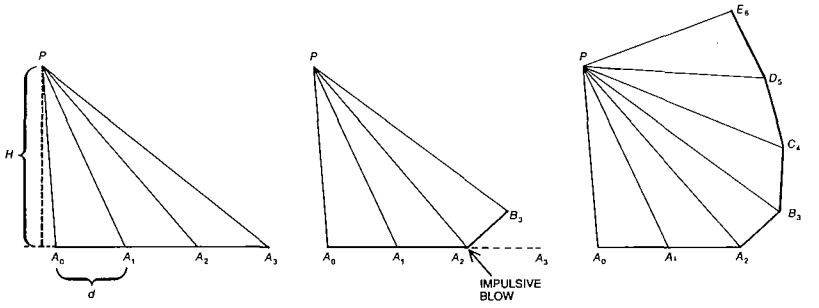
common center of mass. Again, he turned to astronomy for confirmation. Examining Jupiter and Saturn, he discovered perturbations in their orbits when they were closest together.

The apple anecdote that Newton circulated was a ploy to refute Hooke's claim to a share of credit for the law of gravity, Cohen speculates. In fact, Newton displayed a combination of genius, thoroughness, and persistence that left his peers far behind. He repeatedly compared mathematical models to the observed physical world until theory explained reality.



Sir Isaac Newton showed, at left, that a body moving past a point (P) at constant speed describes equal-area triangles at equal intervals of time (e.g., at A_1 and A_2). In the middle diagram, he showed that a force pushing it toward the point creates yet another equal triangle. Repeating the process and making the centripetal impulse a constant reveals an ellipse.

Cancer Confusion

"The Cells That Would Not Die" by Michael Gold, in *Science 81* (Apr. 1981), P.O. Box 10790, Des Moines, Iowa 50340.

While routinely processing flasks supposedly containing live human cancer cells from Russia in 1973, Berkeley biologist Walter Nelson-Rees made an astonishing discovery: The cells actually came from Henrietta Lacks, a black woman from Baltimore who had been dead for 22 years. According to Gold, a *Science 81* staff writer, the accidental spread of Lacks's cells has led many cancer researchers astray.

Before Lacks died of cancer at the Johns Hopkins clinic in 1951, doctors delivered part of a strange purple lesion from her cervix to colleagues who were trying to grow live tumor cells. Lacks's culture turned out to contain the first human cancer cells vigorous enough to thrive and multiply in the lab. "HeLa" cultures became much in demand. Their ability to support human viruses, for example, helped scientists to develop polio vaccines.

But HeLa grew too easily. If only a few cells entered a different culture, they crowded out their host within days. Nonsterile equipment and sloppy lab procedures hastened their spread—a few stray cells on a

bottle lip or counter top were enough to seed contamination. HeLa, suspects Nelson-Rees, can travel inside tiny airborne droplets during common lab procedures such as pipetting. These cultures may have already distorted cancer research. During the 1960s and '70s, for example, scientists reported that human cells grown in a lab could spontaneously turn cancerous. This notion must now be discounted. Findings that all cancer cells shared common traits—ate the same food, flourished in the same environments, and contained abnormal chromosomes (the "mark of cancer")—were all the creation of HeLa. Lacks's cells have been studied as normal heart and liver cells and as intestinal, larynx, prostate, and breast cancer cells.

Nelson-Rees has become a scientific Philip Marlowe, writes Gold. He tracks down fugitive HeLa cells in all corners of the world and publishes "hit lists" naming contaminated cultures. (The cells are relatively easy to spot. All have four oddly shaped chromosomes and a rare digestive enzyme found only in blacks.) So far, Nelson-Rees has identified, as HeLa, 90 of the several hundred human cancer strains used today by researchers. He expects to find many more, any one of which may be warping cancer experiments even now.

Why QWERTY Lives On

"QWERTYUIOP—Dinosaur in a Computer Age" by Ian Litterick, in *New Scientist* (Jan. 8, 1981), New Science Publications, Commonwealth House, 1-19 New Oxford St., London WC1, United Kingdom.

In 1873, American inventor C. Latham Sholes sold a layout for a typewriter keyboard to the Remington Arms Company. One year later, the world's first mass-produced typewriters rolled off Remington's assembly line and soon cornered the market. Litterick, a British computer consultant, explains why a design that has strained the backs and fingers of countless secretaries, students, and journalists remains a standard in the computer age.

No one knows for sure why Sholes chose the "QWERTY" arrangement (named after its top row of letters). He may have wanted to avoid tangled type bars by separating the keys most often struck consecutively (e.g., *t* and *h*). But Sholes' prescience was limited; he designed QWERTY for two-finger typing. As a result, his layout overworks the weaker fingers of touch typists, impeding speed.

All efforts to topple QWERTY have been frustrated. During the 1930s, seeking to minimize movement and balance the typing load according to finger strength, August Dvorak lumped the vowels together on the left side. But QWERTY was so entrenched by then that few adopted his system. More recently, the British firm PCD devised Maltron—a nearly vertical keyboard with left and right halves. The muscular thumbs operate the *e* and other workhorse keys. The system is no faster than QWERTY, but it is more comfortable, as typists reported