Biological Warfare —

Parasites Vs. Gypsy Moths

WASHINGTON, D.C. — It looks like a uneven fight — an average — size fly against a three-inch long gypsy moth caterpillar. But as sure as David beat Goliath, this little fly — a gypsy moth parasite — will win.

Jockeying for position, the fly carefully places a tiny egg on the back of the gypsy moth caterpillar. Later, a fly maggot hatches and feeds on the caterpillar — killing it.

At least nine species of parasitic flies and wasps are helping the U.S. Department of Agriculture and state agencies wage biological war against the gypsy moth in infested areas. These areas include most of New England, New York, New Jersey and Pennsylvania, plus parts of Northern Maryland and Delaware and a small area in Central Michigan. Laying eggs in or on the moth's eggs, caterpillars or pupae, these parasites are helping keep some of the moths' damage under control. Some parasites attack only gypsy moths; others also attack other destructive caterpillars.

Gypsy moth caterpillars were imported more than 100 years ago by a Massachusetts naturalist who wanted to cross the moths with silkworms. The experiment failed and a few young gypsy moth caterpillars escaped and thrived.

In this country, the moths do much more damage than in some parts of their native Europe and Asia, where parasites keep their numbers low. However, none of the moth's natural predators accompanied it here.

Parasites where an important part of an accelerated gypsy moth research and development program USDA undertook in 1974.

USDA intensified foreign exploration, centered around its parasite laboratory in France and a newly-established parasite laboratory in Japan. Th European lab collected parasites from France, Austria, Hungary, Poland, Germany, Corsica and Iran, while the Asian facility concentrated efforts in Japan and Korea. USDA also obtained natural enemies from Yugoslavia, Morocco and India.

As a result, more than 280 separate shipments — close to sixty species — were sent to a USDA quarantine facility in Newark, Delaware, for evaluation, testing and distribution to gypsy moth workers in universities and state and federal governments. The New Jersey Department of Agriculture reared large numbers of several species in parasites for release in the field. In addition, more than three million parasites have been produced in a Pennsylvania state laboratory in Middletown, Pa., and released since 1974. Other state agencies, including those in Maryland and Virginia, have released parasites that attack other destructive caterpillars — besides gypsy moths — in the path of oncoming gypsy moth infestations. They hope these parasites will keep damage down when large numbers of gypsy moths move downward from the Northeast.

However, using parasites to eliminate gypsy moths is nothing new. Beginning in 1905, USDA scientists began working with parasites from Europe and Japan, bringing them to Massachusetts to try to establish them. The scientists expanded the work in 1912 but disbanded it when World War I made normal foreign travel impossible.

"In 1923, USDA sent insect explorers through Europe," said Stanley McNally, an area director USDA gypsy moth parasite program coordinator. "Although they had difficulty finding infestations in an area where parasites controlled the moth well, they found an infestation about 120 miles east of Budapest, Hungary, and set up a laboratory.

"The scientists placed caterpillars on wooden rearing trays with cloth bottoms, and every day they fed them fresh-picked foliage," McNally said.

"When the parasites hatched, they packaged them in a box filled with damp sawdust to pupate," he said. "They put them in larger boxes and shipped them by ship in cold storage to a USDA lab at Nelrose Highlands, Mass for increase and release."

Wilt disease, a virus, was also a problem in the caterpillar collections. But in spite of all the difficulties, more than 100,000 caterpillars were reared and more than 44,000 parasites were shipped back during this phase of the program.

"Considering the primitive state of biological control, compared to sophisticated methods we have today, it's amazing that some of the parasites actually became established," McNally said. "Most of the parasites we see in the Northeast today are descendants of these early introductions, including some in Pennsylvania that helped contribute to the recent collaspe of gypsy moth populations there.

"Wet, cold spring weather, caterpillar diseases and state and federal treatment programs also helped," he said.

By 1933, all the parasites then believed suitable for release in United States had been tried and the program was dropped. Enthusiasm for parasite research waned, particularly after 1945 when DDT and other "miracle" pesticides became available.

"People wondered, why risk the uncertainties of biological control methods against insect pests when chemicals could provide a quick and sure kill," McNally said. "DDT was effective and believed safe. The parasites were hard to establish and sometimes it took them years to have any effect."

Between 1945 and 1958, USDA and state governments treated more than twelve million acres with DDT in gypsy moth programs.

"Then, however," McNally said, "came the knowledge of possible adverse environmental effects and authorities phased DDT out of the gypsy moth program in parasites."

The New Jersey Department of Agriculture was one of the first to review their parasite program in 1963. An old hand at parasite rearing and other biological control work, New Jersey had worked since 1923 with natural enemies of the Japanese beetle and other pests.

"Work continued at our parasite laboratories, even during the 40's and 50's, when other parasite work was at a low ebb," said William Metterhouse, deputy director of New Jersey's Bureau of Plant Industry, who is in charge of the parasite lab today. "So when interest renewed in biological control through the nation, we had the background to help. We've always believed it's best not to rely solely on pesticides."

New Jersey scientists still conduct gypsy moth parasite research, development and action programs, in cooperation with USDA.

"An overall goal of gypsy moth programs is to develop integrated pest management systems to deal with the pest," McNally said. "We want to keep the damage and nuisance it causes down — but without disrupting the environment in other ways. Obviously, parasites will play a large role."

A pilot project, conducted by the Pennsylvania Department of Environmental Resources with USDA assistance, in underway in a Pennsylvania state park. Gypsy moth experts will survey plots intensively every year and apply light doses of chemical or biological insecticides only when infestations reach a critical level. In other years, parasites and other natural controls will be allowed to work on their own.

"This is the role we see for parasites," McNally said. "Not a replacement for pesticides but one of a variety of tools that can reduce gypsy moth damage within the infested area while allowing pesticides to be used less often."

Mrs. Juanita Baker Is Personnel Head

RALEIGH — Mrs. Juanita H. Baker, Special Program Consultant to the Secretary of the Department of Correction, has been selected to be the new Personnel Director for the Department effective August 1.

In announcing Mrs. Baker's selection, Secretary Amos E. Reed cited her outstanding record with the Department of Correction over the past nineteen years including her tour as Superintendent of the North Carolina Correctional Center for Women in Raleigh.

A 1958 graduate of Shaw University, Mrs. Baker began her tenure with the Department in 1961 as a special education teacher at the women's prison. In 1970 she was appointed Superintendent of that institution. In her latest position as Special Program Consultant she has been responsible for the Department's affirmative action, women's affiars (employees and clients) and citizen volunteer programs.

Mrs. Baker is a member of the American Correctional Association, is on the local Board of Directors of the American Cancer Society, serves on the Board of Directors of Wake County Group Homes and is a member of the Williams Grove Baptist Chruch.

She is married to John Baker, Wake County sheriff. They and their two children, Jonnita 20, and John III 18, reside at 1616 Battery Drive in Raleigh.

To the editor. . . .

In her article entitled, "Hillside Must Award Diplomas". carried in the August 2nd edition of *The Carolina Times*, Dr. Ada M. Fisher state, ". . . .a proposal is under consideration (and possibly already enacted) to make Hillside serve only the ninth and tenth grades and give Durham High the eleventh and twelfth grades."

On April 14, 1980, the Durham City Board of Education did pass a long range plan for the re-organization of the school system, (one that had public involvement and support for a period of about six months). May I suggest, however, that this article is not entirely an accurate description of that plan. No further action has been taken since that date, nor is any contemplated.

A copy of the plan is in the office of the Superintendent, Dr. Cleveland Hammonds, for anyone to see who might be interested.

—Josephine D. Clement, Chairman
Durham City Board of Education

Strike For More Pay

Thousands of striking black municipal workers gather at a downtown Johannesburg (South Africa) Transport Depot July 29 during a work stay-away over a pay dispute that has left garbage piled up in downtown streets and other key services at a near standstill. [Related story on Page 13]