

Science Show for Children Being Developed for TV

The Children's Television Workshop (CTW), producer of educational TV's all-time hit *Sesame Street*, is now putting together a new series aimed at acquainting children with the joys of science.

The show, as yet unnamed (although some think it would be a scream to dub it the Isaac Newton Comedy Hour) is aimed at the nation's 8- to 12-year-olds, of whom there are 14 million. It has a start-up budget of \$9.6 million, \$3.5 million of it from the National Science Foundation (NSF), and is scheduled to make its debut in early 1980. Other funds are coming from the United Technologies Corporation and the Office of Education.

The new show is being generated at a time characterized by general lamentations over the state of science education at elementary and secondary school levels. According to evidence gathered at CTW, preadolescence is the time when children leave off their narcissistic ways and become extremely curious about the world around them. However, it is also the time when many, particularly girls, are permanently "turned off" about science, perceiving it as boring and too difficult. Says the CTW proposal: "the absence of early and comfortable encounters with science appears to work to the special disadvantage of girls and minority children."

CTW says statistics provide ample rationale for the program it has in mind. Women, according to NSF, supply only 11 percent of the country's scientists and engineers even though they make up almost half the workforce. Minorities account for 4.4 percent of the total and if Asians are subtracted the figure shrinks to 2.6 percent. CTW also cites a study conducted by Jewel Plummer Cobb of Rutgers University indicating that at the end of elementary school, 25 percent of boys but only 3 percent of girls would consider a career in science.

The new series, to be aired on the nation's public television stations, is supposed to give children a view of science rather more glamorous than what they get in school. According to three NSF studies published this year, science has low priority in elementary and secondary education and is suffering

from the "back-to-basics" movement, which places heavy emphasis on reading and arithmetic. Researchers found that science teaching tends to be humdrum, mainly employing reading and recitation with very little experiential backup or concern with independent thinking.

The CTW people noted that "systematic science instruction does not typically begin before 7th grade" (when children are 12). Developmentally, this does not make a great deal of sense because it is in the years from 8 to 12 that children start taking what might be called a scientific interest in the world about them. That is the time, according to psychologists who were consulted, when the beginnings of systematic thinking are manifested, when children start to search for patterns and develop a more sophisticated sense of cause and effect. They are eager to test their competence against others and to explore extremes—*The Guinness Book of World Records* is a big seller with this age group.

Show Organized Around Extremes

The new show is designed to capitalize on this interest by organizing each week of programs around a pair of extremes—hot and cold, growth and decay, crowded and uncrowded, and so forth. Disciplinary boundaries will be ignored. Role models will abound. In keeping with the age group's fondness for stories, the producers plan to include a continuous dramatic serial featuring attempts by a multiracial team of scientists, headed by a 72-year-old woman, to solve some scientific mystery.

The show is supposed to show science as accessible, and conducted by interesting people, not by "moral cripples," as astronomer Carl Sagan has described the scientists TV has dished up for children. Samuel Y. Gibbon, the show's producer, who formerly produced *The Electric Company*, says, "We will attempt to show science as rational, but also intuitive, neat, but also messy, and characterized not only by patience and rigor, but by wit and playfulness as well."

Compared with what is currently available for children, the show sounds like a real winner. But it will face stiff competition from regular prime-time

fare. So CTW over the past 14 months has conducted an unusual amount of research to determine just what keeps 8- to 12-year-olds glued to the tube. They have surveyed the TV tastes of samples of children from around the country, conducted minute tests of childish reactions to film clips from science-related shows, and elicited opinions through individual interviews and essays by members of the target audience.

According to research director Keith Mielke, the most striking and in some ways disconcerting finding was the persistent disparity between the tastes of boys and girls. Boys have a greater interest in science across the board, but girls consistently are more interested in the aspects that involve people and animals.

In one test, for example, a group of children was shown film excerpts dealing with three kinds of science-related topics—space, animals, and insects or microscopic organisms. Fifty-seven percent of the boys and only 22 percent of the girls preferred the space excerpt; 65 percent of the girls and 31 percent of the boys liked the one about animals. Only 12 percent of either group preferred the excerpt on insects. In another test, researchers showed children 30 photographs of scientific subjects. Pictures that were high in both technological and social content—such as orbiting space colonies—scored high with both sexes. But a picture of a young baby learning was ranked next to the top with the girls and next to last with the boys.

A new device that researchers found useful is a "program analyzer," which permits children to register reactions to films while they are watching them. In a group of children, half were given red buttons, which they were told to push when they found the program content boring. The other half were given green buttons, which they pushed when they found the film fun to watch. When researchers plotted all the results on a graph they found that the lines complemented each other—when the line from the red buttons went down the line from the green buttons went up—which gave them very specific clues about what appealed to the audience. For example, the green buttons were pushed in response to turtles laying eggs and a woman parachuting. Massive red button-pushing occurred during a film of children making a video documentary.

Finally, the researchers conducted a survey of more than 4000 children around the country to find out what their favorite television programs were. From a list of 20 national programs, including ones designed for children, the favorites

came out in this order: Charlie's Angels, Happy Days, The Incredible Hulk, Hardy Boys, and Baby I'm Back (a black situation comedy). "It's enough to make you want to cry," moaned an NSF official. Mielke, however, says the preferences show that the kids are really pretty sophisticated—all but the very young prefer shows that were produced for the general viewing audience. The survey also pointed up significant boy-girl differences. The girls like shows portraying "warm human relationships, often in family situations," which also tend to

feature "strong female leads." The boys like strong male leads in "action/adventure formats" where "physical endurance and competition" is emphasized. There were five science-related shows in the list of 20—Wild Kingdom; Animals, Animals, Animals; In Search Of; Jacques Cousteau; and Nova. All fell in the bottom half of the rankings, with Nova at the very bottom. Science fiction such as Star Trek was highly favored, particularly by the boys; the ratio of boys who watched it to girls was 4 to 1.

The first 13 shows are supposed to be

ready to roll by fall of 1979 and the producers plan to fine-tune the program with inputs from continuous evaluations.

Concocting a hit for the 8 to 12 audience, which likes lots of humor and excitement and does not like to be talked down to, will be a tricky job. And no matter how intensive the research, there is plenty of room for unpredictability. One researcher relates, for instance, that children did not like a photograph of a turtle eating a worm, but a picture of a lizard swallowing a snake went down very well.—CONSTANCE HOLDEN

Warming Trend in U.S.-Soviet Science Cooperation

Plans are in process to reschedule a trip to Moscow by President's science adviser Frank Press which was canceled in July in response to the trials of dissident Soviet scientists. The move appears to be tied to a Soviet decision to allow "refusenik" physicist and electrochemist Veniamin G. Levich to emigrate to Israel. The actions indicate some easing of the tensions generated earlier this year on human rights issues, which directly affected cooperation in science and technology between the two countries.

Trips by official delegations headed by Press and by Environmental Protection Agency Deputy Administrator Barbara Blum were canceled at the instance of Secretary of State Cyrus Vance after the Soviets went ahead with the trial of computer scientist Anatoly Shcharansky (*Science*, 21 July). Shcharansky had been part of a group active in monitoring Soviet compliance with the Helsinki accords. Linking rescheduling of the Press trip with the Levich case appears to indicate that the Administration believes that science and technology programs have useful symbolic value in U.S. responses to human rights issues.

The visit scheduled in July by Press was to discuss the science and technology agreement signed in détente spring of 1972 and is regarded as the keystone agreement for the 11 cooperative programs in science, technology, and health concluded between the two countries. Rescheduling of a visit by Press is considered particularly important because of his direct relationship to the President and because his office deals with the export of sensitive technology.

Cancellation of the Press visit came during a decline in Soviet-U.S. relations over human rights issues. Department of Health, Education, and Welfare Secretary Joseph Califano canceled a planned trip to the Soviet Union in May and in the same period four U.S. delegations dominated by nongovernment American scientists also canceled scheduled trips to the Soviet Union. The trial of Soviet physicist Yuri Orlov, who had also been involved in human rights causes, was a principal cause of these cancellations.

The Shcharansky trial in July led to the cancellation of scientific trips by three other official delegations and reportedly prompted decisions by a number of individual American scientists not to pursue contacts with their Soviet counterparts. August seems to have provided something of a cooling off period; scientists and bureaucrats take vacations then and there was little scheduled activity.

The first strong sign of a shift in the situation came out of a meeting in Moscow in early September between Senator

Edward M. Kennedy (D-Mass.) and Soviet Premier Leonid Brezhnev. Kennedy had asked for favorable action in 18 cases involving Jewish families who had sought permission to emigrate or make visits to either Israel or the United States. Kennedy was told that the Soviets would reconsider the cases on the basis of his request and was given a clear reading that all the cases on the list would receive favorable action including that of Levich and his wife.

Levich is perhaps the best known of Soviet scientist refuseniks. His scientific work is highly regarded in this country and the handling of his case by Soviet authorities gained him considerable sympathy in the scientific community here. Since 1972, when his first application for an emigration visa to Israel was turned down, he has been consigned to a kind of professional limbo and he and his family subjected to pressure and harassment. Representations in his behalf have been made by a number of U.S. scientific organizations. One expression of support and esteem was establishment of an International Conference of Physicochemical Hydrodynamics called the Levich Conference. The third such conference sponsored by a variety of individuals and organizations was held on 6 to 8 November at the National Academy of Sciences in Washington. The sponsors had hoped that Levich would be able to attend, but he was still waiting word on his visa when the conference convened.

U.S. officials say a number of factors appear to contribute to an improved atmosphere. They note that Soviet emigration to Israel in recent months has risen to a rate comparable to that in 1973, the year of the largest exodus. Progress in Strategic Arms Limitations Talks (SALT) may have encouraged both sides to be more cooperative on other issues. And observers of human rights matters note a relative absence of Soviet actions on human rights issues which would have a depressing effect on relations.

Most recent signs of an improving climate was a visit in late September of I. Novikov, head of the Soviet state committee for construction affairs, who met with his opposite number, Patricia Roberts Harris, Secretary of Housing and Urban Development, in an atmosphere described as "constructive." And from 23 to 27 October, HEW Assistant Secretary for Health Julius B. Richmond led the U.S. delegation to Moscow to the annual meeting of the Soviet-U.S. joint committee on health cooperation agreement. Participants say that the mood of the meeting was "businesslike" and program activities appear to be on schedule.—J.W.