Session 4

Making educated guesses
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Will they? They already did; in fact it is a few hundred years they do and "digital" is nothing but the latest form storage, manipulation and transmission of information have taken during our recorded history. Which the next one will be I have no idea and I may not even live long enough to see it, but it will most certainly be discovered sooner or later. So let us recognize that science and its applications will continue to alter the world we live in and shape the form of our interactions but we know extremely little as to the directions this process will take. We can only afford some educated guesses and some tentative predictions or advices, standing ready to modify them as scientific knowledge changes our understanding of the world.

While we know a lot about the past and the present of science the questions we are being invited to debate are very deep and complicated; they require a level of knowledge and foresight I do not possess. Let me state at the outset that I have no clear answer for any of them, at best I will have one or two principles to share with you about how to approach them and a few observations about what economics, at least the economics I am familiar with, teaches us about the social use of science.

The first principle I like to use is empirical, a pure matter of fact: science is neither good nor bad, it favors neither the "individual" nor the "corporation" and, least of all, science alone cannot determine where the distribution of income and power will go. Scientific knowledge describes how the world out there works and how it can be transformed through technological means: it is a tool and what a hammer does depends mostly on the hand holding it, its incentives and its goals. In other words: what matters are the rules of the game and those are social constructs we build collectively day after day.

If the key are institutions, incentives and property rights, then economics can be of some help. But for economics to be of some help (mostly through the applications of that area of research we have rather obscurely labelled "mechanism design") we need first to make a number of moral choices that are outside the realm of economics in general and of mechanism design in particular. We need to decide what kind of "welfare function" our collective behavior is supposed to maximize. To do that we need to decide how we choose such welfare function … and so on and so forth in an infinite regression! Here – I am sure you saw it – I have already cornered myself in a classical conundrum the social sciences have been facing, without being able to solve it, for centuries: there are no well-defined and commonly shared axioms establishing the "right" set of institutions and the balance of powers on the terrain of history always makes the final call. As the poet wrote: *caminante, no hay camino, se hace camino al andar*[1].

The second principle I like to use is a mixture of theory and historical facts. Most of the times, knowledge becomes "socially dangerous" when it is the monopoly of only a few individuals, when it is not commonly shared and understood. Hence, most of the times knowledge produces its best results when it becomes "common knowledge", understood and used by many competing individuals. The

[1] Walker, there is no path; the path is made by walking.

examples of this fact are plentiful and very few the counterexamples. But there are counterexamples and they are important, which is why I wrote "most of the times" and not "all the times": there exist instances of scientific knowledge that become socially dangerous when they are shared by too many people. The knowledge underlying weapons of mass destruction comes first to mind and I believe I do not need to belabor further on this point. What this implies, though, is that also in this case we have no clear and simple rule to adopt, we need to take the chances of establishing a general principle that applies most of the time while being aware that there are important instances in which we will have to take exception to such rule. In which case we will have to go back to the conundrum mentioned before: who controls the controllers and how do we sort that out?

These very simple, almost common sense observations suggest that there is no golden rule we can adopt and use in all circumstances to decide what to do with science and how to "regulate" it. We need to use also here the "scientific method": everything we state as "true" is such only partially and temporarily, until proven wrong. Another poet –by the chance of my limited knowledge Spanish this one as well!– said it very well*: ¡Sencillez divina que derrotas lo cierto y pones alma nueva a lo verdadero!* [2]
Let me add a few "economic intuitions" which I will try to elaborate further during the public discussion. The first is that "competition is good" but competition is neither the natural state of affairs nor a self-enforcing equilibrium, as we have long recognized. Hence, active political intervention is always needed to restore competition and free entry in front of economic and technological changes that, while generated by competition, tend to eliminate it. Politics is the key, like it or not.

The second is that, at the very end, it is demand that matters in the sense that human needs are what determine both the social consequences of scientific knowledge and the direction in which we invest scarce resources to accumulate it. Life and health being the "ultimate commodity" let me try here my only (humble) prediction: the fields of "life science" are, at least quantitatively, going to dominate the future as far as the impact of science on our economic life is concerned. To put it bluntly: the share of "health" in GNP is going to increase for a very long while. And this will force us to face a number of both unexpected and dramatic moral choices because the goal of extending to as many people as possible the benefits of medical (in the broadest sense) advances will increasingly conflict with the scarcity of resources and the hard to accept fact that not all lives are worth the same.

The third is an exception to the second, along the lines of the "most of the times" mentioned above. Killing each other, the opposite of life and health, is unfortunately the other "ultimate commodity". Science applied to war has been a major source of innovations for centuries and this will continue for the foreseeable future. And in this case the pragmatic imperative is that or restricting as much as possible the diffusion of such knowledge. Politics, again, comes into play.

Finally, and extremely briefly, one more intuition: scientific knowledge is becoming increasingly difficult, not just to advance but even to learn, adopt and use. This faces us with the hard fact that there are natural thresholds to our cognitive abilities and these are not distributed uniformly. In fact, nature seems to have distributed them very unequally among humans. While this may have been scarcely relevant until a few decades ago it is now having an impact on income distribution through the everyday more unequal distribution of usable knowledge. And this generates a very particular tension solving which will most likely determine the socio-political future of most advanced societies.

[2] Divine simplicity that defeats certainties and adds a new soul to truth.