

The Twilight of the Scientific Age

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ABSTRACT

This brief article presents the introduction and draft of the fundamental ideas developed at length in the book of the same title, which gives a challenging point of view about science and its history/philosophy/sociology. Science is in decline. After centuries of great achievements, the exhaustion of new forms and fatigue have reached our culture in all of its manifestations including the pure sciences. Our society is saturated with knowledge which does not offer people any sense in their lives. There is a loss of ideals in the search for great truths and a shift towards an anodyne specialized industry.

“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, for whom? Was man made for science or science made for man?” (Miguel de Unamuno — *Tragic Sense of Life in Men and in Peoples*)

This quotation reflects quite accurately the main theme of the present pages. Read it carefully, twice or thrice, think about it for some minutes, and then begin to read the following pages as a musical piece whose leitmotiv is Unamunos assertion. Just a few minutes, or even seconds, may be enough for the reader to realize the most important message that I want to develop, and its connection with the book of title *The Twilight of the Scientific Age* (López Corredoira 2013). The idea is simple: our era of science is declining because our society is becoming saturated with knowledge which does not offer people any sense of their lives. Nevertheless, in spite of the simplicity of this idea, its meaning can be articulated in a much richer way than through one sentence, as in the case of a music which develops variations on a folk melody.

There are several reasons to write about this topic. First of all, because I feel that things are not as they seem, and the apparent success of scientific research in our societies, announced with a lot of ballyhoo

by the mass media, does not reflect the real state of things. Also, because the few individuals who talk about the end of science, do so from relativistic or antiscientific points of view, not believing that science really talks about reality, or they relate the scientific twilight to the limits of knowledge. However, there is a lack of works which question the sense itself of the pursuit of the truth among present-day thinkers. Of course, there are many humanistic approaches which simply ignore science, but ignoring is not the same as considering its sense or lack of sense. There are many well-prepared scientists or journalists who move in the world of science and consider it in their interactions with the rest of society, but usually they focus too much on the scientific and technical details and do not go deeply enough into existentialist or subjective approaches. A wider vision of both worlds, those of the humanities and science, is necessary to undertake the task. I feel I am able to offer something of this sort, given my experience as both scientist and philosopher. It is not a matter of virtuosity in either scientific knowledge or other areas but a matter of being able to integrate a global view of the fate of our societies. Normally specialists are too focused in their narrow or biased views to offer a global analysis and feeling.

When we talk about the sense of something, we cannot undertake a pure analysis in objective terms as in a scientific study. The professional activities on those who dedicate their lives to natural or social sciences usually overlook the fact that, after all, human beings do not move because of *reasons* but because of *emotions*. As psychoanalysis claims, most of our actions are determined by unconscious impulses. And science itself is not an exception: It is made by men whose motivations stem from factors other than a mere pursuit of knowledge. We are not machines, we are not gods; we are just animals, very peculiar animals and very intelligent and curious, that make scientific enterprises work, but subject to multiple internal and external conditions.

Societies as a whole are also sensitive to motivation. As a matter of fact, not all societies developed science. And, as it is known, even civilizations which developed that world-view and that methodology of observing phenomena can decline and lose their interest for continuing the scientific activity. That happened in Western Christian countries in the Middle Ages. Were the Middle Ages a dark age? Possibly, from some intellectual points of view, but it was not the end of civilization. It was an era with plenty of resources to create magnificent things, such as cathedrals. There were means to carry out great advances in many areas. Christianity was not intellectually underdeveloped with respect to Muslim countries, and basic knowledge of Greek science was also present; however, with very few significant exceptions, there was not a great development of sciences in Christian Europe during nearly the ten centuries of the Middle Ages. Why? Maybe because people were not motivated enough to think about nature. Surely, religious context had something to do with this, and the philosophy associated with religion which was ordered to follow faith above all. But possibly this is not the full explanation: The great revival of science in the Renaissance took place within similar religious creeds; also, the Muslim religion was not so different to Christianity and allowed in the Middle Ages a higher development of sciences, declining later when science in Christian countries began to dominate.

In our era, the conditions are very different to the Middle Ages. Nonetheless, in a not very far future, societies embroiled in a lot of survival problems (overpopulation, lack of energy resources, economical

crises, global warming and other ecological disasters, wars, plagues, etc.) may begin to see research as an activity that is not profitable enough and may abandon pure science research. At the beginning, people will trust scientists to solve all their problems, as it happens now, but they will realize that science cannot satisfy all those expectations, and that the returns of hyper-millionaire investments are smaller and smaller, nations will reduce more and more the titanic economic efforts necessary to produce some tiny advances in our sciences, to a point where scientists will say that they cannot continue their activity with such small budgets; consequently, the research centres will begin to close, one after another. Is this the prophecy I want to develop? No, I do not want to talk about prophecies. The future is uncertain and what I have described is only one possibility among many others. I want to speak about our present society, and the trends that can be observed now.

Normally, throughout History, thoughts occur in advance of acts. What we are observing around us now are the effects of an ideology which was in some minds many decades or centuries ago. There is a slow inertia in societies which makes them move at the rhythm of impulses that originated some generations back. Geniuses are in advance of their time; what is famous at any moment is representative of a tradition of old, worn-out ideas. Religions gained their maximum power and influence a long time after they were developed: Popes and priests in the Renaissance, embedded in corruption and malpractice, with much less idealism than the conceivers of the religious ideas, were dominant in a time in which the most important creators were pointing to other directions. Today, science and some of its priests occupy an important status in our society, and gargantuan amounts of money support them. A superficial view may lead us to think that we live in the golden age of science but the fact is that the present-day results of science are mostly mean, unimportant, or just technical applications of ideas conceived in the past. Science is living on its private income.

My interest is to lift the curtains behind the stage of science, and see what is going on in the engine room. If we want to ascertain which will be the next performance on the stage, it is better to see the organization from inside rather than just assisting with the show. In any case, I insist, I am not a prophet and it is not my mission to say how the future will be. Also, it is not my mission to give a report of all the observed trends and ideas around the world of science. What I will offer is my personal view, not necessarily reflecting the views of all conformist and non-conformist present-day thinkers.

The *leitmotiv* is a simple melody. Its harmonization with other melodies and rhythms and the orchestration which integrates all the voices is a more complex thing. As in Wagners operas, we pursue an infinite melody: A continuous flow where the main melody gets lost among instrumental and human voices. The question of the sense or non-sense of the human endeavour called science must take into account many circumstances. The exhausting of important ideas to explore, the limit of knowledge, is part of the matter. The excess of information is another part. But there are more questions to tackle. The question about the sense of all this stems from those different sources, like a river that takes water from its tributaries, and also from the need for introspective reflection. From time to time, it becomes necessary to go away from the river and contemplate it from the shore. Where does the river go? To the sea, we shall answer. And what for? Is it to achieve Truth? Is it to dominate Nature? What for? For

whom? Was man made for science or science made for man?

Thinking about the role of science in present-day society is thinking about the past and the future of humanity. Human beings must question from time to time all their principles and their usual ways of life. There is nothing sacred and untouchable. The missions that science had in the past have been totally accomplished, or almost totally. Now, it is time to reflect anew on our society for the future, not only science but also many other activities or concepts: Art, religions/sects, History, universities, economic systems, political systems, human rights, etc. Very few things are permanent, and all of them are biological, such as taking food and water, sleeping, having sex, etc. All cultural things are subject to change; there is nothing eternal in them. From an anthropological point of view, all the characteristics of our civilization are simple features of the human specie in a given period of time and a given geographical localization. Certainly, the success of Western culture, with the subsequent annihilation of other cultures, has expanded the geographical location of our civilization to the whole planet, and this might lead us to think that our concepts, such as the so-called human rights, are absolute and universal. A mirage, an illusion! We just live our moment of glory, such as those of many empires which have absorbed great portions of land. The Roman Empire and the Egyptian civilization were greater than us; they lasted longer periods of time, dominating relatively large portions of land for that era. They were perhaps as proud as we are of our Western culture but they eventually declined. Now, it makes no sense to us to bury and embalm the pharaohs under pyramids. Possibly, future civilizations will not see any sense in building huge particle accelerators or telescopes.

You may think that the pharaohs were wrong in their belief that they could preserve life after death, whereas we are right in our scientific truths. I agree. I am not a stupid cultural relativist: Of course, atoms exist and they are constituted by subatomic particles; of course, galaxies and stars exist. But the question is not about the truth of scientific assertions but about the place these truths occupy in our lives as human beings. In the Egyptian civilization or in our civilization, we are moved by our beliefs about what are the high values for our lives. The pharaohs believed that the great architectonic efforts of their people were worth it because that would allow them to be closer to eternity after death, and to show their status on earth too. Scientists believe that dedicating their lives to scrutinizing the laws of nature and making a complete catalogue of all the existing forms of matter, either inert or alive, will bring them closer to something eternal: truth; and make some profit on earth too... But then a question like that of Unamuno arises: “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, for whom?” Is not it like the child of the tale *The Emperors New Clothes* that wakes us up from our dreams?

Behind the search for something permanent in our lives, something eternal, something absolute, there is most likely some fear of death. Death is an unavoidable topic if we are going to talk about the sense of some activity for our lives, or the sense of life itself, because precisely our certainty of the finiteness and indeed very short compared to our aspirations of our lives pricks our need to search for a sense. We waste our time: we will never find any sense in terms of eternity, but culture is fed mostly because of these aspirations, so the belief is not a bad business at all. Indeed, culture might be understood as the attempts

of a civilization to alleviate the tension of the uncertainty which produces our certainty that we are going to die. From this psychological point of view, science is just one of the performances of this tension on stage among many possibilities.

History shows us many dawns and twilights in the different facets of human beings. Looking at the past we can date and understand the reasons for the birth of science. We do not know when its twilight will occur, but the reasons for it are already in the air: after a very hot summer always come the season for the drop of leaves.

In the book *The Twilight of the Scientific Age* I discuss some of the problems of science nowadays, which constitute some symptoms of the decline of our culture. Basically, they are:

1. Society is drowned in huge amounts of knowledge, most of it being about things of little importance for our cosmic vision, or producing no advances in the basic fundamentals of pure science, only technical applications or secondary details.
2. In the few fields where some important aspects of unsolved questions have arisen, powerful groups control the flow of information and push toward consensus truths rather than having objective discussions within a scientific methodology; it gives few guarantees that we are obtaining solid new truths about nature.
3. Individual creativity is condemned to disappear in favour of big corporations of administrators and politicians of science specialized in searching ways to get money from States in megaprojects with increasing costs and diminishing returns.

We can use one adjective to describe the status of science at present and in the near-future: *decadent*. It is only a subjective perception. Possibly other people will think the opposite thing, that we live in a golden age of science. There are plenty of reasons in favour of the first thing (see in the book many examples of malpractices, and of hyper-millionaire investments to get insignificant results in comparison with the greatest ones in the classical science). Rather than a question of pure argument, it is also a question of sensitivity, of being able to perceive the sense or nonsense of the major enterprises which are nowadays called science from a human point of view. The quantity of publications, the quantity of big instruments and the technology created, the number of jobs created in research, the accurate control of our science in comparison with past times, etc. might be arguments to show that science is presently living in a wonderful epoch. However, I would reply, the spirit of science is being lost. And how do you measure the quantity of spirit? No, it is not a measurable quantity; forget about creating a new *scientometric* method to determine the amount of scientific spirit. It is a question of sensitivity: just look around; just talk with some leading scientists and observe their lives, their work. Technocracy is replacing the joy of scientific creativity.

The same thing could be said about poetry: Do you think we live in a golden age of poetry now because a huge number of poems can be found on the internet, there are a lot of poetry competitions with hundreds of participants, and there are many poetry clubs, etc.? No, the spirit of poetry is nothing to do with that. What then is? If you cannot find an answer yourself, it is because you are not sensitive

enough to poetry. Something similar happens with sciences. It is necessary to be sensitive to scientific thought in order to appreciate its boom or decadence. In this chapter, I want to make further observations and reflections on what might be called decadence, decay or the decline of science.

The structure of *The Twilight of the Scientific Age* is:

Chapter 1 Leitmotiv: This chapter introduces the present ideas, which will be developed throughout the book. The title plays with the metaphor of the composition of a symphony, in which a melody is the motif underpinning the music (*Leitmotiv* in German). Here, the non-sense of modern civilizations, with all their knowledge and science, will serve as the *Leitmotiv*. The reasons of the author to write this book are also given.

Chapter 2 Some Highlights in the History of Natural Sciences: A short History of natural sciences will be given, with emphasis on the aspects which have provided humanity with new insights, opening new doors to wisdom and moving beyond the obscurantism of superstitions, offering us a better life. These include several episodes in Ancient Greek science, the Copernican revolution, the development of modern physics, evolution theory, and others.

Chapter 3 Institutionalization of Science and its New Socioeconomic Conditions: A sociological description of the present-day institutions of science will be presented, showing how their *modus operandi* affects negatively the scientific creativity. This will include an analysis on how powerful groups of scientists, who dedicate most of their time to administration and politics of science, push science towards their a priori preferred directions, controlling the publications and the flow of money.

Chapter 4 Knowledge: Some authors (e.g., John Horgan) have claimed that the end of science is related to the limits of knowledge. Here I will comment on these ideas, and introduce some new ones. I will argue that science is not being eroded by the limits of knowledge but by unlimited knowledge, because society is drowning in huge amounts of information. The enthusiastic claims of a “knowledge society” are being counteracted by a reality in which too much knowledge is becoming a problem rather than an advantage.

Chapter 5 Orthodox and Heterodox Science: In some more speculative fields of science, orthodox hypotheses are offered as the good ones while other minority (heterodox) ideas are usually ignored or considered as the products of crackpots. The open discussion of ideas is being replaced by dogmatism supported by powerful groups in science.

Chapter 6 The Decline of Science: The descriptions of present-day science given in Chapters 3-5 lead us to conclude that we are approaching a state of decline of science, with the triumph of bureaucracy and mediocrity over scientific ideals. In this chapter, I will describe this panorama of decadence. The case of Grigori Perelman, the Russian mathematician who rejected two important prizes to denounce the malpractices in the science, will illustrate it.

Chapter 7 Philosophizing about Science: We may wonder whether the philosophy of science can help science to be better, and my answer is negative. At present, professional philosophy has as many problems as institutional science, and reading contemporary philosophers is generally a waste of time. A few individual classical philosophers are more worth to be read. I will provide biographies and describe the work of some significant authors related to the topic of this book. Oswald Spengler with his ideas on the end of history and the decline of the West (ideas also popularized by the contemporary author Francis Fukuyama) will be connected with the context of this book, with emphasis on the world of science. Indeed *The Twilight of the Scientific Age* tries to be like *The Decline of the West* by Spengler, but focusing on science.

Chapter 8 Non-sense and the Search for a New Humanity: The final chapter is an extensive discourse on the non-sense of scientific research in our days, and it explores some possible destinies for our civilization with regard to science: most likely a society which preserves the accumulated scientific knowledge but which does not undertake new mega-expensive research projects. Although the fate of our civilization cannot be changed, some recommendations for the future politics of science are given.

References

- [1] López Corredoira, M. 2013, *The Twilight of the Scientific Age*, Brown Walker Press, Boca Raton (FL. US)