

and that methanol offers an opportunity for the country to begin substituting for imported oil in the near future. Support for Reed's view is most evident in Europe, where methanol as a motor fuel is being widely and enthusiastically investigated.

Volkswagen has had a major research program for several years, and in combination with the West German government and other industrial companies (including the German branch of Shell Oil), has been conducting an extensive fleet test since

March of this year. In Sweden, Volvo and the government have started a 3-year effort that will include fleet tests of cars as far north as the Arctic Circle. In both countries the use of methanol-gasoline fuels in the near future as a means of lessening the

History of American Technology—A Fresh Bicentennial Look

The study of the philosophy of science and the history of science are accepted, respectable pursuits 'as scholarly disciplines go; but the study of the history of technology is another story. The Society for the History of Technology (SHOT) held a bicentennial meeting in Washington from 17 to 19 October, and the gathering illustrated how this field is gradually winning acceptance in academic circles.

SHOT was founded in 1958 by Melvin Kranzberg, a historian at the Georgia Institute of Technology, who had been struggling with the problem of devising history courses that would interest his engineering students. Today, after arranging SHOT meetings every year for 16 years, and editing its journal, *Technology and Culture*, for 17 years, Kranzberg remains a zealous enthusiast. He is equally ardent about the history of technology as a discipline and about his society, which—correctly or not—he calls “The SHOT heard round the world.”

Kranzberg's aim, shared by other historians of technology, is to elevate the field to a position of academic respectability, to have it taught at as many colleges as possible, and to have other branches of history recognize its importance. There is evidence of success. In 1973 the American Council of Learned Societies admitted SHOT as a member; the organization has also been made an affiliate of the American Historical Society. Finally, Cyril Smith, who is a metallurgist-historian at the Massachusetts Institute of Technology and is one of SHOT's more prominent members, told *Science* that, despite its brief existence, “The field has become more and more professionalized.”

Smith was describing the fact that the history of technology seems to be changing, influenced by recent public questioning of technology's benefits. Several SHOT members explained that, in the 1960's, a typical paper in the field tended to revolve around a single invention or inventor. It would describe why the invention was needed, the inventor's origins and education, and the discovery itself. The paper would conclude with a catalog of the benefits that the invention brought to American society. Finally, since a number of prominent American technologists,—among them Henry Ford and Thomas A. Edison—rose from obscure backgrounds to wealth, fame, and a place in the panoply of American folk heroes, these papers would have the ring of Horatio Alger stories.

A number of presentations at the SHOT bicentennial meeting were of this type. “The Invention of the Caterpillar Tractor,” for example, centered on its inventor, Benjamin Holt (who became rich and famous), and ended with a discussion of how the tank, which was a natural development of this farming machine, revolutionized land warfare and helped the Allies win World War I.

But now, as Smith said, historians of technology are interested in “how the object relates to other forces in the culture.” Indeed, some of those at the meeting focused on technology's

negative impacts, or ways in which technology has been oversold in America. John G. Burke, of the University of California at Los Angeles, discussed the simultaneous rise, after 1880, of advertising, of the pulp and paper industry, and the increase in water pollution in the United States. Another report, about technology and government during the Depression, criticized the New Deal's promotion of technology as a cure for the nation's ills—such as its attempts to mechanize agriculture or sell thousands of household appliances in the Tennessee region so that there would be a market for the electricity generated by the Tennessee Valley Authority. This report noted that, even then, there were voices warning about the ills brought on by technology—the most obvious being unemployment.

The historians seemed to be taking a second look not only at technology but at its heroes. For example Edison, who is usually portrayed as the consummate inventor, was the complete capitalist as well. According to Thomas P. Hughes of the University of Pennsylvania, the notebooks that Edison compiled while devising the nation's first urban public power system (for the Pearl Street District in New York) show on every other page calculations of the system's market potential, the price charged for competing gas illumination, the cost of copper wiring, and other entrepreneurial concerns.

Feminists in the field are reexamining some of the heroes, too. Charles Martin Hall, the inventor of the electrolytic process by which aluminum is made, could not have succeeded without the aid of his sister Julia, according to Martha Trescott of Southern Methodist University. In 1886, Charles was working in his woodshed (now a shrine of the aluminum industry). But Julia, who also had training in chemistry and electricity, kept an eye on him from her kitchen, a stone's throw away. According to Trescott, it was Julia's care with their correspondence, which described the discovery in detail, as well as her recollection of the date of the invention (a date which Charles could not remember) that clinched a vital patent challenge in their favor. This made Hall, and not an obscure Frenchman, the founder of the modern aluminum industry.

Kranzberg was obviously pleased with the attendance at the bicentennial celebration of 150 people, compared with the typical attendance of 50 or 60. The society's membership has climbed recently as well, to 2100 members. He thinks that the increased acceptance of the history of technology as a discipline is partly responsible. At the same time, he notes, many colleges are teaching courses in values, technology and society, in technology transfer, and in technology assessment—all of which is sparking student interest.

Besides, he says, “It's a fun subject. There are a lot of new avenues to explore and ways of looking at things. It's not like going over and over the same old kings and the same old battles.”—DEBORAH SHAPLEY