

**“Fuzzy Thinking, The New Science of Fuzzy Logic”**, by Bart Kosko, Flamingo, 1994.

“Into every tidy scheme for arranging the pattern of human life, it is necessary to inject a certain dose of anarchism.” This quotation from Bertrand Russell is certainly appropriate at the beginning of this book on Fuzzy Logic. If anything, the “anarchism” of Fuzzy logic has and continues to subvert the old Aristotelian order which forms the basis of all science and Western thought. And the fact that the quotation is by Russell is more than apt because Russell laid the logical foundations of fuzzy logic in the 1920's.

The whole edifice of science is built upon the Aristotelian bivalent logic of **A or not-A**. This logic underlies all of science, mathematics, logic and to a certain extent Western culture. The world, according to this is black or white. The problem is that it is evident to anyone that the real world is grey. The truth lies somewhere between the binary zero and ones. Multivalence or the logic of **A and not-A** discards the binary approach and talks about degrees. This multivalence is at the heart of the fuzziness.

Although multivalence had been investigated by Russell and others in the early decades of this century, it was only in 1965 that the term fuzzy sets was used for the first time by Lofti Zadeh, a professor at University of California, Berkeley. The academic community by and large ignored the revolutionary approach but Zadeh persisted with a few other workers and worked out many results in the new scheme of logic.

It was only after several Japanese companies patented many fuzzy products that the academic community sat up and took notice of this new revolution. From camcorders to washing machines, from copiers to air conditioners, from healthcare systems to controls for a steel mill, the Japanese sold \$2 billion of fuzzy products in 1991 alone! The “subversive logic “ was here to stay!

Written by one of the foremost experts in fuzzy logic, this book develops the subject from the ground up. It introduces the basic tenets of bivalence, points out its shortcomings and goes on to discuss in fair amount of detail, the basics of fuzzy or multivalent logic. In the view of the author, fuzzy logic is not only good for making better washing machines but is really a whole new approach to our understanding of complex systems. These could be natural systems where the fundamental laws of quantum mechanics are probabilistic or even systems of morality and social functioning. Neural networks, Fuzzy adaptive systems, Fuzzy cognitive maps, nanotechnology; these are going to be the buzz words of the twenty first century, invading every aspect of our existence.

The book is extremely reader friendly, full of anecdotes and many asides. Nevertheless, all the essentials needed to understand this novel approach are very well explained with many examples. There is a very good glossary of technical terms and an extensive bibliography for the interested reader to follow up on the subject. All in all, an extremely readable introduction to a whole new subject which will play a vital role in the coming years.