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**Keynote address:**

**Questions of Technology<sup>1</sup>**

Before I present my speech, I would like to thank those who have prepared this conference, and to say a few words about it. The conference is a part of the University of Iceland's participation in international cooperation, and follows a conference on globalisation that was held here about 18 months ago. A large number of academics were involved in that conference, as is the case with this one. I would however like to mention the names of those who bore the brunt of the preparations: Guðmundur Jónsson, associate professor at the Department of Humanities; Sigurður Brynjólfsson, Chair of the Department of Engineering; Örn Daníel Jónsson, professor at the Department of Business and Economics; Irma Erlingsdóttir, director of the Centre for Women's and Gender Studies and Þorsteinn Vilhjálmsson, professor at the Department of Science; and in recent months, one of the staff of the University Funds, Ásta Hrönn Maack, has been the *primus motor* – and I propose that we show our appreciation with a round of warm applause.

Professor Brian Arthur, I was just mentioning the people who have been preparing this conference and I would also like to give you a special welcome to the University of Iceland and to this conference. Thank you for being here with us.

My concern is to introduce specific questions about technology that I would ask you to consider. I hope that these questions will remain in your minds, giving rise to new ideas that could provoke further discussion at this conference. My presentation merely provides a cursory overview of the issues at stake; it is in no way intended to be exhaustive. Rather, its main purpose is to outline a philosophical point of view pertaining to the subject matter of this conference.

To start with, it is interesting to note that what seems to be the first printed occurrence of the word *tækni* (technology) in Icelandic runs as follows: “Science

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<sup>1</sup> In *Technology in Society – Society in Technology* (ISBN 0079-9559-8-8), University of Iceland Press 2005.

and technology do not consider the nature of the human individual, they are impersonal”, a quote from 1925. According to Þórbergur Þórðarson, a much-renowned Icelandic author writing in 1933, a certain Björn Bjarnason from Viðfjörður coined the word *tækni* as an Icelandic rendering of the word “technique”. Regardless of semiotics, however, our basic understanding of technology would seem to imply three aspects:

- Knowledge or skills related to practical tasks
- Machinery or tools to implement tasks
- Ways or methods to achieve objectives

This analysis refers, quite simply, to the different senses in which the word is commonly used. It should be noted that the “objectives” mentioned in the last part of the definition are always given *a priori*, they are pre-defined. This is characteristic of the technical mode of thinking in general—it does not ask about the objectives of human activities, but rather about methods or ways to achieve specific results, and these results are given beforehand in some way. This implies that the technological way of thinking requires, and calls for, definitions of objectives.

I wish to present an hypothesis with regard to the criteria that we use when we evaluate the effects of technology. In a nutshell, the hypothesis is as follows: the criteria that we apply to technology are *reliability*, *efficiency* and *impact*. These three aspects, in turn, intertwine in the concept which, in my opinion, describes the essence of technology: *effectiveness*. Effectiveness implies, for example, that the car does not break down, that the telephone works, that the computer does not crash and so on. What matters is that technology works. In other words, effectiveness is a key concept when we seek to understand the nature of technology. At its core, this concept embraces the idea of an uninterrupted chain of events where one thing automatically leads to another. In this way, then, a certain dream of automation is lodged deep in the nature of the technological mode of thinking. In reality, the automation of technological processes is never entirely perfect. A clock would be a good example of automation; and the idea of a clock that never breaks down and never fails illustrates how we tend to conceive of technology, that is to say, as working perfectly without any intervention on our

part. Thus, automation does not require any thought. This also entails that the technological mode of thinking aims to find new ways to increase automation.

Keeping these remarks in mind, let me raise three questions about technology that I would ask you to consider.

First there is *the academic question*: how should one understand technology in relation to the laws of the universe? This is a question of the extent to which technology is an extension or a reflection of the laws of nature itself. That is to say, to what extent are the laws that apply to technology found in nature? To what extent is the mechanism of the clock different from the rotations of the solar system? We know of course that everything is subject to the basic laws defined by physics – but when we produce new artefacts by means of technology, to what extent are we making something new that works according to its own laws or rules? I do not think that we have found any definitive answer to these questions. Rather, we have accumulated all kinds of musings around answers that, in my opinion, invite some very exciting reflections.

Secondly there is *the technical question* about technology, the question that is raised most frequently in our daily lives. This is the question that asks how far we can go with technology. What are the limits and limitations of technology? Can we realize all the dreams that technology invites us to realize, provided that we have the necessary financial resources? To take an extreme example, we *could*, technically speaking, recreate Reykjavík and its vicinity in outer space. I am quite certain that this would be technically possible as long as the resources were at our disposal. Not that I'm suggesting that we would ever want to do that! In any case, we know that our future will be defined by ever greater technological achievements. That is clear. If we look to the future we see infinite possibilities in terms of technology.

The third question is *the ethical question*, to which I will pay most attention here. This question relates to the way in which we situate technical values in relation to other values of life.

In preparation for our treatment of this question, I would like to introduce a certain analysis of values which is inspired by Aristotle.<sup>2</sup> In my opinion, human wisdom is composed of three kinds of knowledge. First there is *theoretical knowledge*, the objectives of which are truth, understanding and explanation. Theoretical knowledge governs how we judge or value. Secondly, there is *technical knowledge*, which relates to reliability, efficiency and impact. Thirdly, there is *moral knowledge* which seeks justice, friendship and freedom. This threefold distinction shows how we can inscribe technical wisdom in a wider context. It is imperative that we try not only to understand technology *per se*, in isolation, but also in its relation to other aspects of human life and to the universe in general.

I propose to distinguish three types of values: intellectual, worldly and moral values. Technology relates to each of these categories in various ways. Further, I suggest that we distinguish between three aspects of the world: first, the universe in general, second, the human world (which I also propose to call the environment), and third, the intellectual world, the world of human consciousness.<sup>3</sup> We have already raised the question of how technology relates to the laws of nature and how these laws are reflected in the human world. What we might call the production of the human world, or the shaping of the environment, is in my mind essentially technological. In other words, technology is the basis of our (human) life in general.

I have coined the term *umhverfing* to describe humankind's shaping of its environment. The term thus implies the transformation of nature by means of technology.<sup>4</sup> In other words, the environment is understood as physical nature transformed by the human being's technological capacities.

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<sup>2</sup> See his *Nicomachean Ethics*, book VI.

<sup>3</sup> We will leave aside the possibility of a fourth world – a world beyond the universe.

<sup>4</sup> These two senses of the word *umhverfing* – the shaping of the environment and the transformation of nature – are quite easily discernible to any Icelandic reader.

If we want to properly comprehend the role of technology in our efforts to live and survive in the world, we must acknowledge that technology is irrevocably linked to what we might call human spiritual reality, that is to say, to the way we think, to our beliefs and to our general way of expressing ourselves. With regard to these three aspects of human reality – belief, expression, and thinking – technology relates primarily to expression (see table). Of course, nature is a powerful creative force, but technology is the human being’s way of creating the environment and shaping the universe.

belief	consciousness	perception (experience)	theoretical wisdom	intellectual values
expression	will	creation (technology)	practical wisdom	worldly values
thinking	soul	(human) relations	moral wisdom	moral values

It should be noted that in everyday reality, there is no clear-cut distinction between the factors assembled here. For example, the difference between perception, creation and human relations is rather hard to uphold in the real world, as perception is a prerequisite for a certain kind of creation, which in turn affects human relations, and human relations affect perception and creation. In other words, what we are analyzing *in fact* constitutes a whole. Nevertheless, it may certainly prove valuable to try and distinguish different factors of this whole.

Let us now return to the questions that I raised at the beginning. I do not intend to dwell on the academic question, i.e. the question of how we should understand technology in the context of the laws of the world.<sup>5</sup> Let us rather take up the technological question: what does technology allow us to do? I mentioned earlier that we could effectively do anything with technology, as it achieves new heights every day. Here it seems pertinent to introduce a well-known concept that plays a key role in the debate on technology and on the technological way of thinking: “the technological fix”. What this term refers to is the way in which people tend to adhere to the view that all problems introduced by technology can be solved by technology. In other words, we must continuously respond to technology with

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<sup>5</sup> In my opinion, however, this is an extremely exciting question which academics should tackle fervently in cooperative research projects.

technological means. In my opinion, however, we must do our best to counter this tendency and try not to consider technology solely in terms of technical knowledge, but also in terms of moral and theoretical knowledge. Technological understanding is incomplete by itself. Thus we arrive at the ethical question: how do we conceive of technological values in relation to other values of life?

One way to tackle this question relates to the way in which we depict the relationship between technological values on the one hand and what I have called intellectual values on the other hand. The latter primarily include the values that are at stake in the arts, the sciences and the various pastimes that human beings invent and play. Technology itself has intellectual value; just like the sciences, arts and games, it gives pleasure and appeals to us. This means that the value of technology can not be restricted to worldly value and that its objective is not limited to the production of material things. This is especially true in the academic environment where, to an even greater degree than elsewhere, technical values constitute aims in themselves. We should not overlook the intellectual and moral aspects of technology; however, I fear that the human being has a strong tendency to do just that. The neglect of intellectual and moral values gives rise to what I have called “technologism” – the definition of which is the unilateral emphasis on practical knowledge over theoretical and moral knowledge. In other words, instead of applying intellectual or moral knowledge to a problem, we *exclusively* employ the technological way of thinking; and this is equivalent to giving worldly values, which are the primary objectives of technological thinking, absolute priority over intellectual or moral values. To take a mundane example, this type of one-sided thinking would embrace the view that money, which of course is essentially a technological phenomenon, is an end in itself, and that we should ignore all other values. However, everyone knows that money is first and foremost a means to pave the way for the enjoyment and pursuit of intellectual and moral values. Money has the manifest purpose of making good education, and the practice of science in general, possible; as well as improving human communications and eradicating poverty and plagues. Worldly values serve the purpose of improving the intellectual and moral aspects of human life. This, of course, comes as a surprise to no-one; I am merely stating the obvious. The danger of technologism is that people forget these basic truths or at least pretend that they do not matter – that the only thing that matters is the pursuit of worldly

values, the accumulation of financial wealth or political power, or something of that sort. In my opinion, such an endeavour poses a threat to human society.

A word of caution, then, before I finish: we must be careful not to limit our vision to technological ways and methods of solving problems, which is what happens when we are blinded by technologism. Above all, I wish to emphasise that technologism is not technological in its nature. Technologism has nothing to do with technology, but is rather a misconception of an intellectual and moral nature. It is not the technological way of thinking *per se* that leads us astray; it is the belief that technological values, capabilities and functions are the only things that matter. In this way one can see what we might term the ambiguous call of technology: on the one hand, technology demands quite simply to be used, but on the other hand it calls on us to apply intellectual and moral thinking to the ways it is used. The fact is that we sometimes neglect to respond to the latter aspect.

Finally, for the sake of interest, I would like to dwell briefly on the difference between might and right. Technology gives us might, it empowers us; it is part and parcel of ‘the powers that be’ in the world today. There are many kinds of technological functions or methods that increase our power in this way. The problem is, of course, that might does not always comply with what is right. Morally speaking, we should not simply *do* whatever we *can do*, but rather do what is right. Doing the right thing is the greatest problem of all – and the ‘right thing’ in this context is to be understood as having intellectual, technical and moral aspects, or, in other words, it implies and invites intellectual, technical and moral criteria. The nature of technology is such that as it increases our capabilities for action, it neither prescribes nor considers the objectives as such. It is the moral way of thinking that asks about objectives; and we also need intellectual thinking to help us understand life in order to improve our selection of objectives.

To sum up and recapitulate, my hypothesis is the following: dominant technologism stands in the way of our perception of certain aspects of reality and thus bars the way to a deeper and more durable perception of life and existence. If technologism manages to firmly establish itself in our culture, as I consider it has already done to a certain extent, then it will inhibit the academic way of thinking and hinder our understanding of all facets of reality. This in turn will impede our enjoyment of the intuition that is a prerequisite of our becoming happier and more

mature human beings. A lack of deep perception and intuition limits the human being's ability to envisage circumstances that differ from those that currently prevail, as well as the capacity to find new ways to communicate with other beings – and to see what might be improved in one's own life and in the lives of others. To think differently is a prerequisite for thinking morally in view of effectively improving the world by means of creative activity that takes place in compliance with the criteria of academia, art and science, and not only those of technology.