Loren Graham and Jean-Michel Kantor

A Comparison of Two Cultural Approaches to Mathematics :
France and Russia, 1890-1930

Abstract

Many people would like to know where scientific ideas come from and how they arise. In the case of mathematics, new ideas often come in the form of new "mathematical objects:" groups, vector spaces, sets, etc. Some people think these new objects are *invented*; others that they are *discovered*. By exploring the birth of descriptive set theory in France and Russia in the period 1890-1930 we show that the leading French mathematicians worked within a rational, secular worldview that made them doubt the legitimacy of infinite sets, particularly non-denumerable ones; on the other hand, the leading Russian mathematicians, particularly those who subscribed to a religious doctrine known as "name-worshipping," believed that humans had great freedom to invent mathematical objects. Partly as a result of their different cultural environments, the French and the Russians took different approaches to the same problem. In the end the Russians created a new field, descriptive set theory, at a time when the French remained hesitant.