

## Preface

Humans are the living species which is undergoing the fastest expansion in the whole history of the biosphere on the planet Earth. We are everywhere and unceasingly manipulating and transforming the environment around us. The effect of this continuous expansion and workings, being so quick and happening at an accelerated rate, has an unprecedented impact on the surrounding context, with which the biosphere has interacted and shaped its evolution over hundreds of millions of years. The whole system, as often happens with complex systems, has what is technically called a “chaotic” behaviour, which means that here and there critical conditions may be reached where even very little changes in some parameters may originate dramatic changes in the evolution. Apparently, this is the situation we are now approaching.

But the above may be seen as an arbitrary and unwarranted leap to conclusions, so it is better to step back and have a look to ourselves. Basically, we start from an attitude towards surroundings we have in common with all other species: since an immemorial time we are used to picking up what we find around us and require for our vital needs. This predatory attitude, typical of hunters-gatherers, is and has been long contrasted and compensated for by natural feedback mechanisms, maintaining a sort of dynamical equilibrium and occasionally leading to the extinction of some species. Now the expected feedbacks could be strong enough to lead to a critical situation like the ones mentioned above and start a “catastrophic” evolution. Again the word “catastrophe” is meant as a technical term: an extremely rapid and self-powered process.

However, when looking at ourselves in a mirror, what catches the eye most, besides our ancestral hunter-gatherer mood, is the fact that we are mostly concentrated on the relationships around us in our now worldwide societies. The latter relationships are generally shaped on competition to reach control and power over our fellow humans. The status of competition has been promoted from a matter of fact to a real doctrine in the last couple of centuries. The ensuing perennial fight (sometimes explicitly violent, sometimes not) is fed by the uninterrupted manipulation of what we call “natural resources”. An essential tool we use to boost all this is apparently absent in the rest of the biosphere; it is what we call “reason”. Such an instrument or property of our mind has provided us with the capacity to understand what happens around us, i.e. to identify long cause-effect sequences, and to look forward in time, both building reasonable expectations of what it is likely to happen in the future given certain premises and to plan our actions of today in view of goals we wish to attain beyond the short term.

Unfortunately, the social and economic competitor grown out of the hunter-gatherer of his origins, while developing reason, has not lost either his initial disposition to care about the short term only nor his impulse to dominate others and (though deceptively) nature. In this way, reason has been mainly used to overcome old control mechanisms and constraints, starting the extraordinary expansion I mentioned in the first line of this prologue. However, the same reason, in the modern form of science, has also learned to explore the long term and to reliably predict many consequences of our present day behaviour: the conclusion has been that our global way of life is unsustainable, i.e. it is leading to critical conditions likely to trigger a “catastrophic” evolution of the biosphere, including us. Actually the internal contradictions of human behaviours have been pointed out, with different wording, since the dawn of the history of thought (we may call it philosophy), thousands of years ago, but with little, if any, impact on everyday life.

Today, scientific evidence is providing stronger and stronger arguments for the need of a profound change of the very mechanisms that have been the base of the recent evolution of our socio-economic system. However, contradictions are vivacious and persistent, even violent. Awareness of the existence of a global sustainability problem has grown and is now widespread. We see it promoted by mass media, both on paper and on the air; it circulates in our social media. But the same media, in or on different moments or pages and at the same time, continue to proclaim the wonderful prospects of the economic business-as-usual policy and, though the traditional mechanisms of the world economy appear to be in trouble, push to reactivate them at any cost. We, the humans, still concentrate on ourselves, marginally caring about the environment, and struggle to conquer a better position with respect to others. Here too, science tells us that even the internal result is unbearable: social differences inexorably grow. But those (the minority) who have the main

advantages and have a direct influence on the media and opinion leaders do not accept the idea that the machine ensuring their privileged condition should be questioned because of unsustainability and injustice: the result is this incongruent mixture of sensationalism and denial, frustration and irrational faith in technology mistaken for magic.

The scenario I have depicted so far apparently pushes towards fatalism, but if we are worrying about some disease it is important, first of all, to inquire about the causes of the illness in order to define a cure and remedy. Reason comes in again and investigating about the malady is the proper task of science.

That is the reason why a number of us, working on different disciplines, have gathered in November 2018 in Turin, both at the Politecnico and at the University, to discuss the state of the world and the global change under way and also to offer hints for remedies to be assumed with extreme urgency.

Science per se is neither pessimistic nor optimistic: it simply depicts the situation as it is. Maybe the hope that rational arguments can in the end prevail on our predatory instinct is on the optimistic side. For bad and for good, everything is up to us.

In these proceedings the interested reader finds part of the papers that have been presented at the Science and Future 2 conference and, while wishing a good reading, I hope they will help everybody to make up her/his mind and take responsibility for the common future.

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