

An Effort to Explain the Process of Body Formation

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(Translated from the Swedish original

‘Ett forsok till lösning av kroppsbildningens problem’)

ABOUT THE ABSTRACT

Please note: The abstract is not originally written by the author of the paper, but consists of an effort to condensate the content in a shape common to scientific abstracts, performed by a son of his. He himself was due to his unprecedented decease unable to fulfil the publication of the paper.

ABSTRACT

In this paper a model for body formation is proposed, to a large extent founded upon a biologically extended concept of 'altruism', as contrasted to 'selfishness'. Though originally selfish, cells seem to be able to act, as if there an altruistic option, available at events of deep crisis concerning the very survival of a society, as its destruction seems inevitable.

In the paper a special focus is put upon the properties of slime molds, but initially the situation for prisoners in a concentration camp during a night formation in a severe cold weather is described. Facing the common threat to freeze to death, they begin to unify as a group, paradoxically feeling joy and strength being together, in spite of the killing cold. External threats, that disable the individuals of a population from functioning, seem to release supreme, thus far hidden, functions of the individual cells, which enable them to together form a new body, on a higher existential level. However, once formed, these in turn begin to exert selfishness. Hence, it is possible to draw the conclusion that there exists a balance of forces between properties defined as altruistic and properties defined as selfish.

In connection with the process, during which cells under outer pressure unify with other cells, thereby attaining a higher state, they lose their selfishness and begin obeying the orders given by the new body. This is thoroughly being analysed in the paper.

Sometimes it can happen that one suddenly is able to see a solution to an old problem that may have existed latent within the consciousness for a long time. That occurred to me, as I some years ago read ‘The Informed Heart’ by Bruno Bettelheim [1].

The problem at hand was: Which are the necessary preconditions for cells to form a body?

In the book he describes among others [2] an episode in a concentration camp, where the author himself was imprisoned. It was that description which for me became the starting point to the association chain that momentarily created a new coherence within the problem, I had earlier only occasionally been studying, though without any result.

The episode Bettelheim describes was about a nocturnal formation of prisoners during severe cold. After twenty prisoners having got frozen to death, the order disrupted. Open resistance was impossible and it was even impossible to protect oneself. The prisoner regarded as an individual was unable to treat this problem successfully. Therefore the individual had to disappear within the mass. The threats by the guards became increasingly ineffective, as the mental attitude of the prisoners had changed. Instead of protecting themselves they became depersonalized. It appeared that the abandonment of all individual existence, thus becoming a part of the mass, in some way offered better opportunities to survival, though not for the individual, at least for the group.

In spite of the disastrous situation, the prisoners on an individual basis felt free from fear, but powerful on a mass basis. Therefore they were even happier. They did not bother, if the guards shot them. The reign of death and terror was broken. As that stage had been achieved, an almost orgiastic feeling of happiness was spreading among the prisoners.

When they finally abandoned the hope for their further survival, it became easier to act heroically and help others.

After fifty prisoners had died, the torture was interrupted. The almost orgiastic feeling of happiness they have felt disappeared and accordingly their fear returned. Every individual prisoner was now in a relatively more secure state, but he had lost the feeling of security he felt while merged in the mass.

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The decisive observation I made was that the prisoners accidentally lost their individual fear of death and felt invulnerable. But to be mentioned is also the helpfulness and loyalty that accidentally put the community higher than the individual person. They belonged for a while to a community and acted as one “body”.

It was when I had proceeded that far in my reflexions, I recalled a review in Swedish daily ‘Dagens Nyheter’ (i.e. ‘Today’s News’) a long time ago and the related debate in the newspapers. The book was ‘The last enemy’ by Richard Hillary [3].

I had not read the book myself, it was about ‘the Blitz’ over London, but through the review I got an impression about the fellowship of the pilots and their experience of constituting an inseparable unity. The few, who finally survived were unable to return to their daily life and felt still being a part of the dissolved fellowship. The reason why the following newspaper debate remained in my memory after such a long time was that nobody of the debaters wanted to understand, or were just unable to understand the statements in the book.

Perhaps they had neither imagination nor sufficient experience in order to profit by the connections, or else it was in conflict with their psychological or philosophical ideas at that time. Just in that way I remember it.

That memory accordingly constituted a kind of contrast to the description by Bettelheim concerning a quite similar situation.

The final association followed thereafter. Many years ago I had read the book ‘Territorial imperative, a personal inquiry into the animals’ origin of property and nations’ by Robert Ardray [4]. One detail had apparently remained in my memory. That was about a kind of unicellular organisms that during favourable circumstances was uniting into some kind of body. What thereafter happened to that body I am unable to recall.

By these three elements; the prisoners, the pilots and the unicellular organisms, was for me momentarily created a whole new perspective concerning the evolution.

In order to better imagine how the body formation would work, and within a body as well, I made an intellectual experiment by assuming that the cells were equipped with human feelings and reactions.

Imagine, how the cells must have to feel in order to be able to cooperate with each others and form a body, or on the whole constitute a part of a body. They must feel as either the prisoners or the pilots. In order to together be able to build a superior organism with an identity of their own, it will be required that their own respective organism and individual aspirations disappear and are substituted by a total focus upon the superior body. Their lives are now a part of the life of that body, and its life and fate is in turn inaccessible for observation by the individual cell. Hence, I imagine, a total altruism is a prerequisite to a body formation.

The individual cell in a body is exposed to the forces, which is regulating the life and development of the compound body. The world of the cell was earlier open in the process of reacting with the environment, now it is confined to its position within the body, and the cell ‘knows’ principally nothing about the outer world. The messages from the body to the cell may by that be conceived as instincts, incomprehensible but absolutely imperative.

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Those were my first spontaneous reactions within the subject. During the work and especially after I had got access to the description by Ardray, I was impelled to revise my apprehension. I understood that Ardray was treating a special case of body formation, but due to that matter of fact very usable. The whole body formation namely takes place openly.

The concept altruism is usually being used about our conscious reactions. Here it is a matter of almost molecular chemical reactions and energy transformations.

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Organisms, also cells, have a fundamental property – selfishness. That property is a prerequisite for surviving in the struggle for existence. One can rarely imagine selfish beings to function altruistically, and the very concept of altruism is therefore in conflict with the doctrine of evolution. In order to allow selfish beings to form a body it is therefore required a

“change of mind”, or a change of attitude. That was the basic thought in the idea, whose origin I have described above and it appeared to be the necessary innovation, which enabled the development of new perspectives upon the defined problem. Altruism does not exist within the doctrine of evolution. But that does neither describe the formation of a body. Hence, it may not be excluded that altruism nevertheless exists in connection with the formation of a body.

Hence, altruism - according to the definition of mine - includes that, as far as I can conceive it, it has its definite position in the development.

It arises in situations, when a development is moving towards cohesion of cells to a body, an organism of higher order, and with an identity of its own.

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The prerequisite for the genesis of my idea, i.e. my way of judging the description by Bettelheim, consisting of my memory of the pilots and the cells respectively, may very well be more or less misjudged by me, but that doesn't matter. The main issue is that these judgements worked catalytically. They forced me to conceive a whole new context. What I thus far have described was only the startling point for my thoughts. The new trains of thought put my fantasy into work, which in turn led to a further development of the idea in different directions.

Concerning my method of description I must emphasize that, as I am not a biologist, less an amateur, I neither can nor want to use terms and concepts I can not master. That means an inevitable limitation. For me the main thing is to give an account of my trains of thought, as clearly as possible.

Chapter 2.

The book of Robert Ardrey, ‘Territorial imperative, a personal inquiry into the animals origins of property and nations’[4], is treating the concept ‘territory’ extensively by different aspects and through many examples, most predominantly among mammals and birds. He describes among others territories of the perspective “society of outward antagonism, isolated and unified by the defense of a social territory” [7], and one example is the unicellular beings, which are called slime moulds [5].

The slime mould species he is describing was discovered in 1935 and researchers have since then been cogitating over their behaviour. Their history is presumed to go back as far as to the first billion years after the origin of life.

These fungi are of equal size with leucocytes and they exhibit a similar shape. They feed themselves through bacteria in humid soil. Every third or fourth hour they divide and the population is therefore increasing rapidly.

When the population has consumed the nourishment within its territory, the cells are entering into the second phase of their life cycle. They begin to form societies. Around a founding cell the others are clustering in a growing lump and cling on to the others, until they have formed a wrinkly “slug”, which is visible to the eye. Now this society of individuals is beginning to behave as one organism and it is even moving in the direction towards heat or light. Finally, one part of the society is differentiating and begins to form a peduncle, which they make stiff,

using a secretion. Thereafter the others are crawling up to the top of the peduncle, where they are forming a sphere of spores, the seed of a new generation.

That is the way of living that has been modelled about one billion years ago and that still is working.

One aspect of the social behaviour of the slime moulds (Myxomycetes) has been able to explore on a laboratory level. That is what Arday defines as a society with an external hostility, which is founded on the basis of a defense of a territory of a society.

One scientist has, according to Arday, demonstrated that the size of the society territory at a certain species of slime moulds is constant and he has proven that has been suspected for some time: that the means by which a society is being defended is a gas, which is repelling other groups to a certain distance, while simultaneously attracting the members of the clan.

An American scientist has made an extraordinarily interesting observation, which is showing that the cells are able to communicating. When they were put into a Petri dish, they were distributed as evenly in their first phase of life, as if they were repelling each others. (We would prefer to name it individual distance). When the time for gathering had come, it appeared to be, as if a signal had been given, obeyed by everyone.

Further one observation: the amount of fruit-bearing societies within a certain area is independent of the amount of individuals. In other words: if one had a thousand cells within an area, they could form ten groups, but if one had ten thousand, they would still form ten groups. The societies were in some way a function of the space, not of the amount of individuals.

Chapter 3.

Free cells are individuals, which obey certain conditions, they reproduce themselves, they are reacting directly upon the environmental pressure, they bring nourishment, they are selfish and they have an identity of their own etc.

The same conditions were fulfilled also by free bodies and one could probably think of a suggestion of a further higher level, even though it appears that the "technical" opportunities to function as an independent individual are restricted. In this respect I think of insect societies. Their identity as individuals seems to have restricted opportunities to develop and function.

Some elementary characteristics are accordingly returning on all three levels, in spite of the otherwise huge differences. To designate cells individuals maybe all does not agree to do, even less to designate insect societies individuals. As a common definition for these both and for bodies I therefore choose the expression "biological individuals".

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Arday is dealing with the territory behaviour of the slime molds and is classifying it as a society with an external enmity, founded upon a defense of a society territory. But the definition concerns only the development until the signal. The description of the continuation in phase two is namely showing a phenomenon of a completely different kind, according to

Ardrey “a society built up by individuals, who are behaving a one sole organism”. It is even moving towards heat or light and is emitting spores.

A body-like society is something completely else than a territory. I on my part am interpreting the course of events in phase two as the forming of a body of the simplest kind.

The territory of the slime mold is differing from other examples of territories in the book by Ardrey, in that the territory is treated as a necessary preliminary stage in the body forming, which will follow. It is not only a gradual difference between phase one and phase two at the slime molds, it is a specific difference. The slug is something completely different than the territory of phase one, just as the insect society is something completely than a collection of unorganized insects.

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The starting point for the following scenarios is the situation that can be assumed to have existed with the slime molds in the beginning of their development a billion years ago, short before the next phase in their development, phase two. Let us assume that they had developed so far that they were living in populations, having territory borders approximately in the way Ardrey has described with respect to phase one.

The situation for one cell in the population is about similar with that of free cells, which are living without belonging to a territory population and may very simplified be described, according to the following figure.

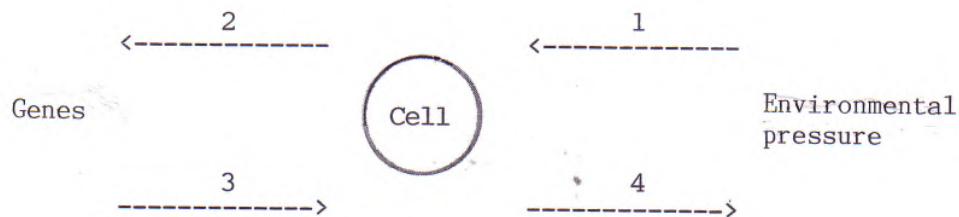


Figure 1.

The picture is referring to the forces that are affecting the external existence of the cell, i.e. in its physical property as a biological individual. The arrows are numbered 1 to 4 and indicate the direction of their influence. I have here left out of account the effects of mutations.

The activities of the cell are driven by the reproduction and the supporting of life which is to be regarded as the motor of the system. It is reacting upon changes in the environmental pressure (1), which implies changes in the gene set (2) and hence affecting the cell (3). The cell may in exceptional cases affect the environment (4). The environmental pressure is a

modifying element in the system. The genes are passive instruments and are lacking a direct contact with the environmental pressure.

Regarding phase one there are some issues that deserves mentioning.

The behaviour of the cell is similar to that of other free cells. The life within a population of a territory also implies that the cell has some properties, which are related to the common population. For example: Everyone is emitting a gas that is repelling other groups until a certain distance, while simultaneously attracting the clan of its own.

As a hypothesis I propose the following scenario: A catastrophe situation is presumed to arise for the first time, caused for example by the gas barriers, which have become too strong to be broken. The highest desire of the cell is to be moved to better hunting grounds, but it is being stopped by these gas barriers. The cell is forced towards a collapse and is unable to react upon the environmental pressure. It seems to be an insoluble situation; its selfish opportunities to survival and reproduction are being eliminated. The situation thus arisen can be illustrated using the following figure:

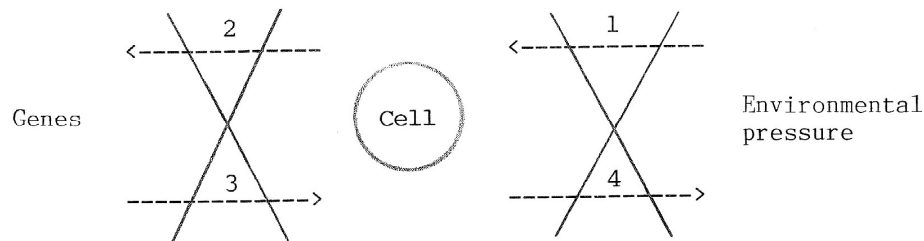


Figure 2.

When the catastrophe has achieved certain intensity, a momentary reaction will take place, which is setting the cells into an altruistic state. The visible result is that all the cells are gathering in a lump and commonly begin to form the slug.

The cells are thus momentarily being transferred from selfishness into altruism, while simultaneously a kind of superior function seems to arise that enables the cells to cooperate in order to attain the goal they are individually unable to achieve.

The state after the transformation to phase two can be illustrated accordingly:

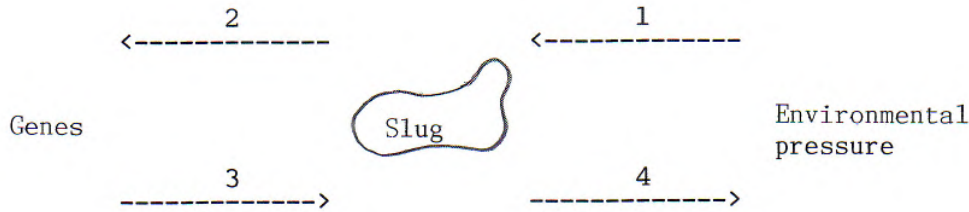


Figure 3.

The figure is showing that now the slug is the biological individual and that is affected by the environmental pressure. The individual cells are apparently no more selfish but altruistic and governed by the superior function and hence, are in phase two no more biological individuals. Through the interaction of the superior function with the environmental pressure it has finally arisen a new kind of body, but very incomplete.

A catastrophe situation of some kind seems according to the hypothesis of mine to be a prerequisite for phase two to be able to arise.

One would judge the description by Ardrey that at first a cell overcomes the inner resistance against a change and in this connection is launching the momentary process in which the cells become altruistic and which leads to the forming of a body on a higher level than the cells. This body is ruled by a superior function that takes over the responsibility for the reproduction of the cells.

Body forming does not differ from other phenomena within biology. In that process the selfishness of the individuals are removed and she is able to act against her sound, selfish instincts. It is a question of a transfer between two completely different states, two different levels of life.

Thanks to the superior function the cells are being liberated from their selfishness and from the struggle for their personal existence, which ought to mean a relief, and that relief seems to release forces that have been bound by the struggle for existence. That struggle has now been taken over by the superior function. That, as I have expressed as “relief”, is a part of the necessary “change of attitude” of the cells, which I presumed in the introduction.

The situation can be compared to that of Bettelheim’s prisoners. Their unbearable situation brought finally about a spontaneous, though occasional change of attitude with them. An occasional superior function, “the mass” of Bettelheim’s prisoners, relieved from the prisoners their personal worries and they became a strong experience of euphoria, of relief. They were hereafter no more bothering for their own fate, but had the powers to help others. A reaction with that meaning may have occurred on the simpler cell level.

“The mass” is a word that can give wrong associations. “The superior function” is better; it shows that it is a question of an individual of higher order that is functioning thanks to the altruism of the individual cells.

In the common sense the slug is no body. It has been formed by free cells, which thereafter are no more being divided. [8] It does not have the opportunities of a normal body, an almost unrestricted ability to chemical control, DNA control, as the biologists are describing it, through which a coherent system of tissues and functions gradually are being formed. The superior function can in the case of the slime molds hardly affect anything else than the behaviour, and that circumstance has defined narrow borders for the development opportunities of the slug. The weak development of its identity thus depends on the fact that effective means for management of the functions of the cells thus are impossible and that the cell division of cells has ceased.

The development of the slug takes place through successive changes in the behaviour of the cells in connection with the interaction of the superior function with the environmental pressure. The more appropriate types of behaviour have a higher survival value for the slug and therefore the behaviour of the cells are being changed with time, and hence the form of the slug and its behaviour. One can imagine that in the beginning there was a formless cell lump, which called by a signal broke the gas barriers of its neighbours.

A consequence of that development is that all cells must master all necessary types of behaviour; they must be able of functioning at all the places within the slug.

Chapter 4.

The description by R. Ardrey of the development of the slug is apparently completely unobjectionable, but on further consideration one finds unexplainable phenomena. It is a question of a process that has to result that the forming of a body on a higher level than the cells of which it has been formed.

Neither phase one nor phase two means in itself any problem. It is a question of an amount of selfish cells, which are living in territories and in phase two it is has reference to a very simple body. Neither of those phenomena consists of anything new, but it is the transformation between them, that is unexplained.

What requires an explanation is the presence of the latent altruism that according to my assumption has developed within the territory and which is being activated in connection with the rise of the level and that has to result the forming of a body on a higher level. How has this higher level been able to develop in a territory population consisting of selfish cells and what kind of force has caused the rise of level?

Darwinism ought to imply that cells regarded as individuals only can have selfish properties and that they not shall be able to act in an altruistic way. It can also be expressed that biological individuals not by their own force are able to act altruistically and thus transform into a higher level with an unselfish cooperation.

These selfish cells thus behave after the level rise in a way that has not been predicted in the theories. One may again make reference to Bettelheim's prisoners. Was their change of attitude something that was accomplished by their selfishness, something that they intentionally and consciously decided to carry out, and if it was not so, from where came their change of attitude?

Altruism according to my definition in chapter 1 has reference to that which arises in connection with the forming of a body. This kind of altruism means that the cells are being sacrificed when the body dies, except for the cells of reproduction. Through the mediation of these the complete genetic matter can be transferred to the next generation.

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I return to the situation I described in the preceding chapter and that was illustrated by three pictures.

That course of events seems to be in conflict with the principles of Darwinism, there arises altruism. That altruism is clearly demonstrated in the description by Ardrey and can not be denied.

In the state being established after picture 2 the history ought to have reached an end and the experiment turned out to be unsuccessful, at least if one sticks to what Darwinism is teaching: "Yet Darwinian theory advocates no higher principle beyond individuals pursuing their own self-interest – i.e. the representation of their own genes in future generations." [12].

In the catastrophe situation I have assumed, apparently some unknown force has affected the territory, thus creating a latent altruism that finally has brought about the momentarily transfer from the lower state of life to a higher.

Here is embedded a difficulty for the thought that is not easily overcome. If regarding the chain of events from the perspective of the lower level, that of the cells, the higher level and the transfer into it seems to be unexplainable, it is impossible to concretize for the cells and that is a general experience. The presence of different levels of life is nonetheless something that awakes many questions

In order to give a concrete form to the impossibility of a cell perspective upon the body, one can as an intellectual experiment try to familiarize oneself with the situation of a cell, situated in its context within a body, for example an eye. I have chosen my example from normal bodies; it is difficult to give a concrete form to something within such an incomplete body as the slug. The cell has its very restricted and local task; it obeys the instructions from the superior function, i.e. its programming. It is not able to have an apprehension of the context where it has its task, not about the outer world, not even that an outer world exists. Its apprehension is restricted to the phenomena of the cell world. And, if it, e.g. due to a mutation should lose its altruism and become selfish; the whole coherence of the body would appear to be meaningless and maybe hostile.

That it all does not seem to be in agreement with the doctrine of evolution appear to be obvious, or rather, it is a question of phenomena that are not being considered by this doctrine.

The behaviour of the cells does thus not agree with Darwinism; here it is a question of a jump in the development that is incommensurable with that theory. Accept then that exception from

or addition to the doctrine of evolution by restricting its validity to biological individuals, directly subjected to the environmental pressure!
For individuals in the process of forming a body and for individuals in a body other laws are apparently other laws valid.

Different experiments that have been performed in order to solve the problem of body forming assume as something obvious that it is a question of a continuum – a continuous development from simple collections of cells to functioning bodies. In that case there is no need for the concept of altruism, which does not belong to the doctrine of evolution. My starting point is that selfish cells can not form a selfish body, if first not their selfishness has been eliminated. They must in other words first become altruistic. Altruism as an inescapable element of life does not belong to the doctrine of evolution and my claim constitutes therefore a departure from it. But the basic selfishness of life is not questioned, which can easily be shown.

I test a hypothesis, a guess among many; perhaps this can simplify the equation. The slug is obviously beginning its development from zero and its situation is therefore maybe comparable to that of the hypothetic first molecule, as one would imagine it. Its properties are the reproductive ability and selfishness. All that has thereafter been developed can be derived from those properties and from the interaction of the first molecule' with the environmental pressure; all abilities which are required in order to survive.

One can approach the problem by investigating what the phase-one cells are losing in connection with the level rise and what is originally characterizing the slug of phase two; i.e. which properties that have been eliminated with the individual phase-one cells and which properties that have arisen in the common body. It is obviously the reproduction that is now managed by the slug on behalf of the cells and selfishness, which is characterizing the slug, the cells simultaneously being altruistic.

These are the properties that can be supposed to have characterized the hypothetic 'first molecule'. The new specimen on a higher level than the cells has to begin from the same situation as the 'first molecule', hence from zero and the cells are now only important as constituents and instruments of the body.

The cells are physically unchanged.. It is in connection with the level rise only a question of a "change of attitude". What later undergoes a change is only their behaviour.

Ordinary properties do not change momentarily; they are stable on the short or the long run and can become changed among others due to the environmental pressure. Selfishness and altruism, however, can not be counted among these ordinary properties that can become an object to a development. Here it is a question of a transition from a free state at a lower level to another, controlled state at a higher level. That a change of state takes place momentarily and not through a successive development demonstrates that it is not a question of ordinary properties.

The selfish slug hence exists on a higher level than the selfish cells of phase one. It is not in any case a question of a transfer of properties from the cells to the slug. "The active force", whatever it is, has created a genuine identity. The cells still have their identity as cells, but they have lost their selfishness; they are altruistic, controlled by the superior function. The cells have made over to the slug to resolve the reproduction problem and can no more exist

separately. There is no turning back and they have only one task, to obey the orders of the slug.

This model can be imagined to be effective for the slime molds, living in a territory, and with the same signification but realized in other ways it can be assumed to be valid in other cases of body forming.

Chapter 5.

As I have described earlier, the territory population of the selfish slime molds, consisting of biological individuals, after the level rise into an altruistic state and re forming a slug that is a biological individual and, hence selfish.

Hence, the selfish cells in the territory are thus being replaced by a selfish slug. One would express it that the sum of selfishness during that level rise is constant. But something analogue would also be said about the altruism of the cells of phase two: the sum of altruism of the slug cells can possibly be assumed to be equal to the selfishness of the slug but of opposite value. (The problem is then only that it is difficult to think of any method that quantitatively measure selfishness respectively altruism.).

That would maybe be expressed more generally: The selfishness of every biological individual can be assumed to balance the altruism of all its parts. An evident conclusion of that would be that altruism without a corresponding selfishness could not exist and vice versa.

Totally, the reasoning would imply an image of balance. And according to my reasoning, altruism should be an equally essential part of nature as selfishness. It is an inevitable part of the construction of every biological individual.

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An effort to make definitions

- Selfishness is a necessary property of biological individuals on every level.
- Altruism, or its equivalent, of cells of normal bodies, is a necessary property of non-biological individuals of every level and that belongs as parts to a biological individual of higher order and which are ruled by its superior function. These non-biological individuals are only indirectly subject to the environmental pressure, mediated by the biological individual of higher order.

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The hypothesis of equilibrium between selfishness and altruism gives an opportunity to further develop the conceptual understanding of what happens in the interval between phase one and phase two. One may assume that as the latent altruism is growing within the territory population, on the higher level latent selfishness is growing simultaneously with the new selfish identity

When the collapse of the cells has become total and their selfishness thereby has been set to zero, a change will take place. The new, selfish identity will be established on the higher level and the cells become altruistic and ruled. The level rise has been completed.

Hence, the latent altruism can not be regarded isolated from the corresponding latent selfishness on the higher level; that follows from the equilibrium hypothesis. Here equilibrium must rule.

It is hence the fundamental properties of the cell, selfishness and the reproductive ability that arise on the higher level. But it only the fundamental properties, the properties of the hypothetical “first molecule” that prevail; everything else that has been added during the development of the cell, e.g. the territory period, remain at the cell during the level rise. At the slime molds is hereafter the behaviour successively being changed. The slug begins from zero as I have mentioned earlier and it creates the properties of its own, which the cells are unable to perceive.

Chapter 6.

It is just during the change between the phases that it seems not to be in accordance with the doctrine of evolution that the process begins, which is resulting in a level rise. Before this the cells are biological individuals and are subjected to the environmental pressure. After this they have disappeared from the “world of Darwin”. They now belong to a closed system as parts of a body and are altruistic.

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The two phases exist more or less independently of each others. One may think that the superior function, which is affecting the behaviour of the cells in phase two and the development of the slug body as well, also is influencing the whole development of the slime molds, hence also over the territory population of free cells in phase one, but that can not be the case. The two stages, represented by the cells in phase one and the slug in phase two respectively, belong to two different levels; the two phases are existing independently of each others, though through interaction, in order not to disturb the balance between the phases.

Hence, an indirect interaction takes place, an interaction that is keeping the territory within the borders, which can be accepted by the superior function in phase two. What is negative to this is damaging the whole process and can not continue to exist. A corresponding situation is existing for phase one.

The course of events can be demonstrated using a figure that is showing the development during one generation cycle, from cell to territory and signal and to slug and spore release.

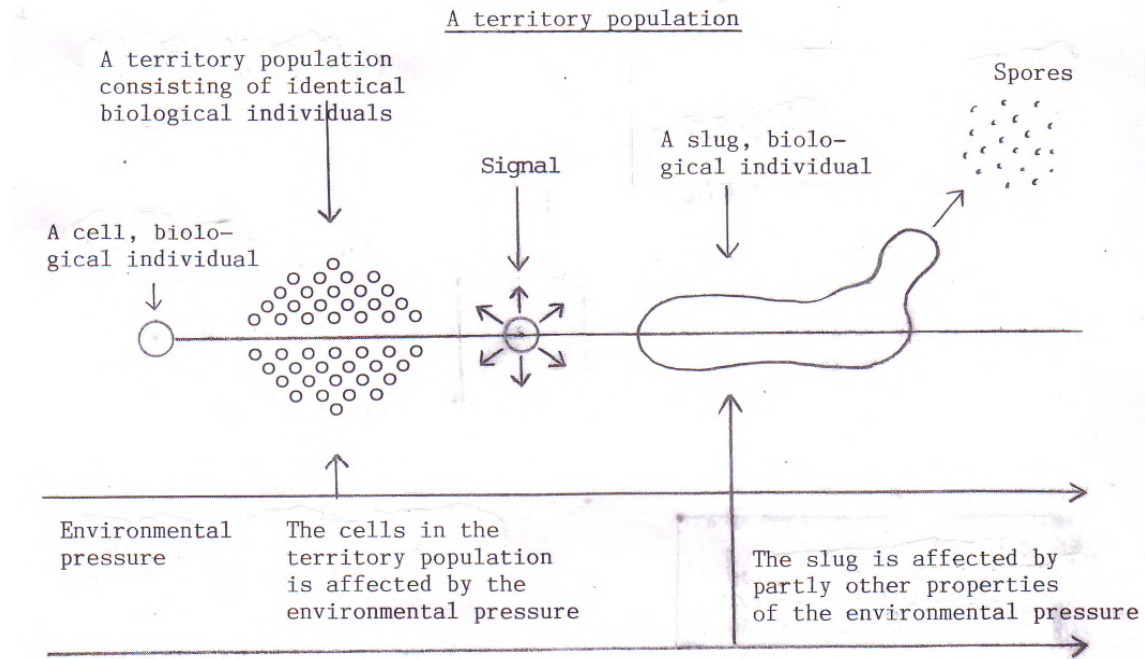


Figure 4.

The behaviour of the biological individuals in phase one is affected only by the environmental pressure, not by the superior function in phase two. Only the slug cells are affected by its superior function. The behaviour that is being developed at the cells in phase two can only be manifested within that phase. It can also be different forces and phenomena within the same environmental pressure that are affecting the different phases. The territory is a development unity, which through the level rise is kept separated from the next development unity, the slug.

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The slime molds are not being split up after the level rise. That causes the slug development not to differ from that of normal bodies. The physical nature of the cells is very likely not being changed after the signal; they are suited to the life in the territory. The slug body is built up by the existing cells.

Earlier stages of the change of the behaviour of the cells will presumably be eliminated, when new, more adequate behaviours arise. When the slug is being created, it happens due to the actual ways of behaviour and no correspondence to the fetus development of normal bodies can hence be observed here.

One can imagine that the slug body is represented by an "inner plan" within the programming of the cells.

The activity of the slug presupposes certain simple functions, different in different parts of the slug. According to the hypothesis of mine, the cells master all existing functions of the slug and are activating those of its behaviours that correspond to the position they occupy in the slug after the level rise.

Therefore, the formation of the slug occurs rapidly and without roundabouts.

That is all what the superior function seems to be able to accomplish, given a certain number of identical cells.

Chapter 7.

When the slug body has been built up it constitutes a biological individual and is reacting upon the environmental pressure. How are the cells being ruled by the superior function, i.e. how is its “will” mediated to the cells?

In normal bodies the influence of the superior function is mediated by chemical feedback, chemical signals of different kind among others.

Within the slug there can hardly exist such in a developed manner. It is difficult for me to imagine that the slug would be able to develop any simple function that would correspond to functions of normal bodies, but I can neither exclude it.

It is hopeless for me to try to come any further in the discussion and to establish any scenarios concerning the slime molds. I have to restrict myself to state that the operation control from the superior function is functioning through some chemical or other communication that in turn causes the slug to continue its simple program.

Even the reactions of the cells upon the communication of the superior function ought to be investigated. There must be something that at the slime molds is substituting the management of normal bodies. Which force is activated? How are the cells being activated?

As a hypothesis I can propose e.g. the following: At the cells maybe such a force can have been established in connection with the level rise and the transition into altruism. The example with Bettelheims prisoners may point to a part of the answer. When their situation became catastrophic they abandoned their selfishness and became altruistic. They were captured by an euphoric feeling in that they gave up all their private concerns and that feeling sufficed in just that case as long as the catastrophic situation endured. A correspondence to that feeling on an elementary, almost molecular level can have developed among the cells and became activated in connection with the operation control by the superior function. This hypothetical euphoria on the molecular level may be the “reward” the superior function is using in order to manage the cells. (Cf. Ch. 11). The both examples seem to that extent similar due to their basic elements that maybe one has to search for the explanation in that direction.

Our activities we use to describe in terms of behaviour, even though it is obvious that everything has an outermost ground. It would be considered meaningless by us to search for the molecular biological connections in human actions. It is therefore, according to my opinion, not wrong to describe cell activities in connection with level rises in terms of behaviour as long as their behaviour can be discerned and judged. I think that this is possible just with respect to the level rising activities of the slime molds. Therefore I have made some intellectual experiments starting from their hypothetical feelings and consciousness.

The degrees of freedom of these cells are a necessary prerequisite for meaningful intellectual experiments to be performed. The functions of normal bodies on the contrary can not be elucidated similarly through feeling insight or observation and the reason is that everything occurs conformable to law, without degrees of freedom.

Which conditions are valid for the relationship between the cells and the superior function? As a hypothesis one might think of the functions of the cells as divided into an external and an internal side, which does not mean that those parts shall be regarded as physically apart, but with respect to their functions. This division can facilitate the understanding of how the slug is ruling the cells.

The external part of the slug includes these reactions upon the environmental pressure. At the external part of the cells the environmental pressure is being replaced by the rule the superior function is performing. How about the internal side of the slug then? To this I count the communication that takes place to the external part of the cells.

When I am talking about “rule” and “actions”, it is of course a question of programmed courses. That can become changed over time according to the doctrine of evolution.

Because the system includes degrees of freedom one can allow an intellectual experiment concerning the consciousness of cells and bodies. That hypothetical consciousness would be thought of as existing within the external part of the slug and be due to the environmental pressure. Besides, in that case also a corresponding consciousness would exist with respect to the impulses from the superior function of the slug.

The cells perceive the slug only through its rule, its “orders” which they perceive as instincts. Any apprehension of the slug as such, or of the outer world with respect to the slug, is not conceivable by the cells.

The contact between the slug and the cells is one-way, from the slug to the cell. Contacts in the opposite direction are not possible, since the slug belongs to a higher level.

The relationship between the external and the external parts of the slug and the cells respectively can be visualized through the aid of Picture 5. The whole lapse is contained within every cell, but by practical reasons it must be recorded with the slug and the cells separated.

In the picture it has been marked that the communication is one-way.

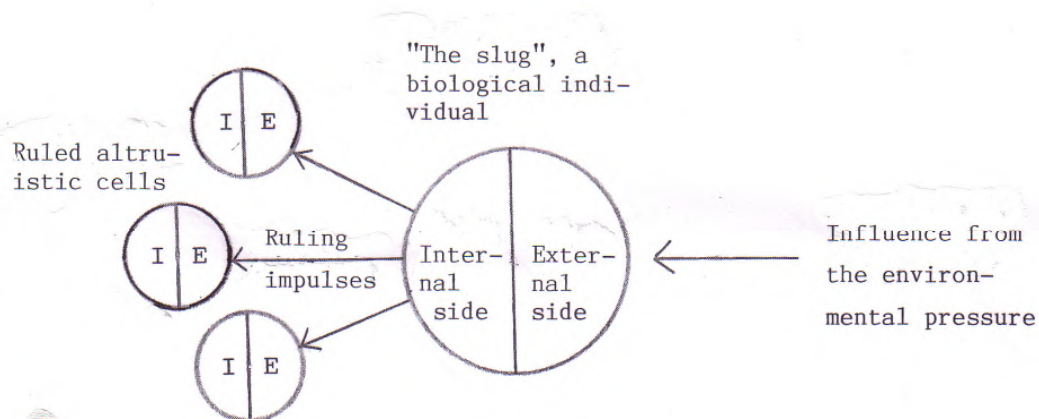


Figure 5.

Chapter 8

The slime molds are during the first phase a territory of selfish cells and that stage endures until a situation, when a catastrophe situation is creating an opportunity for a level rise. The cells become altruistic and they become ruled by the superior function of the body. After the level rise the cell division ceases.

According to the hypothesis of mine, after the level rise there are at the cells of normal bodies not the same situation at hand as at the slime molds. Any division of cells does not take place at that stage. Here there is occurring a development of the same kind as at the slime molds. Different modes of behaviour are being developed, depending on the position of the cells within the body. As is the case with the slime molds, all cells are mastering the same set of behaviours.

According to my hypothesis, these behaviours are the origin to the different subprograms that, after the DNA has begun functioning, together are forming a complete body during the fetus development of normal bodies.

From Bonner [9] I have picked up that the very first stage of the development at animal fetii are characterized by a period, when the different parts of the embryo have the same potential. And Lennart Nilsson and Lars Hamberger [20] write the following: "If examining the surface of the perikaryon (cell body) carefully, one can observe that almost no cell looks like any other." This is what is used to be called cell division. Up to a number of eight, they are all similar and do all the same thing. "How does then every cell then know what it shall become and to which organ of the body it shall belong? Herein is still one of the great mysteries of life embedded..." (I am here citing the text. It has since 1990 been shown that the number of cells usually is 16).

The level rise of normal bodies is likely occurring momentarily, as well as in the case of the slime molds, but that is not equally observable. What has caused the level rise of normal bodies is difficult to know.

This territory phase of the slime molds, with numerous cells, corresponds in the case of normal bodies apparently to a few cells before their level rise. I am here referring to the figure in chapter 6. What I believe I have succeed in explaining with respect to the slime molds in phase one ought - in spite of the differences in the other respects- to be applicable upon the few cells of the normal bodies during phase one until the level rise. Phase one constitutes a lower level than phase two and the cells of phase one are biological individuals and, hence, object to the environmental pressure. Furthermore, in both cases holds that the cells before the level rise are identical and both contain the whole program for the following body formation.

At the slime molds it does therefore not take place any cell division after the level rise and the body formation does not use identical cells and these can neither be physically changed after the level rise. A change of the physical status of the cells is, as far as I can understand, possible only in the case of cell division ruled by the DNA. By this reason it is only behaviours that can be developed here. According to the hypothesis of mine, all the cells have

in their program a common pool of the behaviours required for the different parts of the slug. The program can be thought of as an inner plan for the build up of the slug according to which the cells are enforcing the different behaviours that are being needed in the different states of the slug. As Arday writes: “Around a founder cell others will bunch in a growing aggregate, clinging together until they have formed a sausage-shaped slug visible to the naked eye”[6]

and these have become

its simple functions. The whole development has gone very fast

- * -

The following discussion is intended to clarify the comparison between the different bodies:

A population is a necessary prerequisite for a level rise, since it means that an amount of lower organisms is forming a higher organism ruled by a superior function. Therefore in normal bodies first some cell divisions must occur in order to let a population arise that can perform a level rise. The minimal amount of cells in a population will therefore be two, which I find is lowest possible. In that case we know that it is a question of about eight cells within the population of normal bodies before the cell differentiation.

That means that at the starting point for the level rise it is a conformity between the slug case and the normal case – the level rise of both of them is beginning with a population of normal cells that all is carrying the whole program.

Why must the eight cells be identical, not only in a physical sense, but also with respect to the program? Yes, the starting point is a cell that is carrying the whole program. In connection with the cell divisions that thereafter have occurred during faze one there is no opportunity for those eight cells to have been differentiating themselves with respect to the program, since they belong to phase one and there they can not have been involved in the program that has to be realized after the beginning of the level rise (cf. picture in chapter 6). Hence, all the eight cells are carrying the whole program after the level rise. But each of them can only fulfil some parts of it, just as the slime molds have whole their behaviour program but can only fulfil the parts that are corresponding to their position on the future body.

Here it is a question of a situation that with respect to its consequences corresponds to the “clinging” slime molds that from its total program is activating the behaviours, which is being required at every position on the future slime mold. That shows that in those respects there would be an analogy present between the both systems for body formation, implying that the eight cells chose to fulfil different parts of the total program. The answer to the question that was being cited above – “How does then every cell know what it shall become---“ would then be: Before the level rise the cell does not know what it shall become. That is being decided after the level rise..

The eight cells are then in the same situation as the population of slime molds were after the level rise, but the continuation must be different due to the different preconditions. The difference is among others that the eight cslle now is beginning a long development through cell division, ruled by the DNA in chronological order.

For both the slug and the normal body it seems to hold that they are beginning with a selfish cell, that the body formation is initiated from a population of selfish cells and that the final

result is a body on a higher level. And so it is working not only the first time. It is being repeated in every new generation; always this change at the cells from selfishness into altruism (or chemical operation control) in connection with the body formation. The participating cells are responsible for the level rise under the influence of the development forces and they are biological individuals; after that they are included in a selfish body and are being ruled by a superior function and they are altruistic or chemically managed.

Chapter 9

In the books I have had access to I have searched for data about different theories about body formation.

In the book by Stephen Jay Gould, 'The Panda's Thumb' [13], 1987, the author is studying the genesis of multicellularity at animals. But it appeared that the problem that was dominating his essay was the origin of different animals and relationship. Very little is mentioned about different theories about how multicellularity may have arisen.

According to Gould [14] there are only two established scenarios for body formation, but regrettably neither has been treated exhaustively. In the first scenario, called "the melting", one group of protist cells were brought together. They began to live as a colony, developed a division of labor and developed finally an integrated structure.

In the second scenario, called "the section", there arose cell departments within one sole protist cell. (A third conceivable scenario, repeated inability at the daughter cells to part after the cell division, has nowadays few proponents.)

I have not been able to comment the above as I am lacking the relevant knowledge. But I can barely believe that the problem body formation would be solved according to these guidelines.

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In 'The Ideas of Biology' by John Tyler Bonner, p. 25[10], the transformation into multicellularity. "Why did single-celled organisms become multicellular? Why is it, if some groups found the unicellular existence so permanently advantageous, that all groups did not stick to it? The answer probably lies in the matter of the increase in size. Larger organisms can do things that are not possible for smaller ones; they live in different ways, and by becoming large a new world with new opportunities opens up. (...)"

Among the living multicellular organisms we find an abundant variety of different and from each others separated endeavours to increase the size.

That is interesting but does it not mean that the transformation to multicellularity also is being urged on by these efforts for larger size; behind the transformation into multicellularity there are presumably other causes.

Bonner describes further additionally on p. 121[11]: "Put in another way this means that originally a multicellular organism was a collection of unicellular organisms that were physically attached, but eventually, through selection and the need of improved efficiency of function, the division of labor became marked so that the individual cells were no longer separate organisms but part of a new, larger, and more complex organism. If one were to

examine cell colonies that exist today among the algae, the protozoa, and other aberrant groups, one would find every intergradation from groups of individual unicellular organisms that seem accidentally stuck together to well-integrated yet primitive multicellular organisms. This kind of observation leads to the old question of what is an individual, and the answer seems to be that there is no sharp division line between a group of cell individuals merge to form a true multicellular individual; there is a continuum between the two extremes.”

On p. 28 [8] Bonner writes: “The more successful method of increase in size is to have a series of cells stuck together in a true multicellular organism. But even this can be done a number of ways: the cells can divide and the daughter products fail to separate, or there can be an aggregation of separate cells. Only the former has given rise to higher animals and plants while the latter is found, for instance, in a curious group of organisms called the cellular slime molds. Here amoebalike cells grow first, and these aggregate into cell masses after they have finished feeding.”

He thereafter describes the following process that strikingly resembles the behaviour of the slime molds of Arday.

Any viewpoints upon the causes behind the body formation is not being given, except for the striving for increased size respective a development regarded as passing continuously from simple cell clusters into primitive multicellular organisms.

- * -

The statements that Dawkins has recorded give more motivated explanations to the body formation.

In “The Selfish gene” [16] is among others following stated: “Both animals and plants evolved into many-celled bodies, complete copies of all the genes being distributed to every cell. We don not know when, why, or how many times independently, this happened.”

Some authors use to use the parallel with a colony and are naming the body a cell colony. Dawkins himself prefers to think of the body as a gene colony and the cells as comfortable and practical working units serving the chemical activities of the cells.

Even though the organisms are gene colonies, they have undisputedly attained their own individuality with respect to their behaviour. An animal moves as a coordinated whole, as a unity.

The selection has favoured such branches that are cooperating with others. The intensive competition must have rewarded central coordination rather than anarchy within the common body. Nowadays the intricate, mutual co-development between the genes has gone so far that it is no more possible to identify the individual machine of survival due to its collective properties. Practically, it is generally most comfortable to approximately regard the individual body as something that “tries” to increase the amount of all its genes for future generations.

And in “The Blind Watchmaker” [18]: “It seems that, once the eukaryotic cell had been invented, a whole new range of designs became possible. Most interestingly from our point of view, cells could manufacture large bodies comprising many billions of cells”.

“A major step in evolution was taken when cells that had been produced by successive splittings stuck together instead of going off independently. Higher-order structure could now emerge,...”[19]

- * -

When reading the accounts of Dawkin I find rather much worthy commenting. The constant picture is that the development from cell to body is described as free from conflicts, almost always occurring almost by itself.

The idea of a cell colony is very close and seems to be the closest one can come concerning the active forces within a body. The word ‘cell colony’ gives an apparent impression of clarity. But it is impossible to derive sufficiently strong forces from the colony concept that are able to account for development and reproduction. A colony is a phenomenon that is lacking a sufficient identity of its own.

Proposals to replace the concept ‘cell colony’ with ‘gene colony’ are a track that can lead wrong. The cells are something more than working units for the chemical activities of the genes. It is the cells and not the genes that are actively being involved in the level rise process.

The obvious starting point for the solution of the problem of body formation has been the doctrine of evolution. Therefore it is often being spoken about that the selection has favoured genes that are cooperating with others and that the intensive competition has favoured central coordination to anarchy within the common body.

That there exist cells and bodies everybody knows. It seems therefore natural so imagine that “it only happens” when a body is forming. The problem is not visible.

The hypothesis of cell colonies is hence not completely satisfying; it does not contain any explanations why, it is only question of giving a name, a heading to an unexplained phenomenon.

Any hypothesis about how the body formation might have come about is accordingly not to be found in the account by Dawkins, but only notions about cell colonies and an effort to apply the doctrine of evolution upon the problem of body formation. But that way is, as I have shown earlier, not practicable.

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Chapter 10

In chapter 4 I had not been successful in defining what was causing the level rise, even though I had described the course of events rather clearly. It seemed mysterious and I had therefore used the formulation “some unknown force” and “the active force, whatever it was”.

I had not been able to concretize the phenomenon and I was at that moment unable to see the “simple” explanation that there were some inherent properties of populations that brought about the level rise. Even though I had been able to localize the effect, it is not for that sake less difficult to explain.

- * -

I have given account for three cases of body formation. The first example was the temporary level rise that prisoners of Bettelheim experienced, as they had been subject to a catastrophe threat. That sudden level rise that was manifested by their ‘almost orgiastic’ feeling of happiness endured as long as the threat persisted. According to my point of view, the experience of the prisoners implied the origin of a temporary “body” with a temporary superior function.

This kind of events is very likely not rare in the nature among populations facing an imminent threat and the reaction may possibly have the effect that the population is being saved. Thus far it is a trivial, generally applicable phenomenon. Any permanent body formation is not possible here but it is important to state that the reactions of the prisoners correspond to the opening part of the body formation that is being described in chapter 3.

From the example above it is also shown that the options for a population to transform into a higher level is not dependent of genetic identity of its members. Instead, it is a prerequisite for a permanent body formation.

The two other cases are only concerning permanent body formation. Even here it seems to exist the same starting point as for the prisoners at the start of their temporary body formation: a population facing an imminent threat of some kind.

These three examples would give rise to the hypothesis that populations get properties that go beyond what specific individuals can perform. These can according to the doctrine of evolution only perform selfishness and hence, it is impossible to draw any conclusions from the properties of individual cells, as they belong to a population. Individual members of a population would therefore under the influence of a catastrophe situation be able to make a transition to an altruistic state at a higher level and with a superior function that is ruling their behaviour. This is something new beyond the doctrine of evolution, an opportunity that is being opened for life, a leap in the development.

That altruism is a consequence of the process of level rise. The selfishness of the recently formed body must be balanced by the cells that become altruistic (cf. Chapter 5).

The opportunity of a level rise for populations, with the phenomena that follow, is not in accordance with the doctrine of evolution; it may be regarded as an appendix.

There is a complication concerning the ability of populations for a level rise – they can not by an effort of themselves make a transition to a higher level; it would be equivalent to lift oneself in the hair.

The process seems to be unable to start if not first its members have been subject to a superior pressure; the catastrophe threat is a necessary part of the process. It must therefore exist an externally entering and of the population itself independent threat in order to trig the process. That is an independent precondition for al level rise. Common for all the three cases is also that the threat can not be eliminated through escape. The populations are not enclosed within boarders of some kind that not without further notice can be forced.

In the case of Bettelheim’s prisoners it is the imprisonment within the camp that constitutes the boarder and the behaviour of the matrons that is triggering the reaction. That reaction

implies the origin of a very temporary body. Any solution to their problem is not to be found here. When the threat came to an end, everything was returning rapidly to the original state.

A necessary precondition for the appearance of a lasting body formation is that the catastrophe threat can be repeated in all the following generations. This recurrence of the catastrophes is an unavoidable link in the chain of events and is built in to the system of lasting bodies. It seems to be balanced, hence disturbances are avoided.

What is happening during the initial phase in connection with normal body formation is difficult to observe. As a hypothesis one might imagine that the boarder consists of the membrane that is enclosing the first cell and within which even the cell division must take place. After some cell divisions the situation becomes precarious and thus the catastrophe is necessitates a level rise.

Of the membrane of normal bodies were to get weaker or stronger disturbances would arise and if it should disappear no body formation at all would take place.

Among the slime molds the catastrophe occurs according to my opinions when the nourishment of the cells has been consumed and the individual cells are unable to exceed the boarder of the territory. By this means there is for every generation being created a catastrophe situation.

Concerning the slime molds, I have in chapter 6 made an effort to describe how the boarders between the two phases in the process can be kept stable through reciprocal action between them. If the gaseous barriers would be changed that would give rise to disturbances in the process of body formation.

- * -

That the body formation would be enforced in every new generation due to some, for the population a such, unfamiliar phenomenon, that would hence constitute a part of the answer to the mystery of body formation. It all seems quite peculiar, almost offensive for the thought, but I have not been able to conceive any other explanation.

Every population hence seems to have the inherent property that it in the case of an extreme catastrophe situation and there an escape is impossible, can have the opportunity to start a process, which in the first respect gives rise to a temporary body. This process is a necessary first step leading to a permanent level rise, hence to the genesis of an individual on a higher level of life and with a generation cycle.

- * -

What in a broad sense is happening during the level rise might be that the level rise first is creating an inseparable unity of the cells and that is the prerequisite for the operation control by the superior functions of the cells. Thereafter the superior function of the cells is forcing the cells to surpass the boarder (the gaseous barriers and the membrane respectively).and hence, the catastrophe situation has been set aside. That first action constitutes the beginning of the generation cycle.

Before that the situation of the population is comparable to that of Bettelheim's prisoners and if the catastrophe threat in some way or another were to cease, the level rise would very likely be interrupted and no body formation would take place.

Just the moment of overcoming the catastrophe threat might be the crucial moment. It is the common action of the population on a higher level that is saving the situation and is confirming the body formation.

Thereafter the cells are continuously being ruled by the superior function and they constitute the instrument of the body.

The level rise and the overcoming of the catastrophe threat are genuine actions and not something that depends of some “gene for a level rise” etc, and I assume that these crucial actions do not leave any track within the DNA sequence.

The origin of life is assumed to be the hypothetic “first molecule”, the DNA molecule. It has an important property, the reproductive ability. But only this property does not suffice. A development into higher levels can be dependent of the inherent properties of the populations and no such process can start by itself. There must be a catastrophe threat that does not have any relation to the population as such. This seems to hold for at least eukaryote cells and multicellular organisms.

Chapter 11

Altruism among biological individuals can not exist according to the doctrine of evolution. But there are situations when a biological individual could be thought of acting apparently altruistic, without being in conflict with that doctrine. It holds among others for cases when somebody gives his life in order to save his relatives. Such a case would be possible, if it was a question of saving two or more siblings or more than eight cousins. In such cases the genes concerned have been represented among these relatives to a more than 100 % extent and the genes of his have thereby been compensated. From the viewpoint of the genes this is a “selfish” action, since it increases the amount of the genes of the sacrificing in the following generation.

But for an individual to sacrifice his life at all, is also required a reward. Bettelheim's prisoners were in another connection demonstrating that such a reward through its euphoria that implied a temporary transfer to a higher level. (This case was valid not for genetically close relatives, instead a temporary fellowship between non-relatives, see Ch. 10). Without a reward this altruism would not have been realized, the possible knowledge about relatives or genes of relatives being rescued does of course not suffice.

In the case of these relatives no such reward is being present, even though the genetic preconditions are present and I have observed that nobody of those that have given an account of the problem has given any example.

One has neglected that not only genes but individuals are involved on the life process. It is only individuals that are sacrificing themselves (genes are unable to act) and therefore nothing can happen provided no reward is present in the perspective. Just the necessity of a reward points to the decisive role of the individual in situations like this.

- * -

I treat another scenario that can maybe give another perspective and a solution to the problem, namely a case with a mother and three children. Those have each 50 % of the genes of their mother. They are assumed to be subject to the same situation as that described above and the

mother saves the children by sacrificing her own life. That the mother, contrary to the father with the cousins in the analogue situation, has succeeded in her rescue situation apparently depends on her action being followed by a reward.

If the scenario had been to save only one child, the mother would of course have sacrificed her own life even for that goal that is apparent. The equation does not fit if looking at the case from a gene point of view.

My hypothesis is that the phenomenon that is effective in the scenario with mother and child is interconnected with the reproductive force. That is an original, genuine force that is existing from the very beginning of life and it is the primary property of the original DNA molecule.

The reproductive force belongs to the same category as the phenomena that can appear among populations is certain connections (ss chapter 10).

The both forces are genuine and have in common that they can enable an individual to act in excess of her selfish ability.

That I call them genuine can be visualized through a comparison with the altruism that is assumed to characterize “altruism genes”. That altruism is not assumed to act unconditionally but instead at certain extent of gene compensation, namely when more genes than those of the sacrificing own are being saved. A mother on the other hand that is subject to the reproductive force is reacting even upon smallest possible cause, which in this case is one child.

Hence, it is the reproductive force that is effective in the mother-child case and that is the explanation why it in that case can be a sacrifice and a reward. Its influence implies a temporary level rise that is making the sacrifice possible.

That is explaining the reaction of the mother in the above scenario. But the corresponding effect does not turn up, when only gene compensation is being involved in the process and that is valid independently of the time the “altruism genes” have been allowed to work.

Why can not these genes make a sacrifice possible? I can here only refer to the definition of the concept of altruism that is present in R. Dawkins in “The Selfish Gene” on p. 4[17]: “An entity, such as a baboon, is said to be altruistic if it behaves in such a way as to increase another such entity’s welfare at the expense of its own.”

Here one has chosen to see the phenomenon altruism as a property among others that could be developed through for example mutations and changes of the environmental pressure but has not otherwise imagined altruism in any meaningful context. Altruism according to that definition can not enable sacrifices of the own life, since it has no connection with the genuine forces that can enable an individual to sacrifice his own life.

Chapter 12

I have often been reflecting upon the concept of valuation neutrality as a scientific principle and I have had a feeling that it could not check in all connections.

Among others that principle has as a consequence that the concept altruism has been lacking validity. It has therefore often been talked about “apparent altruism”. Yet, most people can by themselves imagine real altruism or at least experience it through the literature. Without questioning I took it as evident that real altruism must exist.

When I got the idea to explanation of body formation it was based upon the description of the behaviour of prisoners in a catastrophe situation by B. Bettelheim and by a suddenly appearing memory of the slime molds of R. Arday that were joining in a body. My first thought had been that this idea would give me an argument against the validity of the valuation neutrality as a scientific principle.

- * -

Thus far has, as far I can understand, the continuity of the development of life not been questioned. That appears among others through different theories for body formation, e.g. the colony theory: "If one would go through all the cell colonies that exist today, one would find examples of all intermediate stages, from groups of unicellular organisms, ---, to well integrated but yet primitive, multicellular organisms. Between the both extremes a continuum reigns (see chapter 9).

Now I recall a formulation by S. J. Gould [15]. Here it was a question about a geological problem but I imagine that there can be some scientific principle at the bottom: "But they held firm to the dogma that catastrophic causes must never be invoked so long as any gradualist alternative existed."

Regarding the problem of body formation I do not believe that any gradualist alternatives can have any success.

- * -

The phenomenon of level rise has a decisive importance, since with this concept it has been shown that life is existing discontinuously, at delimited levels, and that fact get consequences in different respects.

Before the level rise the cells are biological individuals and directly being subject to the environmental pressure but after that they have disappeared from the "world of Darwin". Their state can not be explained by the doctrine of evolution and they are living in a closed world.

The slug starts from zero and it creates its own properties and functions that the cells are unable to seize. These cells are now the building stones of the body and instruments.

The situation in a body would therefore appear to be unexplainable for the individual cell and I have tried to show that through a scenario in chapter 4.

The cells conceive the slug only through its operation control. Any apprehension bt the cells of the slug as such or of its outer world is not imaginable.

- * -

What I here am going to bring up is what happens at the boarder to a higher level. Such a boarder I have described in chapter 3, see pictures 1-3.

Here two "ideologies" with regard to the cells are standing against each other, selfishness in phase one and altruism in phase two, the lower level against the higher and a situation of choice situation may be conceivable among the cells within the territory.

These cells are situated in a situation that can be described in terms of behaviour and one may as an intellectual experiment regard the cells as being consciously acting – in the reality of the cells one may instead view it as an unconscious game of probabilities.

I have an old left over scenario that may fit here:

In the development process of the type of the slime molds and before it has achieved the first level rise it is a question about two systems that are weighing against each other. At the transition between these two forms of existence, just at the boarder moment both the systems are at hand simultaneously and a situation of choice seems to be at hand for the cells.

This situation invites unsought to an intellectual experiment, where the cells are to be imagined as conscious and able of speculating over their situation.

Their selfish live is comfortable and predictable and therefore they do not want to see any change. They can not imagine altruism to be possible, they are only viewing a change as negative and it seems to be frightening.

But if there were not to occur any change they would finally be lost. The become now conscious of their value conflict between remaining within the comfortable vegetative state or to accept the altruistic state and make the jump out to the unknown.

Here are hence two alternative ways of action, which may give rise to reflections. The one leads to a level rise and the other to stagnation. There is no space for any value neutrality among the cells in this situation. The system that leads to development would therefore maybe have precedence? Not accepting that leads to stagnation and to refrain from development and hence, from increased opportunities for survival.

Whether the one expedient is better than the other I refrain from having any opinion about. Since values always have to be given with respect to a situation of election and my function here is to be the neutral observer. But it is plausible that the cells, if they were able of reflecting, would use the concept “better” and “worse” about the two alternatives,

If the cells in such a situation would try to decide to become altruistic, it would yet be impossible. They would not be able to become altruistic, even if they wanted to be it.

- * -

If life were to be existing as a continuum, the situation that was being treated in that scenario would never have been able to happen and a choice between different alternatives, a higher an a lower level, would be excluded for the cells.

It is the occurrence of different levels, the very discontinuity of life that is creating values. When there within a certain population exists a latent altruism, the choice between two opportunities is thereby been brought to the fore and the concepts higher and lower, better and worse, assume validity.

- * -

Wit the starting point in the eukaryote cells I can imagine three levels: eukaryote cells, bodies and insect societies (see chapter 3).

These three levels are constructed in different ways, depending on their different “technical” opportunities to function and carrying out the reproduction.

Bodies seem to me to be more loosely constructed than cells. The third level, insect societies, are too undeveloped in order to be a basis for further a level and may therefore be regarded as a natural end point in the series.

- * -

Here I proceed from the world of the cells to that of ours. For cells to be able to conceive a higher level is completely excluded. That body is impalpable to the cells. And the corresponding is of course valid for us but it is not the eventuality of a level rise that I shall be treating here. What I am discussing is only the state in which the concepts higher and lower values spontaneously are being conceived of as valid, which is an indication of an election situation.

But that does not necessarily mean that a higher level is realizable. There is no opportunity to beforehand decide whether a level rise is to take place, since it is not hereditary in the sense to be caused by genes; it is instead a question of an election between two opportunities or “an unconscious playing for probabilities”.

- * -

The precondition for the neutrality of values is that life can be thought of as existing in a continuum. In such a world there can apparently not exist any election situation between two levels as a starting point for values. In a world that is presumed to exist without any sharply distinct levels the neutrality of values is therefore a natural and maybe inevitable consequence.

The neutrality of values means among others also that the concept of altruism is lacking validity and it gets also that consequence, when altruism is anyway being observed that it for example gets the denomination “apparent altruism”. There is simply no place for real altruism within the very idea of the world within natural sciences.

Earlier I have shown that this concept has a validity as it is an essential and inescapable part of life (see chapter 5) and that the occurrence of the concepts of higher and lower values are interconnected with the fact that life is existing within delimited levels.

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One can not imagine a higher level than that where one oneself is existing. Hence must follow that no certain statements about that higher level are possible. It can not be observed by natural sciences but the opportunities of a thinkable such higher level can neither be denied.

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