Off the Beat

A Lawyer's Library

"Strangely enough, anyone wishing to write about Galois in Paris would do well to journey to Louisville, Kentucky."
—Leopold Infeld, *Whom the Gods Love*

Mathematicians pondering a mathematical heritage.

French mathematician Evariste Galois, whose death in a duel at the age of 20 cut short a remarkably productive career, is only one of many mathematicians represented in an unusual but little-known collection of rare mathematical and scientific books at the University of Louisville library. A visitor can leaf through the wrinkled, yellowed pages, stiff with age, of a 500-year-old edition of Euclid's *Elementa,* through *Narratio Prima* in which Copernicus's pupil Rheticus first announced the Copernican sun-centered concept of the solar system, and through a copy of Isaac Newton's *Principia* that Newton himself had handled.

The man who assembled this collection was a lawyer and a mathematics enthusiast. Born in 1873 into a prominent Kentucky family, William Marshall Bullitt throughout his long life believed firmly in the value of mathematics. Lurline Jochum, Bullitt's secretary from 1927 until his death

William M. Bullitt in 1940

in 1957, recalls, "When a young man from law school would come into the office and want a job, the first thing [Bullitt] would say is: How much mathematics have you had? He felt that if you had a good mathematical background, then you had a good reasoning power."

While an undergraduate at Princeton University, Bullitt himself took mathematics courses in preparation for his subsequent legal career. Later, he studied at the University of Louisville law school and established a lucrative practice in Louisville, specializing in corporate and constitutional law. His clients included several of the country's largest insurance companies. He even came up with a mathematical formula that helped him win several insurance cases beginning with an important case for the New York Life Insurance Co.

At the same time, Bullitt kept up with developments in mathematics and astronomy by attending meetings of groups like the American Mathematical Society and corresponding with mathematicians and scientists, including Albert Einstein. His friends included astronomer Harlow Shapley and mathematicians George D. Birkhoff, E. T. Bell and Richard Courant.

James G. Baker, now an optics researcher associated with the Harvard Observatory in Cambridge, Mass., first met Bullitt about 50 years ago, when Bullitt contributed money to help him, then a promising young Louisville student, get into a graduate astronomy program at Harvard University. Baker remembers, "He was a very intensive person, almost a nervous person. He could hardly sit still. He was full of energy."

The idea of collecting "the most important original works of the most prominent mathematicians of all time" came out of a suggestion by Princeton mathematician Oswald Veblen during a dinner conversation. He and Bullitt would often meet to talk about mathematics, says Jochum.
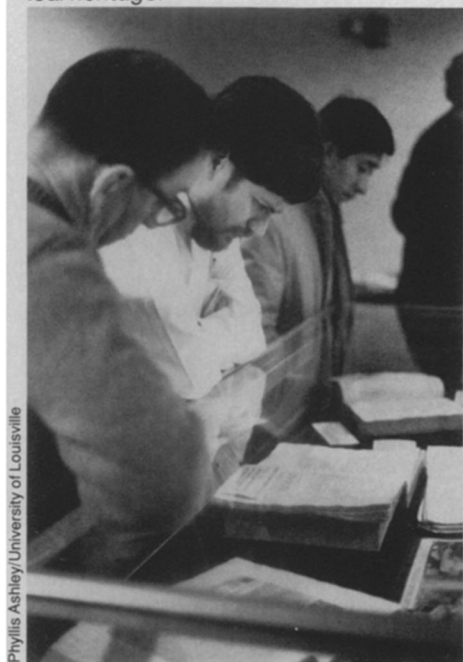
Like everything else he did, Bullitt went about this new project systematically. He asked people like Bell and Shapley for lists of what they considered to be the most important books that he could collect. He wrote to mathematicians at various colleges all over the United States to get their comments on the lists. When he was ready, he notified rare-book dealers of his needs and even traveled personally to Germany and France to locate many of the works on his final list.

University of Louisville mathematician Richard M. Davitt, who has taken a special interest in the collection and looked into how the books were found, says Bullitt didn't miss much. "He had the right contacts," says Davitt. Bullitt's remarkable success also depended, in part, on his timing. The late 1930s and early 1940s were times when many scarce and valuable books could be obtained readily.
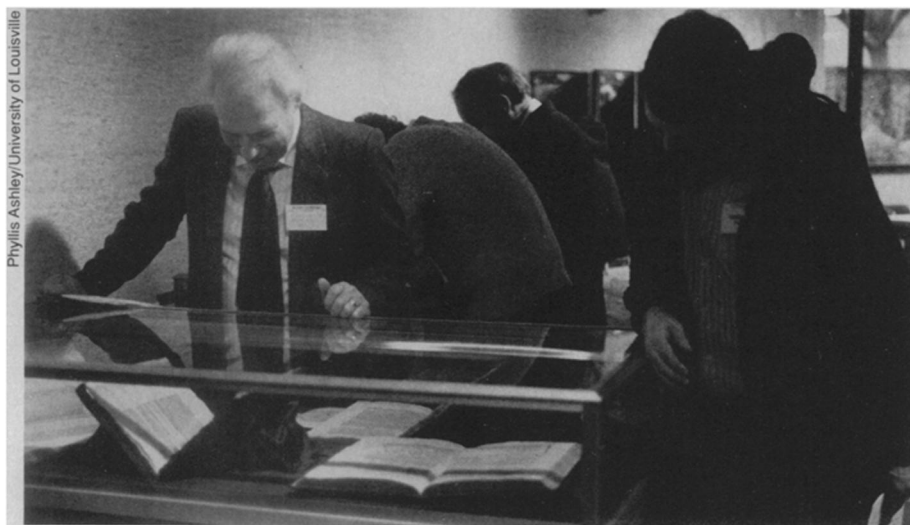
Bullitt kept much of his collection in his law office, locking away some of the more valuable books in the office vault. In addition, he maintained a good selection of mathematics books in a magnificent library at Oxmoor, his family home located just outside of Louisville. Visitors like Baker remember browsing through the library's mathematics books and Bullitt's habit of sometimes testing his visitors by posing mathematical puzzles.

One special feature of the collection attracted a few scholars even while Bullitt was still alive. Bullitt managed to assemble the most complete collection of the works of Galois to be found outside of France. This included copies of hard-to-find, contemporary newspaper clippings, many unpublished items and other documents. When University of Toronto physicist Leopold Infeld decided to write a biography of Galois, he visited Oxmoor and spent several days examining the collection. Infeld, a socialist, described this visit, his first encounter with an American millionaire, in his autobiography, *Why I Left Canada.* He was overwhelmed and uneasy in the abundance, luxury and power that he saw at Oxmoor. "I still re-

During a recent mathematics conference, the University of Louisville library displayed a few of the books in its valuable mathematics collection.

member that in the bathroom the toilet paper was rose-colored and perfumed," he wrote. "The window frames creaked so much in the wind that I was unable to sleep in the midst of all the abundance and luxury."

When Bullitt died, his widow donated the more valuable books to the University of Louisville, although schools like Harvard would have liked to obtain the collection. Later, the remainder of the collection also went to the university library, and the current checklist contains more than 300 items.

Albert Lewis, now helping to edit the papers of mathematician Bertrand Russell at McMaster University in Hamilton, Ont., says the collection is very rich in the authors that it covers, and includes some very rare items. However, he calls it a "collector's collection" because most of the material is available elsewhere to mathematicians and interested historians in other forms or later editions. "It's a marvelous collection, nevertheless," Lewis says.

This kind of resource is useful, says Uta Merzbach, mathematics curator at the Smithsonian Institution in Washington, D.C., because it is sometimes helpful to check original editions of mathematical works. In later editions, particularly during the 19th century, changes made by editors often obscured an author's original work.

But it wasn't historical research or the monetary value of the books that brought more than 50 mathematicians, attending a recent American Mathematical Society meeting in Louisville, to crowd into the university library's rare-book room. It was a chance to trace the mathematical formulae and geometrical diagrams of ancient authors, to puzzle out cryptic Greek and Latin phrases and to contemplate some of the greatest achievements in mathematics. It was a chance to touch a heritage.   —Ivars Peterson

New data change image of poverty

Two new long-term studies question the prevailing belief that the poor form a permanent underclass in the United States that is perpetuated by welfare and a "culture of poverty."

A survey by the University of Michigan's Institute for Social Research in Ann Arbor shows that one in four people in this country lived in a family that required at least some welfare income between 1969 and 1978. Many of those who accepted government aid returned to self-sufficiency within a year or two, the researchers found. Only about 2 percent of the population depended heavily on welfare for more than seven of 10 years.

Many people on all rungs of the economic ladder experience "tremendous changes" in family composition, income and employment, says survey director Greg J. Duncan. As a result, welfare touches many lives.

About half of those who required welfare during the 1970s had a short-term need. "Many families receiving welfare ... were in the early stages of recovery from an economic crisis caused by the death, departure or disability of the family's major wage earner," notes Duncan. Government assistance helped these people over a temporary rough spot.

In their annual interviews with individuals from a representative national sample of 5,000 families, Duncan and colleagues Richard D. Coe and Martha S. Hill also found that most of the children raised in families receiving welfare do not themselves go on welfare after leaving home.

Almost two-thirds of the people who are persistently poor are black. But most do not fit the stereotype of the apathetic "welfare mother" or young, unemployed male. One-third of the welfare-dependent population is old (over 65) or lives in families headed by the old; about 40 percent live in households headed by single women with children at home; two-thirds live in the South, mostly in rural areas.

In a book based on the survey, Years of Poverty, Years of Plenty, Duncan says that traditional one-time surveys of national poverty cannot track patterns of family economic change. The U.S. Census Bureau, for example, has found that the size of the richest, middle-income and poorest segments of the population remains fairly stable, but the Michigan study shows that membership in these segments changes significantly from year to year.

A related 40-year follow-up study of inner-city children appears in the March AMERICAN JOURNAL OF PSYCHIATRY. Psychologist Jancis V.F. Long and psychiatrist George E. Vaillant, both of Harvard University in Cambridge, Mass., report that a majority of children from impoverished homes escape poverty. The researchers used data going back to 1940 on 456 white, nondelinquent youths in Boston, half of whom were from homes plagued by parental cruelty, alcoholism, dependency on economic aid and numerous other problems. All of the youths, aged 12 to 16, lived in poor neighborhoods and did not attend Boston's better public schools.

When 425 members of the original sample were checked 35 years later, about 80 percent of those from "multi-problem" homes had escaped poverty to the middle class or above. Both groups had been employed for more than 90 percent of their adult lives, both had similar income levels and showed little difference in criminal records or mental health. Childhood IQ and coping skills were most closely related to upward social mobility.

The researchers caution that their subjects were favored by being male, white and born during an era of economic growth. But a significant "resilience" was found for children from families with numerous social problems, they say. If deprived family backgrounds do not hold back the majority of urban children, add the investigators, economic aid and social interventions become "less hopeless and more urgent."   —B. Bower