

Book reviews

Reviews

A New Kind of Science, Stephen Wolfram, Wolfram Media, Champaign, IL., 1197 pp., 2002

Wolfram claims to have uncovered a new vision of science.

By using sophisticated computer programs that he developed in his media company, he wants us to believe that he can generate complex behavior through a process of recursion embedded in computer programs of his own design. His programs are said to follow basic rules which can be associated with “elementary cellular automata”.

According to the book’s jacket, Wolfram,

“uses his approach to tackle a remarkable array of fundamental problems in science, from the origins of apparent randomness in physical systems, to the development of complexity in biology, the ultimate scope and limitations of mathematics, the possibility of a truly fundamental theory of physics, the interplay between free will and determinism, and the character of intelligence in the universe”.

There is nothing like “blowing your own horn”. A renowned physicist and Nobel Prize winner like Steven Weinberg [3] refutes most of Wolfram’s claims. While recognizing that Wolfram may have used programs which approximate a Turing Machine, Weinberg shows that Wolfram has a long way to go before he can claim to have discovered how to generate complexity in a machine.

Complexity is a subject dear to system thinkers. At first, we were fascinated by Wolfram’s claims. Soon we came to agree with Weinberg that no product of Wolfram’s programs can be defined as possessing large *effective complexity* in the sense given to this notion by Gell-Mann [1].

In van Gigch [2], we recall that Gell-Mann’s definition of *effective complexity* is based on “the length of the message which is required to describe certain properties of a system”. The message must encompass a description of two kinds of properties of the system:

- *regularities* i.e., a description by which the *compressible* features of the system are encoded, and,

- *randomness* i.e., a description by which the *incompressible* random elements are captured.

Unfortunately, there is no way to ascribe the notion of effective complexity to the computer patterns generated by Wolfram. This is the criticism leveled by Weinberg [3] who states that the so-called complexity of these patterns cannot be compared to each other because Wolfram has no standard or milestone by which it can be done. Another criticism of Wolfram’s approach is that he bases his assessment of complexity on observations and descriptions of the visible patterns, without offering more proof of the validity of his claims.

While we applaud Wolfram’s effort and self-confidence, we side with those who are skeptical of his results.

Wolfram’s book (all of the 1197 pages of it) must be acknowledged as a valiant effort which is worth admiring for the sheer effort and accomplishment that it represents. But no more.

References

- [1] M. Gell-Mann, *The Quark and the Jaguar, Adventures in the Simple and the Complex*, W.H. Freeman and Co., New York, 1994.
- [2] J.P. van Gigch, *Metadecisions: Rehabilitating Epistemology*, Kluwer/Plenum, New York, 2003.
- [3] S. Weinberg, *Is the Universe a Computer?* Book Review of Wolfram’s *A New Kind of Science*, New York, *Review of Books*, October 24, 2002, pp. 43–47.

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The Metaphysical Club, Louis Menand, Farrar, Strauss and Giroux, New York, 548 pp., 2001

The title of this book is highly misleading. It is not a philosophical treatise at all. According to the author it is “a work of historical interpretation”. The name

The Metaphysical Club stems from a group that was formed in January 1872 in Cambridge, MA. and it was at meetings of this club that many of the important ideas of the next century were discussed. In actual fact, the people who fashioned these ideas not only met in one location but, as the author recounts, were distributed throughout what was at the time the “civilized” core of the burgeoning United States.

The book is a partly novelized partly historical account of the ideas of four American thinkers: Oliver Wendell Holmes (1841–1935), William James (1842–1910), Charles Peirce (1839–1914), and John Dewey (1859–1952). (Dates cited in Wightman & Kloppenberg, 1995, not in Menand’s book). Their ideas are intertwined with the history of the times during which these authors lived and which corresponds approximately with the century following the Civil War.

Menand contends that the Civil War caused a great ferment in American thinking and as a result beliefs which are fundamental to the American experiment were born. Specifically he is referring to beliefs about education, democracy, liberty, justice and tolerance which shaped the country these thinkers helped to build.

They believed that ideas “are social” i.e., they are devised not by a single individual but by groups of individuals.

Ideas are adaptable to time and place. “Ideas should never become ideologies”. These authors taught a skepticism for dogmatic authority and obligation. Implicit in these teachings is the recognition of the limits of thought in the struggle to increase human happiness. In short, these ideas have been encapsulated in the philosophical label of American Pragmatism.

Because the assumptions underlying American Pragmatism still underlie how we think today, this book is relevant to the readers of this journal. Besides, each of the above mentioned authors excelled in many areas, e.g., Peirce is well known as a foremost semantist as well as a deep thinker that influenced the shape of the paradigm of the “modern” social sciences. The American modern educational establishment owes also a great deal to Dewey’s fundamental thoughts on the subject.

We will give a brief summary of the book contents which at the same time will provide an idea of how each of the featured authors contributed to the current foundations of American thinking.

In the first few chapters, the author describes the aftermath of the Civil War which was shaped by the politics of slavery. It seems that Oliver Wendell Holmes

had been an officer in the Union Army. According to Menand, Holmes “hated the war”. When Holmes was young, at seventeen, he became a freshman at Harvard College. His life became linked to another important thinker of the times – Ralph Waldo Emerson (1803–1882).

The Civil War generated a dislike for generality, i.e. the war had provided a glimpse of what expertise and professionalism could provide as opposed to improvisation and amateurism. Holmes shared his generation’s faith for science, hated the status quo, and in his own words: “he had not given hope of a glimpse of the infinite”. The main lesson that Holmes took for the war is that “certitude leads to violence”. By certitude he meant the ideologues, dogmatists and bullies – “people who think that their rightness justifies them in imposing on anyone who does not happen to subscribe to their particular ideology, dogma notion or notion of turf”.

Holmes thought that people like this exist in every sphere of life and it is natural to feel that the world would be a better place without them. (Any suggestion that even today we may harbor many “ideologues, dogmatists and bullies” in our midst is “purely coincidental” – as they say in the movies!) Holmes’ ideas about the detrimental effect of dogmatism is today reflected in Churchman’s *Enemies of the Systems Approach*.

The lives of the four authors featured in *The Metaphysical Club* can hardly be summarized in a paragraph of a short review. Holmes became a Supreme Court Justice and through his opinions influenced American social, constitutional and political thinking to this day.

William James was a scientist, interested in zoology and anatomy. He entered Medical School and his ideas became linked to controversies of the times which pitted for and against slavery, Darwinian evolution, natural selection, interracial public policy and the like. In his *Principles of Psychology*, he reconceived the problems of epistemology and psychology. He wrote *The Meaning of Truth* where he stated conditions necessary for establishing that a statement is pragmatically true.

Charles Sanders Peirce was also an scholar from the Northeast. At first, his passion was mathematics. Peirce is best known for his contributions to philosophy and semantics. He asserted that: “the question of truth cannot be settled simply by seeing whether thoughts lead to actions that satisfy desires but requires ascertaining whether signs accurately represent their objects”. (Cited in Wightman Fox and Kloppenberg [1] 1995.)

Dewey first made his ideas known in *The Ethics of Democracy* where he declared “Democracy and the one, the ultimate, ethical ideal of humanity are to my mind synonyms”. (Cited in Wightman Fox and Kloppenberg [1]). Later he devoted himself to education and school reform, subjects for which he became famous. He returned to philosophy and activism in his later years and elaborated his views on pragmatism, ethics and “democratic hope”.

In spite of its misleading title, Menand’s book is highly entertaining and never over academic or scientifically oriented. It was written for a general reader-

ship. It is a highly popular book among recent offerings of the trade.

References

- [1] R. Wightman Fox and J.T. Kloppenberg, *Companion to American Thought*, Blackwell, Oxford. See various citations under authors’ s names.

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