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Current Comments

Science on Television

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Issues and events such as Three Mile Island,[1] the synthetic fuels controversy, toxic chemical wastes, "test-tube babies," artificial insemination projects, the safety of the DC-10, and the crash of *Skylab* are obviously increasing the public's interest in science. Recently several new popular science magazines, such as *Omni*[2] and *Science 80*, have been established to serve this interest. This upsurge in printed science journalism is being paralleled by the growth of science programs on television.

In this essay, I will briefly describe the new science TV shows. Figure 1 lists the networks' addresses, since many of the programs can be rented or bought for classroom use. The programs are shown or repeated at different times in different areas of the country. *Current Contents*® readers who want to see what the public is viewing about science should check local newspaper listings for times and dates. The weekly magazine *Science News* also publishes a column that lists forthcoming programs.

One of the three commercial networks, the Columbia Broadcasting System (CBS), has an ambitious project. *Universe* is intended to be a weekly, half-hour program covering three science topics per installment. A test edition of *Universe* was broadcast on June 27, 1979. It discussed the possibility of a major earthquake in California, the search for an answer to multiple sclerosis, and mysterious flashes on the moon, probably caused by a giant meteor, observed by monks in the 12th century. *Universe*'s executive producer, Ron Bonn, says that six more programs are planned for this year.[3]

The host of *Universe* is Walter Cronkite, who has hosted the CBS evening news for almost 20 years. Cronkite announced recently that he plans to retire from the evening news next year.[4] But he intends to be active in other CBS projects, including *Universe*. According to Bonn, Cronkite will report on at least one science story per program.

Cronkite's commitment to science broadcasting was evident in the late 1960s, when he hosted a CBS series called *The 21st Century*. This series covered pollution, space flight, medicine, electronics, and similar subjects from the futurist's point of view. His interest in science journalism was also made evident by his endorsement of a service offered by the Scientists' Institute for Public Information (SIPI).[5] This was SIPI's Media Resource Service, which directs reporters on tight deadlines to scientists willing to talk with them. To benefit this service, Cronkite spoke at a New York City reception, which I attended. He said if the service "didn't exist, we'd have to invent it."[6]

Cronkite is also board chairman of Satellite Education Services, a nonprofit corporation. This organization is planning a satellite-broadcast news program for high schools. Tentatively entitled *The Way It Is*, the program would in-

Figure 1: Addresses of television networks and studios.

American Broadcasting Companies (ABC)
1330 Avenue of the Americas
New York, NY 10019

Columbia Broadcasting System (CBS)
51 West 52nd Street
New York, NY 10019

National Broadcasting Company (NBC)
30 Rockefeller Plaza
New York, NY 10020

Public Broadcasting Service (PBS)
485 L'Enfant Plaza W, SW
Washington, DC 20024
(202) 488-5000
also:
75 Rockefeller Plaza
New York, NY 10019
(212) 489-0945

British Broadcasting Company (BBC)
Villiers House
The Broadway
London, W5 2PA
England

ATV Centre
Birmingham B1 2JP
England

Granada Television Ltd.
Manchester M60 9EA
England

Norddeutscher Rundfunk
Gemeinnützige Anstalt des öffentlichen Rechts
Postfach 540460
Gazellenkamp 57
2000 Hamburg 54
Federal Republic of Germany

clude a weekly science news segment. The program is still in the early stages of planning.[7]

The other two major commercial networks do not yet have a regular science series. However, a weekly general science series, tentatively entitled *Quest*, is being planned by the American Broadcasting Companies (ABC), according to Executive Producer Jeffrey Pill.[8] Last year, the National Broadcasting Company (NBC) tried a weekly series called *Lifeline*, which was unfortunately cancelled due to its inability to attract a sufficiently large audience. *Lifeline* showed real doctors saving the lives of real people.

While the commercial networks have made tentative efforts to bring science to the TV audience, the Public Broadcasting Service (PBS) began airing many new science shows during the 1979-80 season. PBS is supported by corporate and individual donations, as well as by the federally chartered Corporation for Public Broadcasting. Some of these series devote each segment to a different science topic. This is the format of *Nova*, probably PBS's best-known science series.

Nova, begun in 1972, reaches about 5 million viewers.[9] The weekly series devotes each hour-long program to one aspect of science. Topics recently covered include endorphins, artificial intelligence, hepatitis, spiders, Eskimo whalers, chemical wastes, airline safety, cardiovascular disease, the life of Albert Einstein, the year-long life cycle of a pond, and a profile of the controversial physicist Edward Teller. *Nova* has shown that a general science program for the nonscientist can be both entertaining and informative. It is funded in part by the National Science Foundation (NSF) and TRW, Inc.

Another PBS general science series, *National Geographic Specials*, has entered its fifth year. This series is produced by the National Geographic Society and WQED-TV in Pittsburgh, Pennsylvania, with funding from Gulf Oil. Four programs were shown this year. "Dive to the Edge of Creation" covered the Woods Hole Oceanographic Institution's studies of the Galapagos rift, two miles beneath the Pacific Ocean. The program showed 10-foot worms and other strange creatures that live there.

The other *Geographic* programs were "Mysteries of the Mind," which discussed some of the new findings in neuroscience, and "The Invisible World," which employed slow-motion, ultravio-

let, infrared, and x-ray photography to discuss selected topics in physics and biology. One non-science program was "The Superliners," a memoir of Atlantic ocean liners such as the *Queen Mary* and the *Lusitania*.[10]

Another general science series, *Synthesis*, deals with social and political controversies surrounding scientific issues. Four installments of this series, produced by KPBS-TV of San Diego, California, were broadcast in the series' second year. "Coal: Solution or Pollution" discussed the environmental impact of this energy source. "Here Today...Here Tomorrow—Radioactive Waste in America" probed various suggestions for dealing with nuclear waste. The ecology of the Grand Canyon was examined in "The Grand Canyon: Who Needs It?" A fourth installment, "Closing the Learning Gap," dealt with Direct Instruction, a controversial, highly regimented method of teaching economically disadvantaged children. *Synthesis* is funded by the NSF and Sigma Xi, the Scientific Research Society.

Several PBS series are devoted to explorations of a single area of science. For example, the quarterly *Cousteau Odyssey* has explored the marine sciences since 1977. One recent program examined sunken ships from ancient Rome to modern times. This series is produced by the Cousteau Society and KCET-TV in Los Angeles, California, and is funded by Atlantic Richfield. *Cousteau Odyssey* was a weekly ABC program, called *The Undersea World of Jacques Cousteau*, from 1967 to 1975. This is a fairly long life for a commercial TV series.

Carl Sagan's *Cosmos*, to be broadcast in Fall 1980, is a 13-part series on the space sciences and related topics. Sagan will discuss space travel, extraterrestrial life, the origin and death of the universe, black holes, and time travel, among other things. The series is being produced by KCET-TV and funded by the Atlantic Richfield Company, the British Broadcasting Company (BBC), the Federal Republic of Germany's Polytel International, and others.[11]

A 12-part anthropology series, *Odyssey*, is being broadcast April through June. The executive producer of *Odyssey* is Michael Ambrosino, the creator of *Nova*. It discusses topics such as where the native Americans came from, the Inca Empire in ancient Peru, and Egyptian hieroglyphics.[12] The series is funded by the National Endowment for the Humanities and Polaroid.

PBS also showed a series on economics. Nobel prize winning economist Milton Friedman took his free enterprise message to the airwaves this year in a 10-part series called *Free to Choose*. Friedman devoted the first half-hour of each edition to his argument that capitalism should be allowed to operate without government interference. In the second half-hour, he subjected himself to questioning from ideological opponents such as the noted socialist Michael Harrington. *Free to Choose*, produced by WQLN-TV in Erie, Pennsylvania, was funded in part by General Motors, Getty Oil, and the Readers Digest Foundation.

Two series on PBS examined the world of communications technology. The January 17, 1980 premiere of *Media Probes*, produced by New York City filmmakers Kit Laybourne and Mickey Lemie, discussed the sound media. Some of the topics discussed were Muzak, the social impact of the telephone, and the role of technology in popular music. *Media Probes* did not discuss any aspect of communications technology in depth. The show did give viewers an impression of how we are influenced by the media without always being aware of it. Seven more installments of the series are planned for next year.[13] The series is funded by the Ford and Alfred P. Sloan Foundations, and KQED-TV in San Francisco.

A Canadian program, *Fast Forward*, frequently discusses communications

technology. A recent half-hour segment, for example, discussed interactive television communications systems such as Britain's *Prestel.*[14] But this TV Ontario series moves beyond communications to discuss other aspects of the near future of electronics. It has discussed artificial intelligence, satellite monitoring of the earth, and the application of electronics to medicine.

One ambitious PBS project, initiated early this year, is a science series for children aged 8-12. *3-2-1 Contact* is produced by the Children's Television Workshop (CTW), the New York studio responsible for *Sesame Street* and *The Electric Company.* Each installment is an hour long, and five programs are shown each week. Each week's programs illustrate aspects of different extremes, such as hot and cold, far and near, and large and small. The program makes liberal use of documentary film, animation, computer graphics, skits, and appearances by celebrities such as tennis star Arthur Ashe, actor Gene Wilder, and the rock group Kiss. Some of the many specific topics discussed include computers, sound, gravity, bees, whales, the laws of motion, and volcanoes.

The show aims not to teach science in a systematic fashion, but to develop an interest in science among children. The series also aims to encourage girls and children of minority groups to study science. Thus, the program features female, black, and Hispanic actors and actresses. According to CTW's Research Director Milton Chem, *3-2-1 Contact* reflects more pre-program research than any other series in history. CTW surveyed 10,000 American children over a period of two years, in an effort to ascertain the best ways to expose children to science.[15]

In June PBS is to show another science series aimed at the young. *The Search for Solutions* was shown in movie theaters in New York City and Los Angeles last December. It was produced by Playback Associates, a New York City maker of industrial and documentary films, and funded by Phillips Petroleum Company. The nine 18-minute segments cover topics as diverse as x-rays, the origins of language, and the physiology of hibernating bears. *The Search for Solutions* will be distributed on free loan to schools, colleges, libraries, and museums.[16]

Some of the science programs shown on PBS are British imports. BBC journalist James Burke focused on social and technological change in *Connections: An Alternative View of Change.* This 10-part series was broadcast on PBS late in 1979. *Connections* set out to trace the history of eight influential inventions: the atomic bomb, the telephone, the computer, the production-line system of manufacture, aircraft, plastics, the guided rocket, and TV. Burke argued that these discoveries resulted from a mixture of accident, necessity, politics, luck, and the fusion of unrelated ideas. He identified the "trigger" of each influential device and traced its development, through a complex series of "connections," to the present.

Some of Burke's connections were complicated indeed. The development of modern rocketry, according to Burke, is traceable to the invention, in the age of Napoleon, of food bottling. This triggered the development of canning, air conditioning, and refrigeration, all of which Burke said were essential to rocketry. Similarly, 15th century attempts to pump water from mines led to studies of air pressure, culminating with the invention of the telephone. Some critics, such as former *Nova* producer Graham Chedd[17] and *New York Times* science writer Malcolm W. Browne,[18] thought Burke's connections were arbitrary and far-fetched. However, Burke suggests that his view of technological change is not the only view. One of his aims was to show the difficulty of predicting exactly how

technology will develop. He also tried to get viewers to ponder questions such as: Can technology be controlled, and if so, how?

Two other BBC productions dealt with two of the world's scientific giants. *Einstein's Universe*, narrated by actor Peter Ustinov, was a 113-minute attempt to explain Einstein's concepts in non-scientific language, as well as in visual terms. Ustinov, for example, played an astronaut who, after a near-light-speed space journey, returned to earth to find he'd outlived his twin brother. The program used animation and models to explain Einstein's theories of space and gravity. Ustinov and science writer Nigel Calder, who wrote the program's screenplay, also discussed Einstein's theories with British and American physicists and astronomers.

Evolution was the subject of a seven-part series, *The Voyage of Charles Darwin*. This drama chronicled Darwin's 1831-1836 voyage aboard the *Beagle*. The series portrayed Darwin's naturalistic observations, his conflict with his colleagues aboard the *Beagle*, and his formation of the theory of natural selection. Producer Christopher Ralling admits he took some dramatic license: "We had to telescope Darwin's thoughts and make him look at beasts and fossils with wisdom he acquired only much later. Each episode starts with a voice-over of him writing, late in life. Thus, we were not really cheating."[19] Malcolm Stoddard played Darwin in this series, which was funded by Hoffman La Roche and the Andrew Mellon Foundation.

Though I have focused on programs being shown in the US, I should mention that Great Britain produces many science shows that have not yet made it to the US. A seven-part BBC series on Robert Oppenheimer will probably be shown on PBS next year.[20] Jonathan Miller's *The Body in Question* covered the history of medicine, as well as medicine's impact on science and art.[21] ATV Centre's six-part series, *The Mighty Micro*, investigated the state of the art and the future of microelectronics.[22] BBC's *Horizon* regularly examines such topics as the use of robots in industry, the biotechnology revolution, careers in science, and the workings of the eye and brain.[23] Granada Television's *The Living Body*, broadcast in Autumn 1979 and Spring 1980, was a 20-part series on human biology for 12 to 14-year-olds.[24]

Also of interest is the Federal Republic of Germany's *Bilder aus der Wissenschaft*. This series, broadcast on the first German channel, might be described as the German forerunner of programs like CBS's *Universe*. Its half-hour programs are devoted to several topics in science. A segment of the November 28, 1979 show discussed the development of ISI® and the *Science Citation Index*®. Using examples from German science, it also showed the scientometric applications of our data base. The program includes an interview with yours truly and, in particular, wonders why there have been so few breakthroughs in Germany in the past few decades. A videotape is available at ISI.

In the near future science on TV will take new forms. I have discussed the British Post Office's *Prestel* system many times. This system lets consumers use their telephones to tap *Prestel*'s data bank. The information appears on the TV screen. In addition to ISI's electronic science magazine, SCITEL®,[14] *Prestel* subscribers can get government statistics, book listings, listings of research establishments, information on Parliament's activities, job listings, and other information. This type of system is still in its infancy. But it would be a major source of scientific information for the public.

We applaud PBS's efforts to bring science to the television viewer, and we welcome new methods of conveying information. While commercial TV has made some creditable starts, it should

be encouraged to further develop its science broadcasting. These days there can be little doubt that there is a sizable audience for science. But regardless of any commercial gain, the private TV industry in this country has a responsibility to report science to the public in a responsible manner. Almost every public issue today is touched by science.

There is one television program that I would like to sponsor. It would be a demonstration, with expert witnesses, of the medical and economic benefits to society of basic research. I'll be saying more about this in the future.

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