What is research?¹

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I am going to take a critical look at what it means to do research. The point of view I express is a personal one that seeks to disturb the calm and complacent consciences of those who are dedicated to research. You may not agree with me, but I hope that at least you will take what I say as an invitation to reflect and perhaps even formulate fresher points of view.

It all began when our primary or secondary school teachers inspired us by telling stories about the struggles and miracles of science. This did not impress all the pupils, but it did some of us-after all, here we are doing research. Our ability to solve problems that the other kids found difficult was a factor that sharpened our interest in the sciences. We felt a kinship with science and mathematics and experienced a certain ego-boosting pride, as if to say, “here I count for something”.

As lovers of scientific knowledge, simply thinking about the great events in scientific history was enough to feed our intellects. We were told of the exploits of Galileo, Newton, Darwin, Einstein or Bohr, who for us became heroes worthy of emulation.

Eventually, we finished our degrees with high grades and were able at last to gain access to one of those 'high-tech' centers where, so we were told, research is done. “But what exactly is it that we really do?”

History teaches us not to separate individual experience from general events. Hence, when Galileo observed the satellites of Jupiter, he was also demonstrating that not everything revolves around the

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Newton’s laws were not formulated for the purposes of engineering applications but to reveal the non-teleological mechanism of our Universe. When Laplace told Napoleon that he had solved the system of equations which explain the motion of the planets without the need to invoke God, the important point was not his mathematical juggles but the struggle to arrive at the truth without resorting to ancient mythologies. Darwin put humankind in its place within the animal kingdom. Etc.

Changing ideas about the Universe are what drives the scientist. Before becoming a data collection on Nature, science was mainly devoted to combating superstition, the principal aim was rigorously to realize the dreams of Epicurus and Lucretius—to overthrow the idea of the gods controlling the Universe, to emancipate Nature from the grip of haughty lords and dark, mysterious forces, to demystify the Universe and face truth head on. In other words, knowledge for the sake of knowledge, the elevation of mankind with an understanding of his surrounding without need of resorting to white lies.

We live in different times. Nowadays oppression does not come from powers making claims on behalf of divinity. The value that motivates today’s world is called Money rather than God. The conspiracy between capitalism and democracy is all-consuming, their enemies have two destinies: either be absorbed or be eliminated. The applied sciences have always been allied to capitalism; they drive technology and flood the market with products labelled with a price. The pure sciences, or those with non-industrial applications, such as astronomical research, for the most part, were revised in terms of their driving principles; they were adapted and absorbed to the needs of our times. Present-day utilitarianism revolts at the idea of knowledge for its own sake. Even Buddhism, with its initially antimaterialist ideas, has been rendered into a marketable product in the book shops or in the form of courses on transcendental meditation. Culture has also been turned into a "cultural industry", to use Adorno and Horkheimer’s expression. Scientific knowledge has become a milk cow on which to grow fat\(^2\), an industry providing jobs to some State employees in order to make possible they can live with their spouses and their children in the welfare state.

Genius science is substituted for science of the masses and for a democratic science that advances with the rhythm of mediocrity. The stomach is put before the brain. Everything is bureaucratized, everything

\[^2\] "Science. Heavenly goddess for some people, and an industrious cow which produces butter for other people." (Goethe)
requires paperwork and to conform to mediocrity in order to effect a project.

“The democratic academy truth is subject to public verification; truth is what any fool can see. This is what is meant by the so-called scientific method: so-called science is the attempt to democratize knowledge - the attempt to substitute method for insight, mediocrity for genius, by getting a standard operating procedure. The great equalizers dispensed by the scientific method are the tools, those analytical tools. The miracle of genius is replaced by the standardization mechanism.” (Norman O. Brown, “Love’s body”)

Those research ideals have been left behind. Intellectual restlessness, the search for truth created those colossi of knowledge who moved among the different fields like salmon among rapids. Today, such pirouettes have become impossible because knowledge has become heavy and sluggish. You will see an elephant sliding before you see a scientist knowing so many fields as our scientific forefathers did. Nowadays, a scientist has to specialize. Scientists have been specializing for quite a long time, but it is now a question of microspecialization. There are experts on cool stars, the Galactic bar, certain types of chemical reactions, etc. The most a scientist can hope to achieve is mastery of a few microspecializations, in which to invest their efforts or creative interests. It is hard to imagine someone getting into a specialization because it is his only interest, unless the system has sent him crazy enough to believe that his topic is the centre of the world. This clearly is not so. Rather, it is more a case of converting the scientific process into an industrialized mass-production system. Everybody attends to his own cog so that the system runs smoothly.

It is a treason to our scientific forefathers’ ideals. Descartes gave science a sense for mankind as a search of truth in his “Rules for the direction of the mind”, and expressed in the first rule:

“Thus, if somebody wants seriously to research the truth of the things, must not choose a peculiar science, since all of them are related among themselves; rather, he must only think about increasing the natural light of reason, not in order to solve this or that school difficulty but to get an understanding about life that shows us the behaviour we have to choose.”
And, what does the scientific industry produce? The answer depends on the observer. From inside, we see tons of printed paper which is not read by anybody except some few specialists, each one about his topic. From outside we get a hermetic impression, such as we said “what amazing things these people must be discovering! It must be so difficult and advanced that it not accessible to my level of understanding”. That is the impression which is produced among those who pay the taxes so the State will continue funding further research. Those who are dedicated to applied sciences have an easiest task because they promise technological advances. The pure sciences without immediate practical applications, in order not to loose the thread of State subventions, must also promise technological progress for the country in the long-term. If it is necessary, they lie. If the technological argument does not work, they attempt to impress people with the knowledge content. If it is necessary, they exaggerate. They say that a satellite or a telescope is going to create a revolution in astronomy, that we are going to observe the whole Universe and some parts of other ones,... and then the artefact arrives and... the revolution has been rather small. Perhaps they scrape something else about some galaxy which was not in our collection.

We must not deceive ourselves. The more the history advances, the more difficult the achievement of a relevant truth is. Newton’s scientific activities during one year of his life, with a mere notebook and a pen, were more fruitful than the activities of thousands of the best actual scientists in their whole lifetime and with millions of euros... It seems that there are many writings, many data,... but in the final analysis our comprehension of Nature in global terms advances at a very slow and nearly imperceptible pace. Great efforts bear less fruit.

“Death of science consists of the existence of nobody able to live it. But 200 years of scientific orgies get fed up in the end. It is not the individual but the spirit of a culture who gets fed up. And this is manifest by sending to the historical world of nowadays\(^3\) researchers who are more and more small, mean, narrow and infecund.” (Oswald Spengler, “The Decline of the West”)

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\(^3\)Decade of 1920s, when there were still some important discoveries in physics. Nonetheless, I think Spengler is right in his prediction about the decline of the scientific world, as well as the decline of culture in general, although it was not as soon as he predicted. In my opinion, he was beyond his time, and he saw the problems of the future in our civilization in a prophetic way.
The fight for the economic power and social status promote fights among specialist from different fields rather than searching “the truth” altogether. Astronomers ask money because they are disembowelling the cosmos secrets; the particle physicists are disembowelling the matter secrets; the biologist the life secrets;... What impatient individuals who want to reveal all of Nature’s mysteries and do not want to leave anything for the next generations! Some data has not still been exploited completely and we think about getting the next data. Fast!, before any other makes the discovery! Impatience has never been typical of wise people. I know well your little secret: will to power. In regard to this topic, Nietzsche has made a deep psychological analysis of men’s intentions:

“Why do we try to demonstrate the truth? Because of a larger feeling of power, because of the utility, because it is indispensable. Summing up, in order to get some advantages. But this is a bias, a signal which points that deep down we do not worry about the truth.” (Nietzsche, “The Will to Power”)

The fight among specialists from different branches is similar to that for defending the lands in the medieval age. The “authorities of the matter”, as they call themselves, are like lords of some lands who guard fervently their kingdom. When an intruder tries to insert his nose in a specialty which is not his, he will soon receive a cohort of “authorities” reading his rights. Generally, the lands are also fenced with a language and symbols to be crossed only by experts. In some occasions, I would say that formalisms are made to frighten other people, in order to make the entrance difficult.

Saying that doing research is collaborating for the peace and fecundity of mankind’s progress is slightly naive. Nations do not invest on research today because of beautiful phrases like the above one. Nations, like persons, look for prestige. A country sends its sportsmen to the Olympic Games to win prestige, in order to get people to say: ‘sportsmen with certain nationality won a medal...’; and then the national hymn will be played and all that. Next day, the newspapers publish in their pages “our sportsmen won some medals in ...”, this “our” makes the reader feel proud to belong to his country and then he will like to produce for his society. In the same way, the State pays scientists, even non-technological ones. If they are not useful for industrial production, they are at least useful to produce prestige. It is very beautiful

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4This was said by the king of Spain, Juan Carlos I.
to find in the news: “a scientist of our research centres discover...”, it makes the citizens believe he lives in a true country. There are meetings about science even in undeveloped countries, do they also want to collaborate for peace and the fecundity of mankind’s progress while their citizens live on poverty?

The great Spanish philosopher Miguel de Unamuno, expressed in the presence of these events: “let them invent!”. This expression has contained more than a simple rebuff. If we are interested in knowing the truth, the way is not through microspecialization. Let the nations invest their efforts, their own pride will announce the news to the world and the ideas you were interested will arrive at your ears. Of course, this position does not include neither a job nor a medal, only wisdom and prudence.

“Do they invent things? Invent them! Electric light is here as good as in the place where it was invented. (...) On one hand, science with its applications is useful to make life easier. On the other hand, it is useful to open a new door for the wisdom. And are not there other doors? Have not we another one?” (Unamuno, letter to Ortega y Gasset)

“Yes, yes, I see it; a huge social activity, a powerful civilization, a lot of science, a lot of art, a lot of industry, a lot of morality, and then, when we have filled the world with industrial wonders, with large factories, with paths, with museums, with libraries, we will fall down exhausted near all this, and it will be, to whom?, was man made for science or science made for man?” (Unamuno, “Tragic Sense of Life in Men and in Peoples”)  

That is, to whom? Perhaps, the historical moment when we must raise again the question has already arrived. Where are we going? The scientific method is awfully eroded. That thing with a reason for being at the beginning of the modern age as a promoter of positive knowledge; that later century of enlightenment;... all that is part of the past. Today, science is as crushed as the contemporary art. In words by Feyerabend in his “Against method”:

“Science failed to be a variable human tool to explore and change the world and rendered itself into a solid block of knowledge, impermeable to human dreams, wishes and hopes.”

Science looses its first attractiveness, simple technical operations remain. Which is the thing in whose name we do research? In the name of truth? Of economy? Of prestige? Max Weber thinks that the
dreams of a science as a way to the truth, or happiness, or knowledge of God, etc. are shipwrecked.

Neither the scientist is a prophet—says Weber. Science as an amusement still remains but the growing pedantry and smugness limits it.

Doing research is fighting, what else human beings could do? To fight against the power of others or to attain our own power, that depends on us. Science can be a revolution or deadlocked idleness. Still waters, without hitting the stones along their history, tend to form bogs.