

Information aesthetics

The information aesthetics initially developed by Max Bense and Abraham A. Moles in the latter half of the 1950s tried to bridge philosophy, psychology, aesthetics, social sciences, and art theory. The goal was to develop a theory that would allow one to measure the amount and quality of information in aesthetic objects, thus enabling an evaluation of art that goes beyond "art historian chatter". Information aesthetics investigated the numerical value of "the aesthetic object" itself. Based on David Birkhoff's mathematical theory of aesthetics (1928-33), the theoretical mathematician Norbert Wiener's *Cybernetics: or, Control and Communication in the Animal and the Machine* from 1948, Claude Shannon's information theory from 1948, and Charles Sanders Peirce's semiotic theory, Bense focused on physical concepts such as entropy, process, and co-reality, while Moles, similar to Daniel Berlyne, accentuated aspects of perception theory and psychology. (Klüttsch 2012:67)

Bense's early thinking on aesthetics starts with a Hegelian view in which art is seen as a teleological epistemic process. By the 1950s and 1960s, his interests had shifted to Peirce's pragmatic semiotics, which views logic as a function of signs and symbols. By understanding aesthetic objects as signs, Bense linked semiotics to Shannon's purely technical information theory, where he adapts the concepts of linguistic signs to the problem of signal loss in technological communication. As a link between the technical notion and the human notion of communication, Bense built on Wiener's cybernetic theory. Following Wiener's theory of feedback, whereby some proportion of the output signal of a system is passed (fed back) to the input, Bense devised a model for theorizing how the process of art production, consumption, and criticism is procedurally related in terms that suggest computation. In this theoretical frame, Bense aimed to create rational aesthetics free from subjective speculation and grounded on a purely scientific base. (Klüttsch 2012:67)

As a keystone for his scientific aesthetics, Bense adopted Birkhoff's mathematical measurement of aesthetic values. In the late 1920s, Birkhoff had presented a simple formula to measure the aesthetic values of art: $M = O / C$, where the aesthetic measure (M) is defined as the ratio of order (O) and complexity (C). This formula was adapted in very different ways. Whereas Bense adhered to the original equation, $M = O / C$, Moles modified the formula into $M = O \times C$, with drastic implications. If you take low order (O) and low complexity (C), for Bense the measurement (M) can still be high, but with Moles's modification it would be at a minimum. If both values C and O are high, Bense gets a comparatively low measurement (M), while Moles gets a maximum. Both approaches serve a purpose, and both pose problems. Bense was focused on the relation of the two values and couldn't explain why very low values for O and C would be considered high aesthetic values. Whereas Moles's formula excludes the problem of the extreme ends of the function, it doesn't have an answer for the relation of O and C (O = 0.1 and C = 10 have the same value as O = 2 and C = 5). This fundamental problem was not discussed in detail in the Stuttgart school. (Klüttsch 2012:68)

As these structuralist approaches to sign systems emerged, Bense combined Shannon's information theory, especially his analysis of the English language, with Birkhoff's mathematical analysis of aesthetic measure and Noam Chomsky's generative grammar (an idea of a general grammar that is hardwired into human brains and serves as a base for all natural languages). He formed a theory that allowed for the analysis of an art object on a micro-aesthetic level by investigating the use of sign repertoire. Having a repertoire and rules for combining the elements of that repertoire, Bense now had the tools to form a model for the macro-aesthetic values of aesthetic objects. In art he saw a process that moves in the opposite direction of the typical physical process. While for Bense the physical world heads toward

chaos (entropy), the world of art heads toward order (negentropy). Both *process* and *order* are key terms in his aesthetic, and these concepts deliver the ontological basis for his scientific approach. (Klütsch 2012:68)

Max Bense tried to place the aesthetic value of aesthetic objects within a metaphysical framework of process ontology and semiotics. Their intersection is the basis of information. He inverted the physical process of entropy in the arts: art seeks order, not chaos. The relation of chaos/complexity and order defines the aesthetic value. This implies a fundamental principle, which has the status in his thinking of a natural law. Order is a state of circumstances; it is a property, that is, a relation between entities. Artificial objects have special properties of "co-reality"; they are more than their material carrier. In the case of aesthetic objects, coreality is determined by macroaesthetic rules. These rules can be interpreted as executed algorithms; the result refers to a process of *neg-entropie* (negentropy). English philosopher Alfred North Whitehead (*Process and Reality*, 1929) developed a process-ontology that was useful for Bense in this regard. (Klütsch 2012:68)