mals such as dogs, Pasteur and his team keep a loaded revolver within reach as they work on the sleeping beasts. It isn't just for the animals but also for the researchers. "If a terrible accident were to happen to one of them, the more courageous of the others would have to put a bullet in [the injured person's] head," says Roux's niece Marie Cressac. If the reported treatment becomes routine, life in the laboratory could become much less tense.

Pasteur's latest accomplishment comes at a time in life when most people reduce their workload. Even though he is 62 and partially paralyzed by a stroke, Pasteur continues to experiment as he has all his life.

In his youth, Pasteur discovered properties of crystals, but he later studied bacteria. He found that these tiny microbes can cause disease and spoilage. Pasteur's knowledge of bacteria led to a heating process that kills microbes that spoil wine, beer, and milk. This process is being called pasteurization, in honor of the versatile scientist. He also debunked the theory of spontaneous generation—the ancient belief that living things could grow from naught.

In other research, Pasteur found the microbe that was killing silkworm eggs and so saved the French silk industry from disaster. He cured chicken and swine diseases, devising a vaccine against anthrax. Until he did, French sheep farmers were losing up to 30 million francs a year to this disease.

Pasteur turned to rabies in part to prove the principle of vaccination, which still has doubters even though English physician Edward Jenner 89 years ago showed that cowpox inoculates people against smallpox.

Pasteur's aversion to rabies may also stem from an incident he witnessed as a child in the village of Arbois. When Pasteur was 9, a rabid wolf bit several people there. Neighbors rushed one man to a blacksmith's shop, where his wound was cauterized with a branding iron—killing the rabies before it could infect his body. Other bite victims were not so lucky.

Despite his successes, Pasteur is not uniformly popular among the science elite. He can be harsh with his colleagues. For example, he once said of them, "One must not assume that an understanding of science is present in those who borrow its language."

A close associate, Charles Nicolle, says Pasteur is "possessed of that indomitable temerity that a sacred delirium imparts to the genius." —*N. Seppa*

Gravity tugs at the center of a priority battle

CAMBRIDGE, England, July 1686 — A bitter dispute over who came up with a fundamental rule of gravity threatens the publication of a sweeping new theory on the nature of planetary motion.

The theory at issue is the work of Isaac Newton of Trinity College in Cambridge, already known and highly respected for his research in optics and mathematics. Newton proposes a law of gravity based on the idea that bodies attract each other in proportion to their masses and inversely as the square of the distance separating them. Doubling the distance between two celestial bodies, for instance, would reduce the gravitational force between them to one-quarter of its previous value.

Isaac Newton, Lucasian professorship of mathematics, Trinity College, Cambridge.

Newton's forthcoming book, *Philosophiae Naturalis Principia Mathematica*, explains how his theory accounts for the elliptical orbits of planets, the motion of comets, the occurrence of tides, and a variety of other phenomena.

It's an "incomparable treatise," says Edmond Halley, clerk to the Royal Society for the Improvement of Natural Knowledge in London, who is in charge of publishing Newton's book and has studied the first two parts of the manuscript.

Now, Robert Hooke, secretary to the Royal Society, contends that Newton did not himself invent the notion that an inverse-square force law governs planetary motion. "Newton stole the idea from me," he insists.

Hooke says that he had written to Newton about planetary and projectile motion in 1679, after developing his own "system of the world" to explain natural phenomena. He admits, however, that he was unable to master the mathematics required to show how elliptical orbits arise from an inverse-square law.

Acknowledging that Newton had succeeded in solving the mathematical problem but incensed that his own name is not mentioned in a section of Newton's treatise recently read at a Royal Society meeting, Hooke has demanded that Newton give him proper credit in the *Principia* for the inverse-square law.

According to Halley, however, Newton insists that he himself had discovered the inverse-square law during his studies of planetary motion. Unlike Hooke, Newton had not come upon it by accident, Halley says.

Edmond Halley, clerk, Royal Society for the Improvement of Natural Knowledge, London.

In the latest development, Newton appears to have gone through the existing manuscript to delete Hooke's name from any pages in which it had been mentioned. He has also informed Halley by letter that he intends to suppress the third part of the *Principia*.

"Philosophy [science] is such an impertinently litigious lady that a man had as good be engaged in law suits as have to do with her," Newton wrote. Clashes with Hooke over scientific matters on two previous occasions appear to rankle him still.

Newton's threat to withhold a critical portion of his highly anticipated book comes as a great shock to Halley. A few weeks ago, the Royal Society's council had approved Halley's plan to publish all three books of the *Principia*. Because of its own financial difficulties, stemming from the commercial failure of an elaborate book on the history of fishes, the society had made Halley personally responsible for funding Newton's publication.

Hooke's claims are "outrageous," says Christopher Wren, former professor of astronomy at the University of Oxford. "The consensus at the society—and in the coffeehouses—is that Hooke is making a fool of himself."

There is a great distance between a truth that is merely glimpsed and a truth that is truly demonstrated, he adds.

If Newton's book is published, it may prove hard going for most readers. Newton has boasted privately to a friend that he has deliberately made the *Principia* as unreadable as possible "to avoid being bated by little smatterers in mathematics."

"It's a tough book to dip into," says a critic who has seen portions of the manuscript. "Only experts will be comfortable with it."

"Not even the author could possibly understand it," adds a Cambridge student.

Halley sees it differently. "It's an epoch-making book," he says. "Newton unifies the disparate theories of Galileo and Kepler into a single, coherent, mathematically and experimentally supported whole."

Halley is cautiously optimistic that once the storm blows itself out, Newton will continue preparing the *Principia* for publication.

If it's completed and printed, Halley says, "the world will pride itself to have a subject capable of penetrating so far into the abstrusest secrets of nature and exalting human reason to so sublime a pitch by this utmost effort of the mind." —*I. Peterson*