

Ethics and Biology: Some Reflexions of A Biologist

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1. Although “moral behavior” may be defined somewhat differently, all definitions will have three points in common:
 - (1) moral behavior is not stereotypic, not instinctive, not genetically dictated;
 - (2) moral behavior is about how we deal at the existential level with ourselves, with conspecific individuals, with non-specific organisms and with the abiotic Umwelt;
 - (3) moral behavior is the consequence of judgments about what is considered *good* or *bad*.

It is not about esthetical values. The latter are primary self-expressions of artists, bringing psychic equilibrium and self-estimation. The artistic expression has to do with the ability of the artist to make material things (including strings of words), which are *exaggerations* of the experience of natural reality (colour, shape, size, combinations of observed items, sounds, translations into words, etc.). The making and/or observation of the creations by the maker and the observer make them forget their actual existence (especially worries, duties and problems), the bigger the attraction, attention, admiration, ecstasy, compassion, etc., of the piece of art is. It has a homeostatic function.

Second, artists may hope that the appreciation other people have for the artistic product is transferred to the artist himself. So, art can be placed very well within a biological context. I will not develop deeper this thesis here, as it is not our actual goal in this essay.

Congenital behavior in multicellular organisms is fixed within neural circuits and is influenced by hormones, being regulated in an involuntary way. Genetically determined instinctive behavior is behavior forced by internal drives. Therefore, it is not considered as “moral” behavior. In that sense a train of parental care observed in a lot of fishes, amphibians, reptiles, birds and mammals must not be considered as “moral”. Even in human behavior, parental care may be in part a-moral.

Moral behavior in humans is considered as a kind of behavior that is *wanted* by them, following in general the argumentation that it may be given explicitly when asked for, and being sustained by basic values of relationships. So, the same kind of parental care, which may be wished in full conviction of being

good in humans, may be considered as a moral behavior.

Nevertheless, part of human behavior is regulated by the same kind of neuronal, hormonal and physiologic machinery as in other vertebrates; but in humans, it can be wished or refused by the thinking apparatus in the brain. When people are *obliged* by other people to execute some behavior, this behavior is not interpreted here as “moral”. So, when one is forced to be a blood donor, such behavior is not taken to be a moral one, but when the same donation act is wanted by the donor, it is.

2. From a biological point of view each thought and each behavior, including moral wishes and decisions, are, or are the consequence of, quite complex neural processes (revealed in neurology), which are not experienced consciously by us during thinking. Therefore, these processes are often underestimated. Such processes are physico-chemical, so they are subjected to general natural laws. This means there is no room for non-determinism (excepted perhaps some aspects within the quantum mechanical subatomic micro-physical field, which are not seen at higher levels). So, there is no place for *free* decisions, when they are considered as a reality *beside* physical laws and causality, although the *feeling* of freedom may well be present. I experience my own feelings of free will without doubt, but nobody else can feel or experience them directly as I do. I can express by words and attitudes this feeling free, and by constructing a theory of mind I can project my ability of having such feelings at least to other humans as *alter ego*'s. But just as a dream is purely mental, i.e. not directly connected or fed by the outside world through sense organs, the feeling of freedom (again in the sense of being possible to escape from physical laws) must be interpreted as purely imaginary and subjective. Nevertheless, both a dream and the feeling of freedom are objectively real neuro-physiological phenomena. The natural scientific approach is objective (or intersubjective), while the experience of a dream or of the feeling to be free is real but subjective experiences, being not introduced to the brain by sense organs.

3. The question must be raised whether a mental proposition (such as a moral judgement) can *evade* from physico-chemistry and has *its own life*. I

in the world of Euclidean geometry $a^2 + b^2 = c^2$ in a rectangular triangle. Such a proposition is only present in an imaginary world without necessary reference to a physical outside world fed by sense organs (although we can make physical drawings following our imagination). The previous propositions are thoughts relying on a set of axioms and logical operations. They form a mental world on itself (the inside of thinking), and are governed by reasoning which hopes to be correct and consistent.

Some discussions in the field of morality may rise from two levels: (1) from differences about the estimation of values given to the same kind of items, and (2) from revealing mistakes or supposed mistakes about the consistency of the reasoning inside the same moral system of convictions. The feeling of being free during thinking, is fed by the feeling of being able to make *choices* within the way of thinking. In the same manner one can formulate within the thinking state behavioral rules, which are *at that level* (= being within the process of the internal thinking world itself) free of the existential biological world in which one lives.

In fact, two concepts of freedom can be considered: one was already stated above, being the idea that free will implies that thinking can be separated from physical laws. This may be concluded to be impossible: thinking has simultaneously objective neurophysiological facets, which are totally embedded in physical laws. In other words, such a concept of thinking and free will is an illusion. The other concept of free will that we'll consider, fully agrees with the fact that thinking is a physical process, whereby being able to follow one's own physical-mental behavioral outputs without being forced by other people gives the subjective feeling of freedom. I adhere to this concept, whereby subjective thoughts and objective neural physical processes totally coincide (cf the study of live scans and simultaneous reports by the subjects when the feeling of being free is expressed by the studied person).

It has been proven that persons make decisions that *are clearly influenced by neural inputs of which they are not aware of at all*. As a result, they do not feel any kind of *obligatory* thinking: they *feel* free to think what they are thinking, although the external observer experiences that they are causally influenced by neural inputs from the outside world. As the thinking process coincides with self-consciousness (which can be understood as a form of cognition), they don't feel and perhaps *cannot* feel their non-freedom, as they are not able to have a look into the machinery of processes going on in their own brain

during the moments of thinking.

4. On the other hand, all thinking acts are also at the same time neuro-physiological processes, which follow natural laws that don't tolerate any deviation. I propose there is only one phenomenon, having two "faces": one is the objective aspect from the external observer, as studied by scientists and formulated in scientific terms, the other is the subjective conscious thinking experience from the owner of the thinking brain. This duality is sometimes presented as the image of a coin (one phenomenon) with the subjective experience being one face and the objective description being the other face of the same coin. Thinking is very complex, as there are a lot of bifurcations and feedbacks on the physiological roads. The thinking person does not feel these roads and the constraints. Reasoning may be a series of *consecutive* bifurcations that are so close to each other that they give the impression of being possible to radiate from the same point (as multiple *simultaneous* bifurcations). But the reflecting person may *ask* himself after a thinking process why he has had at time t_1 a thought T_1 and at t_2 a thought T_2 , and, e.g., not the reverse, or anything else. Because he is able to think at t_3 the same thought T_1 or another thought T_3 , he interprets this faculty of being able to *change* a thought during the time progression as a kind of freedom. He may think he could have been able to have the thought T_3 made at time t_3 already at t_1 , although he never can prove it. From a physico-chemical configuration on t_1 only one other physico-chemical configuration can follow on t_2 in a causal sequence, etc.

When being awake in the awareness state of the brain a series of neuro-physiological activities (which may be discontinuous, but is experienced subjectively as continuous, stopped when sleeping or being unconscious) occurs at a lot of cerebral places, triggered by inputs from the sense organs and from different cerebral loci. Thoughts are "worked out" by a lot of neural modules. At any conscious moment one network dominates and fills up consciousness. It may trigger further mental reflections (associations) that do not longer need to be fed by external inputs, but rely on past events (stored in the long-term memory). These reflections are situated in the so-called working memory of the brain (merely located in the tertiary non-specific association area within the prefrontal lobes of the neocortex).

When a brain is able to work out its proper neural network physiologically, following its own internal determinism, I call this an "open determinism" because the course changes in consecutive

moments and is not totally fixed all the way long before. This is due to the continuous stream of inputs (new ones and feedback of previously made thoughts), which causally influence the output. The content of conscious experience is changed continuously, giving the *appearance* of non-determinism and the *feeling* of freedom. When an outside factor, being a new trigger, e.g. seeing a lion in the neighbourhood, does suddenly change the course of the inner neural network progression, one feels disturbed and programs in order to run away are made. When one is able to follow such escape (and potentially life saving) programs, one feels disturbed but still free. Only when one is obliged *not* to follow his/her own mental programs, one feels forced and no one does feel anymore free. Nevertheless, *absolutely* feeling free is an illusion, with the same kind of reality of a dream during dreaming. In our context this means that an *absolute* free will is a wrong belief, while subjective free will may occur as a real feeling, connected to an objective neurological process. When “moral” behavior implies the ability of making decisions freely, it only can be considered when a *subjective feeling* of making free decisions is present. After all, it corresponds to our psychological experience and may sufficiently satisfy us.

5. I still would like to consider some special situations. There are decisions which are taken without external pressure, thus the person may tell he deliberately makes a free decision, while other persons recognise she/he does not, due to neurological disturbances (cf. in schizophrenia, manic-depression, etc). There may be *inner pressures* that the person does not realise. One can then put forward the question whether such persons are *responsible* and are able to act in a free manner, thus acting after a moral deliberation. The same holds for people who are addicted to drugs. They can feel free when making the decision of wanting another quantity of a drug at the one hand, and they can experience that they indeed show an addictive behavior, knowing and feeling not being free anymore, at the other hand. Also babies from an early age will feel free to make some decisions, but their brain machinery (rational brain parts versus emotional limbic brain parts) has not developed yet in order to produce rational considerations in balance.

In fact, I would consider that mentally ill persons and babies, as mentioned in the abovementioned situations, demonstrate that they, as well as mentally sane persons, are the “victims” of their physico-neurological machinery working causally and following physico-chemical laws. Therefore, I would never give

a *full* responsibility to any person, neither to other animals. No one is his/her own creator, neither the cause of the matter and the features he/she is made of, neither the cause of the physical rules or natural laws that are working in and upon him/her, fully influencing what he/she is doing or not doing. Therefore, only *relative degrees of freedom and of responsibility* can be awarded to human beings and to other organisms, in relation to their capacity of self-reflection about the morality of what they are doing.

In most societies these relative capacities are thought to be *absolute*, which is incorrect.

6. From the foregoing it is clear that moral behavioral rules do have at the same time both an internal purely cerebral thinking aspect, where chemical reactions are not felt, as well as an external biological determinism. Many philosophers have proclaimed and some still proclaim that thinking is absolutely free, because being well trained thinkers *par excellence* they experience a –albeit subjective– feeling of being free during thinking. Biologists will consider the same thinking always as neuro-physiological processes which are fully determined.

7. Within the process of thinking the relationship between a reflection and the existence of the person who did the thinking in a room, connected to other persons etc., is not yet actual. This relationship only surfaces in his consciousness when the thinker comes out of his thinking world and experiences or considers himself again living in a society, within a culture, being a father, mother, son or daughter. Then the behavioral *thought* comes into the field of daily existence, resulting into actions of “to do or not to do” something.

8. If one proposes that a thought is the subjective experience of an objectively complex neuro-physiological process, then thoughts are consequences of other thoughts in congruence and synchrony with the chemical processes which are causally followed by other chemical processes. Only in this sense, mental experiences such as ethical “values”, which are neural processes, *follow* from previous thoughts or neural processes, being “facts”. So, there is a causal link, but there is no link between both *categories* at the level of argumentation itself, as most philosophers have correctly argued, starting, perhaps, from David Hume. Examples of behavior observed in other persons or in other animal species cannot be a valuable *foundation* of argumentation for an ethical judgement, because a fact is an observation while an ethical judgement is a thinking act based on values. When other human beings follow the same behavior, one agrees with each other on an ethical basis, and can

feel sympathy and solidarity as well as less solitude, but the act of judging concerning ethical values remains strictly personal. The argumentation has to come from the thinking and appreciation inside a person, and not from imitating the behavior and the ethical convictions of other people, using *that* as an argument.

9. At another level also, values do not follow from facts: facts are statements about observational judgements in the field of cognition and they do not have the power to generate values in the field of ethics by obligation. Even the sociological fact that other people have values is no argument to jump from the cognitive world of observation to the ethically judging world.

There are four kinds of propositions, important in the present context, which cannot be deduced by each other:

(1) propositions about facts of the kind "A has the feature a". Such propositions are only true or false on the base of cognitive observation. Such propositions have nothing to do with esthetical and ethic opinions.

(2) the imaginary world of mathematical propositions, which are tautological.

(3) esthetical propositions of the kind "I very highly estimate the music of Bela Bartok". One can observe that a lot of other people like this music, but it can never objectively be deduced that the music of Bela Bartok *is* beautiful. So, flowers, although they may be liked by a lot of people and although this may be stated as a sociological fact, cannot be stated and be considered *objectively* beautiful. One can say that a lot of flowers are able to induce to some extent estimations of beauty in a lot of people, but still this does not imply that flowers *are* beautiful.

(4) ethical propositions of the kind "euthanasia is a human valuable solution in certain circumstances" cannot be deduced from facts or from esthetical appreciations either. It can only be stated that a lot of people agree and others don't. But also when the whole of society stands behind an ethical proposition, it is only *an argument*: from the *number* of people agreeing upon only the *number* of loudspeaker boxes claiming the same ethical opinion can be stated. This number does not add anything to the intrinsic argumentation. E.g. I may be against death penalty, and this opinion is independent from the number of sympathisers or opponents.

I agree, of course, that the *number* of loudspeaker boxes claiming the same opinion can be used for building up and changing laws in a society through democratic consensus. In this context, laws in society

don't say things *ad fundum* concerning ethical opinions intrinsically, but they express the fact that a majority of people may have such opinions. However, there are juridical laws in a particular society that can be incorporated, considering differences in opinion (divorce, abortion, euthanasia, etc.), while other do not allow such a pluralism (neglecting red lights at cross roads, not paying taxes, death penalty, etc).

Many laws *do not oblige* people to do this or that (although a lot do), while these laws *allow* people to do this or that, according to their moral conviction. One *must* stop in front of red traffic lights, but one is not obliged to divorce or to undergo abortion in certain circumstances.

So, mathematical, esthetical and ethic propositions cannot be regarded as objective items or properties of items: they are propositions that rely on logic and on the choice of axioms, or on ethical values, which are given by thinking humans to entities and to their behaviour.

10. The idea that humans can *freely* formulate esthetical and ethical propositions is incorrect: each moment in human thinking is always determined by feedback from the past. It is true that *new combinations* of old building blocks of thought can be constructed and can be presented as new associations, producing new opinions and decisions. But this does not violate the (open) determinism of nature.

But not only the *thinking* past of a person plays a role. Let's turn now to biology for a while. Feelings like becoming sick, up to becoming unconscious when seeing blood, or showing empathy when seeing and hearing signs of pain in other humans or non-humans, for sure have biological roots: they may prevent the escalation of intraspecific and even interspecific damage. Perhaps it can be compared to the specific behavior, occurring in a lot of animal species, of stopping a fight after the opponent has surrendered. Nevertheless, such innate feeling or behavior can be inhibited by training or by neural developmental disorders (cf. autism). Let me first say that it is not just an arbitrary coincidence that the colour *red* is been used as a stop sign. In modern wars bombing and destruction of "the enemy" is done from large distances, without detailed visual contact with the wounded, bleeding, screaming or dying *human* enemy (as well as other animals). Otherwise, such close contact would induce strong biological aversions (and would thus compromise the abilities of the soldier) and give strong mental depressions during a long period afterwards (even when one is not wounded). In preparing for wars, soldiers are brainwashed in order to "animalise" the enemy (as

being inferior, beastly, sub-human, immoral etc), so that it becomes less morally unacceptable in their spirits to do harm and kill these human beings (all this beyond the situation of vital *self defence*). The surgeon learns to use the scalpel and inhibits his biological repulsion by keeping in mind that damaging the body of a human being may be life saving and may hopefully decrease pain levels. Nevertheless, the skilled and well-trained surgeon will still feel strong barriers to operate a patient when he/she is a close member of his own family. A lot of people do not consider most animals to have feelings of pain and joy, and therefore they experience no restraint in treating them differently as compared to humans. A lot of other people will feel strongly opposed to kill (or let kill) or eat great apes, monkeys or other mammals, less opposed with regard to birds, still less with regard to reptiles, amphibians and fishes, and still less with regard to invertebrates. What does a lobster or a mussel *feel* when put alive into boiling water? We don't know for sure. In order to not induce *needless* suffer or pain, a rule of prudence can be followed.

Empathy –even transspecific- does not seem to be restricted to humans. In a zoo it has been reported that a gorilla, who was seeing a bird in his cage that could not fly (being ill), took it carefully and climbed with it on top of a branch. There, he spread the wings of the bird and let it free, in order to let it fly normally again. It has also been reported that a killer whale (*Orca*), after killing and eating some seals, helped another one by pushing it in the direction of the seashore. Of course, we must not attribute to other animal species the same feelings we have or can have as humans (although there is a lot of variation inside cultures), because this would be an anthropomorphic fallacy; but the given examples may provide matter for reflection, I presume. Moreover, a lot of chemical drives and even neural structures and physiology are the same or nearly the same from fishes to mammals, including humans.

No doubt biological evolutionary factors, as well as education, (we must not forget), play a strong role in these matters which clearly have ethical dimensions.

11. Up to now we have put forward that ethical behavior is based on arguments about good and bad. We may now ask if, in order to be qualified as “moral”, these arguments must be *formulated* or must be liable to be formulated in an explicit manner. If we claim such a demand, only humans are *moral beings*. But, e.g., it is known that chimps punish members of the group when they don't follow certain conventional

rules, such as not going quickly enough to the sleeping quarters at the end of the day. The animal keepers, for example, installed the rule that evening dinner was only served after every chimp had entered the sleeping quarter. This rule was quite good understood by the group members, but when younger ones kept on playing, thereby forgetting the hour, all other chimps that were already in their sleeping quarter had to wait for dinner until the younger ones had entered. So, there was a consensus within the group to punish the ones who did not follow that rule. In another situation, members of a group of chimps helped each other to solve a problem, without saying a single word. In the case I have in mind they were helping each other to overcome an electrically charged metal fence around the stem of a tree, placed in order to keep them from climbing the tree to get the leaves. In another case, it has been reported a clear example of cheating. A mother chimp, in fact, produced a false alarm call, in order to chase away other chimps that were observing through an open window, how the baby of the mother chimp was taking apples from a box in the room, where both were located and wherein the other chimps could not enter. Being much frustrated, they were shouting and throwing small things through the window to the mother and the baby inside. When hearing the alarm call, the chimps outside ran away, no longer disturbing the baby taking apples out of the box. The only chimp who was not afraid of hearing the alarm call was the baby.

In all such cases chimps apply solutions to a problem, which we ourselves would not always imagine. Therefore, we have the impression that the chimps are able to make judgements in the moral field and to take decisions without any verbal argumentation. We'll still consider kinship altruism and reciprocal altruism later on. It is not clear and not sure that chimps consciously consider theoretically a lot of possible reactions, as we often do, when solving a problem. They react quite directly with regard to problems, which may seem easy to solve for us, but that are already quite difficult or insoluble for other species. They also react differently from each other. Of course, they do not make *choices* free from causal determinism. Experiments with dogs have shown that, when they could see at some distance a piece of meat, and when there was a fence between them and the meat, they would first move *away* from the meat, in order to go around one end of the fence. So, they could approach the meat afterwards without meeting any further obstacle now. When, in another experiment, they are allowed to be quite near to the meat although there is still a fence between them, they

not only see the meat but also smell it. In that case, the signals of the meat are so strong that they are no longer able to move away from the meat first, in order to approach the meat without any obstacle, as in the first experiment. In the latter case, the dogs always try to approach the meat directly. Our prefrontal lobes in the neocortex are so big that we are able to consider a whole set of possible scenarios prior to acting. For reasons of previously memorised experiences, one option for action will dominate. We experience this as a choice, but before it is achieved a lot of work has been done in the subconscious domain, mainly in subcortical areas. It has been proven that *decisions* are made *before* we are conscious of our “decision”.

12. Moral behavior has, among others, a function of trust in complex societies, where the amount of non-stereotypical, non-predictable behavior is important. The more complex a society is the more interesting will be guessing what another member of the group will do or not do: it affects the quality of life and even the survival. A moral behavior follows for some period the same rules, which try to be consistent with each other. This means that other people are able to consider a set of possible reactions a moral being can have. Therefore, humans and some other animal species are able to construct a “theory of mind”. Maybe this faculty coincides with the that of self recognition in a mirror a kind of self-consciousness which arises in human babies from 3-4 years on and which is also observed in all great apes (including gorilla’s) and in dolphins. A kind of theory of mind is also necessary to allow real teaching.

In human societies the positive estimation a person can receive from the whole society or from at least a part of it (the clan, the family, an ideological, religious or other kind of group), is quite important for constructing self-estimation in that person. When such self-estimation is insufficiently positive, a person becomes depressed and becomes mentally ill, which implies decreased functioning in the context of survival. For example, to lie is quite a dangerous behavior. It may have proximate advantages, but the ultimate negative consequences may be important and more far-reaching, the more because trust cannot be bought. When valet cleaning fishes take mucus from the intra-buccal wall of members of other non-predator fish species, instead of taking parasites, the latter will avoid further visiting such cheating cleaning station and prefer to go to other places where the service is better. This is an example of interspecific trust. A rule belonging also to our own human ethical repertoire, is that of valet fishes having to behave honestly in order to keep clients

coming. When there is competition between honest and cheating cleaning stations, the honest ones will have the most clients, so a “moral” rule is installed by the evolutionary mechanism in total absence of any form of cognition, as is the case in the whole biological evolution (cf. the blind watchmaker, R. Dawkins). In nature, pretending to be dead and mimicry have been installed through evolution. When the cheating is not remarked (or understood as such), no problems emerge for the cheater. Instead, the cheating can be repeated for the profit of the cheater. Nearly 50 species of the family Cuculidae (cuckoos) are nest-parasites, while circa 50 other species are not. Finally, this behavior is worked out through evolution in such a way that the cheaters and their offspring have no risks. A chimp that has been beaten by another during a fight may behave as a cripple for some period afterwards each time he sees his victor, even when he is no longer suffering and does no longer show this distraction behavior when his victor is not in sight. In human societies, cheating is much more risky when it is detected, but there are a lot of situations where some cheating is used and in which it cannot easily be detected: e.g., behaving like a sick person when one is not sick, in order not to go to work. In some cases one will not tell another person the “full truth” about his/her illness at a particular moment for morally higher arguments.

13. It has been remarked that while some religions have problems in explaining the presence of evil and pain, when they proclaim one almighty and totally good god, neo-darwinism has problems in explaining the phenomenon of altruism. Those religions must claim that humans with free will make wrong decisions and are punished for that. Sometimes, the adherents say that the goodness of the god does not coincide with human goodness, or god’s thoughts are sometimes incomprehensible for humans. Such visions are not acceptable for us (apart from the fact that the non-scientific *belief* in supra-natural entities cannot get on well with cognition and rationality), because humans are not really free and because a lot of suffering has nothing to do with bad human behavior.

At the other hand, the phenomenon of altruism in biological evolution has two levels: kinship altruism and reciprocal altruism. The continuous struggle for life must end in selfish behavior, this is the idea. So, there is no room for altruism. If there is altruism, then it could have no *natural* explanation. Kinship altruism (W. Hamilton) is present in many of the animal species as parental care, where it serves

for the survival of part of the parental genes in the next generation. Of course, it also occurs in the human species. But altruistic behavior between not directly genetically bonded individuals of the same species (friendship, coalitions) as well as between members of different species (symbiosis) has to be explained as a form of mutual advantage: *if you scratch my back I'll scratch yours*, i.e. reciprocal altruism (R. Trivers). A literal example within the same species is the grooming behavior between chimps but there are a lot of symbiotic behaviors also between members of different species. The delay of executing reciprocal acts may become larger and larger, and may become a *possibility* without certainty of fulfilment. An interesting case may be the blood donation example we have already mentioned above. When a blood donor is paid directly, this is a kind of direct compensation and thus of direct reciprocity. It is the case of most economic transactions (which may be much out of balance, nevertheless). When blood donation is not paid directly, but when the donor is compensated for by receiving a pin, he is able to show to other people his nice behavior and he may expect kinds of reciprocal nice behavior towards him. It has been shown that people who receive a pin are more motivated to be a blood donor. Moreover, a lot of persons do *tell* other people they are blood donors, which means they may expect a kind of altruistic reciprocity from others who know it. Even when nobody knows about the behavior of the blood donor, he still can reasonably hope to be helped once later on, when he himself needs to receive blood, so he invests into the system in order to be helped by the same system when in need. Thereby, giving some blood is not life risking, while receiving blood when needed may be life saving. So, the reciprocity is not in equilibrium in all aspects. In the other aspect, namely when all blood donors giving blood are able to profit from the system, some kind of reciprocity is present.

Friendship bonds, when both parties know each other, are other forms of potential reciprocal altruism. They are such that the equivalence between donation and reception is not or cannot be measured. This is true for both parties and the value of these coalitions relies on its long duration, which can generate unexpected forms of aid. The repeated exchange of gifts and kind wishes over long periods underlines in a symbolic fashion the continuity of the reciprocal altruistic relationship and the wish or need to maintain it.

Other kinds of reciprocal altruism may occur between members of the same hobby club, going from

collecting stamps to poetry and music circles. The stronger the mental and ethical character of the club (service, charity, etc.), the stronger will be the readiness to reciprocal help.

The linkage in such cases is the sympathetic feeling of being motivated by the same object, which creates a bond of friendship, inducing mutual help individually or as a group against the outside world. Perhaps the degree of protection can become so strong that being a supporter of an ideology (exposed by some public or secret signs) is sufficient. So, one can help or can be helped by people who did not know directly, but with whom one knows to be linked by the same principles or values or interests. The degree of abstraction can even go further: a person can hope to obtain more estimation for his *image* even beyond his proper existence. Maybe this can help his relatives. In the artistic world it may be significant that historically there has been a shift from not signed to signed works, perhaps coinciding with larger and more open, larger and more complex societies.

But there also exist (however rarer) cases where some people remain totally anonymous in adhering to some ideology or principles involving altruistic behavior. In such cases, these people obtain a bigger satisfaction in behaving in an anonymous way, minimising calculations of their own direct profit, although profit will never be totally absent. One can feel good by doing well as such! One does not necessarily expect any reciprocity by the people or the system/society, but feeling good by doing well may be sufficient. There are cases in which there may be hidden motives, which means altruistic behavior can be considered as a virtue, a duty or a helping for his/her own salvation. *In a sense* this is pretty selfish, because the accent does not lie on being happy *in helping another human being* to become happier. Nevertheless, although the *effect* may be the same, helping another person just for helping him is considered with more sympathy than helping another person for one's own pleasure only. Of course, both forms of altruism are evaluated as morally much higher than egoistic, not helping behavior. The "strongest" form of altruism would be that in which one behaves in an altruistic way totally anonymously, and without calculating any positive reciprocal effect, and without any sympathy for its own altruistic behavior. In such a case *any* selfish profit would be absent, but I do not know of the existence of this kind of behavior at all. In fact, all altruistic behavior has a part of selfish aspect or spin off. Of course, we may admire the fact that the more

a person acts in an altruistic way the more his/her own profit dimensions are smaller, but knowing this yet can stimulate potential reciprocal help. And the person who first displays high altruistic behavior may know this! In other words, it seems very difficult to totally escape from own profit aspects by displaying altruistic behavior. This may be the case for martyrs who overtly or silently demonstrate altruistic behavior with a hidden agenda, i.e. making publicity for the ideology or the religion they belief in.

14. Sometimes altruistic behavior is proposed as an evolutionary feature that doesn't need any more specialised foundation, argumentation or justification than having blue eyes or having a language apparatus in the brain. Maybe the *faculty* of behaving morally as relatively highly intelligent social animals is present in humans due to evolution, but the *content* certainly is not and it may change within a person over the years, and may have different accents in different cultures. The same holds for languages. I merely incline to the kinship and the reciprocal altruism explanations, which fit quite well within the evolutionary scheme. Moral behavior in complex societies, i.e. behaving for the good, needs reflections and evaluation of possible effects in the short and in the long term. In non-reflecting nature *ultimate* consequences, which cannot be "foreseen" by nearly all animals that lack the knowledge (apart from humans), can be reached only by responding to *proximate* needs (drives). That is the trick used, by which ultimate "goals" are reached without any insight. In the same way marvellous adaptations of body plans to all kinds of appropriate actions in specific environments are achieved by aggregations of molecules and sets of physico-chemical reactions, which don't understand the effects they realise. Human beings can reflect on both proximate and ultimate effects at some extent and are able to postpone proximate drives for a while by using our intellectual capacities for making decisions. Moreover, we may sometimes be able to detect non-advantageous aspects at the ultimate level. Such divergences between the advantages of proximate goals and ultimate goals do not or almost don't exist in non-human behavior, I presume.

While selfishness, kinship and reciprocal altruism may be innate in a lot of species, the evaluations of these behavior may become very intricate in complex societies. The capability of reflecting on all these matters allow humans to change opinions and change their behavior in a culturally changing society. Moral goals and effects can be discussed by *using* the best scientific

knowledge available. Also in this sense, there surely is a relationship between ethics and scientific knowledge. A lot of general ethic rules are too abstract and simple in order to give quickly good solutions in ever changing societies. Agreement about moral propositions may differ when the reasoning is not correct or does not use the present scientific knowledge, or just because there is a divergence in the appreciation of some basic values. There is always a lot of tension between selfish and altruistic goals and in the division of material goods among people.

15. Humans start growing up as very selfish beings, being totally helpless for survival, following their proximate drives as emotional triggers in order to obtain attention and parental care. The limbic system is already developed to a considerable extent at birth, while the parts of the brain involving rational reflections generally become mature only at about 18 years old (note: detailed plasticity at the level of the neural synapses remains for life).

The avoidance of conflicts, shed of blood, pain and other sufferings inflicted on oneself and on other organisms that experience or that can experience such feelings, are plausible goals for survival and controlled success in producing surviving offspring.

The *feeling* of forming together a firm tight society has become more and more a problem because the initial selfish behavior is not corrected enough by training during development. In small societies where everybody knows each other and where a lot of cooperation is needed 24h/24h in order to survive day by day, year after year, the feeling of belonging together is installed easily through individual development. This increases, in an important way, reciprocal trust and solidarity and altruistic behavior for a lifetime. The hospitality and sharing behavior in poor, small societies is very remarkable, compared to the selfish behavior of people in much richer and bigger societies. In the latter education and school evaluation is much stronger and necessarily individual and it furthermore induces individualism and selfishness. Being together in a school or living together during a one day vacation trip is by far insufficient to induce the sensation of belonging together. During military service living together for a longer period 24h/24h is as a mere artifice, concerning still a small section of life, but has anyway a consolidation function, which may help to experience this feeling. Therefore, "atomisation" of the education leading to stable selfishness with a lack of willing to work together, might be corrected by civil training, living together and solving survival problems together,

both in mixed native and non-native segments of a society. It cannot be denied that we *are* social animals, but just as we have a language apparatus in the brain that has to be trained, our social nature has to be trained in order to install better altruistic behavior. It is true that very selfish people don't receive as much esteem as people who are inclined to share, and in contrast to asocial beings such as hedgehogs, humans *suffer* by being alone and not being appreciated by other people. Both *giving* as *receiving* affection gives good feelings. Individual struggle for life is one way of behaving in nature. But in bigger and more complex societies this is very risky, and it is quite unpleasant for social organisms. So, we see that in non-reflecting species, behavior expressed by communities, like in schools, troops, groups, colonies etc has already been genetically incorporated, which is remarkable for a *blind watchmaker* (see R.Dawkins, J.Braeckman). In reflective, emotionally sensible and intelligent organisms living in complex societies such as ours, the development and encouragement of cooperation is necessary. The feeling of belonging is not instilled automatically by living in the same country. It can be practiced because of rational calculation, but it only makes the cooperants feel happy when an emotional bond is installed, being affective, estimating and trustful. It is clear – also on the terrestrial scale- that inequality between members of a society and whole societies and between cultures, which are not isolated anymore by information channels, is becoming more and more threatening for everyone. It must be clear that the inequalities that exist between several societies over the globe are primary due to differences in the climates (which affect the necessity of working and creative regimes) and differences in the repartition of fertile and otherwise rich soils. These differences generate differences in working rhythms, scientific knowledge,

medical and social care as well as general life standards. A part of the differences in cultures are the result. All this matter has to do with biological survival and feelings of affection and welfare in a trustful and peaceful atmosphere. We still have to follow a long way to becoming altruistic in bigger and bigger concentric circles. The borders of these circles don't stop at the limits of mankind, but involve other biotic and abiotic surroundings. Our house is the globe, and we have to learn again –this time at a bigger scale- to treat it much more carefully. No doubt: we are at the heart of *ethics and biology* at the global scale.

KEYWORDS Ethics. Brain. Behavior. Social Biological Nature

ABSTRACT We discuss the notion “ethics”, being at the one hand a product of physico-chemical reactions in brains, and a field of reasoning around values of behavior at the other hand. Both are fully anchored in our social biological nature. What we consider to be moral behavior is not restricted to human beings. The social function of being moral in an open society is analysed.

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