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CITY OF INFINITE BRIDGES

Mathematicians may be familiar with the stories of Königsberg, city of seven bridges, but few are aware—and even fewer convinced—of the startling events surrounding them.

The former capital of East Prussia, Königsberg (now Kaliningrad, Russia) is remembered chiefly for the famous math problem solved by Leonhard Euler in the 18th century. The city contained two islands enclosed by the river Preger, each connected to the mainland and to one another by seven bridges. The puzzling question submitted by Euler was whether all seven bridges could be crossed in a single trip without doubling back.

Anon., Map of Königsberg (1807).

In a feat of public curiosity that seems almost inconceivable by modern standards, the townspeople began to walk about on

Sundays trying to solve the problem themselves. Of course, no one could, and in fact Euler proved that such a quest was impossible.
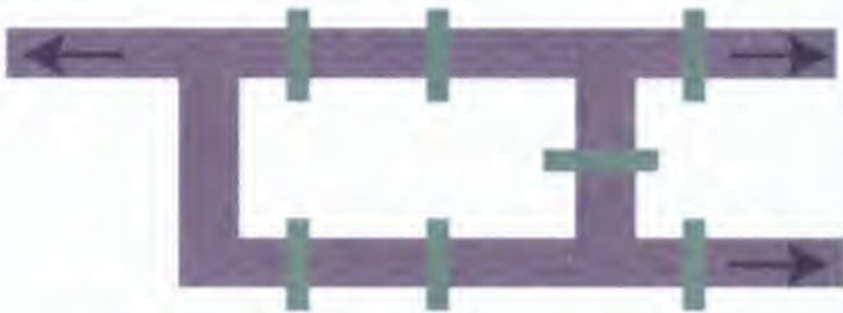
An abstracted model of Königsberg and its seven bridges.

The mathematician's wife, Katharina Gsell, was known to dabble in numbers herself, but her own contributions have for the most part been written off as the whimsical diversions of a Swiss housewife. Her gifts have only recently come to light due to the fortuitous discovery of her half-sister's diary, into which a very strange sketch had been inscribed. It is of note that Euler eventually left Katharina for this very same sister, and that the geometrical figure was composed as a spiteful refutation of her ex-husband's celebrated proof.

The diagram was not of the sort Euler had drafted—in fact, it is likely no one had ever conceived such a configuration. It was essentially a map of Königsberg plotted on a familiar Cartesian grid, only folded to link two of its corners as if by an adhesive. The resulting shape—something of an inward-facing loop—allowed the connected landforms to function as a single "node," thereby off-setting the numbers in Euler's math. In this tangled, imaginary city, all seven bridges could be traversed in a single, non-repeating route.

Katharina's visionary graph presaged the science of ellipti-

cal geometry and would almost certainly have inaugurated this revolutionary field (just as her ex-husband's work had helped establish topology) had her ideas ever been taken seriously. This being 18th-century Europe, few believed feminine minds capable of rational thought, let alone complex mathematics, and this lack of validation further incensed her. Katharina grew feverish with rage. She barely ate, stopped sleeping almost completely, and channeled all her fury into the city that had caused her such torment.

Shortly thereafter, reports of bizarre happenings began to surface. Townspeople spoke of having dreadful dreams, visions of natural disaster—floods, earthquakes, hurricanes—which ravaged the city night after tempestuous night. The collective despair soon carried into the waking hours, and for many there was no respite at all. Some wept, others went into self-exile, a few even threw themselves from the town's now-famous bridges.

To this day, it is believed by certain citizens of Kaliningrad that Katharina's proof was a curse upon the town, that it brought their ancestors to the brink of madness, and that it was not until Euler and his two wives had died that the plague of nightmares was lifted.