

Teaching on evolution in European Schools

**By Maciej Giertych
Non-Attached Member of the European Parliament**

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Maciej Giertych
60 rue Wiertz
1047 Bruxells**

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On evolution in the European Parliament

On Oct 11th 2006 I organised a hearing in the European Parliament on the teaching of evolution in European schools. I invited three speakers and played the role of moderator myself. Present at the hearing were a fair number of journalists, Members of Parliament and assistants. The session was provided with simultaneous translation into English, French, German and Polish.

I started by explaining that when I was in school evolution was taught as a biological fact scientifically proven by palaeontology. My further education (a degree in forestry, specialisation in plant physiology and genetics) and scientific career needed no reference to evolution and I ended up teaching population genetics to biology students. It was only at that time that I learned from the school textbooks of my children that the emphasis in teaching evolution shifted from palaeontology to population genetics, my field. I had to protest. The argument that race formation is an example of a small step in evolution is false because race formation depends on the reduction of genetic information while evolution postulates its increase. I checked that the same “proofs of evolution” are taught in schools all over Europe and not only within the Marxist-inspired programs of Polish schools. I started to investigate what has happened to the arguments for evolution I was fed while in secondary school (in England). It soon became obvious to me that there are many scientific objections to the theory. They deserve more publicity than they have had and hence, the hearing I organised in the European Parliament in Brussels.

I started by giving the floor to a palaeontologist, asking him what happened to the palaeontological arguments for the theory. Dr. Hans Zillmer, a German palaeontologist, participated in several digs around the world, is author of several books on evolution, published also in Poland. He presented beautifully illustrated information about new discoveries indicating that dinosaurs and people lived simultaneously, about the joint occurrence of fossil remains of organisms said to belong to very different geological eras and about the existence of completely unchanged organisms over many strata that are dated to be spanning an extensive time scale of many hundreds of millions of years. He has also shown photographs of people living today with skulls exactly as those of the Neanderthals and also of living apes with skulls similar to those of the fossil Australopithecines. Thus there is no sequence from apes to men but substantial variation both within living and fossil men and apes. He concluded by questioning the current teaching about the dating of the stratigraphic column.

As second speaker I invited a sedimentologist, a hydraulics engineer from the Paris École Polytechnique, Guy Berthault. He presented results of his research on the formation of sedimentary rocks. He said that after mixing mercury, water and oil we shall observe distinct layers, not because mercury is old and oil young but because they differ in specific gravity. Similar is the case with sedimentary rocks. Sediments do not fall from the sky. First there is erosion, then transport and finally sedimentation. During transport particles rub against each other and arrange themselves depending on

their specific gravity, shape and size. This transport most commonly takes place with the participation of water, though it can also be by wind or a dry landslide. Berthault observes these phenomena behind glass panes in large hydraulic laboratories where water carries a mixture of various materials. He observes the simultaneous formation of many layers. His main studies were conducted at the Colorado State University in collaboration with Prof. Pierre Y. Julien but presently he works with scientists of the Russian Academy of Sciences in St. Petersburg where simulations are being conducted in laboratory conditions to obtain concrete layer sequences reproducing stratigraphic formations known to exist in nature. Berthault's results make the whole system of dating in geology obsolete. He questions the whole stratigraphic column. For layers to form what is needed is a lot of water carrying material from erosion. Millions of years are not needed; minutes, hours or days suffice to explain all formations. Of course, without millions of years, there is no evolution.

The third speaker was Prof. Joseph Mastropaolo, a human physiologist from California State University, who proposed that in schools we teach devolution rather than evolution. The existence of devolution we can demonstrate experimentally. The world is burning up in terms of energy consumption. The information resources of the biosphere are declining. The extinction of species is an observed fact. The formation of new ones we do not observe at all. The genetic load, that is, the number of genetic defects in a population, is growing throughout the living world. He presented fearsome data on the exponential growth of genetic defects in the human population which endanger the very existence of our species. The process in the direction opposite to evolution is demonstrable. For evolution we have no scientific evidence. He mentioned also the various mechanisms by which defects are corrected in nature, such as healing, re-growth of lost tissues or organs, immunological resistance to parasites, cysts rendering foreign bodies harmless, etc. The correcting potential is great, both on the individual and population level, but it has nothing to do with the postulated evolutionary processes. Nothing new appears. Mastropaolo somewhat spoiled the impact of his presentation by blaming all the "rivers of blood" organised by Communist and Nazi ideologies of the 20th century on the acceptance of the theory of evolution. This extrapolation has some justification (see my chapter "*Breeding people*" below) but it was obviously an exaggeration.

After these three presentations we had a discussion, with the speakers responding to questions coming from the audience. Throughout the session there was no reference to creationism whatsoever. Even "intelligent design," so fashionable in the USA, was not mentioned. There were some critical remarks, but there was no fuel in the presentations to justify accusations of being religiously motivated.

Next morning in the Polish press I was accused of propagating religious fundamentalism. This was started by a Warsaw daily (*Życie Warszawy*, Oct.12th 2006) which wrote that I demanded that parents should decide whether children will be taught evolution or not. I and my three guests were described (*Gazeta Wyborcza* 13th Oct. 2006) as being proponents of the "creationist theory" according to "which all living organisms have been simultaneously created by God as the Bible describes it" and the "Noah's Flood is a historical fact." I was described as referring to calculations about the capacity of Noah's Ark amounting to a tonnage of 14,000.

Next day, almost all other papers went on to ridicule me, quoting *Życie Warszawy* and the nonsense about the capacity of the Ark. They claimed that I have organised a session on creationism in Brussels. *Gazeta Wyborcza* (Oct. 13th 2007) wrote that “Prof. Giertych and three scientists have been arguing that the theory of creationism, that claims the Universe, man and all organisms were created simultaneously by God, should be taught in schools.”

Following this, numerous TV and radio agencies approached me and recorded what I had to say on the subject of the session I organised in the European Parliament. Nowhere was any of this reported. Attempts were made to provoke a religious response from me but I was careful not to be drawn into an exchange on this level. I kept my remarks strictly scientific, and for this reason my comments were considered useless. What I have been trying to tell the media was of no interest to them, since I was not saying what the media wanted me to say.

I am accustomed to the fact that the media lie. What surprised me was that I was also attacked in the same manner by Catholic media, in spite of the fact that the Polish Catholic Information Agency did reach me and interviewed me on the subject. What they published followed the lay media and not what they heard from me. I have tried to find out where *Życie Warszawy* got their information about the capacity of Noah’s Ark etc. I was told by the author of the article that some things were added to his text which did not come from him. Of course, any retraction by the daily paper is useless to me – the story got a life of its own and eventually became international. The world media, as well as scientific journals, protested our promotion of a position considered scientifically unacceptable. Ridiculing me and my guests in the European Parliament became commonplace.

And yet all we were trying to do was to encourage teaching the truth in schools.

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The session in Brussels had an interesting sequel in the Parliamentary Assembly of the Council of Europe. Worried by the publicity our session received, the Committee on Culture, Science and Education produced a document entitled “The dangers of creationism in education” (Doc. 11297, 8th June 2007). Guy Lengagne, a French socialist, was the rapporteur. In an explanatory memorandum the rapporteur specifically mentions among the reasons for this report my engagement in the topic as a Member of the European Parliament and the position expressed in the Polish Ministry of Education following the media uproar the Brussels session has created.

The Parliamentary Assembly of the Council of Europe had sufficient common sense to refuse debate on the Lengagne report by a vote it took on the 25th of June 2007. The document was returned back to committee to be altered under a new rapporteur, Anne Brasseur from Luxemburg. A revised and softened version of the document (no. 11375) returned to the Parliamentary Assembly for debate, which was held on Oct. 4th 2007. After introduction of some amendments it was adopted. The vote was 48 for, 25 against, and 3 abstentions, with 449 not voting. It is obvious that on the issue of evolution the European political establishment is far from unanimous.

The evolution controversy

Personal engagement

Since I have organised the hearing in the European Parliament on the teaching of evolution in Europe (on Oct. 11th 2006) the media (TV, Radio, Internet blogs etc.) have been accusing me of all sorts of idiocies in connection with my opposition to the theory of evolution. I am accused of claims I never made but they fail to write what I actually do claim. I am accustomed to being criticized by the media for whatever I do. It is more difficult to sustain attacks for things I did not do or say. My anti-evolutionary views internationalized, when the renowned British scientific journal *Nature* attacked me. It allowed me to respond (no. 444, 265 (2006)) with a short letter on the topic. This was later attacked by an avalanche of angry comments that so respectable a journal as *Nature* should never have allowed such nonsense on its pages. Unfortunately *Nature* failed to publish my response to all these attacks. Thus I have decided that it is perhaps worth putting down my views on paper and circulating them in the European Parliament, so that people would know where all the fuss came from.

I shall start by explaining why I got involved in the conflict over evolution. I learned about evolution in secondary school at times when all the main evidence originated from palaeontology. I never needed the theory of evolution to explain anything while I was studying forestry, while I worked for my PhD in tree physiology, or for my habilitation (equivalent to DSc) in tree genetics. Population genetics of forest trees became my main narrow scientific speciality, and it was in this field that I made my scientific career, attaining a significant position, both in Poland and internationally. I know nothing about palaeontology. I believed that since palaeontologists claim that they have evidence for evolution, then it must be a scientific fact. As a rule scientists believe each other. So I believed in evolution as did everyone around me. Religious considerations played no role. God could have created the world instantaneously, but He could have just as well acted gradually, through evolution. It is the role of scientists to search for the truth.

When my children reached secondary school I found out from them that the main evidence for evolution comes not so much from palaeontology, but from population genetics. Here I am teaching population genetics to biology students at the Nicolas Copernicus University in Toruń and I do not know that my narrow speciality provides “evidence” for evolution. I had to look into the matter more closely.

What I found in the textbooks of my children horrified me. The main evidence for evolution was said to be the example of a certain moth (*Biston betularia*), which sits on the bark of birch trees and is normally whitish; however, in industrial regions where the bark of birch is covered in soot, the moth becomes black. Here is an example of race formation (= micro-evolution), a small step in evolution! Birds are the selecting agent, since they consume the moth they more easily see, white ones on black bark and black ones on white bark. Exactly as Darwin postulated! Natural selection leads to evolution.

Race formation (= micro-evolution)

The problem, however, is that since the days of Darwin we now know much more about the formation of diversity and of races. He observed diversity within species and stabilization of this diversity. He observed that finches on various isolated islands differed in the shape of their beaks. This led him to postulate evolution as the mechanism of differentiation in populations. In nature we find diversity arising from the mixing (recombination) of gene resources (alleles) in the process of sexual reproduction, and in particular during reduction division (meiosis) that leads to gamete formation. In this process features inherited from the mother and from the father get mixed so that the resulting gametes (egg cells, sperm cells, pollen grains) are all genetically different. Today we know, both from the formation of races in nature, as well as from breeding work, that races are a consequence of isolation, selection and genetic drift. Without isolation there are no races. If we have a pedigree dog and, for a moment, we forget about the isolation, then we end up with a mongrel, or, to speak more professionally, the noble variety returns to the unselected gene pool. Selection is a process that eliminates what in the given life conditions is less adapted for life (e.g. white moths sitting on black bark get spotted and eaten by birds) or deemed useless by the breeder. Genetic drift is the accidental loss of some genes occurring in small populations - isolated or selected races are usually numerically small. This process is similar to the accidental loss of the number of surnames in small isolated human communities; when someone has no sons his surname disappears.

Now we know that neither isolation, nor selection, nor genetic drift increase the gene pool. Quite the opposite – they reduce it. Formation of races is a process in the opposite direction than evolution. This is a process leading towards a reduction of gene resources. Teaching children that this is an example of a small step in evolution is simply wrong. It amounts to misleading them.

Of course when the industry stops emitting soot both the birch bark and the moths return to white colour. No new species was formed. There was no isolation from moth populations further away from the industry, and in the wild population genes for both white and black moths exist. What has only changed is the selection criterion. Now black moths sitting on birch bark get spotted more readily by birds. The same happens in breeding. At some time we needed tomatoes with delicate skins in order to digest them more readily. Now we need those with tough skins so that they would not rupture during machine picking. So we use different tomato races for direct consumption, collected by hand, and different ones for industrial processing (ketchups, soups, pastes, juices), collected mechanically, and the two are prevented from interbreeding.

Mutations

The question arises: where does new genetic information come from? We need it, so that when it is acted upon by natural selection it could give something that did not exist before, such as a new organ, a new function, or a new barrier to sexual reproduction. Answering this question, school textbooks mention positive mutations. The problem, however, is that we do not know of any positive mutations we could present as an example. Of course we know a multitude of negative mutations and of neutral ones. In fact we fear mutations. We protect ourselves against X-rays, against

radioactivity, against asbestos and other mutagenic agents. Even if positive mutations do occur they get lost in the mass of negative ones so that we cannot pinpoint them.

Some time ago we expected to obtain useful new varieties through mutagenesis. I myself have visited three forest research stations (in USA, Sweden and Czechoslovakia) where, with the help of a cobalt bomb, an attempt was made to hasten evolution in order to obtain new interesting forms. Nothing came out of this research. This line of research was abandoned long ago. The same happened in various agricultural plant breeding stations. Nowhere in the world has anything positive been attained in this manner. Here and there some commercial benefits were obtained (dwarf forms, flowers without certain pigments, oranges without seeds etc.). However these are not examples of new genes appearing, but quite the opposite, examples of gene destruction. None of these are positive from the point of view of the mutated organism.

Today it is very often claimed that organisms resistant to antibiotics, herbicides etc., are evidence for positive mutations. This, however, is not so. First of all, most commonly such forms develop as a consequence of recombination within the existing genetic variation. Secondly, this adaptation, even if it does originate from mutations, has to be treated as a form of defence of existing functions and not as a development of a new one. Thus it belongs to such repair processes known in nature as wound healing, re-growth of detached body parts, elimination of defective cells or individuals in a population, attainment of immunological resistance to an invasive protein (e.g., through vaccination), repair of mutagenic defects, etc. There are herbicides (see chapter "Role of information in biology" given below) so constructed that they would attach to a vital protein specific for a given weed, thereby immobilising it and causing death of the weed. The appearance of a mutation that gives a protein variant that is still functional (neutral mutation), but without attachability to the herbicide, is in fact a defence of the functionality of the protein, and therefore of the organism that needs it. This is not creation of a new function.

Information exists in nature in DNA. It is mobilised for life processes by the DNA/RNA/protein system and conveyed from generation to generation. It can be spoiled by accidental changes (mutations). On its own it will not improve itself. This is equivalent to a computer program, copied from disk to disk. It can become accidentally spoiled, but it will not improve itself spontaneously. Accidental changes can be injurious or neutral. They will never be positive.

Population genetics does not supply evidence for evolution.

Palaeontology

In view of this change in the mode of teaching about evolution in schools, I started studying what happened to palaeontology. Why does it not reign any more in the teaching of evolution?

It appears that already in 1980, at the international congress on evolution held in Chicago, palaeontologists admitted that the dominating feature of the fossil record is stasis – the continuing of species in an unchanged form through all the strata in which they are found¹. There are many that still live today, essentially in the same form as

¹ One of the reasons the Guy Lengagne report "Dangers of Creationism in education" was proposed in the Council of Europe was the publication and wide distribution of "The Atlas of Creation" by Harun Yahya, a

they are being found in geological strata considered very ancient. All we know about the “missing links” postulated by Darwin is that they are still missing. They are missing not only in the physical sense of not having been found in the fossil record, but they are also missing conceptually, since we cannot imagine how they would look if they did exist. For example, how would an intermediate form between a mouse and a bat look like for us to consider it as the missing link? Of course when only size is involved, we can imagine intermediate forms, say, between a mouse and a rat. However, should we find fossil remains of a mule, would that be evidence of evolution from an ass to a horse or perhaps from a horse to an ass? However, it would perhaps be safer to admit that no evolutionary conclusions can be drawn from such a find.

Unfortunately, the strong desire to find a “missing link” and the fame that will be attached to such a find, lead to the unfortunate situation that in this field of science there are many errors and also frauds. Not only the Nebraska man and the Piltdown skull were forgeries, but even the Neanderthal man is used in the evolution controversy in a dishonest manner. He used tools and practiced religious burials. He represented a race of man. In fact people with similar features can still be found among living people, though perhaps not as frequently as in an earlier epoch.

For me, also, the famous drawing, showing in one row a chimpanzee, a gorilla, a Neanderthal, an Aboriginal and a Scandinavian, is a forgery. What do we see in this drawing? What hits the eye in particular is the change of colour from black to white, a reduction of hairiness and an increasingly erect posture. However, from fossil bones we have no information on the colour of the skin nor on its hairiness. This picture is also racist because it suggests that those with darker skin and more hair are somehow less human than the Aryans. That leaves us only with the posture. The slightly stooping figure in the middle representing the Neanderthal originates from the first individual of this human race discovered in a place called Neanderthal. He happened to be an old man with arthritic deformation of the spinal cord. Further individuals of the Neanderthal race do not possess this stooped posture. Even if all Neanderthals were of such a stooping posture would that be evidence of evolution from the chimp to the Scandinavian or in the opposite direction? After all, in that row only the Neanderthal is of fossil origin – the others are currently living organisms. What scientific value does this drawing possess? We all know it. The message it conveys does not come from scientific research. This is evolutionary propaganda, not science.

Of course the sequences of fossil pre-hominids proposed by palaeontologists which we so often hear about in the media contain nothing of permanent scientific value. These sequences seem to be affected by every new fossil find, which means we really know nothing about our animal ancestors. The same is true for the proposed sequences for horses, birds, etc. If consecutive scientific finds continually modify some theory it cannot be considered an established fact.

In view of such evident lack of intermediary forms palaeontologists came to the conclusion that they will not find them. Thus it was necessary to look for evidence for evolution somewhere else. This is why focus turned to evidence from the field of

Turkish Islamic fundamentalist. The Atlas is a beautifully illustrated documentation of stasis. Photographs are given of fossil remains from various geological strata, as well as of living animals and their skeletons which are exactly like the fossil ones. Regrettably this excellent documentation is used not so much as a contribution to science but as an argument to accept Islam and the teaching of the Koran.

population genetics. In palaeontology itself evolutionary ideas were proposed for a process that would leave no fossil record. Sudden evolutionary jumps are being proposed, which amounts to a resuscitation of the “hopeful monster” idea. For some reason or other, once in a blue moon, a reptile gives birth to a bird or something like that. For serious scientists such ideas are unacceptable. An idea appeared called “punctuated equilibrium”. This idea suggests that stasis dominates in nature, yet evolutionary changes do occur occasionally, in very exceptional conditions, over small areas and very quickly – but we cannot locate evidence for this. This is a beautiful idea, since it assumes non-existence of evidence; however, the only problem is that it cannot be proven. Until we observe conditions for the rapid appearance of many positive mutations, this concept will remain only an idea. It has nothing to do with science – even though a Harvard professor stands behind it.

When speaking of evolution it is not possible to avoid mentioning the dinosaurs. They seem to be the favoured symbol of the theory. The media are trying very hard to hide the fact that there is a growing body of evidence that they were contemporary to humans. In several places around the globe there is evidence of human and dinosaur footsteps side by side in the same fossil strata. Pictures of dinosaurs have been found in pre-Columbian art (Ica stones of Peru). Recently bas-reliefs were found on the remains of a 12th century Ta Prom temple in Cambodia depicting various animals, including a Stegosaurus. Marco Polo wrote that he has seen the Chinese emperor being driven in a chariot pulled by a dragon. Stories about dragons exist in all cultures (The Wawel castle in Poland, Loch Ness, St. George is said to have killed a dragon, etc.). All of these stories could have arisen from some historical memory of dinosaurs living among us.

Sedimentology

In the same year - 1980 - when palaeontologists admitted failure in finding the missing links, in Washington State, USA, a major volcanic accident took place. Mt. St. Helen exploded. This local catastrophe provided a natural sedimentological laboratory. The first explosion blew out sideways which, coupled with a landslide, caused the water of Spirit Lake to be blown up a neighbouring mountainside. The returning water brought with it the whole hillside. The agglomeration of moved material is up to 100 m. thick. Behind this material, water mixed with volcanic ash accumulated, forming a new lake. After a few weeks the pressure of this “milky” water on the fresh landmass caused a break in the latter and an emptying of the lake. The flow of this milky water down the valley caused more damage than the initial eruption itself. In the fresh landmass itself a canyon was carved 40 m. deep. When everything settled down it turned out that the newly accumulated landmass was arranged in layers. We have horizontal strata. If it were not for the fact that we know the accumulation took about 36 hours to form, we would be dating the strata in millions of years.

This catastrophe mobilised scientists to study the mechanism of strata formation in the laboratory. When water carries a mixture of various materials it segregates it in the process. This can be observed behind glass in special laboratories. One of the largest such laboratories is at the Colorado State University and it is there that the most important discoveries in the field were made. To speak most simply, when water carries something it first loses heavier elements, then medium ones, and finally the

fine particles. This shedding of material occurs simultaneously, with the only result that what was carried furthest is deposited furthest and therefore deepest. As a result in deltas we obtain segregation into layers of the materials brought by rivers. After a heavy rainstorm some dirt deposits will collect between pavement and roadway. Cutting it vertically will reveal an arrangement of the material into layers. This is exactly what the new sedimentological research is demonstrating. We know also from the practical experience of farmers that it is possible to separate seed from chaff by shaking them together. The same physical principles are involved here.

Going further it is possible to observe from behind the glass panes how the various particles interact in various hydraulic conditions and when and in what sequence are they deposited. For example, when flow moves in one direction and then in another, characteristic repetitions of certain sequences occur. This could be attributed to the periodic movement of water regulated by gravitational pull of the moon (low and high tides). Transferring this knowledge into the field one can try and suggest under what hydraulic conditions the observed stratigraphy developed. This led to the growth of a new discipline, palaeo-hydraulics. One can try and replicate in the laboratory the hydraulic conditions acting on mixtures of material collected in the field to obtain similar stratigraphic sequences as in nature. Very interesting research on this topic is now being conducted in St. Petersburg by the Russian Academy of Sciences. The leading scientist in this field is Guy Berthault.

Of course both the accident with Mt. St. Helen and the new sedimentological research are placing the current dating of the stratigraphic column under a big question mark.

Stratigraphy

Where did the dating of geological strata come from? The dates were proposed in the 19th century on the basis of the observed rate of sediment deposition in lakes and other still water reservoirs. This is referred to as the uniformitarian mode of strata deposition, as contrasted to the catastrophic mode dominating in geological thinking prior to Darwin (Darwin was inspired by Charles Lyell's *Principles of Geology*, 1830, that first proposed this uniformitarianism in geology). These millimetres of annual depositions, multiplied by the depth of strata of various sedimentary geological formations, gave the proposed millions of years of deposition. Today geology students are being taught how to date strata by the fossils contained in them and how to date fossils by the strata. Circular reasoning indeed!

If someone thinks that these 19th century estimates were confirmed by isotopic dating of rocks then they are grossly mistaken. This is being done only for igneous rocks and not for sedimentary ones. The assumption is that at the time when lava solidifies there is crystallization of some crystals that contain radioactive isotopes that will decompose with time. There are many problems with such dating because frequently different crystals from the same solidified magma have very different isotopic age. However this is of no significance to the issue at hand since it does not concern sedimentary rocks. Re-deposition of material does not affect the age of the particles forming them. There is no way we could date the stones or sand grains that constitute the newly formed strata near Mt. St. Helen. Age from their crystallization will tell us nothing about the time when they were arranged into layers.

There are also other problems with the uniformitarian explanation of strata formation. Today at the bottom of lakes dead animals are not being buried. They are eaten by scavengers and decomposed. Fossil remains are not being left for future palaeontologists to discover. People bury their dead, and thus we are able to find the Neanderthals. Animals end up in the fossil record only as a result of catastrophes, when they are buried as, for example, around Mt. St. Helen.

Another problem is posed by the so-called polystrate fossils. We find petrified trees standing erect covered by several geological layers. Have they waited several millions of years for their burial? It is obvious that they were buried in some single catastrophic event.

In view of the new empirical evidence from sedimentological research mentioned above the whole stratigraphic column requires a total rethinking. It will not be easy for geologists to accept such a revolution in their way of thinking, but they will have to face it.

Catastrophes

In view of the above the topic of major catastrophes returns. For the deposits exposed by the Grand Canyon to form obviously more time would be needed than for those near Mt. St. Helen (it is estimated that it would take several months, while for the 100 m. of deposits near Mt. St Helen 36 hours sufficed), and a lot more water than Spirit Lake held. The whole layering in the Grand Canyon, dated at several hundreds of thousands of years, could be explained by one great catastrophe, with the participation of enormous quantities of water.

Some years ago information hit the news that Bob Ballard, the discoverer of the Titanic, had found traces of human settlements under the Black Sea. He judged that they formed as a consequence of a flood that occurred 7500 years ago. Karol Szymczak, a professor from the Warsaw University, who conducted archaeological studies in Uzbekistan in similar strata, judged that the same flood must have reached also the region he was studying. He proposed a map covering the Black, Caspian and Aral seas and also Azerbaijan, Turkmenia, the Kuzyl Kum desert and southern Russia. This is an enormous area, flanked by high mountains in the south (Anatolia, the Caucasus, Elburz, Kopetdag, Pamir, Altai), but open to north on both sides of the Urals.

On the other hand we know that in the extensive northern area, from river Ob in Siberia to Alaska, within the permafrost, there are frozen bodies of many animals, including millions of mammoths. They are being mined for ivory tusks and at least half a million have already been placed on the market. The accompanying meat is edible, at least for dogs. It was established that the mammoths died from suffocation. In their alimentary canals there are undigested meadow plants. What incident could have placed such large animals into the permafrost at a rate preventing digestion of consumed herbs? By what technique? Obviously we are dealing with some exceptional catastrophe extending over enormous areas, and at a time not at all that distant.

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Teaching of the Catholic Church

All of the above I have been proclaiming for years. I try not to get involved in the theological or philosophical dispute, because I do not feel competent in these fields. Unfortunately, however, I am constantly being criticized as being a religious fundamentalist in the way I approach the subject of evolution. I am being accused of making references to the Bible, to the Book of Genesis, to creationism. I am said to calculate the capacity of Noah's Ark and similar theses. Nothing is further from the truth. I never make such claims. I cannot help the fact that empirical evidence from scientific research I refer to above is closer to the descriptions in the Bible than to the theses of the evolutionists; however, this is not my conclusion, but of those who hear me speaking or read my texts on the topic. It often happens at public meetings that someone in the audience picks up the biblical notion and fires a question at me pertaining to creationism. When this happens I try to show that evolutionists have their own religion and bend facts to support it while at the same time ignoring evidence that does not fit with it. That religion is atheism. The listeners may perhaps construe that I defend the biblical version; however, I do not derive facts from the Bible as Protestant fundamentalists often do (for them only the Bible – *sola Scriptura* – is trustworthy), but facts lead me to conclusions that are not at variance with the Bible. For me more important is the Magisterium of the Catholic Church and it neither demands that I accept nor that I reject the theory of evolution. It only encourages me to seek the truth, and it is not afraid of the truth.

Regrettably, very vociferous in attacking me are Catholic philosophers of nature, who have built their scientific careers on the belief in the “fact” of evolution they learned in secondary schools and on their adaptations of Catholic theology or philosophy to this “fact.” A criticism of the theory of evolution affects the foundation of their achievements. I have no intent or patience to listen to their arguments about the compatibility of Catholic theology with the theory of evolution, because I reject the latter. Usually I try to fend off their attacks with a question: “We know that Cain was allowed to kill sacrificial lambs and eat them, but was not allowed to kill his brother Abel. Was he allowed to kill and eat his grandmother?”

Knowing that I treat seriously the teaching of the Catholic Church, my critics quote to me *at nauseam* the words of Pope John Paul II: “theory of evolution is something more than a hypothesis.” However it is my critics who support themselves with Church documents, not I. I regret to say that also bishops use this quotation to criticise me. At least bishops should know what the main message of the letter John Paul II addressed to the Pontifical Academy of Sciences on Oct. 22nd 1996 was. The main point of the papal admonition was to recall the teaching of the Church about the instantaneous creation of the human soul and the exceptionality of man created in the image of God. The Pope recalls - after Pius XII - that: “If the human body takes its origin from pre-existing living matter, the spiritual soul is immediately created by God”. This is a quotation from the encyclical *Humani generis* of 1950. It is worth noting the conditional tense used in this sentence. Thus nothing has changed in Church teaching since 1950. John Paul II claims also that **“Consequently, theories of evolution, which in accordance with the philosophies inspiring them, consider the mind as emerging from the forces of living matter, or as a mere epiphenomenon of this matter, are incompatible with the truth about man. Nor are they able to**

ground the dignity of the person.” The text given in bold here (taken from the English edition of *L’Osservatore Romano* no. 44, 30th Oct. 1996) was placed in Italian as a subtitle to the official first publication in French of the letter in the Italian *L’Osservatore Romano* (24th Oct. 1996); thus, it represents its most important message. The Pope rejects the notion that hominisation arose from the material characteristics of a living being. However, the media did not notice this. They keep on repeating that “theory is something more than a hypothesis.” This, of course, we know from every dictionary definition of these two words. Similar was the case when in his Regensburg speech Pope Benedict XVI criticised the West for eliminating supernatural truth from the academic debate. The media have only noticed the criticisms of Mahomet. One should not repeat the laic media but read texts on one’s own.

In the criticism levelled at dissenters from the theory of evolution, including Catholic clerics, one usually finds that there is recognition of only two sides in the debate, atheistic evolutionists and creationists who interpret the Bible literally. I am always placed in the second category. The Catholic clerics propose a middle ground, evolution guided by the Creator. There seems to be total blindness to the existence of dissenters from evolution on strictly scientific grounds. There is refusal to see a confrontation within empirical sciences and a claim that it exists only in the theological and philosophical sphere. The crux of any scientific theory is that in order to be accepted it must be confirmed by repeatable experiments or observations. Without this repeatability it will forever remain only a theory. With repeatable evidence against it, it is dead.

I have no doubt that truth will eventually win. It always does.

Breeding people

Richard Dawkins, the famous Oxford professor, a proclaimed atheist and a devoted defender of the theory of evolution, has recently declared himself in favour of eugenics (www.lifesite.net/ldn/2006/nov/06112103.html).

In a letter to the Scottish *Sunday Herald* (Nov. 19th 2006) Dawkins wrote that no one wants to be in agreement with any opinion of Hitler, however, it is time to reject such a position: “[I]f you can breed cattle for milk yield, horses for running speed, and dogs for herding skill, why on Earth should it be impossible to breed humans for mathematical, musical or athletic ability?” ... “I wonder whether, some 60 years after Hitler’s death, we might at least venture to ask what the moral difference is between breeding for musical ability and forcing a child to take music lessons. Or why it is acceptable to train fast runners and high jumpers but not to breed them.”

Of course for atheists and evolutionists *Homo sapiens* is no different from any other animal and we can do with it the same we do with animals. However, the Catholic Church teaches something different. John XXIII in his encyclical *Mater et Magistra* wrote: “The transmission of human life is the result of a personal and conscious act, and, as such, is subject to the all-holy, inviolable and immutable laws of

God, which no man may ignore or disobey. He is not therefore permitted to use certain ways and means which are allowable in the propagation of plant and animal life.”

Recently we got information in the news (a Polish weekly *Wprost* Jan. 28th 2007) that the first super-Poles have already been born. They were referring to the selection of embryos within the procedure of *in vitro* fertilisation, selection not only for vitality, which has been practiced ever since the procedure was introduced, but also for inheritable traits following an analysis of DNA. Of course the procedure does not involve breeding of an ideal human being, but is based on the killing off of those that do not conform to the ideal set. Embryos that do not conform to the set requirements are rejected – down the sink. In many countries, regrettably, also in my own, it is permitted to abort embryos that have defects. This is basically the same procedure. It is a negative selection aimed at killing those human beings that do not conform to some set standards of acceptability. It amounts to discrimination against the disabled¹.

Living in Christian communities we often do not realise the extent to which the civilisation of death is based on eugenics. Here is another example. Prof. Peter Singer from Australia received the prestigious chair of bioethics at Princeton University, USA. Singer is famous for promoting the killing of children, as well as of old and disabled people, who are a burden to their families, the health services and the states. Their healthy organs, of course, could be used for transplants. On the other hand Singer is a defender of animal rights and of the environment. Numerous lectures of Singer in Europe are meeting with demonstrations organised by pro-lifers and by organisations helping the disabled. He teaches bioethics in the USA (*Washington Times* June 30th 1998).

A new human right has appeared – the right not to exist. The Constitutional Tribunal in Germany made doctors responsible for failing to do genetics tests. It ruled that a person is entitled to compensation for having been born with a genetic defect. A person had the possibility of not being born at all – as a defective individual the person could have been killed in the womb of his or her mother. This was a question of a person's right not to exist. Since the person was forced to exist he or she deserves compensation. Similar verdicts have been appearing in the USA: “[T]he plaintiff both exists and suffers as a consequence of the negligence of others” (*Gazeta Wyborcza* Apr. 25th 1998).

This is not a new issue. Already in ancient Sparta children with defects, as well as various sick and disabled people, were thrown off the Taygetus rock into a spacious grotto, so as to be eliminated from the society. Today this procedure is most strongly associated in our mind with Hitler's Germany and with its racial policy of killing off the mentally deranged. The Germans had a program of eliminating life not worth living (*lebensunwertes Leben*), particularly the mentally ill.

Hitler's Germany introduced eugenic laws. It was decided that whoever is not of Aryan origin, or is in a marital union with a non-Aryan person, cannot be allowed to work as a government official. Should he or she associate himself/herself with such a

¹ Recently the media reported (e.g. *Rzeczpospolita* 28th August 2007) that an abortion in Italy aimed at one twin killed the healthy one instead of the one with Down's syndrome. The abortionist, Dr. Anna Maria Marconi, claimed the babies changed position between the diagnosis and the abortion, hence the mistake. Accused of eugenic practices she replied: “The law allows this.”

person the employment should be terminated. A person was defined as non-Aryan should one of the parents or grandparents be an alien, in particular, Jewish. There was promotion of the Aryan race by encouraging unions among most typically Aryan people. Also employed was a positive selection in favour of the most desired traits. Children of subjugated people with blond hair and blue eyes, that is, most Aryan ones, were separated from their parents and destined for de-nationalisation and upbringing as super-Germans. Among others this concerned babies born in Auschwitz. Stanisława Leszczyńska in her famous "Report of a midwife from Auschwitz" describes how all babies born in the camp were killed by drowning except those having Aryan features selected for de-nationalisation.

As a science eugenics appeared in consequence of the adoption of Darwin's theory of evolution. If the evolutionary advance depends on the survival of the fittest then we should make sure that those who are less adapted be prevented from participating in reproduction. This is a practical application of the theory of evolution together with its atheistic definition of man. The evolutionists of today would prefer to forget about the link between Darwinism and eugenics. I shall try to recall it.

In 1871 Darwin published a book entitled "The Descent of Man." In chapter 5 he writes:

"With savages, the weak in body or mind are soon eliminated; and those that survive commonly exhibit a vigorous state of health. We civilised men, on the other hand, do our utmost to check the process of elimination; we build asylums for the imbecile, the maimed, and the sick; we institute poor-laws; and our medical men exert their utmost skill to save the life of every one to the last moment. There is reason to believe that vaccination has preserved thousands, who from a weak constitution would formerly have succumbed to small-pox. Thus the weak members of civilised societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. It is surprising how soon a want of care, or care wrongly directed, leads to the degeneration of a domestic race; but excepting in the case of man himself, hardly any one is so ignorant as to allow his worst animals to breed."

Obviously this is a scientific justification for eugenics. In the same book a little further Darwin writes (in chapter 6):

"At some future period, not very distant as measured by centuries, the civilised races of man will almost certainly exterminate, and replace, the savage races throughout the world. At the same time the anthropomorphous apes, as Professor Schaaffhausen has remarked, (Anthropological Review, April 1867, p. 236), will no doubt be exterminated. The break between man and his nearest allies will then be wider, for it will intervene between man in a more civilised state, as we may hope, even than the Caucasian, and some ape as low as a baboon, instead of as now between the negro or Australian and the gorilla."

Ignoring the fact that these two quotations are contradictory (a common occurrence in Darwin's thinking), since in the first it is suggested the savages will replace the civilised and in the latter the opposite is predicted, please note not only the obviously racial character of the latter quotation but also the prediction of an unavoidable extermination of lower races. For the Englishman Darwin these were Negroes and Aborigines. For the German Hitler the lower races were in the first place Jews and then Poles.

This was not an accidental coincidence of Hitler's and Darwin's thinking. The link came through the community of scientists engaged in eugenics. Here are a few examples.

Leonard Darwin (1850-1943), son of Charles Darwin, was the president of the English Eugenics Education Society, member of the editorial board of *The Eugenical News* and since 1927 honorary president of the International Federation of Eugenic Organisations. In the thirties of the 20th c. Prof. Ernst Rüdin from Munich was president of the Federation.

Leonard Darwin wrote (*The Eugenics Review* vol. 31-32, 1939-1941) an article in memory of a German dermatologist Dr Friedrich Schallmeyer (1857-1919), a pioneer in eugenics. In 1903 he won a competition organised and financed by Friedrich Krupp AG for the best answer to the question: "Was lernen wir aus den Prinzipien der Deszendenztheorie in Beziehung auf die innerpolitische Entwicklung und Gesetzgebung der Staaten?" ("What do we learn from the theory of origins in relation to internal political development and state legislation?"). It is obvious that Krupp wanted to utilise the theory of evolution for state purposes. We are speaking here of times long before Hitler. Schallmeyer won the competition out of 60 entrants with his book "Vererbung und Auslese" (Heredity and Choice). He described the consequences of inconspicuous selections constantly being made by man in the choice of a life partner and he postulated that the state should influence this process, particularly through propaganda, so as to influence racial advancement both in terms of quality and numbers. He appealed for "racial hygiene." He warned also that an obstetrician helping in a difficult delivery causes an increase of this problem in later generations. Leonard Darwin ends his article with a statement that it is not his role to decide who contributed more to the development of eugenics "in the right direction" in Germany, Schallmeyer or Dr Alfred Ploetz. It needs to be pointed out that this text was written in 1939. What fruits this "right direction" brought we now know.

The aforementioned Dr Ploetz was an employee of the Kaiser Wilhelm Institut in Berlin, president of the Deutsche Gesellschaft für Rassenhygiene (German Society for Racial Hygiene) and representative of this organisation in the International Federation of Eugenic Organisations. He was also editor of *Archiv für Rassen- und Gesellschaftsbiologie*. The editorial board of this journal included also the above mentioned Prof. Ernst Rüdin. Rüdin was also an editor (together with Heinrich Himmler) of the colour monthly *Volk und Rasse*.

Dr Josef Mengele, who conducted genetic research on prisoners in the Auschwitz concentration camp, received money for this purpose in 1943 from the Deutsche Forschungsgemeinschaft (German Scientific Council) through Prof. Otmar

von Verschuer (1896-1969), director of the Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre, und Eugenik (Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics). Later in his report to the Scientific Council Verschuer wrote (Gerald Astor, "The Last Nazi" 1989):

"My co-researcher in this research is my assistant the anthropologist and physician Mengele. He is serving as Hauptsturmführer and camp doctor in the concentration camp Auschwitz. With the permission of the Reichsführer SS [Himmler], anthropological research is being undertaken on the various racial groups in the concentration camp and blood samples will be sent to my laboratory for investigation."

According to the biographical data collected on Prof. Otmar von Verschuer (http://en.wikipedia.org/wiki/Ottmar_von_Verschuer) Mengele supplied him in 1944 with bodies of Gypsies, skeletons of Jews, blood samples from identical twins experimentally infected with typhoid fever, eyes of people having differences in eye colour between the left and right eye, etc.

Prof. Otmar Freiherr (baron) von Verschuer was before the war a lecturer in hereditary pathology at Berlin University and in 1951 he obtained the chair of human genetics at Münster University. After World War II baron von Verschuer became a respected scientist. According to the *Science Citation Index* for the years 1945-69 he is cited in the scientific literature 350 times – this is quite a lot. Thus he did not disappear from the scientific community, in spite of his Nazi connections.

Officially, for a while eugenics became taboo, but not for long. In 1960 a new scientific journal was set up under the name *The Mankind Quarterly*, edited in Edinburgh. As a subtitle it had: "*An International Quarterly Journal dealing with Race and Inheritance in the Fields of Ethnology, Ethno- and Human Genetics, Ethno-Psychology, Racial History, Demography and Anthro-Geography.*" Sir Charles Galton Darwin (1887-1962), grandson of Charles, was a member of the editorial board. In the years 1953-59 he was president of the British Eugenics Society. For obvious reasons initially there were no Germans on the editorial board, even though the majority of western countries are represented. However, soon Otmar von Verschuer joined the editorial board and he is now listed among the initiators of the journal. In 1979 the journal moved to the USA, settling in Washington where it continues to be published. It deals with such topics as the need for racial segregation in US schools, links between race and intellectual level, and the like.

It might be worth mentioning that Sir Charles Galton Darwin got his second name in memory of the precursor of eugenics in England, Sir Francis Galton (1822-1911), who coined the term "eugenics," understood as the guided evolution of man, and introduced it into scientific circulation. He authored the book "Hereditary genius" published in 1869. Also his articles on eugenics appeared in a collection entitled "Essays in eugenics" published in 1909. It was he who established by his testamentary donation the chair of eugenics at London University. In 1909 he established the Eugenics Education Society under his presidency. In 1926 it was transformed into the Eugenics Society and in 1989 into the Galton Institute. Today this Institute is famous

for its promotion of contraception and the organisation of the “Darwin Lectures.” Galton was a cousin of Charles Darwin.

This information should suffice to show the link between Darwinism and eugenics.

A great promoter of eugenics and Darwinism was the agnostic, socialist and liberal philosopher Bertrand Russell. In his 1929 book “Marriage and Morals” he wrote:

*“The ideas of eugenics are based on the assumption that men are unequal, while democracy is based on the assumption that they are equal. It is, therefore, politically very difficult to carry our eugenic ideas in a democratic community when those ideas take the form, not of suggesting that there is a minority of **inferior** people such as imbeciles, but of admitting that there is a minority of **superior** people. The former is pleasing to the majority, the latter unpleasing. Measures embodying the former fact can therefore win the support of a majority, while measures embodying the latter cannot.”*

From this the proposals to kill off the mentally insane (in Hitler’s Germany), or to abort disabled pre-born children (today in many European countries, regrettably, also in Poland) find political support. However, the breeding of geniuses (e.g. of the superior Aryan race) generally does not.

The proposal made today by Prof. Richard Dawkins amount to nothing else than the breeding of geniuses. Since it is possible to increase desired traits in cattle, why should it not be possible to increase in this manner the musical abilities of man? Or perhaps improve physical traits useful in sport or modelling or elsewhere? If man is no more than a highly evolved animal, what would stop us from such a breeding program? Apparently nothing does.

Today, with the help of the Internet www.ronsangels.com/index2.html it is possible to buy human egg cells or sperm from fashion models. The trading agent is Ron Harris, supplier of photos for the *Playboy* magazine. The sale is on the basis of an auction: *“This is Darwin's "Natural Selection" at its very best. The highest bidder gets youth, beauty and social skills. "Natural Selection" is choosing genes that are healthy and beautiful”* writes Ron Harris in the introduction to his Web site. The ads of individual items include photographs of the donors, information about their age, origin, age of their living grandmothers, etc. Harris takes only 20% of the money bid. The rest goes to the donor. The cost of *in vitro* fertilisation, implantation, delivery, etc. has to be covered by the buyer. This is a regular business proposal.

Darwin can be used in various ways.

Karl Marx introduced the theory of evolution into social relations. In a letter to Ferdinand Lassale dated 16th Jan. 1861 he wrote: *“The work of Darwin is of great*

significance and it suits me as a natural basis for the historical class struggle” (K. Marx and F. Engels “Listy Wybrane”, Książka i Wiedza 1951, p. 159, item 52). With such support it is hardly surprising that Darwinism reigns today. During Communist times the theory of evolution was promoted in all schools, not only because it provided an atheistic alternative to the traditional Christian explanation of origins, but also because it explained the need for the elimination of the undesirables. Darwinism was linked with Michurinism, the theory that acquired traits can be inherited. It was hoped that training would be hereditary. People were brainwashed and those resistant to brainwashing were eliminated in the name of social Darwinism.

In the name of the survival of the fittest the world became increasingly inhumane.

Of course the genocides of the 20th century have more to do with the desire to rule over other people against their will than with eugenics or class struggle, but it remains a fact that Darwinism was used to justify many of the atrocities that accompanied German and Russian attempts to dominate over non-German and non-Russian people. Also in the industrial revolution factory owners justified their quest for financial gains with the notion that ruthless competition was the mechanism of progress.

As Philip Trower has rightly pointed out (“The Church and the Counter-Faith”, Family Publications, Oxford, 2006) there are four different concepts functioning as the theory of evolution, which tend to blend into a single philosophy in the minds of Westerners of the early 21st century. For mental hygiene it is necessary to keep these ideas separate. I shall follow Trower in my presentation of them.

The first is the idea that all life forms are descended from a single life form. Darwin did not invent this idea. It existed in the minds of 18th and early 19th naturalists such as Georges-Louis Leclerc, Carolus Linnaeus and Georges Cuvier, who were not concerned with how one form transformed into another (transformism was the term used for evolution at the time) but how to classify the living world into species, genera, orders, families, etc. depending on the relations between them. They of course noted the lack of intermediate forms, both in living forms and in the fossil record. Without these gaps in continuity of the living world it would not have been possible to propose criteria for defining taxa. Darwin knew this. He wrote (The Origin of Species, chapter 13): “*Extinction has only separated groups: it has by no means made them; for if every form which has ever lived on this earth were suddenly to reappear, though it would be quite impossible to give definitions by which each group could be distinguished from other groups, as all would blend together...*”.

The second meaning of evolution is the idea that natural selection, or the survival of the fittest, is the mechanism that allowed transformation of one form into another. This indeed is Darwin’s discovery, and what is more, it is basically true on the level of race formation within a population that is reproductively compatible (usually, though not always synonymous with species). Only this idea deserves to be referred to as Darwinism. Natural selection was of course common knowledge before Darwin, because people knew that inferior forms die more readily than healthy ones. However, it was Darwin who proposed that this process can lead to the development of new forms. Breeding based on selection and isolation is known since antiquity (vine, horses etc.). However, it is the extension of the mechanism of race formation to the formation

of new species and higher taxa (otherwise referred to as extrapolation of macroevolution from microevolution) that is at the centre of the controversy over evolution. Darwin expected that small variations, generation after generation, over millions of years, would lead to the formation of new organs or functions. But of what value is a developing organ until it is fit for use? Darwinists still struggle with this problem, especially since many of the organs (e.g., an eye) have a level of irreducible complexity that cannot be reached by a single step in transformation.

The key point about evolution in this second sense is that it proposes transformation without foresight, natural selection being a process that works accidentally, in no particular direction.

The third meaning of evolution is that it is an ongoing process. If that were so we would expect to see intermediate forms not only in the fossil record but also a multitude of forms all around us in various stages of semi-development. Most obviously all we see are perfectly functional well adapted forms, or ill adapted ones that get quickly eliminated by natural selection. Nowhere do we find organs or functions in the process of being perfected. Evolutionists prefer to forget about this difficulty. Instead the concept of ongoing evolution is being employed for relations between humans, expecting progress all the time. It is here that all the atrocities accompanying eugenics, class struggle and social Darwinism find their source.

Finally it needs to be pointed out that the theory of evolution is also extrapolated to the inanimate world, to the whole universe. Everything is said to be continually changing into something different and better, from the absolute chaos of the Big Bang to some cosmic idyll of the future. Obviously varying atoms and galaxies do not compete for survival and are not subject to a natural selection process. Why then use the same term, evolution, for their development? The law and order we see in the micro- and macro-cosmos, the unchanging physical and chemical laws that drive the universe, demand an explanation. Since the complexity of the biosphere is said to have been explained by evolution why not use the same concept in the inanimate world?

Yet, the factually observable facts point in exactly the opposite direction. Genetic diversity and the number of species decline. The sun and stars burn down. The total energy of the universe is spending itself. The Second Law of Thermodynamics is relentless. Entropy reigns.

Role of information in biology

(This paper is of a more technical nature)

Life is more than just chemistry and physics. It includes also information. Information is part of the biological reality. We can study it from the point of view of molecular biochemistry but also in terms of mathematical relations, logic and transformation.

Comparison with computers

There is some analogy with computers. A computer has a shape, dimensions, a chemical composition, physical parameters etc. All of this we refer to as hardware. But there is also software, currently much more expensive than hardware. We have the

programs, the data bases, the files, the calculation sheets etc. Without the software, a computer is a pile of junk. With the software in place it does not change its shape, weight, chemistry of physical parameters, but it becomes functional.

Working with computers we have learned certain facts about the role of information in dealing with almost anything.

We know that a program can become spoiled on its own through faults in the disks that carry them. We know that we can spoil a program by mistake. We know that it will never correct itself. By accident it will not become better or more useful. After an accidental change the number of functions a program has will not increase. We know also that an error can protect a word or file from being erased when deletion is commanded.

A computer program has a plan, a purpose, a direction meant for it by the programmer. There is an intelligent input.

Breeding

Similarly a breeder has a plan, a purpose, a direction for the intended improvement. However a breeder does not create new information. He only selects among the information available in nature and strives at such a combination of it so as to direct the breeding program towards the desired improvement.

Natural reproductive processes maintain biodiversity through recombination. Natural selection acts on existing forms. It reduces numbers and eliminates genotypes that are not adapted in the given environmental conditions. It does not create anything new. Breeders replace natural selection with their own, favouring what meets human needs.

Physicists

In the physics of micro- and macro-cosmos there are doubts about the probabilistic model of explaining reality. There is a school of thinking that favours an information model¹. They speak of the Unitary Information Field Approach (UIFA) assuming that somewhere there is information which is being realised in the functioning of the cosmos. They envy biologists in that they have found their Information Field, in the genetic code. It needs to be pointed out that we know where this information is located only since mid 20th century. When the theory of evolution was proposed and during the time its role in dominating biological thinking developed most, we had no idea that information for the realisation of biological systems existed and was specifically located in a particular place within a living cell.

Fate of information

Now let us look at what happens to the information accumulated in the genetic code during the functioning of biological systems, or when man manipulates these systems. In Table 1 some of these biological functions and human activities are listed, segregated into those that reduce information, mix information and increase information.

¹ R. Horodecki 1989 Unitary information-field approach to the description of reality. **Problems in Quantum Physics**, Gdańsk; 346-357.

Reduction of information

Isolation of a biological population will lead to a reduction of genetic information. Frequently, after substantial environmental changes, there remain small *refugia* where a limited number of individuals of a given species survive and where in consequence a population poor in genetic resources results. Inbreeding is the consequence of isolating a population. Sexual reproduction occurs between relatives and in extreme cases we see self pollination. This always leads to accidental loss of some information. This loss of some genes is referred to as *genetic drift*. (This can be compared to the accidental reduction in the number of surnames in a small group of colonists who are left without new arrivals for several generations. Such a phenomenon was known to have occurred on several Caribbean Islands during the 18th and 19th centuries). A gene once lost is lost for ever. It does not reconstitute itself. It can only reappear if it is reintroduced.

Table1. Fate of information in living systems.

INFORMATION		
Reduced	Mixed	Increased
Isolation	Panmixy	
Inbreeding, self-pollination	Hybridisation, introgression	
	Genetic engineering, GMOs	
Genetic drift	Meiosis, crossing-over	
Selection	Heterozygosity protects recessives	
Adaptation	Migration	
Domestication	Protection of gene resources	
Improvement	Care for biodiversity	
Breeding	Increasing heterozygosity	
Race formation	going wild, mongrelisation	
Deleterious mutations		Positive mutations

Selection acts much faster. Forms which are not adapted to a given environment will perish together with their genes responsible for the lack of adaptation. As a result a population develops that is adapted to the specific conditions of the place, adapted in the sense that it is deprived of the genotypes that are unable to live in this environment. The gene pool is reduced relative to the one it was derived from. One can observe some vegetation on industrial spills. Many seeds fall there, but only few survive. The population that develops there may be adapted to the spill, e.g., a high level of heavy metals, but it is genetically much poorer than the population of seed that fell on the spill.

Based on this adaptation mechanism much work has been done by breeders leading to the domestication of plants and animals. The domesticated plants and

animals are genetically poorer than the wild organisms they were derived from. When we speak of genetic improvement we mean "improvement" from the human point of view. A yield of sugar from sugar beets is increased or the yield of milk from a cow. But this is always at the expense of some other functions which results in the "improved" varieties becoming less able to live in natural conditions, becoming man dependent. The more improved the varieties, the more dependent on humans they are, and the poorer they are in genetic diversity.

Breeding, as well as natural adaptation, lead to the formation of races. Races are genetically poorer than populations they were derived from. All races of dogs can be bred from wild wolves, but it is not possible to breed a St. Bernard from a terrier.

It is of course well known that mutations can destroy genes. Since we are bombarded all the time by mutagenic agents (radiation, chemicals) the number of damaged and therefore defective genes in any population increases. We speak of an increase in the *genetic load*. When such defective genes meet in a homozygote the defect shows and natural selection eliminates the genotype with the defect.

Reshuffling of information

Population genetics recognises recombination of genes as the primary source of variation in nature. It is universally accepted that *panmixy* occurs in nature. Panmixy is the random meeting of gametes in the process of sexual reproduction. Each gamete (pollen grain, sperm, ovule, egg cell) has its own genetic identity and therefore when two combine a new entity arises.

In extreme cases we have *hybridisation*, the meeting of gametes from different species. When the hybrid is viable and fertile with one of the parental species we get *introgression*, the entering of genes of one species into the population of another.

Genetic engineering is the transfer of genes from one population to another by some other method than through sexual reproduction. A parasite may introduce its genes into the genome of the host to use its metabolism for its own purposes. An insect (a sawfly) may cause a willow leaf to produce a gall that is useless for the willow but is a home for the insect. The genetics of the willow was modified. Its metabolic potential was utilised according to genetic information from a foreign entity. Now we do the same in genetic engineering. We transfer genes from a fish to a tomato. We produce modified organisms referred to as transgenic (GMOs). We mix genes from organisms that do not hybridise in nature.

In sexual reproduction we observe a mechanism for the mixing of genetic information at the reduction division. During *meiosis* the information inherited from the father and the mother is reshuffled. During pachytene *crossing over* of chromatid parts occurs. During anaphase homologous chromosomes separate and together with the parts exchanged during crossing over they travel to the opposite poles. In the process the chromosomes (or their parts) originating from father and mother get mixed so that each resultant haploid gamete is genetically different.

If a haploid gamete contains a gene that is maladapted to a particular environment or in some way defective, this will cause difficulties to the gametophyte, resulting in it being impoverished or simply perishing. In this way defective or ill-adapted genes get lost if they affect the quality of the gametophyte. However, after fertilisation, in a diploid zygote and the resultant sporophyte, the ill-adapted or

defective gene can survive, thanks to the presence of a functional homologous one from the fertilisation partner. This is referred to as dominance of some genes over recessive ones. The net result is *heterozygosity* or genetic biodiversity in the population. This is a natural mechanism for the protection of genes useless in a given environment but possibly useful in another in which some descendant will happen to live. Unfortunately this is also a mechanism that protects defective genes, the *genetic load*, as it is called.

Gene mixing results also from plant and animal migration. Each species constantly places some of its progeny beyond its current range of occurrence. Man also frequently transfers populations beyond their natural ranges. If they find it possible to interbreed with the local populations, the new arrivals, whether natural or artificially introduced, become a source of an increase in the genetic biodiversity. As new territories are being colonised by a species sometimes separate waves of colonisation from different refugia meet and then recombination between them occurs, giving a rich genetic diversity of the population.

Seeing that the genetic resources of our planet decline, man has made efforts to protect them. We now often speak about the protection or even promotion of biodiversity. It needs to be stressed that breeding and gene pool protection have opposite effects on genetic information. However, in breeding work it is possible to deliberately increase heterozygosity to assure greater stability of the improved population. Highly bred pure lines are especially hybridised to achieve heterozygosity. The breeding population is often deliberately kept diversified to counteract the loss of genes accompanying selection.

Highly bred improved plants and animals need human protection. Usually they need special environmental conditions that only man can supply (fertilisers, fodder, antibiotics, pesticides, herbicides etc.). But that is not all. They require human protection from outbreeding. They have to be kept isolated. Once the isolation is discontinued we get mongrels; selected varieties go wild.

Increase of information

There is only one mechanism that is credited with increasing genetic information. It is mutagenesis. It is assumed that once in a while a mutation occurs that is positive in the sense that it introduces some new function or organ that increases the survival potential of the individual and of the population derived from it. A positive mutation is the only possible source of new information. The whole theory of evolution hinges on the existence of positive mutations. But do we have good examples of them?

Darwinian evolution

Darwin observed variation within species (beaks of finches); he observed adaptation to various environments and diversification of isolated populations (now referred to as genetic drift). What he observed was the consequence of recombination and of reduction of genetic information. Yet his conclusion was *Evolution*, a natural process giving growth of information.

His conclusion was wrong! Adaptation, often referred to as microevolution, is not an example of a small step in macroevolution. It is a process in the opposite direction!

In school textbooks throughout Europe we find the example of the peppered moth *Biston betularia* that sits on the bark of birch trees. It was found to change its colour to black when in industrial areas the bark of birches was soot covered. When industry was cleaned up the peppered moth returned to its whitish grey colour. This is an example of adaptation, reversible adaptation, since there was a breeding link with wild populations living outside the polluted area. Natural selection, birds feeding on the moths, leaves only those that are least seen when sitting on the birch bark. Genes for the dark colour are present in the wild population and dominate it when environmental conditions demand it. The dark coloured race has no new genetic information. It has only a portion of the information present in the wild genetic pool. In fact only proportions of black and grey moths change. These are differences in numbers, not in kind.

Another example often referred to in textbooks is the ability of herbs to adapt to industrial spills. A fresh spill is usually barren because of the heavy metals it contains, injurious to plants. However, after some time the spill gets overgrown. Plants adapt to the inhospitable soil. This is acclaimed as evolution in progress. However we have known for more than 50 years that this adaptation is not an improvement of evolutionary value. For example a grass, *Festuca ovina* L., that colonised a spill rich in lead achieved tolerance of this metal as a dominant characteristic. Once outside the spill there was very strong selection against the tolerance. Thus in normal conditions this adaptation is immediately lost due to natural selection – hardly an argument for evolution¹.

It must be stressed that the formation of races is not an example of a small step in evolution.

Lessons from breeding

Breeding work has taught us several important things.

First of all we now know that there is a limit to the possibility of breeding in any particular direction. The information content of a gene pool is finite. In breeding we can use what is available and no more.

Secondly we know that our improved varieties need isolation to maintain their improvement. Without the isolation they will go wild, interbreed with the wild varieties and thereby lose their identity.

Thirdly we know that highly bred, improved varieties are biologically weaker than the wild varieties.

We have painfully learned that wild varieties are absolutely necessary for breeding work. We must have the rich pool of genes in the wild conditions to be able to select from and to incorporate what we need into our bred varieties, as new demands on the breeding program are articulated.

¹ Wilkins D.A. 1960 The measurement and genetical analysis of lead tolerance in *Festuca ovina* **Scottish Plant Breeding Station Report**; 85-98. Wilkins D.A. 1957 A technique for the measurement of lead tolerance in plants **Nature** 180; 37-38.

To summarise, we must learn how to manage the resources of genetic information available to us in nature, because they are finite and can be irretrievably lost.

Mutations

Now a word is needed about mutations, the only potential source of new genetic information. We have been studying mutations for over 70 years and some definitive conclusions are permissible.

First of all, we observe a general decline of interest in mutagenesis as a breeding method. Most laboratories all over the world are closing their mutagenic programs. Some useful varieties have been obtained through mutagenesis, but few and far between, and they are only useful from the human point of view. Some dwarf forms were obtained useful as root-stocks for grafting or for rock gardens. Some very sensitive plants were obtained good for monitoring pollution. A seedless variety of oranges was produced. There are many ornamental varieties of flowers which have been deprived of certain natural pigments by mutagenesis. In each case, however, the plant obtained is biologically poorer and usually weaker than its non-mutated progenitor. It is deprived of something that in natural conditions is useful.

We know of many mutations that are deleterious. We are afraid of them. We try to protect ourselves and the wild gene pool from various mutagenic agents. We discourage nuclear tests, redundant X-rays, asbestos, etc. If a mutagenic environment favours positive mutations they are deluged by a multitude of destructive, negative mutations.

We know of the existence of mutations that are biologically neutral. These are changes either in the non-coding part of the genome or in the genetic code but not affecting the functionality of the protein they code for. We refer to these variants as alleles. When copying a text we can make mistakes. If the mistakes do not alter the meaning of the text, we can refer to them as neutral. As long as the meaning is preserved the changes are tolerated, but usually they are also considered a nuisance. Also in the genome, the information change when neutral is tolerated, but if it reduces functionality of the protein it codes for, even slightly, then there will be selection against it. However, when the meaning is changed, when functionality is significantly altered, we can speak of a change, either negative or positive.

Positive mutations are more a postulate than an observation. Usually races of organisms resistant to man-made chemicals (herbicides, fungicides, pesticides, antibiotics etc.) that have developed only after marketing the given product are quoted as examples of positive mutations. When dealing with such arguments it is necessary first to realise that the new forms are not new species. They are usually interfertile with the original population, and usually disappear when the use of the chemical is stopped. Thus they appear similar to the reversible adaptation of *Biston betularia*. It is quite possible that the adaptation was similarly achieved, by recombination. There are very few examples where a documented change in the genome is responsible for the newly generated resistance to a chemical.

In the known examples it can be shown that the change involves a defence of natural functionality. It is not a creation of something new but a protection of something already existing. Here is one example analysed in detail.

The “evolution” of resistance to Atrazine

Amaranthus hybridus L. (smooth pigweed) is a weed that has adapted itself to the herbicide Atrazine¹. Atrazine was developed specifically to combat this weed. It acts by attaching itself to a protein (Q_B) coded by gene psbA important in the photosynthetic process. The protein-Atrazine complex prevents photosynthesis. In the resistant variety the sector of the protein to which Atrazine attaches itself has a change of one amino acid, from serine to glycine. This changes the binding affinity enough to produce Atrazine-resistance. In the genome serine is coded by the AGT triplet (adenine, guanine, thymine) while glycine is coded by GGT (guanine, guanine, thymine). This change occurred in the psbA gene in the 682 position. Thus effectively a mutation of one nucleotide from adenine to guanine has provided the smooth pigweed with resistance to Atrazine. This is advertised as a positive mutation that gave *Amaranthus hybridus* a new function, resistance to an herbicide.

However, it needs to be pointed out that the mutated form lowers functionality of the Q_B protein. Thus, as soon as use of Atrazine is withdrawn the wild form of pigweed returns. Thus, by natural selection, the wild form is preferred and not the resistant one.

In experimental conditions, using cell cultures of *Nicotiana tabacum* cv. Samsun treated with Atrazine, a change was obtained in the 264th codon of its chloroplast psbA gene from serine (AGT) to threonine (ACT). This single nucleotide change (from guanine to cytosine) also provided Atrazine resistance which was stable in the absence of continued selection pressure². A similar serine to threonine substitution giving Atrazine resistance was observed in potato cells³. This was not tested in field conditions.

Now what are the conclusions?

To start with, the mutated protein performs the same function in photosynthesis as before. Thus for the organism in question (smooth pigweed, tobacco, potato) the mutation was a neutral one in the case of the serine to threonine change, or slightly deleterious in the case of the serine to glycine change.

The acquired resistance amounts to protection of an existing vital function that has been inhibited by an artificial chemical introduced into the environment. It is not a new function, but a defence of an old one. This is comparable to the acquisition of resistance to various diseases following vaccinations.

In nature duplication of gene sequences is possible. One could argue that the pigweed could achieve a duplication of the mutated genome sequence, so as to hold both the wild type (for normal conditions) and the mutated one for times when Atrazine is released into the environment. Furthermore one could argue that development of new herbicides might lead to other mutations similarly neutralising their effects. Following duplications the pigweed could hold in store many variants of

¹ Hirschberg J, Mcintosh L. 1983 Molecular basis of herbicide resistance in *Amaranthus hybridus*. **Science** 222; 1346-1349.

² Sato F., Shigematsu Y., Hamada Y. 1988 Selection of an atrazine-resistant tobacco cell line having a mutant psbA gene. **Molecular and General Genetics**; 214; 358-360.

³ Smeda R.J., Hasegawa P.H., Goldsbrough P.B., Singh N.K., Weller S.C. 1993 A serine-to-threonine substitution in the triazine herbicide-binding protein in potato cells results in Atrazine resistance without impairing productivity. *Plant Physiology*. 103: 911-917.

protein Q_B or other targeted proteins able to deal with the potential presence of a whole list of herbicides in the environment. However, this would be again no more than a defence of existing functions, like the vaccinations we get for many different diseases.

Thus it is improper to use the information about resistance of *Amaranthus hybridus* to Atrazine achieved by a mutation as evidence for a positive mutation or as evidence for a small step in evolution.

Defence of functionality

There are various ways in which functionality can be defended in natural conditions.

Natural selection is one such mechanism. By eliminating defective forms natural selection protects the population from deteriorating.

Natural selection also occurs on the level of cells. Within a tissue defective cells will be eliminated, prevented from multiplying.

There are various mechanisms of correcting defects. Healing of wounds is one such mechanism. There are others, also on the genomic level. Defective nucleotide sequences can sometimes be corrected. Just as computer programs can have some back-up information allowing corrections, so do biological systems.

Finally biological systems have a method of identifying and neutralising an invading foreign factor. On an individual level this is referred to as immunity. An invading protein is recognised and antibodies are custom made to neutralise it. This immunological adaptation can also occur on a population level. An organism that adapts its biology to combating the foreign chemical multiplies and replaces the whole population that fell under the heavy selection pressure of the chemical. The conclusions for the example described in detail above (on resistance to Atrazine) can similarly be applied to the observed strains of diseases resistant to various antibiotics and other pharmaceuticals.

An adaptation that frustrates the effectiveness of a chemical as a killing agent is positive only in the sense that it protects existing functions. It protects the ability to use existing useful information. It does not provide new information, for new functions or organs.

This in no way helps to support the theory of evolution.

Information and time

There are two visions of the Universe. Relating those visions to information and time we can say that one vision starts with total chaos at the beginning of time (Big Bang) and sees gradual accumulation of information through evolution of particles, molecules, compounds, organic compounds, and life all the way to man and on towards an ever improving and increasing in information content glorious future increasing in information content. The other vision starts with a glorious, plentiful, beginning and then sees gradual corruption, extinction of species, deterioration of genes, dissipation of energy and movement towards an inevitable end of the visible reality. Available to our senses and our scientific cognition is only a small segment of the time postulated in these visions. The big question is: In the time available to us do

we see an increase of information or its decline? As I see it all scientific evidence points to a decline!

It is high time school curricula in Europe reconcile with this fact.

Concluding remarks

The debate over the theory of evolution will not subside. It is rampant in the United States and is increasingly so in Europe. We cannot run away from it. Children in schools must know that it is a debatable issue and what the debate is about.

In fact there are two debates. One is ideological and the other scientific. The ideological confrontation has two sides very strongly motivated by their respective world views. Atheists believe, and I insist on the word *believe* here, in evolution. They need it to justify their atheism. On the other side there are the creationists, believers in God the Creator who made everything from nothing by His own will. I include the promoters of the Intelligent Design concept in this category. Evolution disrupts their view of the creation process. This ideological debate is irreconcilable and no amount of words will settle the issue.

The other debate is between scientists. There are those who see in the available evidence a process of transformation from one kind to another, from simple organisms to more complex ones, from few to many types. The opponents, and I include myself in this group, consider the evidence as totally inadequate, in fact, totally lacking. For us the evidence points to stasis, stability of life forms (like begets like) or even to a process in the opposite direction, to devolution, to constant diminution and erosion of information existing in the biosphere. Here debate is possible and the accumulated evidence for and against evolution can be subjected to a critical evaluation according to some strict procedures universally accepted in the international scientific community.

Whether the first type of debate, the ideological one, is permitted to be presented in schools, and in what form, depends on the religious or irreligious philosophies of the school owners. Obviously, in denominational schools, whether Christian, Muslim or Jewish, the creation story will be told and the atheistic opposition to it will be criticized. In atheistic schools the opposite will be true. In religiously indifferent schools both ideologies would be tolerated without any one being forced upon the pupils. Believers in creation can both reject and support the theory of evolution, provided the role of Creator in the process is admitted. This is the current position of the Catholic Church. For atheists it is irrelevant what believers think about the role of Creator in the evolution process, as long as they are not required to accept it. However, for them disbelief in evolution is an ideological impossibility.

The scientific debate on the theory of evolution should be presented in all types of schools. The pupils should know that scientists do differ in their views and in particular that they confront each other on the issue of evolution. Every discovery, every observation, must be subjected to full scientific scrutiny and evaluated on its empirical merits alone. A hypothesis is only a hypothesis until it is proven by several

independent observers to be valid. Then it becomes a theory. However both a hypothesis and a theory is only tentative, pending new data that may support, modify or reject it. It becomes a scientific law when it reaches a state permitting its falsification.

According to Wikipedia: “Falsifiability (or refutability or testability) is the logical possibility that an assertion can be shown false by an observation or a physical experiment. "Falsifiable" does not mean false; rather, it means that something is capable of disproof. When an assertion has been shown to be false, then some contrary examples or exceptions to the assertion have been demonstrated, observed or shown. Falsifiability is an important concept in science and the philosophy of science. Some philosophers and scientists, most notably Karl Popper, have asserted that a hypothesis, proposition or theory is scientific only if it is falsifiable.”

Falsification depends on the spelling out of a result that, should it be obtained, would disqualify the theory. Albert Einstein claimed that $E = mc^2$. If anyone could show in a reproducible experiment that in some circumstances $E \neq mc^2$ then the theory would be disqualified. Without such evidence it holds. Archimedes claimed that a body immersed in a liquid loses as much weight as the weight of the liquid it displaced. If anyone could prove the loss of weight to be different this would disqualify Archimedes' Law.

Evolution has not yet reached the stage where all would admit that some particular result would disqualify it. Thus it is not a scientific law and therefore it should not be taught as such. It should be presented in schools as a scientific theory pending confirmation, as a theory that has both supporters and opponents. What is more, both the arguments for the theory and against it should be impartially presented. Pupils must be taught how to evaluate data, how to debate a controversial issue. They must be taught to think on their own. The teaching process should not depend only on the feeding of facts. It must also teach how to use one's own reason.

Thus I appeal to all those responsible for determining school curricula in Europe to set them up in a manner that would present impartially the debate on Darwinian evolution.

Table of Contents

On evolution in the European Parliament	3
The evolution controversy	6
Breeding people	14
Darwin can be used in various ways	19
Role of information in biology	21
Concluding remarks	30