is fallible, we should apply it with caution. He said that we should apply our best theories to social problems but not depend on them for ever. I would rather claim that since rational technology is much more than just applied science, we should never try to apply *nothing but* scientific knowledge. We should always try to obtain other kinds of knowledge before implementation is done. Or, as will be argued, we should strive for a social system — pluralistic and competitive — which forces social engineering to respond to *personal* knowledge as well.

The fundamental difference between science and technology is that science aims for truth whereas technology aims for practical usefulness. Truth is objective and absolute, and unrelated to where, when and who says it. The usefulness of a technique, on the other hand, depends on the user. There are techniques that are very useful in one place but almost useless in another; for example, an air-conditioner is very useful in Africa, but hardly useful at all in Greenland. There are techniques that once were very useful but that are almost useless today, such as the classical steam engine. And there are techniques that I find very useful in my personal life but which my neighbour would never make use of.⁴

The difference in aims means a difference in the role of the expert. Rational technology is not done for its own sake, but for the service of others. Accordingly, the technological expert needs to know what the others, the laymen, need and want. The final judgement of his work is made by non-technologists. Science, on the other hand, is conducted for the sake of truth. Therefore the pure scientist has no interest in the needs of the non-expert. He has no authority but himself and his colleagues. These are the philosophical reasons why the technologist needs more knowledge than science, and why technology cannot be identified with applied science.

Furthermore, we can now see why the utopian scientific dream would be irrational even if science were certain. Scientific knowledge is always general, and expressible in terms of principles and laws. It does not concern itself with particular, or personal, knowledge except in test cases. You cannot find all relevant knowledge about Smith and Jones by reading books or by making experiments in isolated laboratories. You have to ask Smith and Jones themselves. In other words, that kind of information is spread out among millions of potential technology-users. And it cannot be gathered and centralized except by non-scientific means. Therefore the expert-ruler, relying only on scientific theories, would make a poor practioner indeed.⁵

DEMOCRATIC PLURALISM VERSUS MARKET PLURALISM

Popper's democratic social engineering is a poor substitute for real technology. The reason for this is that it relies on general elections as the only system for information and pressure. Popper thought that this was sufficient as a safety-valve against false scientific the-

ories, against their implementation and against totalitarianism. He is probably right about this. But he did not fully realize that rational technology needs more than scientific knowledge, and that political elections are insufficient to coordinate the relevant knowledge and power needed to make social engineering rational, i.e. to make it serve people.

The market has no role in the Baconian view of the relation between science and technology. You get useful technology simply by applying science, and that's it. In my view the market plays a vital role for the function of good technology, at least in terms of efficiency and usefulness. Two important properties of the market system will be mentioned here. Firstly, the system allows for technological pluralism. Secondly, the price mechanism works as both an information system and as a power system.

The importance of technological pluralism should be obvious from our criticism of the welfare state kind of social engineering above. The welfare state produces no alternatives when it comes to schools, childcare, health care and so forth. You are offered one choice, and you take it or leave it. (And sometimes, as with schools, you cannot even leave it!) In a pure market system nothing would stop you from starting alternative schools, private hospitals and new (or old) methods of child care. Nor would it be the case that public hospitals would be "free" of charge while all the others were too expensive. All the products of private social engineering would have their fair market price, and you could choose freely among them according to your own personal needs, wants and means.

That would liberate the personalised adaptation of social technology. Single techniques, not just bundles of them in the political party programs, could be compared and judged one by one, and minorities would be able to get the social service they preferred. As a result, social technology — as a whole — would produce techniques more useful to and better adapted to people, and it would therefore be more rational.

But would it not be possible to have pluralism within the public systems? In Sweden we do have pluralism of sorts, and there are plans for increasing the freedom to choose by political means. You *may*, for instance, now choose between public hospitals — at least *if* the ordinary hospital cannot give the service you want, *if* there are other places that can give it to you, and *if* your doctor recommends it to the board. That is an improvement.

Why cannot that process continue? There are two main reasons why genuine pluralism is difficult — even impossible — within a public system.

The first reason is that the pluralistic public model presupposes an unrealistic picture of how politics works. Politicians need experts to run a complex modern society. They need them for constructing roads and bridges, for health care, for schools, for defence and so forth. Even if the producing units were to be entirely private, the politicians need their own experts in order to buy the best products. Sometimes the politicians themselves become experts within their fields. But experts have by definition obtained a professional competence — and hence have a vested interest — in a social, scientific or technological field. They are never experts on Smith and Jones. They believe that there is "one best solution" for each practical problem, and their natural goal is to maximize the influence and power of their own profession. With a monopolistic buyer, that makes it very hard for that producer who only offers "the second best solution". Experience show that there quickly develops a natural symbiosis between the politicians and their experts which makes pluralism very unlikely. But a truly pluralistic system allows each user to make his own definition of "the best solution". If rational technology aims at *usefulness*, then there cannot be any "best solutions" in a general sense.

The second reason is economic. I am not an economist so what follows is my layman's view of the matter. It seems to me that pluralism is more costly than mono-production. If a car factory produces just one kind of car in limited numbers, it can do that more cheaply than if it produces five different kinds of the same

total number. This was one of the convincing arguments for socialistic production. Most people seem to agree that, in theory, socialistic mono-production should be cheaper than the wasteful pluralism of capitalism: Who needs five brands of marmelade and ten different sorts of toothpaste in our shops!? But we all know that this idea does not work in the long run because there is no competition. I would say that the market system is cheaper, not because of its inherent pluralism but *in spite* of it. But in a pluralistic *public* system there is no competition to keep the costs down. This should imply that we could, at least in principle, have pluralistic production, but at a much higher price than if it were mono-production.

The first argument says that, in the long run, the rationality of politics and technology is a hindrance to pluralism in public systems. The second argument says that even if politicians were saintly representatives of the people and truly autonomous versus the experts, then pluralistic social engineering within the welfare state would only be obtainable at a cost far higher than today. (Remember that, as things are today, without pluralism, about two thirds of the Swedish national income is managed and spent by the state.)

THE PRICE MECHANISM AND THE SUBJECTIVE EVALUATIONS OF USERS

The second important property of the market is the price-mechanism. Much has been said about this by distinguished scholars such as Ludwig von Mises and Friedrich von Hayek, and I will just mention some relations between their findings and the function of technology.

The rational technologist needs more knowledge than he can learn at universities and laboratories. He also needs some access to the users of technology. In the welfare state this link between the social expert and the laymen is handled by the politician. In a public system the incentive for the expert comes from political committees and budget departments. The social technologist, say a child-care manager, is more concerned with the ever ongoing game of getting as much as possible from next year's community budget than with satisfying the needs of the children and their parents. In a free market he will not get any resources at all unless he concentrates on his clients. His incentives to develop new equipment and better pedagogic methods would come from precisely those people who will use the new techniques themselves.

Prices tell the expert which techniques are useful and which are not. If a technique is successful then there will be more buyers or the users will be prepared to pay higher prices. And if the resources for development are completely dependent on what people buy, and not on tax subsidy, then only those lines of research which are successful will be developed further. Hence, we will have a rational development of social technology.

Remember now that we are talking about technology, not about companies or factories. A technique may well be independent of the companies that employ it. A technique may blossom and die without the companies involved doing the same. The expert however is usually tied to his technique through his competence. That means that the expert clearly has a vested interest in the technology as such. When his technique is no longer asked for, then he either has to learn new techniques, or do something entirely different for a living. Therefore the expert is often very sceptical about free markets. He does not like the idea that common laymen should be allowed to define what is good technology and what is not, especially within the social sector.

Because private companies operate in the market and depend on their clients for their survival, the social engineer finds such companies unsuitable — even undignified — as managers of social technology. What the social engineers forget is that social technology, like all kinds of technology, should aim at producing useful techniques. And the usefulness of techniques cannot be determined without the subjective evaluations of users. This means that com-

mercial companies will do much *better* than public institutions as managers of social technology.

The problem of poverty is irrelevant here because this special social problem may be separated from the question of how to obtain rational technological development. Whether one advocates pro-market solutions such as a voucher system or a pure charity system, the cost, quality, efficiency, adaptiveness — in short, the usability — of the social service delivered will depend on the inherent pluralism and price-competition of a free market for social technology.

The neglect of the market, especially in social technology, has had devastating effects both on research and implementation within the welfare state. Due to the economic illiteracy of the social technologists, and their naive belief in what science is capable of doing, the application of social knowledge works very badly. The state mobilises armies of scientists — from feminist sociologists to zealot ecologists — in the belief that they will deliver practical solutions to all social problems. The result is that both the scientific and the technological research is much worse than it could have been.

A NEW ENLIGHTENMENT

This completes our diagnosis and criticism of social engineering in the welfare state. We found that the Baconian view of science and technology has been revised, and should be revised even further. Science is fallible, and the tragic follies of the 20th century in attempting to engineer societies on the basis of so called “scientific” socialism will — we must hope — not be tried again. Utopian scientific experiments are now rapidly being replaced by open societies. But the traditional, assembly-line model of technology still forms an important part of the ideology of welfare states. The scientific ideals of truth and objectivity spill over into the absurd belief that there is such a thing as the “scientific management” of the whole of society. This is absurd because technology needs more than science to work well. Technology has to be controlled by the user, not by the expert or by the politician. Therefore it cannot stand apart from the market.

None of this means that I am against science and technology, or against enlightenment in general. On the contrary, I am very much in favour of science and technology. My criticism concerns the use of science and technology in society, and the part they have played in the *ideology* of the welfare state. A New Enlightenment is needed, where the role of science and technology differs from their role in the Old Enlightenment. Scientists and technologist should not be officials of the state. They should participate in civil society, and produce and trade like honest people. Social engineering is definitely still needed, but only in the voluntary and private sector.

In the same way that western democracies now separate the state from religion, modern enlightened society should make a definite separation between the state and science. Had this been clear in the minds of the intellectuals of the welfare states in the West, then many of the most serious problems we face today might have been avoided.

NOTES

1. J. Agassi, *Science in Flux*, chapt 12, Reidel, Amsterdam, 1975.
2. K. Popper, *The Logic of Scientific Discovery*, Harper and Row, New York, 1965; *The Open Society and Its Enemies*, Routledge, London, 1962.
3. The example is from Agassi 1975, pp 294-295.
4. This point is further argued in “The Rationality of Technology”, *Science Studies*, No. 2 1989.
5. This point is elaborated in “State, Technology, and Planning”, *Philosophy of the Social Sciences*, vol 21, no 4, 1991, and in my *Etik, Teknik och Samhälle*, chapt. IV, Timbro, Stockholm, 1992.