Art at large

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The ultimate machine

The ultimate machine will have desires and needs, and its own machine Buddha nature. It will respond to the environment, move, participate in dialogue with others, and have means of restoring its energy. Finally, it will be a sculpture. It hasn't been made yet but it has two predecessors. These two penultimate machines are the works of an expatriate Pole, sculpturer and inventor, Edward Ihnatowicz, who is working currently in the engineering department at University College.

SAM

Having made conventional sculptures - mostly figures in bronze, Ihnatowicz became increasingly interested in applying technological ideas to art and by 1968 produced an extremely sophisticated cybernetic sculpture called SAM (sound-activated mobile). The work consisted of a form constructed from four petals on top of a vertebrae-like neck. The sculpture was sensitive to sound and inclined towards any source of quiet but sustained noise. Shrieks failed to provoke a response, but quiet words did, and a great many people spent hours in front of SAM trying to produce the right level of sound to attract its attention.

Ihnatowicz himself described it as his first electro-hydraulic sculpture, articulated, sensitive to the environment and controlled by an electronic system. The appearance of the work was to reflect the idea behind the work and the technology necessary to realise it.

Senster

His next project was a large structure operated by a computer, designed to explore the possibility of a much more subtle and varied movement, as well as more complex reactions to the environment. It looks like a giant lobster claw, is called Senster, and is now in the Evoluon in Eindhoven. Senster responds to directional sound by moving in what could only be described as an organic way, indeed the same way as the real claw of a lobster. The mechanics of Senster are readily visible - the actuators, pipelines and wiring are undisguised. A hydraulic system supplies the power for the independent movement of the joints of the Senster. It was chosen because it is quiet and facilitates fast and accurate movement. Each of the activating mechanisms forms a closed electro-hydraulic servo system which responds to the analogue signals from the control unit. The sculpture was intended to react to the environment in a more complex fashion than was actually feasible within the limitations of budget and time. The input of information is twofold. Microphones listen to the sounds made by the visitors and a radar watches their movements. This information in combination "motivates" the movement of the claw. Since the Senster responds to a number of stimuli simultaneously its reactions are more life-like and less obvious than if merely the volume of sound were to provoke a slow or fast movement. Senster is controlled by a computer which coordinates its activities, translates the input signals into instructions and modifies the behaviour of the sculpture according to past experience and the

present contingencies. An important part of the interface are the so-called "predictors" which determine the accelerations and decelerations required for the most efficient movement of the claw.

One of the initial problems was how to pick out the sound to which the Senster should respond amidst the noisy background of a public hall. What in fact happens is that the sounds which reach the two channels are compared at frequent intervals through the use of the control computer, and reaction is motivated when the sounds from the two sources match as far as possible. What occurs visually is that the microphones point at the source of sound and within a fraction of a second the Senster turns towards it.

Towards the ultimate

Senster provoked the kind of reactions which one might expect from people who are trying to communicate with a person or an animal. It appeared more as an organic creature that is capable of evaluating the messages that are sent, and responding to them. This is some-what reminiscent of the program DOCTOR developed in America, where patients had a conversation with a computer and were convinced that their partner in dialogue on the teletypewriter was a human doctor sitting in another room. This sort of confusion is merely at its beginning. As machines begin to simulate even more convincingly all aspects of human behaviour so the spectator will have to become more conscious of the processes involved. Indeed, the next work Ihnatowicz is planning will demonstrate even more accurately a pattern of behaviour which is organic in character rather than mechanical. One could say that animal behaviour is the result of a response to a series of inputs operating in combination, competing with one another, and finding some sort of a resolution which ultimately ends in an action. As Ihnatowicz is evolving a system for more combinations of inputs, so his works will one day have that uncanny quality of the inhabitants of a mechanical zoo, which to all intents and purposes demonstrates the behaviour associated with living creatures.

While what Senster does is more fundamental than what it is, the ultimate machine will be a more complete being with the hardware determined by software. The machine will express itself even to the point of getting extremely bored and manifesting this state by going to sleep. But how much of a spirit can a machine be endowed with? A machine which is essentially a sculpture and not the ultra-intelligent machine of Irving John Good which will eventually resolve our problems. The ultimate machine is a very extraordinary proposition since it will be modelled on nature and yet have that irrationality which is a part of every work of art.