

The Power of Big Ideas

Was the light bulb more important than the pill? An online gathering of scientists nominates the most important inventions of the past 2,000 years. Some of their choices might surprise you.

BY SHARON BEGLEY

WHAT CHANGED THE COURSE OF HUMAN events most profoundly? It wasn't a general or battle, emperor or president or assassin, as the "Great Man" school of history holds. It was more likely ... well, clocks or hay, the thermos bottle or smelting or writing. It was, in other words, a technological invention, according to 80-plus scholars gathered in the electronic salon called Edge

(www.edge.org). In November, literary agent and author John Brockman, who presides over Edge, asked scientists and other thinkers to nominate the most important invention of the last 2,000 years. In the postings being released this week, one theme emerges: while the absence of any single political event would not have changed history much (if Gavrilo Princip hadn't shot Archduke Francis Ferdinand to start World War I, something else would have), the absence of certain inventions would have produced a world far different from the one we inherited. Without the automobile, there would be no suburbia.

Some of the Edge offerings are predictable (the steam engine, the telescope, space travel); some suggest that their nominators should log off occasionally (the Internet, public key encryption). Others are provocative: batteries, notes philosopher Daniel Dennett of Tufts University, allowed the development of transistor radios and cell phones, which are "the most potent weapons against totalitarianism ever invented, since they destroy all hope of centralized control of information." Even an invention as simple as knitting, argues physicist Freeman Dyson of the Institute for Advanced Study in Princeton, N.J., triggered changes. Before knitting, many children died over the winter, so parents did not dare invest emotionally in them. The warmer clothes made possible by knitting "freed parents to develop a loving relationship with their children," says Dyson. Together, the nominations make a strong case that how we think, and the social and political institutions we create, are products of the science and technology we invent.

READING GLASSES Simple pairs of spectacles, says psychologist Nicholas Humphrey of the New School for Social Research in New York, "have effectively doubled the active life of everyone who reads or does fine work—and prevented the world being ruled by people under 40." That alone gets them into the inventions pantheon, but glasses also foster the mind-set that people need not accept the body nature gave them, and that physical limitations can be overcome with ingenuity.



THE ATOMIC BOMB With the destruction of Hiroshima and Nagasaki in 1945, mankind demonstrated that it had forged a technology that could, in seconds, return civilization to the Stone Age. Forever after, with or without a cold war, we will live in the shadow of the mushroom cloud.

THE PRINTING PRESS Among Edge's 80-plus postings, Gutenberg's 15th-century invention of movable type won by a landslide. The printing press allowed, for the first time, the rapid and widespread dissemination of information, knowledge and scholarship. It not only made myriad other inventions possible, since most inventions build on accumulated knowledge, but also triggered profound and lasting social and political changes. The printing press "led directly to mass literacy [and] democracy," notes Hendrik Hertzberg, executive editor of *The New Yorker*. Agrees physicist Raphael Kasper of Columbia University, "It spread knowledge beyond a small number of privileged individuals, thus permitting larger numbers to share or debate world views and to build upon past and present ideas."

