

A Natural Science Camp for Pre-Teens

- Richard G. Dawson, Naturalist, Kansas City, Missouri, Parks and Recreation Department

A detailed account is given here of an elementary pupil science camp. The pictures were taken by Carter Hamilton, Kansas City, Missouri 64111.

During the summer of 1964, the Kansas City, Missouri, Recreation Division decided to offer natural science camp sessions for midwestern children completing grades 5 to 8. While all camps include nature study in their list of activities, the emphasis given nature and the opportunity for creative first-hand study are limited necessarily by time and by staff capabilities. We conceived of our camp as offering to interested youngsters the opportunity to participate in a fairly intensive first-hand group experience in field ecology, individual projects and investigations in the field, and a series of lectures and discussions in the natural sciences by experts in the community. Science Pioneers, the sponsors of the Greater Kansas City Science Fair, helped with publicity, speakers, and materials. The city provided the resident camp area in Kansas City's Swope Park, making this the ninth different kind of summer resident camping program offered during the summer.

At the Camp Hope area, the two, 11-day periods were set aside with a full-time staff of two high-school biology teachers, one graduate student, 3 undergraduate students, and five high school assistants (plus kitchen and service personnel). Facilities include two living units each having wall-tent accommodations for 25 campers, a dining lodge and kitchen, and about 200 acres of rolling wooded hills and valleys that contain formerly grazed land, permanent and temporary

streams, a lake, and the flooding valley of a small river. For the program, the dining lodge was divided by a folding partition into an eating-lecture area and a nature center area. Into the 25'x30' nature center were brought a five-foot sink with 5 faucets, benches and tables, 11 aquaria and 7 cages of various sizes, 6 B and L elementary science microscopes, and 1 student dissecting microscope, various kinds of ecological collecting and sampling equipment, books for identification and leisure-time science reading, and large charts of the area's wildlife. Since most of the specimens collected were to be taken back to share with my high school biology students in September, the Shawnee-Mission, Kansas, high schools allowed me to use some of the equipment from our school biology laboratories. Thus, the facilities and staff were provided by the city or other agencies, and campers paid \$22.00 to cover the costs of food and supplies.

The sessions were held June 11-20 and July 6-16, with a total of 96 campers. Most participants were 11 and 12 years of age, and over half had previously been Science Fair entrants. Since this year was an experimental operation, we made some changes between the two sessions. The following summary includes the modifications.

On the day of arrival, the campers were given a 25-page booklet on the ecology of the area, ecological principles and tech-



Fig. 1. Counselor Doris Isaacson identifies a water scorpion for a camper.

niques, a list of useful reference books, and ideas for ecological investigations that could be used in camp or for science fair projects during the coming school years. A 70-page mimeographed field guide to the wildlife of the camps had been prepared during the winter and was available for one dollar. At our first general session, we discussed the purpose of the camp, the backgrounds of the campers, and began consideration of their individual projects. That evening, the general meeting was a discussion of physical geology as applied to the terrain on which they would be living and working at camp.

The next three days were devoted to studies of natural communities on the site. Campers were divided into three groups; each group spent one day studying the uplands, one day the streams, and one day the lowland and lake. The staff was also divided into three teams, one for each community. Three hours were spent on the community studies in the morning, and two in the afternoon, with the field excursions mostly in the cooler morning hours. The afternoons were used for examination and interpretation of what had been collected.

Some topics involved in such community studies are:

Identification of the most common plants in each habitat.

Determination of amount of leaf surface exposed per square meter in each habitat. Quadrat counts of invertebrate animals and herbaceous plants.

Making of simple food-web charts from quadrant results.

Transect determination of abundance of tree types in upland and lowland.

Soil temperature on north and south sides of hills, in grassland and woodland.

Types of feeding being done on trees by animal life.

Soil chemistry (pH, N, P, K) in weedy field, woodland, rotting log, and soil next to limestone outcrops and to leguminous plants.

Microcommunities on and under rocks and stumps.

Succession of animals from dead tree through rotting log to soil.

Distribution of insect galls on a single tree, and on different trees of the same species in different locations.

Succession of plants and animals from abandoned field through shrubs to oak-hickory woodland.

Relative light intensity in different habitats. Adaptations of aquatic organisms to temporary streams, to fast currents, and to muddy bottoms of pools and lakes.

Bacterial counts (with nutrient and EMB agar plates) of water in stream fed by septic tanks, at various distances from con-



Fig. 2. Richard G. Dawson, camp director, discusses the anatomy of a crayfish.



Fig. 3. Camper writing report of his research project.

- tamination point.
- Color and shape camouflage of insects.
- Seining for small fish in pools of stream.
- Interpreting animal tracks in mud along stream and lake edge.
- Finding and explaining examples of soil erosion, and proposing ways to remedy the situation.
- Soil texture distribution in different habitats.

During the next seven days, each camper had 9 half-days to work in one or more specific areas of his choice in making investigations, collections, or displays. A staff member was assigned as resource person to assist campers in each general area, i.e., microscopic study, forest ecology, conservation projects, insect collections, herpetology, soil chemistry, animal behavior, geology, trees and flowers, birds, weather, etc. Each camper made a display of his work to exhibit the last day, and explained it to the

assembled parents in his part of the closing program (each one could take up to 1 minute).

During the camp, general evening sessions included staff-led discussion-lectures on animal behavior, land biomes of the earth, paleontology, constellations of the summer sky, and the care of animals in captivity. Guest speakers provided by local scientific groups covered such topics as artistic elements in nature and how to make use of them, the geology of the Kansas City area, archeological history of mid-America, astronomy and telescope building, and weather forecasting. We showed films of wildlife ecology from the Missouri Conservation Commission, and were taken on a field trip to its nearby wildlife management area. Other off-camp field trips included a fossil excursion to nearby quarries and road-cuts, a tour of an historic old farm, and a tour



Fig. 4. With dip nets, children investigate life in a small stream.

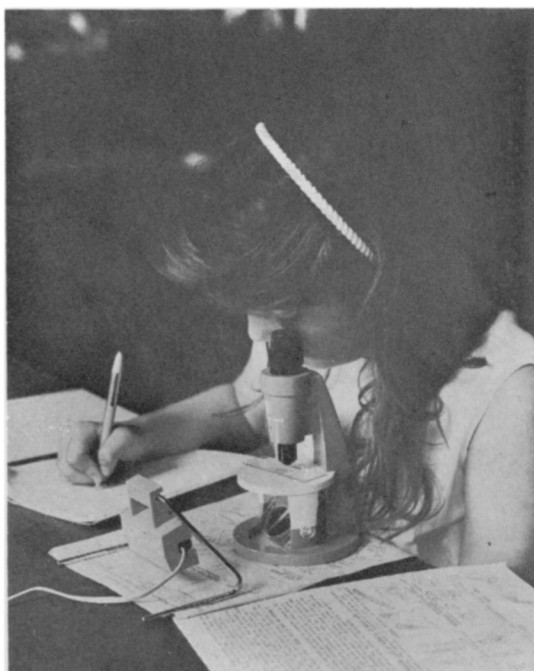


Fig. 5. The microscope reveals a new world of form and structure in nature.

through the Swope Park zoo with explanations of care and feeding of the animals. The local astronomy club brought out six telescopes up to 250x for observing the moon one evening. And another highlight was the frying and eating of surplus copperhead snakes caught during the camp.

In addition to the science program, the campers had available daily swims, horseback riding, archery, cookouts, folk-dancing, and a camper carnival.

Both campers and staff were very enthusiastic about our first year's natural science camp. Eighty-five percent of the campers said they would like to return for another year's camp, and most of the rest said they were glad they had come this summer. We found the Kansas City community had many organizations willing to assist us, once we had found a suitable campsite and staff.

The staff was hired for the entire summer's range of camp sessions. Besides the two biology teachers, only one other counselor had more than one year of college biology. We found that the entire staff did not have to be previously expert in science, provided they were willing to carefully prepare their own work in the session. In fact, enthusias-

tic, well-trained, general camp-leaders are a great asset to such a program—as our girls' unit showed, where no science majors were members of the unit staff, but where many of our most eager young naturalists were developed.

For future years, we expect to keep the basic outline of the camp program the same, but plan to emphasize different aspects of ecology in the group community studies next year and change the subjects of most general sessions to make the program equally applicable to first-year and returning campers. This kind of program could be set up in a 4-year cycle of specific activities without duplication for any individual. As a continuation of the program, the city is also providing Saturday natural science sessions at the camp during the school year, to provide a science stimulus for the 9 to 13-year-olds comparable to what the Kansas Junior Academy of Science Seminars give the high school group.

Anyone desiring more detailed information about the operation of the first year of this science camp, or wanting to make suggestions for our future development, is invited to write to the Recreation Division, City Hall, Kansas City, Missouri, 64106.