

Crisis: some systemic reflexions by Charles François

What do we call "Crisis"?

The word itself is very devalued and has lost much meaning because of its constant use in connection with any complicated situation.

Meanwhile, it is undoubted that we are in the midst of a profound global transformation in practically all areas of the life of societies. This change began in Western Europe several centuries ago and has accelerated more and more.

The societies of the past were more stable than the current ones because the basic mode of life varied little from century to century. One could speak, for example, of an ancient culture or civilization of wheat and vine, of a civilization of rice, of others of corn and (in Africa) of cassava cultures. There were also oasis and camel cultures, fishing cultures and even predatory cultures (barbarian peoples living on raids to the detriment of the most advanced cultures).

In these cultures the crises resulted: from local or regional ecological abuses (which affected the basic subsistence for survival), from leadership conflicts, from local or regional climatic catastrophes (droughts, glacial periods) of large epidemics or pandemics.

Man, global crisis factor

The humanity of the beginning of the 21st century is for the first time facing a situation of global change on a planetary scale.

The origin of this change is endogenous to the human species: since the 17th century, man has increasingly been introduced into the planetary ecology as a great factor of change, increasingly powerful.

Scientific and technical evolution has endowed humanity with powerful means of action that have transformed it into an actor of great weight in the global planetary ecology.

This transformation is a consequence of fundamental factors that have been reinforced reciprocally:

- A rational and scientific vision of the world that appeared and expanded in Europe, from the Middle Ages and the Renaissance
- The development, slow at the beginning and then in constant acceleration, of increasingly complex techniques, which all lead to an "artificialization" or "artificialization" to use a heavy but useful neologism
- The growing mobilization (thanks to technological progress) of energy sources that previously were not known how to take advantage of. This process began in Western Europe with the increasingly intensive exploitation of coal deposits, until its near depletion. It continued in the 20th century in a similar way with the use of other fossil fuels: oil and natural gas (also exhaustible, no doubt)

Without realizing it, man has thus become a factor of accelerated ecological evolution, on a global scale.

Coal mining and oil and gas exploitation continue to return to the planetary environment, unceasingly, gigantic amounts of fossilized solar energy in vegetal form during the billions of years of the geological eras: primary, secondary and tertiary.

The inevitable consequence is and will be increasingly in the future, the warming of the planetary global climate. This profound change could surely also cause profound adaptive disorders in all human societies. It is in this sense that the word "crisis" acquires its full and ominous meaning. Faced with this perspective, all of humanity should react in various ways: • Study in depth the global effects of the massive consumption of fossil fuels • Forecast deadlines for depleting them as accurately as possible • Look for alternative sources of renewable energies • Plan the transition from fossil fuels to renewables to ensure economic, demographic and socio-cultural stability in the long term

Financial crisis: a typical psycho-sociological phenomenon It is more than an economic issue, but this is reflected badly, particularly in the vocabulary that uses the word "investors" to qualify the majority of "speculators" who buy and sell "securities" in the stock market, with the hope of making a "difference", or "profit" Obviously, the divergent opinions that are held about the current and future value of an action in the stock market, sometimes involve subjective and moral criteria, rather than rational terms. That is what the word "speculator" reflects (The history of the great and sudden disruptions in various markets during the last centuries, reflects very clearly this recurrent psychosociological phenomenon in all moderately advanced cultures). The current financial crisis is nothing more than the repetition of such a recurrent psycho-sociological episode in the evolution of the economy. It is an evolutionary phenomenon little perceived and understood, given that man had lived until a recent past in the "present", that is without being aware of the deep long-term transformations that his initiatives introduce in their complex relations with his environment. Even today, the vast majority of people live existentially in the present with little memory of the past and few projections in the future. Only limited and partial short-term goals are of interest, with no vision and concern for the possible or probable ulterior global consequences. The most widespread current opinion is that "development" (economic and social) must expand and continue without limits reaching the whole of humanity. It is labeled as "pessimistic" or "alarmist" who warns about the probable limitations of development in relation to planetary resources. A recent article stated that: "... we are not making progress in the growth and development of human society at the pace that is required". In this regard, while it is desirable to extract populations and fractions of populations - even in the developed world - from their misery, the most sensible and appropriate goal to aim at is certainly not to lead the whole of humanity to share the hyper consumption and waste that characterize for the moment the societies considered as developed. If we take into account the medium and long-term dimension of the future, a rational goal would be to guarantee to the whole humanity a level of life as good as possible based on the truly renewable planetary resources assuming the need to keep the planet habitable . Non-renewable resources should be used to "prime" a self-sustaining production system, based on renewable resources. Good examples would be the use of non-renewable fuels as a contribution to the construction of hydroelectric power plants, or their use for the improvement and generalization of systems for capturing solar energy. The dynamics of the use of fossil fuels The growing and massive use of fossil fuels from the Middle Ages, first in Western Europe, has been the main triggering factor (the other is technical innovation) of the enormous demographic, economic and social development during the recent centuries. The use of fossil energies was at first a self-sustaining and subsequently self-accelerating phenomenon. This was possible only thanks to the existence of a gigantic energy "treasure" accumulated in fossil form during several hundreds of millions of years (from the primary era to the most recent geological period). Since the production of fossil energy reserves is a process extremely slow, it can be considered that the energy "treasure" is not

reconstituted appreciably while humanity consumes it at an increasingly accelerated rate. The obvious conclusion is that the "treasure", at the current rate of its use, will inevitably be exhausted in a period probably of some decades, according to the "Hubber Peak", characterized by an exponential long-term growth curve up to a very high maximum, followed by an almost total fall in an extremely short period. Finally, we arrive at the criterion that the fossil "treasure" should be applied, at least in part, to create the infrastructure and the practical methods of using renewable energies, applicable to all the varied uses we are making of fossil fuels, "priming", as we said above, the renewable energy pump. Likewise, a precise description and a balance of the collateral effects (ecological, socio-political, etc.) of the massive use of fossil fuels should be established, and eventually the reparation of the considerable collateral damage produced should be addressed. The potential global political instability in relation to the existence and consumption of fossil fuels Although generally not recognized, the political power of nations depends more or less closely on the exploitation of the energy potential they are able to control and use. No modern nation can be powerful, let alone maintain itself as such if it does not have the fossil energies that ensure its material productive bases and the maintenance of its economic and sociopolitical infrastructures. This issue has a very significant temporal dimension • The international political power of a country is guaranteed and solid only to the extent that it has energy autonomy; that is, still mainly the control of energetic reserves in their own territory ... or more difficult to guarantee and maintain, in the territory of other states • Considering that fossil fuels located or still to be discovered will be exhausted when exploited, any country should to ensure its autonomy: To foresee the depletion of non-renewable energy reserves on which it depends (especially non-territorial own reserves) To provide for the qualitative and quantitative replacement of these energies by others that are renewable and technically usable (ie how to replace massively in the future the naphtero or diesel engine by other types of engines that would not use fossil fuels?) An adequate prospective (or forecast) can guarantee a transition to other forms of economic and productive organization, and avoid eventual violent socio-political convulsions starred by masses brought to conditions of misery and poverty.

The competitiveness of nations: present and future

While science and its technical applications have been the basis of the competitiveness of nations in the world economy, it is clear that nothing has been, is, nor will be possible without the guarantee permanent supply:

- Raw materials (whose exploration always requires energy)
- Energy The issue of competitiveness is ultimately summarized in the free and sufficient provision of raw materials, and even more, energy Given that such provision varies over time and - in particular - may decrease and even disappear, maintaining competitiveness will mean major changes in the future

1. the replacement of the use of non-renewable energies with renewable energies
2. the recycling of used and discarded products in view of the recovery and at least partial regeneration of the raw materials that were used for its elaboration.

This implies the replacement of the current organization of consumption with massive final production of waste, by a closed circuit organization as much as possible, based essentially on recycling

This change will profoundly change the notion of competitiveness and accentuate its technical aspects

The change of historical significance of nature and dimensions of human societies

The last two centuries have witnessed the progressive replacement of numerous local or regional human societies (cities, principalities, states, nations) by aggregates and federations of them in much larger groups - in diversity - in extension - in population. Each of the previous societies had its own geographical and ecological environment well defined and defined - depending on the possibility and speed of the displacements - according to the specific characteristics of its environment (see note on civilizations of wheat, rice, etc.)

Human action has transformed radical mind these conditions, and new adaptations are already essential. The necessary mutation of the notion of economic efficiency

The current notion of economic efficiency has an "endogenous" character. This means that only economic criteria are used to define the notion of efficiency.

Such an idea is implicitly based on the belief that economic science can be established by abstracting at least certain non-economic factors.

Thus, only in part are human motivations taken into account, and that - when they are taken into account - only the individual or collective "interests" are considered in terms of "gains and / or losses".

In addition, the concept of "competitive advantage" generally dominates economic thinking, except for example the cooperative idea (where the "competitive advantage" corresponds to the cooperative idea (where the "competitive advantage" corresponds to the group over the individuals ... but to the advantage of these).

This way of seeing reflects the historical situation of humanity.

Up to our time the human species could progress without limits towards the greatest use of its planetary environment. In addition, their waste did not have a very significant negative ecological significance.

This overall situation has changed profoundly in the last two centuries. In the course of the same the human species has become a dominant factor in the planetary ecology and has begun to seriously impact on their own global conditions of survival, in ecological and biological terms.

Therefore, the notion of economic efficiency should in the future include the cost of maintaining planetary habitability for the human species.

This implies the need to maintain this same habitability for all living species and especially for those on which our survival depends.

In practice, it means introducing the notion of efficiency at a global ecological level, much more comprehensive, rigorous and meaningful than simple economic efficiency.

Human mechanization through technique

The dominant process in human evolution during the last two centuries has been the overwhelming advance of all techniques, which continues at full speed.

A little-noticed consequence is that man (biological, psycho-social) has become a "piece" of an immense machine, on a planetary scale, his activities being increasingly conditioned by that machine that was created by himself.

It seems to be a "giant" and refined version of the termite and anthills of the animal kingdom.

But a new element appears whose future effects are still unclear: the intelligence of each of the participating individuals.

By the way, this intelligence is also generally conditioned by the human "termitera". The question arises especially in individuals who manage to more or less escape the common psycho-sociological conditioning (in general, by having changed from "termitera"). However, in a new turn of the screw, these "de-conditioned" tend to

general to become in turn conditioners, of course in the (evolutionary) framework of the "termitera".

This mechanism creates a complex system of collective socio-cultural self-control, which ended by individualizing several cultures in a world that was, even up to the 18th century, far from unification.

The "twelve big problems" (provisional list)

1. Global degradation of arable land
2. World advance of desert areas
3. Global global warming of climates
4. Planetary pollution: terrestrial, oceanic and atmospheric
5. Accelerated use and depletion of non-renewable material resources
6. Accelerated use and depletion of non-renewable energy resources:
coal, oil, gas
7. Destruction of multiple plant and animal species, that is, a
irreplaceable genetic heritage, and generally still unknown
8. Genetic mutations of plant, animal and human diseases,
with risks of new and uncontrollable epidemics and pandemics in the short
term.
9. Increasing threat of such global pandemics spread by networks of
rapid global communications.
10. Accelerated demographic and techno-economic human growth that could
overcome the planetary "human carrying capacity".
11. Improvement and multiplication of weapons of mass destruction,
violence and crime to the detriment of an equitable distribution of
the economic resources worldwide.
12. Racial, political, ideological and / or religious conflicts resulting in
wars and revolutions increasingly extensive and destructive.

The "twelve great problems" II.

Almost all the problems mentioned are aspects and / or direct or indirect results of the population explosion (problem number 10) whose origins must be sought in the conjunction of new technologies, with the massive mobilization of fossil energies. These conditions have led to the plundering of the planet's resources, and to the installation of an "ideology of growth" (or "development") that looks unsustainable, when there is almost nothing left to plunder the "geological treasure" put at human reach by nature.

At such a moment, the survival of the great human masses that appeared during the last 200 years, will depend on the possibilities of transforming the exponential growth of the economy and the multiplication of men in a dynamic stability regime.

Beyond the indiscriminate plundering of non-renewable resources, what is implicitly questioned is the real permanent "carrying capacity" of the planet in the human population.

It is highly probable that the current planetary demographic level is not sustainable, at the current rate of consumption of resources.

... And that we are approaching a transition towards a regime of dynamic stability fluctuating around a future sustainable level, with recycling of inputs and renewable sources of energy.

The problem of the transition is that, if we massively surpass that level, a violent demographic oscillation of relaxation is inevitable.

Such a transition will be subject to the intelligence with which, on a world level, the oscillation of relaxation is managed by political leaders avoiding famines, pandemics, maintenance of arms and revolutionary movements, criminality and social pathologies in all its forms.

The "twelve big problems" III.

Each of the "12 problems" is also an aspect or a consequence of the lack of perception of the limits.

This general problem is of great importance: it results from the belief or ideology of unlimited growth that appeared in Europe in the 19th century and spread to the propagated to the whole world, particularly during the second half of the 20th century,

It is clear that any growth depends on its ability to capture the resources of its environment.

It is also very frequent that growth tends to continue and accelerate until it begins to exhaust its environment.

In the beginning it is, in general, modest, but it frequently becomes exponential or logarithmic because, having seemingly inexhaustible resources, it self-retro-feeds in an accelerated way.

However, at some point there is a turning point, when the growing system begins to produce a significant decline in available resources

It is also remarkable, although in general it is not contemplated, nor is it understood, that the ability to receive and assimilate the environment for useful products - and those that are not - is also a crucial and limited resource.

All this explains why the growth curves of the real phenomena show some very general characteristics:

- 1) Growth at the beginning slow, but becoming exponential towards a limit to infinity (obviously unattainable) and sudden fall and not infrequently total, by sudden break of trend at some point and critical moment.
- 2) Logistic growth, with the appearance of a braking term that produces a curve characterized by the approach closer and closer to a maximum that can not be reached at all.

The crucial point is to understand the difference between these two types of growth and to understand that, while the first leads to annihilation, only the second can lead to an optimum, generally more or less fluctuating, in relation to environmental conditions. Metaphorically, one could speak of the "breathing" of the system.

For the practice of our socio-economic systems, this means that - in order to avoid a catastrophic collapse at some future time - we must look for and find a long-term or very long-term sustainable functional regime - with relaxation oscillations that will give it a character of fluctuating dynamic stability between limits.

Such a regime will inevitably depend on the environmental conditions, and the dynamics of the same over time ...

The eventual ignorance, or misinterpretation of these conditions implies an invisible threat, but portentous for the system.

All this constitutes both a great backwardness and an imperative to assume the necessary awareness that leads to curb these negative impulses, in favor of permanent agreements, which privilege a global vision and ecological criteria, and human coexistence on the planet.