

ECOLOGY and PHYSICS

Foreword

At the beginning of modern science, three centuries ago, physics was a mechanical-type science: Newton was its principal beginner. The usual thought background of Western culture is still to-day greatly depending on the Newton world-view, concerning space and time, and also for the mechanical nature given to almost all phenomena. The dogmatic idea of a real and objectif matter world completely separated from mind-spirit world is the “evident” background of “tested science”: in other words, Newton’s science accepts the cartesian chasm with no critique.

Modern western science was born on the background of a *particular* philosophical view: so it has no warrant according to the scientific method. That philosophical view – taken as *sure* – is just mantained to-day, and not viewed only as a *work-hypotesis*. Science remains in the limits of the view where it was born three centuries ago.

Science, in its standard version, is still strictly bound in the cartesian-newtonian view. The whole universe, included living nature on Earth, is viewed as a giant machine we can take down and put together again: as a consequence, nature has no ethical meaning. *Mankind is not a part of nature, but is something different*. So the fight against nature and ecological problem were greatly increased.

Is metaphysics of an age the physics of the previous age? The present mechanicistic and materialistic view directly comes from nineteenth century physics, not from ideas born in the twentieth century. Science gives a strong resistance to all paradigmatic changes, that could modify its general interpretation.

Here we make a quick review of some great changes of past century: relativity, quantum physics, system theory, mind phenomena. We then speak about any consequence in our culture behaviour towards natural world if people’s thought could accept some pattern ideas of new science, now in minority. **We hope that an ethics including all natural world and a good influence on ecological problem can arise.**

In the book *The Turning Point* by Fritjof Capra (New York, 1982) is written:

In great difference from mechanicistic cartesian world-view, the emerging view from modern physics can be called organic, holistic and ecological; or a systemic view, in the meaning of general system theory. Universe is not viewed as a machine composed by a lot of objects, but as a not-divided, dynamic whole, with completely interconnected parts that we can understand only as dynamic patterns of a cosmic becoming. (translation from the Italian version of the book)

Classical physics

As above written, the first background of classical physics that has remained a dogma up to almost the middle of twentieth century is the existence of a true and objectif matter world with its own working laws. The observer task is to find these *objectively existing* laws. All phenomena occur *in* space and time, absolute and existing independent entities.

A small first fall in the mere mechanical view appeared in the nineteenth century with thermodynamics and the concept of *field*. But thermodynamics was then explained as a statistic-probabilistic mechanical movement and field can be viewed as a mathematical question, useful for a calculation simplifying. The mechanistic view was strengthened by them. The only non-mechanical news were the electromagnetic wave spreading theory (*Maxwell equations*).

With concern to matter constitution, the atomic theory strengthened again the mechanistic world-view: 92 “small balls” (*atoms*) were all reality. Around the century change, radioactivity appears: atoms are not unbreakable, are formed by protons and electrons (then, also neutrons). The “balls” are much smaller, but there is no change: three “elementary particles” are all universal.

Relativity

With special relativity (1905), space and time lose their own independent and absolute existence, matter and energy become the same thing. With general relativity (1916), gravitation becomes the “geometry of spacetime”: we can now write physical laws valid in any reference system, for any kind of movement: acceleration is like a gravitational field. Concept revolution *seems* great, but we are still well bound in the cartesian view: matter and energy are the same, but the principal chasm is always present: there is an *objectif* energy-matter world, explored by a *divided* human mind.

Matter impenetrability (that is the *empty-full* dualism) and the logics “*A cannot be not-A*” are still considered obviously true. Everything, any problem, any process are divided in smaller and smaller parts, with no care to the fact that any division cannot be neutral nor always valid, because is born by some “prejudice”. Non-quantifying and non-measurable entities are *denied*.

Present current thought has perhaps accepted the energy-matter unification, and stop. They are *physical* entities: *mind* is different. It *externally researchs* about an *objectif physical world*. Mind is human only, some “bold people” gives mind to other *individual* beings, if they have a central nervous system, like other mammals.

Ethics only deal with the mind-endowed living beings, that is humans.

So we are at the first decades of the twentieth century.

Quantum physics

As you know, Werner Heisenberg stated in 1927 his well known “principle of uncertainty”, that was first regarding position and speed of a particle. We cannot exactly know together both values: if we choose to define one, the other one is completely indefinite. The observation “chooses” which value we can know. The principle is valid also for other couples, like energy-time: if we want a precise time, the “particle” has a completely undefined mass-energy: it means that *is nothing* we can call in any way. The mind-nature of these entities is perhaps only concealed by mathematical language.

In the Thirties many debates among physic scholars took place: “Copenhagen interpretation” was the result. Uncertainty is not a limit of our measures or our senses, but is a characteristic of the whole world, is in the nature. We cannot divide

phenomenon and observation, because there is no “objectif reality” at all. The cartesian split mind-matter is over: we cannot divide them.

As well known, Erwin Schroedinger reached the same Heisenberg’s results and wrote the *Schroedinger equation*, by which we can describe the trend of the *chance* to find a particle in a defined position. It is something very fuzzy, but enables us to a phenomenon description *versus time*. The observation makes “collapse” of probability into “certainty”: could it be an attempt to make again important “the observer-man”, some centuries after Copernicus revolution? Somebody thinks this is a coming back to anthropocentrism, with an “observer pride”. On the same way the *anthropic principle* will later arise: Is Universe made for mankind? But a marmot, a mountain or a stream can say the same. Any entity looks at Universe as “made for self”.

Moreover, the idea of *quantum vacuum* comes from the uncertainty applied to the energy-time couple: there is no firm particle or other entity, the only reality is a kind of creative vacuity, an energy dance in which entities are born in the being and vanish to the nothing. The dualism *full-empty* disappears. “A” and “not-A” can be together.

System theory and collective beings

At the second half of twentieth century, in the study of *systemics*, the ideas of *complex system* and *collective being* were worked out. A system with a certain degree of complexity evolves becoming *completely* unexpected after short time, also in a theoretical way. Really it soon is in some unstable branching-point, after which it follows *completely different* ways for *infinitely* small differences before the point.

We cannot have no forecast at all, never in probability.

We use to say the system takes *by chance* one or another way, but we can say also the system *chooses* its following way. *In complex systems mind phenomena are emerging*. (G. Minati, *Esseri collettivi*, Apogeo, 2001). According to English philosopher-science man *Gregory Bateson*, mind is emerging from the complexity of a system. There are kind of phenomena that behave in different ways, also if with the same identical previous evolution.

A typical exemple of a complex system is the earth atmosphere: the forecast of weather phenomena is completely impossible after a small time, due the so-called *butterfly effect*, that is the system choice in an unstable branching-point.

The mind emergency in a system causes *a nonsense* the idea that it could be exactly repeated. A complex system generally has a different story in any case. The “exactly checked conditions” have no meaning.

Coming back to quantum physics, observation is an unstable branching-point of the system. The observer importance is over (*Prigogine*).

With this point-of-view, mind is ever-present in natural phenomena. We recall that *mind* has not ever the same meaning of *consciousness*, as psychoanalysis teaches.

Following this thought school, we are in a natural world formed by mind-entities, with no exact border: human entities are only a part of it. So ethics must concern the whole nature.

The idea of *sensing beings* comes also from some Eastern philosophies (of Indian origin) like **Buddhism and Jainism**, where ethics concern all beings, not

only humans. The occurrence of mind makes a system a subject-object worth of ethic meaning.

Examples

Some experiments were carried out on social insects (*termites*). With shields and complete isolation among termite groups of the same termitary from all known fields, the insects are perfectly able to built the termitary framework with complete precision on each side of the shields: there is a whole exact planning also if not supported by any energy field of any nature. Each insect perceives at once any kind of trouble to any part of termitary. The simplest hypotesis is that termitary *has* (or *is*) a unique mind. Instead the cartesian standard science gives the label of *misticism* to any knowledge is out of its dogmatic background.

Termitary is **only an example**: there are so many other symilar entities, as a species, a culture, an ecosystem, a society, a cell, a tree, the whole Earth.

An ecosystem is a mind-endowed complex system. This is perhaps the reason why we feel emotion in a natural forest: there is an emotional exchange. Many American native tribes performed the *rain dance* as an attempt to influence the weather mind system. Sometimes with good results, sometimes not at all.

Finally, we have seen that other living beings, a forest, a swamp, a species are mind entities: from a different approach, Jung-follower author James Hillmann wrote about our immersion in the World-Soul. **Ethics claim respect to all natural entities.**

We can speak on the mind of the Total System, that is the whole Biosphere: so we recall the idea of *Gaia* (by *Lovelock, Margulis, Sheldrake*).

We are now very far from the traditional idea of an *external* man who studies and changes as he likes a world made by energy-matter. The chasm, the dualism between the energy-matter world, for mankind benefit, and the mind-psychis-soul world (viewed as a mankind exclusivity by Western culture) is over, has disappeared. We are also far from the idea that mind is only the output of a central nervous system.

Corrent thought and official world are still on a “ninetenth century position”, in which the universal is mechanically made by small particles, where mankind only is mind-endowed and worth of ethical regard.

The way we have attempted to follow gives us a hope: **to find again the spirit of the tree, the swamp or the stream.**

Guido Dalla Casa

guido1936@interfree.it