Review

Title: Goodbye, Descartes: The end of logic and the search for a new cosmology of the mind
Author: Keith Devlin
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A book which contains several disciplines that are interrelated may be hard to find, yet when we look at the contents of this book we may agree with Devlin's claim that it is not easy to categorize this book. Every one of the traditional fields of science such as mathematics, logic, philosophy, linguistics, computer science, artificial intelligence, psychology, sociology, or cognitive science is appropriate. How could all these disciplines be discussed in one single book? The difficulty in combining those disciplines can be caused by the different nature of some disciplines compared to others. Hard sciences such as mathematics and computer science is exact by nature and relies mostly on logic, whereas soft sciences like philosophy and other social sciences tend to be more subjective and often full of uncertainty and might be illogical. However, Devlin who is a mathematician and works as a senior researcher at Stanford University's Center for the study of language and communication has successfully connected those disciplines in this interesting book.

We cannot deny the fact that technology has been glorified in this information era. Those who have mastered the technology of information will have power over the world. With mathematics, humans have been able to understand, explore, control, and even conquer our physical universe. With human's mind, language is generated and programmed in the computer that can communicate with other people. Human languages have been formulated and programmed in the computer which can work like human. It is this absolute certainty of mathematical knowledge that has motivated generations of thinkers to try to find mathematical explanations of human reasoning.

This human effort of formulating and programming languages can be traced since the age of Aristotle and Plato. The logic of human reasoning is formulated in what is called as syllogism. With syllogism, Aristotle tries to explain the logic of human's mind by using mathematical formulas. As a mathematician, Devlin explains these complicated formulas for scholars from other disciplines to understand. Since mathematics follows logic and is exact as well as neutral in nature, many scholars believe it to be the primadona of all sciences and should be used as a standard of judging the quality of other sciences. It is through such principle of logic that modern linguistics and computer science have been born.

A prominent figure who has successfully applied the mathematical logic into linguistics is Noam Chomsky. Sentences are generated and analyzed in the forms of tree diagrams. Children, as what Chomsky believes, are innately provided with the ability to generate sentences. In order to develop a mathematical theory of language, Chomsky turns his back on social and cultural aspects of language and concentrates instead on the mechanics, in particular the abstract structure of language. His
Cartesian style certainly pulls the interest of many scholars who uphold the logic of mathematics. Thus, Chomsky’s theory of syntactic structure is very definitely hard science.

With science and mathematics enjoying a very high status in the early part of the twentieth century, and with logical positivism the flavor of the time in scholarly circles, anyone who chose to work in one of the social sciences was under considerable pressure to be recognizably scientific. However, Devlin starts to question whether human language can be formulated and approached through mathematics. Can language be treated as a neutral object? Here lies the weak point of Chomsky’s theory. His mathematical approach to the study of language should be acknowledged as a negligence of the word meanings. Even a grammatical sentence cannot guarantee to convey the real meaning as intended by the speaker. Such as stated by De Saussure during 19th century that a word can only convey a small part of the real meaning. Therefore the effort of formulating language can be seen as sheer useless. It is misguided, for the mind does not operate according to rules. It is time, he argues, for us to come to terms with the fact that logic simply cannot capture the real processes of human thought.

Devlin differentiates logic and human rationality by using several interesting examples and experiments. One of them is by using an example of what is generally referred to as the “Monty Hall problem.” To begin with, Monty directs our attention to three doors. We are told that behind one of them is a chest containing ten thousand dollars; behind each of the other two doors is a banana. One can pick one door and keep what is behind it. Monty knows where the money is, but we do not. After the person makes a choice, the chosen door is not opened. Instead, Monty opens one of the remaining two doors to reveal a banana. Since he knows the location of the money, he can, of course, always do this. Having eliminated one of the other two doors as concealing the money, Monty now makes the person an offer: Do you want to stick with your original choice of door, or would you rather switch to the other unopened door? It will cost you ten dollars to make the switch. The most common response people give when presented with this scenario is that changing their original choice does not make any difference to their chances of winning the money. So they decide not to pay the ten dollars to make the switch.

The Monty Hall problem shows that the person who wants to win ten thousand dollars can act in an entirely rational way. However, from the mathematical analysis of the problem, we are told that to switch is what we need to do to win the game. Yet the majority of rational people not only adopt the wrong strategy, the illogical one of staying with their original choice, they also have difficulty in coming to terms with the fact that switching is always advantageous. An intriguing aspect of this example is that, even when the correct choice is explained and justified, many otherwise rational and intelligent people continue to feel that the argument must be wrong and that their ingrained instincts are more reliable.

Devlin concludes that in order to understand the way human thinks, one thing we need to do is by leaving Descartes’ deconstructualization approach which relies on logic and mathematical formulas which are objective and neutral. Descartes’ views have led to numerous attempts to develop mathematical sciences of language and reasoning. He believes that people can develop a mathematical theory of language and reasoning that is as precise as physics. Devlin maintains that humans are never in a position of a completely detached observer with no prior experiences. Hence, we should not regard prejudice as a condition that leads us to interpret the world falsely.
Our prior experiences are a necessary condition in order to interpret our beings and the world around us. Devlin also cites a statement from Damasio’s book *Descartes’ Error*. For Damasio, the Cartesian idea of a "coolly rational person," who reasons in a manner unaffected by emotions, is an oxymoron. Truly emotionless thought leading to behavior is quite irrational.

Devlin invites us to review Plato’s writing in “The Republic.” In Chapter Seven entitled *Plato’s Cave*, Plato’s simile of the cave has been subjected to a wide range of interpretations. Yet such is life, one’s experiences will yield different understandings even when viewing the same object. This is similar to the story of an elephant and the six blind men. Each man may tell the truth based on the part he touches. However, each truth may still be misleading when it comes to reveal the whole truth.

With the decline of positivism and the growth of postmodernism, Devlin’s argument has certainly been a strong advocate in favor of the postmodernists. Devlin’s critique and analysis about the end of logic have answered many questions that soft scientists used to wonder. The very shortcoming about this book is perhaps on the fact that Devlin’s arguments are not supported with enough alternatives to be suggested as a way out. Devlin does suggest the use of soft mathematics as an alternative as it may open an opportunity for a new value system. However, as to how far this system can be applied, Devlin does not seem to offer any significant analysis.

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