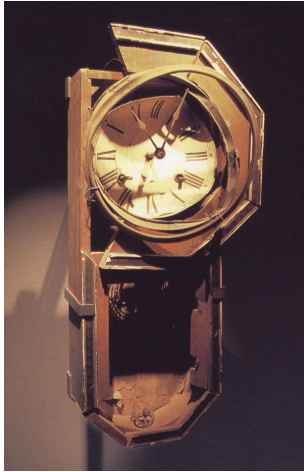


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What Can We Do?

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Dear Friends in Science,



I take this opportunity to address the subject of the science and technology of weapons development, and its impact on our society, all from a somewhat personal perspective, a rather subjective approach, as opposed to our usual striving for objectivity.

This clock, found in Nagasaki not far from the epicenter of the nuclear explosion, announces that I shall take you to a history lesson, even if I never cared much about history when in school, and still feel as a pupil who didn't do his homework.

When I was six, my family transferred from an old village house into a new city block, the surroundings of which was resembling a building site for quite a while, rather than the normal urban look. But for us the kids this was the most wonderful playground we could ever dream of, since it was probably our first hands-on contact with technology and materials, even if in a rather primitive form. From a pile of wasted material we have built a small house and we were sitting on the cardboard covered ground for hours, talking about the world as seen by our childish eyes. And as I remember, the atomic bomb was often mentioned, even if no one of us knew what an atom actually was, but it must have been something very big and powerful!

Of course, the kids of the neighbor block also had their house just a stone-throw away, and we often engaged in a game of 'cowboys and indians' (we did not play 'partisans and germans', because no one wanted to be a 'german'). As it often happened, those games ended up in quarrels and eventually even fights, after which we were throwing stones at each other from the safe shelters of our houses. And, as it often happened, somebody got hit and went home crying loudly, while the remainder of his gang ran away. The 'winners' then courageously marched to the 'enemy' territory to tear down their house.

This story might sound funny, if it were not horrifying from a certain point of view. Just think: it is enough to have an IQ slightly higher than a monkey to discover the most basic military strategy: **hit your enemy where he is most vulnerable - at his own home**. Similar things have happened in every war we remember, from ancient history times to the most modern conflicts, offered serially 'on-line' over the TV screens and the Internet. It happened so in Coventry and Dresden, it happened so in Vukovar and Sarajevo, it happened so in Baghdad, and in New York in 2001. Hiroshima and Nagasaki were not available on-line at the time, but certainly those

dramatic moments would have been covered by the media equally well, given a chance. The photos and movies made immediately after have come up much later.

When my friend and colleague Dr. Peter Starič invited me to help him to arrange some of the material for his book on the development of the atomic bomb, I got the opportunity to gain a deeper insight into the whole situation experienced by the scientists involved into the Manhattan Project. Being of a technical profession with occasional excursions into science, I often wondered how strong the human emotions, fear and hatred in particular, must be if our most noble properties, which we poses as a species, can in critical times become subordinate to a completely opposite goal — the **creation for destruction!**

True, it was the scientists, led by Szilard and Einstein, to trigger the sequence of events which have culminated in the development of the atomic bomb. However we should also recognize that the **use** of the bomb was never in the domain of scientific decisions, those decisions were brought up by the political and military leadership. There are clear records of dilemma among the scientists who were developing the bomb about its actual use, but we can hardly resist the impression that all of them were actually shortsighted, idealistic naives. To the very last moment they believed that the effects of the bomb will be demonstrated on a desert polygon (like the first test at the Trinity site), or on the battlefield at most. And all in spite of the fact that many of them actually remembered the merciless militarism and brutality of the nazi regime, which some of them even felt on their own skin.

So it happened that in the moment of explosion the scientists were thrown into the role of passive observers, mute by horror and shame, and it took quite some time before they started rejecting such a policy in the first place, to which act a decisive contribution was made by both Einstein and Oppenheimer with their high moral stand.

From today's historical perspective, do we see any solution for similar situations in the future?

Well, it is not realistic to expect that the technical development, and the development of weapons in particular, would stop. The development of weapons often leads and even spins up the rate of new technologies. In this development the scientists and technicians have a dominant role from the very start. Even if a scientist, who discovers a new idea, leading eventually to an application as a weapon, would consciously hold the discovery for himself, it won't be long before the same idea occurs to somebody else with less second thoughts. Likewise, we should not hide behind a syntagma that 'everything can be used for either good or evil, thus the discoverer need not be responsible for the use of his discovery'.

Let us admit it, the image of a scientist in our popular culture is that of a rather smart, but mostly irresponsible individual, maybe also slightly nuts, if not a completely crazy, or even deliberately malevolent genius. Whether we look into children's literature and cartoons, or more serious science fiction novels and movies, the picture is always the same: a scientist will do almost anything in order to realize his idea, regardless of wider consequences for the environment or the society. Although such an image has been present for centuries, maybe before Archimedes, it became some sort of a cliché after the development of the atomic bomb, and is owed mostly to one or another variation of the public perception of Albert Einstein.

Unfortunately we scientists ordinarily do very little to oppose or dismiss such stereotypes. We are often prepared to work for low wages, if we are just left alone to do what we like best, and with few exceptions we will not do anything to present our work to the general public. And then we wonder why is the interest for study of sciences and technical stuff so low. But even to those who show such interest we behave mostly like a stepmother or a stepfather, leaving them to themselves in the first year of study and wait for the natural selection to do its job.

Nevertheless, a certain insensitivity and detachment from everyday problems is, in a way, necessary for scientists: it is good if we can preserve our childish views and curiosity throughout our active lifetime. In the words of a Douglas Adams' character in his *Hitch-hiker's Guide to the Galaxy*: *"I'm a scientist and I know what constitutes proof; but the reason I call myself by my childhood name is to remind myself that a scientist must also be absolutely like a child. If he sees a thing, he must say that he sees it, whether it was what he thought he was going to see or not. See first, think later, then test. But always see first. Otherwise you will only see what you were expecting. Most scientists forget that. [...] So the other reason I call myself Wonko the Sane is so that people will think I am a fool. That allows me to say what I see when I see it. You can't possibly be a scientist if you mind people thinking you're a fool."*

In spite of the fact that today technical and scientific achievements are raining on the market and in the news at an ever increasing rate, it is difficult to expect that we scientists and technicians will regain and reinforce our badly shaken respect any time soon. Especially not if the prices of those devices on the market will continue to drop like rain. So, as scientists, what can we do?

On one hand it is necessary to come forward and present our work to the society, simply because most of us are being paid from the taxpayers' money. On the other hand we have to exploit our respect, whatever has been left of it, to publicly back up the election to leading positions of such people, who will be able to recognize potential conflicting situations soon enough, and who will not be afraid to use the means required for a peaceful solution of such conflicts. But if and when it becomes necessary to engage in the conflict, we should make sure that the decision of using certain potentially dangerous scientific achievements will not be left to only a narrow group of people.



It may sound conceited when I say that as scientists we have a duty to a more intensive public approach that it has been in the past, and that this is our most important task. I am nevertheless convinced that such is our historical responsibility, which we will not be able to avoid.

That is, in my opinion, one of important messages of this book.