HISTORIOGRAPHIC VICES
II. PRIORITY CHASING

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SUMMARY

This second essay (Num. I: HM 2, 185-187) argues that the historian may be interested in studying priority controversies but should analyse historically significant events rather than award status.

The status of mathematicians depends partly on their reputed innovations. At times an innovation has been defined as a result never before known by anyone. Some mathematicians have tried to maintain the competitive advantage of secrecy and also to claim priority later on the basis of diaries, notes, private communications, or published ciphers. A familiar example is the "priority" of Gauss for least squares. Sometimes priority controversies, often accompanied by charges of plagiarism, have played a significant (usually baleful) role in the development of mathematics, as did the Newton-Leibniz quarrel.

Today, it is generally agreed that only printing (or other public communication) counts in the competition for status, and priority disputes are rare. The sharpness of the "first" concept has been blunted by better communication, greater cooperation, the recognition that near-simultaneous discovery of equivalent results is normal (with credit properly going to all parties), and the custom of giving ample credit by joint authorship or explicit acknowledgement to all participants in discussions leading to a paper. Most mathematicians today consider as barbaric the attitude, attributed to R.L. Moore, that a "real mathematician" would rather that a problem remain unsolved than share credit for its solution. Nevertheless, whether motivated by ambition, the competitive habit, or a desire to be socially useful, mathematicians want to find *new* results. Hence, their natural preoccupation with priority questions. Typically, they first become interested in history by wanting to know whether what they have found is actually new. For them it is quite natural to ask "Who did it first?" They may even imagine that answering such questions is the main duty of the historian, and this notion is reinforced by the large number of "firsts" assigned in older histories of mathematics.

The historian can be helpful to the mathematician in finding antecedents of his work, and he should try to convince his

colleagues that the old adage "Those who are ignorant of history are condemned to repeat it" is as applicable to mathematical research as to political activity. But one hopes that mathematicians and historians will come to realize that "Who did it first?" is the wrong question.

Detailed knowledge of the history of a few mathematical topics leads to the view common to historians that priority questions are very elusive, seldom answerable, and of little importance to historical understanding.

To begin with, we can never know who first thought of anything. Sometimes documents show that a mathematician (usually one whose fame has preserved his papers) anticipated an idea that was later published, but we have no way of knowing the unrecorded thoughts of others. Such cases reveal much of interest. They indicate that an idea was thinkable in the intellectual context prior to its publication, that before an idea is recorded it is usually "in the air" more or less as it later appears, and so on. But they also establish the indeterminacy of the concept of "first person to think of it." Hence, the most that we can hope for is to find the first extant record of an idea, an apparently solvable problem because of the finiteness of the literature.

On closer examination, however, the hope of finding a "first" comes to grief because of the historically dynamic character of ideas. If we describe a result with sufficient vagueness, there seems to be an endless sequence of those who had something within the vague specifications. Even plagiarists usually introduce innovations! If we specify the idea or result precisely, it turns out that exact duplications seldom occur, so that every mathematical event is a "first," and the priority question becomes trivial.

For example, the classic "Who invented the calculus?" is vague enough to carry us back to antiquity and forward to the present century. The usual answer, Newton and Leibniz, is misleading at best, false if interpreted literally. They were nearly independent of each other but heavily dependent on their predecessors. They did not "invent" quite the same thing nor what we now call calculus. Similar remarks apply to the traditional claim that Descartes invented analytic geometry. On the other hand we can say with some assurance that Leibniz invented the elongated S symbol for the integral, but what difference would it make to our view of the development of mathematics if we were to discover that it was suggested to him by someone else?

As another example, consider the so-called "fundamental theorem of algebra" -- we say "so-called" because there are many theorems (all more or less about the existence of solutions of algebraic equations) that go under that name. It is often said that Gauss gave the "first rigorous proof." In fact, his proof was not rigorous in modern terms, and what he proved was not the same as the theorems of his precursors nor of today's textbooks. We

can say that Gauss analyzed previous work on the question, pointed
out some errors, and gave the most thorough treatment of his day.

There seems to be an indeterminacy principle on priority. We
gain determinacy on who was first only by narrowing the specifica-
tion of the event. With sufficient definition, we find a single
person responsible (occasionally a group of independent produ-
cers), but at this level of specificity nearly everything is a
"first." The answer to the usual priority question turns out
to be a chronology of related results.

But suppose we do find a priority question that can be
answered? Suppose we established that Leibniz did plagiarize
Newton or vice versa? What diference would it make to our
understanding of the development of calculus? We might revise
our judgement of the morals of Leibniz, but not of his genius,
because the basic ideas underlying the calculus were present in
many minds and publications of the day. "The calculus" was not
a single idea that someone could steal. The contributions of
Leibniz to the notation and algorithms of calculus and their use
by him and his collaborators are the important things for under-
standing his role.

Of course, I do not mean that who did what and when is of no
importance. On the contrary, such is the essential raw material
of history. Rather, I am urging that this raw material is mis-
represented by converting it into a sequence of first discoveries
of results known today. Each person was the first to do pre-
cisely what he did when he did. The historian's job is to find
out, relate, and explain these distinct events. Duplication of
results at much later times, multiple independent "simultaneous"
discoveries, plagiarism, priority controversies and other status
struggles are all possible subjects of study. But the historian
misses his calling if he ahistorically assumes the role of
arbiter in status contests, whether historic or imagined. He
is likely to avoid a wild goose chase only by settling for a
trivial gosling. Even a success would be negligible -- final
only until another chaser looks at the matter more closely.

True, priority chasing is only a minor vice. It may even
stimulate the establishment of better chronology, upon which
more important historical conclusions might be based. But it
remains a vice, giving a false picture of the historical process
and distracting the researcher from analysis of the complex
evolution of mathematical activity.