

EDUCATION

Teacher Training Liberal

► THE AVERAGE school teacher gets a far more liberal education than many other professionally trained persons, a national study shows.

A survey report by the Institute of Higher Education of Teachers College, Columbia University, stresses "generous elective privileges" that give teachers the chance to "broaden and enrich their education in liberal arts subjects." Heavy professional requirements for students in other fields make it difficult for them to study outside their special area.

Critics who blame shortcomings of the school system on too many "methods" courses for teachers are "using a fiction to come to grips with a reality," the study contends.

Much criticism of teacher education is believed based on poor judgment, misinformation and "armchair opinion." The report also asserts that many specialists who criticize teacher training are less interested in furthering the cause of liberal education than in replacing courses in teaching with courses in their own specialized subject matter.

Colleges requiring "entirely too much" instruction in teaching methods—as much as 53% of the curriculum—are not typical, the study showed.

A sampling of 35 teacher-training insti-

tutions showed elementary school teachers received an average of 36% of their total instruction in professional studies. Secondary teachers devoted only 17% of their learning to such studies.

By contrast, typical engineering and pharmacy schools require 45% of all studies in technical subjects. The average for business administration is 47%; nursing, 52%; and music, 68%.

The average engineering student is allowed only five percent of his instruction in elective courses of his own choice. The average pharmacy student is allowed four percent. But 39% of the education of secondary school teachers is allowed in electives, and elementary teachers get an average of 16%.

Moreover, many of the education courses rated in the professional category are not "methods" courses, but studies of the history, philosophy and psychology of education. Properly taught, they can contribute as much to a liberal education as courses in literature or science.

The study was directed by Dr. Earl J. McGrath, Institute executive officer and former U. S. Commissioner of Education, with the help of Dr. Charles H. Russell, Institute research assistant.

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GENERAL SCIENCE

Hedge Apples as Food

► CONCERN OVER the world's increasing need for new food materials led a 17-year-old student scientist to investigate nutritional possibilities of the Osage orange, or common hedge apple.

The project, conducted by Victoria Sue Richards, a senior at Garfield High School, was awarded one of six top prizes at the National Science Fair-International in Kansas City, Mo.

Hedge apple trees produce large quantities of yellow, rough-surfaced fruit, four to five inches in diameter. Although the wood of the tree has been used for Indian bows, railroad ties, fence posts and wheel stocks, Miss Richards found no record of any practical use for the fruit.

She first disproved a widely held theory that the fruit is poisonous by injecting a filtered solution of ground Osage orange and water into five mice. No ill effects resulted.

Next, the fruit's general food value was determined by laboratory analysis. A dried composite sample was shown to contain 10.75% protein, 2.95% moisture, 23.48% fat, 4.45% mineral, 7.93% fiber and 29.4% sugar.

Since the fresh fruit itself is tough, sticky, and not especially tasty, Victoria dried and powdered it to test its potential as animal food. Mice ate hedge apple mixed

with powdered egg, and guinea pigs sampled it with alfalfa pellets, but neither showed appreciable weight gain. The young researcher's best results were with baby chicks, which thrived on a diet of powdered hedge apple mixed with chick starter—although it took a few days for them to become accustomed to the taste.

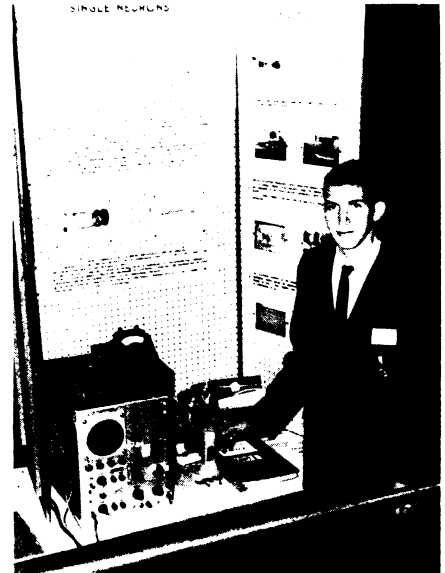
Victoria then tried her hand at preparing food for human consumption. Cookies made of 50% hedge apple and 50% flour had a good texture, a pleasant odor, and "a strange, but palatable, taste," she reports. A coarse-textured bread, using 25% hedge apple and 75% flour, had similar characteristics. Roasted hedge apple seeds were found "pleasantly edible" with salt and butter added.

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Single Nerve Fibers

► A 16-YEAR-OLD STUDENT scientist from Eau Gallie, Fla., reportedly has developed a new technique for keeping single nerve fibers alive and functioning in tissue culture for several weeks.

The project was displayed as an exhibit at the National Science Fair-International in Kansas City, Mo., by Christopher George Cherniak, a junior at Melbourne High School, Melbourne, Fla. It attracted wide



Christopher George Cherniak

interest from representatives of the medical profession and the Armed Services.

Christopher's exhibit won him an NSF second award, as well as special first place awards from the American Medical Association, the Army, the Air Force and the Navy. The Armed Services are said to be speculating on the technique's possible uses in studying nerve gas effects.

Christopher said he was led to undertake his research by the fact that no technique existed for maintaining single nerve cells outside of an animal, or for observing their functioning continuously.

After culturing lengths of a frog's sciatic nerve, he developed an apparatus and a nutrient solution to keep the nerve alive, and monitored the nerve's electrical activity. No damage resulted to the nerve, he explained.

The boy next used a second special apparatus to culture single nerve fibers taken from the leg and motor nerves of horseshoe crabs and blue crabs. They were isolated from the motor nerve bundles, mounted in the culture "with a minimum of injury," and kept free of bacteria, he reported.

Subsequent monitoring of electrical activity, comparing the actions over a period of time, showed the nerve did not deteriorate in functioning. The dissected single nerve fibers, when assembled, were kept functioning in the culture as reflex arcs for several weeks, Christopher said. His technique, he asserts, has the advantage of allowing observations of the nervous system in its component parts, yet with the parts still functioning together as an integrated whole.

Environmental variables thus can be minimized in studying simple behavior, and the neurons can be identified in terms of their functional characteristics.

His eventual goal is the use of networks of living nerve cells for the study of primitive behavior in invertebrate animals.

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