Calvin Jongsma
Dordt College

BACKGROUND AND DISCUSSION OPENER

MATHEMATICS: THE LOSS OF CERTAINTY
by Morris Kline

A survey of Morris Kline's publications within the last decade presents one with a picture of his progressive alienation from the mainstream of mathematics. After publishing his monumental history of mathematics in 1972, Mathematical Thought from Ancient to Modern Times, a work which gained him a good deal of respect and appreciation from mathematicians everywhere, his later works have steadily edged him into the fringes of the North American mathematical community, if they have not completely ostracized him from it. In 1973 Kline published a bombastic exposé of the new math revolution in pre-college education, Why Johnny Can't Add: the Failure of the New Mathematics. In it he accused mathematicians of imposing their narrow views of modern mathematics upon mathematical educators, with rather disastrous consequences. This work was the culmination of over a decade of critique of the work of SMSG and like groups, critique in which Kline rallied a number of other prominent and concerned mathematicians to question what was going on in the new curricula. 1973 was not the first time Kline took his cause to the public, for he had been given press coverage in some of his earlier speeches against the new math movement, but it was certainly the first time he reached such a mass market with his indictment of the mathematical establishment.

In 1977 Kline attacked university mathematicians even more directly with his publication Why the Professor Can't Teach: Mathematics and the Dilemma of University Education. Here Kline painted university professors with a broad brush as picayune researchers without much talent for teaching. Moreover, he continued a theme begun in his earlier books; namely, that mathematical research in our time isn't very significant, as it is highly specialized and abstract and removed from the concerns of physical science. This work did little to heal the widening breach between Kline and the mathematical community, as one might expect (or read from the reviews given in The Monthly, May 1979).

The book presently under discussion, Mathematics: The Loss of Certainty, was published in 1980 and was reprinted in 1982 as a paperback by Oxford University Press. Once again Kline took his message of doom to the people, this time to expose the entire mathematical enterprise of the 19th and 20th centuries. And, predictably, the mathematical community was not very pleased or amused with the result (cf. the review in the November 1982 issue of The Monthly). Kline's account they hold, is exaggerated and inaccurate and his conclusions simply do not follow. We now have the chance to make our own assessment of the matter, to debate the merits of the work pro and con, though we've probably already been polarized one way or the other by it, since Kline's style doesn't leave much room for a moderate position. To get the discussion started I will state an initial impression or two of the work which I have and then try to moderate any comments you may wish to make about the book or its contents.

Kline, it seems to me, is a man who feels lost in the world of today's mathematics. He strongly identifies with the Renaissance and Enlightenment view of mathematics as the study of the structure of nature (though without its Christianizing elements), but he believes that subsequent events in the historical development of mathematics have made that view untenable. He therefore opts for the closest contemporary position on mathematics that he can find, a combination of a version of empiricism (the truth of mathematical foundations are tested by the empirical applicability of the results in the superstructure) with some form of Kantianism (man imposes the structure of mathematical science upon the external world he experiences with his mind). This position reveals an unresolved tension in Kline's thought. On the one hand he feels that mathematics ought to be closely tied to natural science if it is to be genuine, but on the other hand he feels that mathematics has progressed beyond the point where one can believe in any close connection between mathematics and the world. Mathematics, he is sorry to say, has lost its hold on truth. Non-euclidean geometry and different varieties of algebras have shown mathematicians that mathematics cannot be built up from self-evident or necessary truths. What's more, Kline says, mathematics strove for a weaker notion--consistency--but found that to be unattainable as well. The results of the 19th and 20th centuries have shown us how ephemeral the dreams of mathematicians were and to what depths of despair they have fallen.

This basic tension shows up throughout the work in various ways. In his recital of the history of mathematics, Kline seems both to admire and lament the progress which mathematics made as it lost its grip on truth. He both degrades the present state of mathematics and yet eulogizes it as the best there is. He castigates the mathematicians of the 17th and 18th century for too heavy a reliance upon intuition and for their lack of rigor, and yet he criticizes later mathematicians for being too concerned with logic and rigor. The mathematicians of the 19th and 20th century are chastized for focusing so much on Euclid's Elements' logical defects, yet Kline does pretty much the same. Hilbert's concern with consistency in 1900 was his concern alone, Kline says, yet he also maintains that mathematicians saw the significance of these issues in their drive toward purifying the foundations and retaining as much truth in it as is possible. Other examples can also be given, but the pattern is clear: Kline wants it both ways at once in order to make the story more dramatic. Depending upon what Kline is stressing, he tends to skew his interpretation of the record to suit his purposes at that moment.

Kline's style of writing makes interesting reading and is historically informative, but it often lacks scholarly accuracy and sound judgment. There is much in the text that is worth reading and reflecting upon, but it is not a work to be given to the unsuspecting student of mathematics, much less to an unknowing public, without a fair appraisal of its theses. As teachers of mathematics, we are in a position to do just that. As colleagues, we can help one another see how that can best be done. As Christians interested in the foundations of mathematics, we have a responsibility to determine just how true (besides how consistent) Kline's indictment of modern mathematics is.