Abstract: This article is not an attempt to explain consciousness in terms basically of quantum physics or neuro-biology. Instead I should like to place the term "Consciousness" on a broader footing. I shall therefore proceed from everyday reality, precisely where we experience ourselves as conscious beings. I shall use the term in such a general way as to resolve the question whether only a human being enjoys consciousness, or even a thermostat. Whilst the difference is considerable, it is not fundamental. Every effect exists in the perception of a consciousness. I elaborate on its freedom of choice (leading to free will), in my view the most important source of creativity, in a similarly general way. The problems associated with a really conscious decision do not disappear by mixing determination with a touch of coincidence. Both must enter into a higher unity. In so doing it will emerge that a certain degree of freedom of choice (or free will) is just as omnipresent as consciousness - an inherent part of reality itself.

Can we decide freely between several alternatives? One is readily inclined to say: "Of course! After all, I am always deciding something." We all feel subjectively that we are relatively free to choose. But can we conclude from this feeling alone that it is an objective fact? Are the variants at our disposal real alternatives? Or is not the next step determined rather by external circumstances and our so-called "decision" a mere illusion? Are we merely deluded into thinking that we have free will, as many scientists and philosophers claim?

In order to be able to answer this age-old question, we have to understand what consciousness is, basically at least. We can, after all, only talk of an active decision if this is taken consciously. All else is not decided by us, our conscious being. Let us first establish therefore how we become aware of the alternative options. Interestingly, the nature of this awareness corresponds to our awareness of an object, and so we will examine this first.

Retrocognitive Definition

Let us take any object around us at random, say this journal. We perceive it as an extensive surface or form. In addition, it constitutes a unity of diverse texts, illustrations and blank spaces. We know that this unity is relative because we can focus on individual texts or tear
pages out of the journal and forget the remainder. We also know that each text is composed of individual letters but that these only form sentences when arranged consecutively in context.

On the other hand, we only ever read one letter or one word simultaneously. Furthermore, each optical cell of our eye can only take in a minute portion of each letter. This optical cell is by no means elemental either. Instead, it is composed of molecules and atoms which in turn are made up of elementary particles. At this (quantum physics) level, there is no such thing as "solid" parts, for here the principle of the indeterminacy of a "body" applies. Otherwise we would ultimately end up with infinitely small (infinitesimal) particles - that is to say with zero.

But nothingness produces nothingness too. And letters do not become a text if they do not join together to form connected sentences. Although we only perceive a portion of a sentence at any one moment, we have the latter as a whole in mind. We have stored it and now we can recall its words, i.e. repeat the sentence, again and again. In so doing, we carry out a retrocognitive movement, enabling us to become aware of the sentence as a whole. We do the same thing when we understand the sentence simply by quickly glancing through it and recognize its entirety not in the sum of its words but in their reciprocal relationship to each other. The words merely define the entirety of the sentence.

Furthermore, the written form of the sentence is neither its meaning, nor does it reflect its meaning. Instead, the latter is comprehended intuitively. The thoughts, images and sentiments (associations) triggered in the reader by the individual words join together to form an integral meaning. The sentence is thus merely the frame that defines its deeper content. On the other hand, no statement could acquire meaning without expressing itself in some kind of frame. It would be nothingness.

Exactly the same is true of every single letter, an article or an entire journal. No matter how far-reaching the associations may be, we only perceive the respective whole by conscious or sub-conscious feedback between the individual parts. Sometimes we perform this movement with our eyes; sometimes it is purely mental. In the latter case, moreover, feedback can only be due to the simultaneous interaction of the "individual" pieces of visual information.

This is how we perceive everything. Without containment by feedback, every effect would be infinitesimally small - in terms of space and time. Instead of surfaces we would perceive "dots", and instead of periods of time "moments". In that way we could perceive nothing. There would be no distinctions as these can only be established by comparison, i.e. feedback. There would be no space, for this is only delineated by objects. There would be no structure for this can only acquire wholeness through the retrocognitive interaction of its parts. There would be nothing perceptible at all because we can only perceive parts in their entirety. It is only through the constant containment of central zero points and moments which in themselves are meaningless that we perceive objects.
"Minimal" Consciousness

If we assume that the outside world exists objectively, we must grant all the things that differ from us such a containing "perception" for they obviously interact with each other in real terms.

It is accepted that a body is formed by the interaction of its molecules with each other. That is feedback, i.e. containment of infinitesimally small centers in and between the particles, in all parts of a whole as well as in the whole. Every whole so defined as to form a body interacts with other such wholes, so that together they form a greater retroactive whole. At the same time, none of them can be reduced to something elemental, merely to other containments. An object contained also delineates something else in turn, etc. It should also be noted that it is only the comparing interaction with the surroundings that makes a concrete whole possible; this thus differs from its environment in a specific manner whilst at the same time forming a different whole with it.

Let us now call to mind that feedback is also at the root of our consciousness. For what else is its determining feature, if not the retrocognitive perception of a supposedly external object? We become aware of its being. The same is true when an object appears before our mind's eye. We appear to perceive something apart from ourselves with which we interact. Without this feedback there would be no intellectual substance. In this way our awareness delineates the entirety of our relationship to the physical or mental object observed. Even if we regard our ego as an object (consciousness of self), it is no different.

Figure 1: The woman only recognizes the helicopter by retrocognitive comparison of its details. This perception itself establishes a feedback relationship between the woman and the helicopter - a whole thus contained. If the woman turns away, the image is retained in a retrocognitive loop of her mind. The interaction between the helicopter and the ground is also based on feedback and containment. The same goes for the differentiation between them.
As every interaction is retrocognitive perception of the other side respectively for those involved and overall delineates a whole, every thing in existence, which is always such a containment, is endowed with at least simple consciousness.

What does this mean? Does it mean that every elementary particle contained by oscillation can think ("experience reflection")? Yes, obviously. In its own way and not as sophisticatedly us we do, of course. Elemental thought processes are intended to show us here how freedom of choice comes about in principle.

Before we can examine that, we must first look at a further fundamental characteristic of reality which goes hand in hand with retrocognition.

**Structure and Whole**

We have seen above that interaction only means something in its entirety. In essence, it is the contained whole itself because it cannot be completely reduced to parts - ultimately to nothing. It is only containment that lifts the object out of the infinitesimal into existence.

However, the act of containment makes the boundaries of the object relatively indefinite or blurred. (When we walk around the shores of a big lake, we never see the entire lake at one and the same time, and consequently we cannot prove that it has an unbroken surface. It is only when we draw on our memory of the rest of the lake's shoreline that we arrive at the entire water surface.) But the entirety of the feedback defines the object as a whole against the backdrop of what remains indeterminate (the lake's surroundings, which might be a barren desert, a garden full of flowers or any other object at random as long as it is not submerged and swallowed up by the lake). Meanwhile, the containing interaction, in comparing the banks, also distinguishes between them. Vis à vis this delineating structure, the integrating wholeness appears relatively diffuse or continuous. (Compared to the differences between the banks, the entirety of the lake is a relatively uniform phenomenon.)

The unity of determinate and indeterminate described above applies both to the observations of quantum physics as well as to ordinary human ones. It is quite immaterial whether we are talking about the entirety of a physical body or that of a complex consciousness. Neither can exist without this unity.

Every structure is a whole and is composed of such, but wholes too are only formed by structures, namely by those containing them and those comparing them with others and differentiating. (Only a particular combination of seats, engine, metal and wheels suggests the entirety of an automobile to us, and if we cannot clearly distinguish it from a pile of scrap metal, it would never occur to us to drive it.)

Structure and whole are thus interactive, this moreover at every point of reality. It is only their unity spanning everything down to the smallest point that can create a reality. Reality is infinitesimality-structured. It is important to recognize that all seemingly separate things are
connected with each other in this way, for the perception of their separateness is equally the
definition of their linkage which the relative separateness entails. Moreover, the
infinitesimality structure links everything with what is not perceived. We shall see how later.

From the above we can deduce the following: Whenever we perceive a whole, i.e. an object
or a relationship, we perceive its infinitesimality structure. (Otherwise we would perceive
nothing.) In so doing, it is not necessary to recognize its composition to infinity. The relative
continuity of its whole is in itself sufficient expression of an infinitely fine structure. To be
sure, we also get round this as a rule by not asking ourselves how whole and structure differ.
At every point we perceive both together, just infinitesimally united!

The sense of integration associated with all perception perhaps makes this clearer. Without
this we can perceive nothing. If you look carefully, you will see that even the sight of an
abstract line triggers a feeling in you "contained" in its image.

The determinate and the indeterminate

But even an infinitesimal structure can be more or less structured because after all it
delineates spheres of reality of varying degrees of differentiation which it in turn joins
together in an infinitesimal-structured manner. This is the only way to explain transitions
between relatively discontinuous and more continuous parts of reality, such as, for example,
between interacting objects and the intermediary movement between them. For the same
reason (though it is not the same) we can also distinguish relatively between a structured,
containing movement and the contained, more uniform whole. Both are infinitely finely
webbed as also is their connection/wholeness. The more or less structured forms of our reality
emerge from the infinitely fine web structure and are linked with each other to form a single
movable mesh.

This quality enables us to recognize differences within a whole, particularly various
concentrations intuitively. The more important the whole vis-à-vis its different parts, the more
its containment is concentrated centrally because its peripheral details require less attention.
Its entirety "condenses" as it were in the center and is heightened in an infinitely small point.
The "condensate" embodies the determinate within what is diffusely contained and the
indeterminate feedback movement. Meanwhile, the same motion defines the whole vis-à-vis
the outer lack of definition. The infinitesimal center which can always be deduced and with
which the containment merges is also a direct link with the indeterminate identity of all
infinitesimal points not contained, as well as with those contained "per se".
We perceive all this together. It is only the inseparable unity of identity and differentiation, of lack of focus and contrast, of the determinate and the indeterminate that results in a realistic perception. For the same reason the latter is largely intuitive. It is the perception of the infinitesimality-structured (including infinitesimal) unity of interactions and their nuclei.

**Freedom of choice**

The same thing happens when we weigh up several alternatives. Imagine you are a hunter pursuing a herd of game (or a gang of poachers). The path suddenly forks and you have to decide which of the two directions to take. First you try to read the tracks more closely, and you take into account the habits of your prey and the possible benefit to you, i.e. you try to deduce your decision. If this leads you to a clear-cut conclusion, the route to take will be obvious. It is predetermined and you have no need to choose.

If, on the other hand, you do not arrive at any clear-cut answer, you can just as well toss a coin and let chance "decide". That too is not a conscious choice. (At best it is the decision not to make a choice oneself.)

If the first course is not feasible and the second does not appeal to you, you will make your decision "intuitively" or "instinctively". Now is that chance or determinacy, or maybe both? If, for example, as a result of your efforts you should happen to notice another important feature about the tracks, then both chance and determinacy are involved. Your logically consistent efforts will have led you to chance findings which then play a part in your subsequent deliberations, etc.

Yet, seen from a different more all-embracing viewpoint, every chance meeting is unequivocally predetermined. On the other hand, any chain of cause and effect can only be traced back to the point at which it "ends" in something unpredictable. Neither does the
mixture of determinacy and chance, such as we find in the act of consciously searching, add up to a choice. For although they influence each other, both remain themselves. The outcome is predictable in parts and governed inbetween by unknowns, but it is by no means freely chosen. Neither is the interplay of logic and chance whilst you are pondering the matter.

However, your intellectual act of weighing up the pros and cons constitutes a feedback between the alternative routes. Let us call to mind what that means: A whole is contained, going as far as an infinitesimal center. The containing interaction also differentiates between the alternatives, and peripheral structure and innermost core form an infinitesimality-structured unity.

This unites determinacy and indeterminacy totally as well. In such a unity neither is itself any longer, neither is even partially separable from the other. It is only from this new state that a conscious decision, a really free choice, can be made. If it were made purely arbitrarily, however, it would no longer be a free choice, but pure chance. A conscious decision must be meaningful for the person making the decision, i.e. his arbitrariness and the contexts containing the whole, which provide meaning through feedback, must blend intuitively. At the moment of making the choice they are identical.

As a hunter, therefore, you take in the doubtful situation intuitively and decide intuitively. Logical deliberations and chance influences flank this decision by necessarily leading to the moment of choice. Both are involved in this moment as they are linked to it in an infinitesimal manner.

To be sure, you can only choose the left or the right path on which to continue, and this then opens up feedback. Your free decision therefore means meaningful determinacy within the indeterminacy of the path ahead. You create this determinacy out of identification with the point in the center of the entirety of your possibilities which is determined by infinitesimal containment and yet neutral. The decision in favor of one position or the other cannot therefore be predetermined. It is only after the indeterminacy of the alternative path to be taken and the overall situation have been totally united with neutral, "unbiassed" determinacy that they can flow back into real determinacy - the path chosen freely by you.
Figure 3: All the factors of importance for the decision-making process first merge into the hunter's deliberations - shown here as shaded areas becoming darker toward the base. But their complete merger in him is not the moment of his free choice. Instead this arises out of the total unity of the identity point with the differentiation between all the factors, their structured relationship with each other. Only this gives this point meaning. Such a state cannot be shown pictorially. The transition to it is merely suggested by the triangles in the center.

The decision has thus been taken, and moments of choice such as this are present at all times and everywhere throughout the infinitesimal-structured world through us and all other conscious entities. A certain degree of freedom of choice is thus an inherent feature of all consciousness.

The broader context

The respective degree of freedom depends, of course, on the opportunities available. Here the more complex, as it were collective, consciousnesses with their more diversely branching relationships have greater latitude than the simplest ones in which we fail to detect any alternatives at all. Yet every feedback explores ways of opening itself up. In this way the most primitive consciousness seeks options which are by no means illusory.

For seeming simplicity is no reason for doubting that a consciousness is active. We learn from the chaos theory that no feedback repeats itself strictly speaking as everything is linked with everything else and exerts a mutual influence. According to holistic theories which study relationships in their entirety, all phenomena are coded in every single one. Both mean that a consciousness incorporates the information content of its infinite, more complex and seemingly merely outer surroundings - as its inner one. In actual fact, therefore, it cannot be so simple. Neither can the opportunities at its disposal be unequivocally laid down either. Every determining influence from without only works in cooperation with the consciousness affected, and in this way the latter is always involved in deciding its further development.
The information about its infinite surroundings which, to use a term of David Bohm's, it enfolds remains largely hidden. It blends into an infinitesimal enfolding. Thus the infinitesimal structure by no means defines merely the unity of the respective forms of existence as they appear to be on the surface; instead the most minute containment includes in itself the information for the unfolding of the entire universe. However, the infinitesimal structure unfolds its whole only in more or less limited form, as a relatively simple phenomenon in our reality.

This does not mean that the complex whole which remains largely sub-conscious decides everything for its simpler manifestations. Neither does it mean that the decision-making process of a consciousness takes an infinite, hidden course.

The infinitesimal structure of the world shows us in all things the identity of the whole, infinite universe - revealed via its structure and (two words are one too much!) directly as the identity of all points at every point. In this way every concrete consciousness employs the potential - indeterminate in itself - of the nearby infinite whole in itself, doing so individually and including its determinate surroundings. It really does choose by itself, without having to rely completely on the decisions of others or its sub-conscious. Its relatively free will is real.

Résumé

Let us summarize the main points in this regard: Feedback and infinitesimal structure are features of every form of existence and define them as consciousness. At the same time they form the "mechanism" which leads to creative decisions which every consciousness therefore makes incessantly within its given possibilities. The infinite connection between all consciousnesses also enters into the infinitesimal structure of each one, so keeping the respective framework of possibilities open and contributing to the decision-making process without determining it completely.

Each of the points lying infinitely close together and characterized by being distinguished from what is relatively separate by comparative feedback - each of these is surrounded by an autonomous consciousness of its own. Reality thus means a web of consciousnesses of infinite complexity which emerge as the cause and effect of universal creativity which is attuned yet relatively free.

Doubtless much of what has been said can only be comprehended intuitively. Moreover, to understand the circumstances that we have broken down into relatively separate elements, a different way of thinking is called for than the usual one. As the infinitesimal structure of the world reveals, a deeper unity of analytical and intuitive knowledge is called for overall in order to progress beyond narrow-minded limitations and the seeming inconsistencies in our experience that result from these. Then we will rediscover the underlying cooperation and personal responsibility in all our relationships.
The ideas I touch upon in this article have already been developed in far greater detail. My German book *Die Erschaffung der Realität* ('The Creation of Reality'. Dresden, Germany: Sumari, 2009.) puts them in a wider context and examines them in the framework of sub-conscious processes, subjective experience and the creation of relatively stable reality. Read here the abridged version *How Consciousness Creates Reality* in English.

This description of infinitesimality structure is written with respect to **dynamic focus**:

**Infinitesimality Structure**

Multitude cannot exist without its oneness and oneness cannot exist without determination by multitude.

Oneness however means identity and identity in its last consequence through all „stages" is a zero point. On the other hand this infinitesimal center needs circumscription by details. So despite the details’ identity in oneness, they as individuals have to find their way into circumscription. And as individuals they contain infinitesimal centers by themselves etc. Hence the circumscription of such a center is the changing between single points.

That means an existing structure includes both extremes, the absolute identity and the absolute separation. Their unity then also has to be constituted by change - now between this common point of identity and being separated. Both are nothing at all without this change by which they are determined only. The unity built that way of oneness and multitude in turn has its infinitesimal center of identity...

The same is valid for every area on every scale. A continuum of this kind is the precondition of permanent objects. Through the omnipresent change between the extremes of identity and separation any point is immediately joined with each other as well as continuously mediated and also apart from the others.