

## Ecoanic meditation

[Black/White Box/Cube]

Peter Mahr

*I'll sleep in this place  
with the lonely crowd;  
Lie in the dark  
where the shadows run from themselves.  
Bruce/Brown 1968*

Since 1900, the relation of science and art has continuously been subject to diverse investigation in artists' work and from the artist's point of view. This is true of the entire spectrum of the sciences: psychology, psychoanalysis, logic, phenomenology, psychopathology, anthropology, linguistics, mathematics, economics, sociology, art history, film studies, and the study of literature. Foster and his colleagues demonstrated as much in their survey on the 20th century. The natural sciences have also been granted the status they are due. Recalled is the concept of entropy, for example, and the way that it played a role during the 1960s in post-minimalist art as well as in semiotic aesthetics.

It was Umberto Eco who interpreted entropy in his aesthetics based on the theory of information, and thus responded to the philosophical quest for a rich theory of art as the epitome of the arts. As Eco states at the beginning of his central chapter "Openness, Information, Communication" in the first, 1962 edition<sup>1</sup> of his key aesthetic work "Opera aperta", the work of art is determined by the viewer's contributive reception and material reconstruction. Yet the starting point of this theory of aesthetic activity remains information.

According to Shannon – to whom Eco refers primarily – the processing of messages runs from the source, via the transmitter, the signal sent, the channel with possible interfering noise, to the signal received, receiving apparatus and finally to the destination/receiver. Interference in this progress may lie in the natural and/or artificial range of the channel, e.g. in the air or in a cable. The complexity of the code used compensates for the interference; the code being a repertoire of actualizable symbols that remove the interference to the background, factoring it out as attributable to something specific.

As the signal is binary – it either occurs or it does not –, the information exists in the form of a unit, a *binary digit*, a bit. This is also true of a natural lexical language, the elements of which – phonemes – are either given or not. This language is a matter of the number of possible alternatives – that is, from the source of information. Information is thus a mathematical measure of possible alternatives. Since all the possible alternatives from the source are equally probable in principle, but there is only one state of this equal probability, the elements of the system must strive towards a state of disorder, with regard to the possible alternatives. By contrast, the system of probability constitutes the order, for the prediction of behaviour.

Eco himself expands on Shannon's scheme with the following thought experiment conceived by Maxwell. Imagine a demon that inserts a dividing wall into a box in which molecules of gas are moving at different speeds; he opens and shuts this wall using a small closable hatch so that the faster molecules are separated from the slower ones and distributed into the two chambers. As a result of this measure, the temperatures in the two chambers would begin to differ. In this way, generally irreversible processes with an unavoidable increase of entropy could be cancelled out as with processes like the one exemplified by post-minimalist Robert Smithson: if a child runs clockwise in a sandpit with black sand on one side and white sand on the other, the sand will become grey; if the child then runs anti-clockwise, the sand in the sandpit will not regain its previous appearance, but will become even greyer. Maxwell's demon embodies a principle of order that makes it possible to predict thermal differentiation, a middle state with an equal probability to be calculated statistically.

As demonstrated by the discussion up to the present day – Nørretranders summed it up –, thermodynamics provides the statistical theory suggesting that thermal energy is not used up, but is converted – as in the case of a the motor which transfers the amount of low-entropy energy fed into it into high-entropy waste heat. If one takes Maxwell's demon seriously, this begs the question of how he could see the molecules at all. Using a lamp? But like any additional activity and thus all knowledge pertinent to these questions, it would cost additional energy. Information is therefore a material entity; in the context of an observer, it is a pattern of material and/or energy used. As Eco puts it, information is a message that effects a change in the viewer, a sign being received without attaining immediate significance. Entropy is information that may be charged with significance.

One could imagine Maxwell's demon – to continue thinking beyond Eco with my own – existing in an open, if not completely transparent, because completely defined black box. In this case, cybernetics from Wiener to Glanville speaks of a white box, with shedding light on its blackening aspect after having recognised the role of the system's observer. The function of this box would be, in Shannon's sense, that of a channel that can be designed, of that section of the transfer to which initially – in a logical way – the same input as output is attributed, or is it? No, not at all. For in terms of microphysics, an interference as small as it might be must be accepted in sections of the channel as small as they might be. Without being already something that processes – or even a machine –, this piece of natural matter could be studied and employed in precisely the same way as a black box. But this very endeavour is not only the activity of science, but also of art. As a processing black box, the channel can become the subject, as a specific object, to put it with Judd.

With the artificial means of, say, a typewriter with around 85 possible symbols and a page comprising 1800 characters, the probability that chaos would emerge from the source of information would be very high if there was not introduced a forecasting system of probabilities using a certain code. Such a code consists of a repertoire of signs within oppositions, rules of combination and a fixed correspondence of

symbols and their meaning. The result is a message with a definitive order, which overlays the partial disorder.

The aesthetic of the message then consists of a new idiom, which is defined by a new relation of sounds and concepts in a new type of sentence constellation. This is accompanied by emotion as a form that can be added to the connotation of the signifier.

But despite the augmentation of information theory by the semiotics of the signifier, as introduced by Saussure, the message of the given symbol remains central as the denotative signified. Because – as in the case of the unicorn – the object referred to is forced into the background opposite to the the concept or mental image, the specific use of a symbol and its associations must be related all the more to the established code within cultural practice. By insisting on the semiotic unit of the signifier and the signified – for example of the acoustic or visual image and the concept – Eco is faced by the constraints that the code practices on the signified parallelly to the unconventionality of the signifier.

In order to do justice to the historical dynamics of artistic sign production, Eco now reinforces the signifier with Peirce's semiotics of the interpretant, of a sign that refers, in its turn, to the symbol that denominates the object. This adds up to an infinite generation of signs, to the successive interpretative systems of "communicative conventions as *cultural phenomena*" (p. 115).

The secret of what Eco calls semiotic information here is a process that withstands the entropy of non-semiotic information. It can be defined as a disorder in opposition to an order and form-giving emerging later. The key factor is no longer the disturbing aspect of the interference, but the interferential ambiguity within the aesthetic function.

Therefore, in the case of every work of art and particularly in avant-garde art of for instance automatic way of writing, openness means an improbable order that is consciously risked. For that reason, it calls for particular sensitivity on the part of the artwork's reception. The handling of such kinds of disorder must be practiced as fields of formative nuclei, says Eco, basing this approach on the modern Aristotelianism of his teacher Pareyson. The interpretant is thus deflected to the intentional act of the viewer, of whom some "artistic" effort is expected when there no longer seems to be a difference between interference and signal. In the case of signals with high improbability and low redundancy, the key factor is the selection of the recipient's psychological pole, even though this selection is historically, socially and anthropologically defined.

Thus the open work of art corresponds to the psychological tradition from which theoretical aesthetics emerged as a theory of art. The structural analysis of communicative phenomena, to which Eco's semiotics will have lead without philosophical foundation from the late 1960s onwards is still linked to a psychology of the transaction between stimulus, perception, understanding and the world of the recipient. In particular, Eco takes this standpoint because of the psychological genesis and only partially objective structure of forms. The openness of the forms is set against the ostensible closeness of the forms and the isomorphism of object and perception in Gestalt psychology. The partiality of the cognitive process is still assured. Thus an artistic component becomes visible in every perceptual experience; an action on the basis of formative, i.e.

genetic-psychological and Gestalt-giving intentions. Eco refers to the aesthetic pleasure of the artwork through mechanisms of integration and completion – in a similar way to cognition – as first degree openness. He sets second degree openness alongside this. Defining it as aesthetic pleasure in the open process of perceiving the new form, its difficulty may also trigger a discomforting interference, a delay in enjoyment, ultimately a rejection of the artwork.

As far as the black box is concerned, we have seen it as a model in information theory and in cybernetics. After more precise consideration, this scheme cannot avoid either being depicted in objects with specific conditions and meanings, nor being relativised with respect to its metaphorical qualities. If the black box stands for an unknown space to be tested possibly revealing to be dead, there is no wonder soon that it provides a large number of metaphors: the box with which magicians, according to Trawöger, remind us of our being child; flight recorders that are usually orange to make them easier to find; coffin, a usage that is evidenced as early as 1674, according to the Oxford English Dictionary; the dead (part of the) machine; the Skinner box, after Slater; the torturing *silencing box*; the *camera obscura* of photography; black movie theatre – all these are sometimes known as a black box. In addition, the metaphorical aspects are already suggested by the primary, opposite qualities of the “black box”: opaque/transparent, discrete/open, dark/light, stiff/soft.

Not least, this expressing in metaphors triggers complex pragmatics involving the black box. Two examples: by assuming that the black box is not empty, precisely, but at least that its interior is unknown, the very fact of this something’s closed quality and with that the possibility of closeness corresponds to a need not only for opening, but also for the concealing and securing of treasures or secrets. Thus Bachelard can state in a sheer axiomatic way: “The little box contains unforgettable things”. And inasmuch as the box – whether black, white or whatever colour –, *secondly* is an object of choice, this choice takes place instead of doom and necessity. The box becomes selected, and with it the concealed objects or processes. They are not meaningless like an unused box, the meaning of which is not defined. The interpretation of the concealing boxes leads to the unintentional but still desired object or action, as Freud demonstrates with Shakespeare. The third daughter in “King Lear” who does not profess to love her father in an exaggerated way like her two sisters is as silent and “unimpressive as the lead” of the third casket offered to suitors besides the gold and silver caskets in “The Merchant of Venice”. Yet the lead casket is the one to be guessed. In it the future bride’s picture is to be found. If dumbness in dreams often means death, but also salvation, the motif in both casket choices is not only the choice of death. Analogous to the dream, through the creation of the opposite the goddess of death could turn into the goddess of love.

The black box is now regarded as the white box if its function or condition is known or has been recognised. This meaning of the general way of functioning also seems to have been transferred to the sober, “technical” term white cube as a specific open or closed space (of art). By definition, every process there is art, including the condition of the empty space as a possible artistic, visual spatial object and as a space

that is granted a threefold function creating meaning, adding value and transfiguring. But as a white box, the white cube is reduced to the *black cube* – without alluding to the Kaaba here –, if its formal nature is determined by these functions alone. There is then the danger that, as Latour observes on science and technology, with the marketing of the in- and output in the artworld the inside of art – paradoxically – disappears more and more as a result of this kind of *blackboxing*. The white cube would then be a black box; the clarity and brightness maintained would merely be socially necessary illusion. The permeation of the movie theatre space as video/-installation in parts of the white cube, as observed by Manovich and Steyerl, would not be the problem. Rather, the opening of the art space into a situative space since the 1960s, which introduces the viewer into a performative, self-reflective relationship with the object “box”, would then be reversed, as Eiblmayr indicates.

The same applies to music. The empty, no – silent concert hall was the response that the piece 4’33” made to the canned (blackboxed) background music of the Muzak Corporation. After having experienced himself as a black box emptied of meaning in a personal experiment, with this piece Cage expected an acoustic performative, reflexive auto-relation of his listeners – even though they were completely quiet –, which could be experienced, if not as anguish, at least as considerable discomfort. To echo Serres as consolidation of the senses and fine arts, this was a matter of putting back the black box – “this black resonance box” – on the foundation of the fact “that cognition, screaming world plus attentive ear, creates the biggest white box.”

Eco thus invites us to open up the technical information box – which the black box is, of course – to semiotic, semiological and hermeneutical processes. This is the only way to grasp the aestheticity of the work. Only when the message appears in the new way of speaking and is filled semiologically with emotion as form, can aesthetic pleasure emerge via the assimilating interpretant, which is developed from the formativity of information.

Significantly, “Opera Aperta” comments on the aesthetic possibilities and the communicative quality of the painting of *art informel* and 1950s installation art. The text touches on the informal optical-kinetic structures of Jesus Soto, for example, which mirror the viewer’s individual body parts such as his eyes and his movements, but not the viewer as a whole. An activity is already demanded from the viewer here (p. 158). But does this activity still include the formation of a sign, during which the images on the mirror become signs in an interplay with the object and the interpretation? Isn’t the mirror, like the black box in general – as Eco writes in “About Mirrors” – a channel, a medium that also forgets what it has mediated?

But what is said by the fact that the mirror itself, as a simple component – to be more precise, one wall – of a box, is the very thing that brings openness into that phenomenon that is to be subjected to a closed explanation in classical science? The closed explanation corresponds to the closed experiment, in which the mirror is part of the formation of the both scientific and artistic phenomenon. In this sense, as Feyerabend has indicated, Brunelleschi’s drawing of the Baptistery of Florence can be characterised as an experiment and this, like experi-

ments in general, with respect to the comparison between image and reality, to the “strict” conditions of the experiment, and in particular to the construction of the image according to rules, to the theory of painting and the aim to enhance his reputation.

By contrast, when Mach analysed Newton’s bucket experiment with respect to the conclusions that Newton drew for astronomy, his undertaking aiming at a critique was to break open closeness.

I hang up an empty bucket on a rope, keep turning the bucket and thus tighten the rope to the point beyond which it no longer hangs vertically. I fill up the bucket with water and let go. It spins around, faster and faster. But the water does not turn with it, by any means, or at least not until a certain time has passed, after which centrifugal force begins to operate, lending the originally flat water surface a “concave figure”. The relative movement of the water to the bucket is thus reduced and the “true”, absolute – as Newton says – circular motion increases up to the point at which the water is motionless in relation to the container. This fact is only modified by the “re-twisting” of the rope in the other direction, when – after the bucket has slowed down and come to a standstill – the movement begins in the opposite direction.

Mach contradicts this view with the fact of reciprocal action; the fact that masses represent forces, the size of which can be calculated from their speeds. For this reason, the motionless masses are also forces, insofar as the other masses are not motionless. If all “masses, all speeds and thus all forces are relative, <then one must conclude> that the world system is only given to us *once*, but the Ptolemaic and the Copernican views are our interpretations”.

As a third party alongside Newton and Mach, we watch the twisting bucket. What do we see? And what is the message? There can be no question: As “scientists” we are looking directly into the black box. However, as is already the case in photography, the “notion of a dark corridor” does not apply – rather, as Barthes amended – we are concerned with an *imago lucis opera expressa* here, too. The concave water surface reflects us, so that we do not discover ourselves in a *camera obscura*, but to our informal pleasure in a refined *camera lucida*, in the most admirable of ways.

*opera expressa* zu tun, wie Barthes richtig stellte. Der konkave Wasserspiegel spiegelt uns, die wir uns nicht in einer *camera obscura*, sondern zu unserer informellen Freude in einer veredelten *camera lucida* wiederfinden, in vortrefflichster Manier.

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