

Healthy chaos

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" There will be no order, only chaos." -Sol Robeson (Mark Margolis), Pi In general, chaos theory is defined as the study of forever-changing complex systems. It contends that complex and unpredictable results will occur in systems that are sensitive to small changes in their initial environmental conditions. It argues that although chaotic systems appear to be random, they are not. Beneath the random physical, environmental or natural behavior, patterns emerge, at least suggesting order if not revealing it. In Darren Aronofsky's independent 1998 film, Pi: Faith in Chaos, Maximillian Cohen (Sean Gulette) attempts to apply the principles of chaos theory in order to determine the pattern behind the apparently random nature of market prices when he recognizes that the stock market is simply a non-linear, dynamic chaotic system like any other appearing in nature.

The themes presented in Pi are representative of more than stock market numbers. Rather, Stuart N Davidson contends that " Chaos theory is becoming as important to medicine as it is to physics," (1998). To be sure, we have seen the theory used to model other highly complex systems, including everything from population growth and epidemics to arrhythmic heart palpitations. The truth is, when applying chaos theory, we can see that even something as seemingly random as a dripping faucet has a pattern or sense of order behind it.

Davidson argues that " a healthy human is a series of fractal systems each in a state of internal chaos but global order. However, if we put very large numbers of us apparently well-ordered organisms together in social units . . . chaos again appears, but then again becomes perceived as orderly when regarded from afar," (1998). This is to say that neither humans, nor social

structures, though they seem to be well ordered, are free from internal chaos. This chaos however, can be regarded as healthy. Interestingly enough, it is "orderliness in some of a patient's physiological parameters," that often seems to be "one of the surest signs of disease," (Davidson, 1998).

Aronofsky's film can then be seen as a sort of allegory or fable then. In Cohen, we watch a character whose entire existence is meant to revolve around order and logic: "11:15, restate my assumptions: 1. Mathematics is the language of nature. 2. Everything around us can be represented and understood through numbers. 3. If you graph these numbers, patterns emerge. Therefore: There are patterns everywhere in nature," (Pi, 1998). As he grows increasingly closer to finding the order in the market however, his life and mind spiral out of control.

It is Sol (Mark Margolis) who seems to be the voice of wisdom in the film, accepting chaos as healthy and natural as Davidson might suggest. "The Ancient Japanese considered the Go board to be a microcosm of the universe. Although when it is empty it appears to be simple and ordered, in fact, the possibilities of game play are endless. They say that no two Go games have ever been alike. Just like snowflakes. So, the Go board actually represents an extremely complex and chaotic universe," (Pi, 1998). It is in fact, Sol who foreshadows Maximillian's eventual "crash" when he explains the cycle in which computers first realize that they are crashing, and then spit out their contents before destroying themselves. This is what Max does; he finds the number, but destroys it, then crashes himself. But in the end, we are faced with a pleasant image, of Max smiling at the trees, which contrasts

many of the disturbing images earlier in the film.

It is apparent that Aronofsky, and Davidson for that matter, are trying to introduce us to a new way of looking at the world. We must consider the possibility that chaos is the good and natural way of life, rather than something to be overrun with patterns and logic.