

Elementary School Biology via Television

CHARLES WALCOTT

Massachusetts Audubon Society, South Great Road, South Lincoln, Massachusetts

The birth of a bat, a snake hatching from its egg, a baby deer nursing from its mother, bull moose fighting, or the fertilization of an egg—these are a few of the natural dramas that have been watched by 4th, 5th, and 6th grade students in the New England area last fall. To see these things the children didn't have to leave their classroom or desert their teacher for all these adventures were part of "Exploring Nature," an experimental television program. This series of 30 half-hour programs was produced by the Natural Science Television Project, an organization composed of the Children's Museum of Boston, the Massachusetts Audubon Society, and "The 21" Classroom" of WGHV-TV. Funds were provided by the member organizations and also by a study grant made available to the School of Education of Boston University through the U. S. Office of Education in connection with a study of the educational results of the project. The programs themselves were produced under the supervision of the Education Department of the Massachusetts Audubon Society.

The aim of the project was to teach elementary school students the principles of biology. Such principles as the flow of energy in the organism and in the community, evolution, animal behavior, and the structure and function of living organisms were stressed throughout all the programs. The television programs generally dealt with a single topic, but each program was related both to the ones that preceded and followed it. This gave the student a chance to continually review the material already presented and thereby get a unified picture of biology.

The television teacher was Prof. William H. Weston. A Harvard professor of many years' standing, he continues to enliven the teaching of biology and to share his enthusiasm with young and old alike. By making extensive use of live animals and plants, film, special art work, carefully designed props, and other materials, "Cap" Weston was able to keep the children interested in the subject without

resorting to gimmicks such as may be found on some commercial programs. It would be disastrous if the programs were dull, but fortunately live material, being unpredictable, is never dull; by using it and much other visual material, the student's interest was tightly held.

The television program was only a portion of the project. The other important part was the teaching that went on in the classroom both before and after the broadcast, and for this reason the success or failure of the project rested mainly on the classroom teacher. It was her job to prepare her class before each televised lesson and to follow up afterward.

To aid her in this, a detailed Teacher's Guide was prepared. This is an 140-page illustrated booklet that contains a summary of the background material on each topic and is designed for the teacher not familiar with biology. It also contains a summary of the television program itself, a series of questions for class discussion, a list of the important new words used in the lesson, and two book lists—one for the teacher and another for the student. By using this Guide a teacher who is completely unfamiliar with biology can effectively prepare the class for the television lesson and also follow up. But the follow-up does not end with a class discussion of the program. The Teacher's Guide also suggests simple projects for the student and gives complete instructions on how to do them. In addition, for use by the student, we have prepared "Student Guides." These are four-page leaflets describing simple projects easily performed with equipment available around any house. It is our hope that, for a student in a class severely limited in the time available for science instruction, the project sheets may increase his understanding of the material, showing him how he himself may demonstrate the principles discussed on television.

All this preparation required a great deal of work by many people. The production and broadcast of the television program alone required the services of 23 people at WGBH-

TV. The Teacher's Guide was prepared by a committee of Audubon teachers and edited by Drs. Drury, Meyerricks, Weston, and Walcott. The Student Guides were written and the experiments designed and tested by Mrs. P. J. Darlington; the illustrations and layout were by Polly Shakespeare. I was the producer of the Television Program and Edmund Cabot was the Assistant Producer. The art was done by our artist, Betty Sears, and film was taken by Peter Ourusoff, Benjamin Walcott, and the rest of the crew. The staff of WGBH-TV, Channel 2 in Boston, broadcasted the program.

The general sequence of the program topics and the concepts to be covered in each were outlined last spring by Professor Weston working with a group of teachers from the Massachusetts Audubon Society teaching staff. On Monday of each week, therefore, Ned, Cap, and I held a production conference at which we went over this material and tried to determine the most effective way of getting it across to our audience. This was not the first time that we had considered the problem, however. During the summer we had all been busy taking film sequences to illustrate important points, and in the weeks before the Monday production meeting we had been busy obtaining film material from other photographers and gathering additional material. On this Monday we went over the concepts to be covered, and Cap, Ned, and myself, with the advice of the Audubon teaching staff, decided how the material was to be presented, what visual material was to be used, what the studio



The star of our show, "Cap" Weston, leans on some very handy guinea pigs.

set-up would be, what vocabulary words would be used as "super slides" (words to be super-imposed over the picture on the TV screen), and all the necessary details of the TV production. Ned took complete notes which he later turned into the program script. Towards the end of the afternoon, Betty Sears, our artist, arrived and we ran over the script with her, suggesting the art work that we thought would be effective and profiting greatly by her experience in presenting ideas visually.

Tuesday was usually spent frantically editing film, preparing the tapes of natural sounds, finishing the script, and making arrangements to obtain the fossil dinosaur footprints, insects in amber, and other objects to be used on the television program. At the end of the day the finished work print of the film we were planning to use was matched to the negative, and the negative was rushed to a commercial laboratory to have a special television print made. The unfortunate thing about using film is the amount of time required for adequate preparation. We found that taking and editing five minutes of film involves the work of one person for three full days. But the use of film allowed us to show so many things that would otherwise be impossible, that we didn't begrudge the time.

On Wednesday, Cap, Ned, and I went over the finished script, making any small changes we felt necessary, and then Cap went over the film. If the film took more than a few minutes he would do his narration then and record it on $\frac{1}{4}$ " magnetic tape. He usually



Professor Lyman of Harvard, our guest, takes the heartbeat of a ground squirrel.



Betty Sears, our artist, lends much visual pleasure to our Exploring Nature Show.

did this two or three times, and we chose the best one of three, edited it where necessary, added sound from our library of natural sound recordings, and finally synchronized the tape to the film.

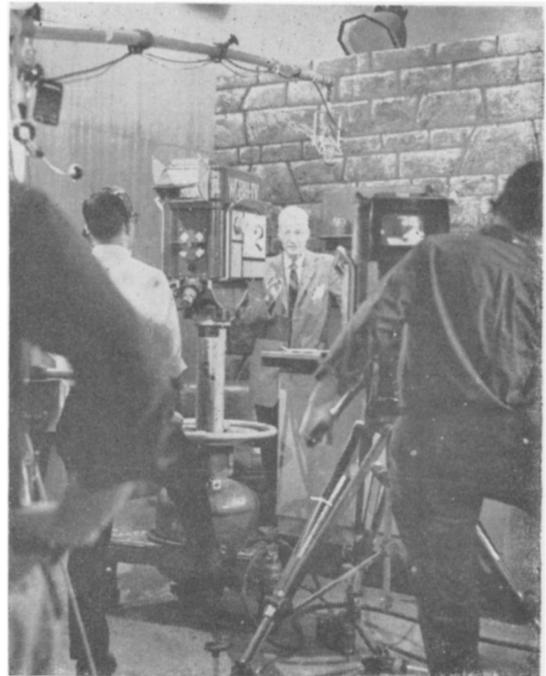
On Wednesday afternoon a copy of the completed script was taken to the TV director, Jean Brady at WGBH, and we went over the script to see if there were any unusual problems. Jean decided how the set should be arranged, discussed the lighting with Kenny Anderson, our lighting director, and also planned the shots for the camera men.

Thursday was spent gathering materials, perhaps beginning work on next week's film, and generally gathering the props. Late Thursday afternoon all the material to be used on the TV show, including the film, art work, and the necessary items for experiments and demonstrations collected from a multitude of different people around the Boston area, was taken into the studio where Jean and the TV crew worked far into the night arranging the set, art work, and other material.

On Friday began the lengthy task of piecing all the elements of the program together. In the morning we all went over the script, timed portions of it, and made the final

decisions as to how we were going to arrange the materials. About noon the set was lit, and at 2:15 the crew had arrived, the cameras were warmed up and rehearsal could begin. Rehearsal lasted until about 3:45, there was a 15-minute break for final adjustments of the lighting, to repair the damage the racoon had done to the scenery, and other last-minute details. Promptly at 4:00 p.m. the video tape machine was started, and for the next 29 minutes and 25 seconds, with a maximum error of 1 second, the program was recorded, an exacting time limit due to the tight schedule of the New England Educational Television Network. Recording the program on video tape was a great advantage. In the event of a major catastrophe it could always be done over. If absolutely necessary, video tape can be edited, and best of all, video tape can be played back an almost unlimited number of times, and each time the quality of the picture and sound is almost indistinguishable from a live telecast.

By Friday night the tired crew had finished; the props and film had been returned to headquarters, and then at 7:00 p.m. the program which was recorded on video tape two weeks before was broadcast. This third and final broadcast had been preceded by two



"Cap" Weston surrounded by hundreds of people and vast amounts of equipment.

morning broadcasts which were used in the schools belonging to "The 21" Classroom." The seven o'clock broadcast was viewed by the general public, as well as by the interested parents of those students who watched the morning broadcast in school. The weekend was then spent filming for future programs and doing the many things that had been neglected during the week.

As can be imagined, the expense of the project was great: the total was near \$75,000.00. The question that we kept asking ourselves was: "Does 'Exploring Nature' help in the learning of biology at the 5th grade level?"

This was the same question being asked by Dr. Garry at Boston University, and presumably in a year or so he should be able to tell. As of the moment we can only report what we know. We do know that there are over 3,000 copies of the Teacher's Guides in the hands of elementary school teachers in Massachusetts, Connecticut, New Hampshire, and Rhode Island. The Student Guides, which were made available to students at our cost, roughly 10¢ for the four issues, have over 11,000 paid subscribers so far, and the TV program is broadcast three times on Friday by WGBH-TV, Channel 2, in Boston and once by WENH, Channel 11, in Durham, New Hampshire.

How do the classroom teachers feel about the project? In response to a questionnaire they are generally most enthusiastic. "They see something work," "The children listen attentively," "are spellbound," "of great help to the teacher," "classroom richer because of experience," "best thing to come into elementary school science in my memory." Professor Weston was: "pleasing to listen to," "holds the child's interest," was "liked by children," "highly conducive to enjoyment and understanding and his enthusiasm reflects in the children." On the other hand, some teachers have reservations: "Professor Weston uses too many long words"; "he tends to lose the children's interest by a monotonous style." Probably the most encouraging comments about the series come from the children's own letters—the fifth grader who wrote: "We had no school today, but I watched the program three times. The 'birth of a bat' was swell." What more can we ask?

The program, then, seems to have accomplished some of our aims. As far as we can tell, the children found it interesting, and if we can judge by their letters, they learned a great deal. Furthermore, because the television programs are recorded on video tape, they will be available next year for use here and also to other TV stations and school systems in other parts of the country. We would be glad to send sample copies of the Student Guides, Teacher's Guides, or a copy of one of the video tapes or kinescopes of the TV programs to anyone who is interested. It would seem that an effort to supplement the teaching of elementary school science with a program of basic biology on television is feasible. What the long-range effect of this sort of project may be, we cannot assess. But, in any event, these helpful criticisms guide us in preparing future programs. It is fair to say that without honest and complete cooperation between the television production staff and the classroom teachers who use the program, this sort of television venture is liable to fail.

Thus, by bringing to life for our young audience some fundamental principles of science, we feel that we have prepared them to better understand, to weigh, to judge, to appreciate, and to interpret the knowledge they will acquire in the future.

FAST Journal

The periodical of the Florida Association of Science Teachers is an interesting development showing what state organizations may do in publications concerning mutual problems involved with science teachers within one area. NABT member and Assistant Editor, J. D. Woolever, Sarasota, Florida, is editor. Professor Clyde Reed, University of Tampa, Florida, a candidate for NABT Regional Director, is Editor Emeritus. The subscription price is \$2.00, and inquiries concerning it should be directed to Managing Editor, Dempsey Thomas, 4850 Lords Avenue, Sarasota, Florida.