All-out war was declared. Gypsy moths were barraged with insecticides. First the New England states drenched themselves in lead arsenate. Victory was declared, but the gypsy moths continued to spread. Following World War II, DDT replaced lead arsenate, with over three million acres sprayed in 1957. The gypsy moths continued to spread. After the publication of *Silent Spring* in 1964, DDT was replaced by carbaryl (Sevin). The gypsy moths continue to spread.

As experience in Wellesley between 1980–82 confirms, gypsy moth populations crash on unsprayed areas as quickly as on sprayed areas. Worldwide records going back more than 200 years show that gypsy moth outbreaks spontaneously collapse after two to three years if nothing whatever is done.

Indeed, the most rapid expansions of gypsy moth populations have followed large-scale spraying, which kills off natural enemies. Such enemies include imported parasitic wasps and flies and the *Calosoma* beetle crawling over the front page of this pamphlet. Gypsy moth caterpillars are also eaten by native birds, insects and mammals.

Recently, to avoid injuring non-target species, including man, more specific and less dangerous gypsy moth pesticides have been developed, including *Bacillus thuringiensis* (BT). Two interesting pesticides are being tested: Gypchek, a formulation of the nucleopolyhedrosis or wilt virus that ends gypsy moth outbreaks, and Dimilin (diflubenzuron), which interferes with insect metamorphosis.

Today, the European gypsy moth is endemic to the northeastern and middle-Atlantic states. Outbreaks flare up each spring along the interstate highways heading west. A new invader, the Asiatic gypsy moth, has landed on the Pacific coast. Half the world is dressed in polyester, but caterpillar silk still reigns supreme.

Occident and Orient
One earth

Natural Resources Commission

OF SILK, WAR AND GYPSY MOTHS

Four millenia ago, so says tradition, an Empress of China raised silkworms in her garden. From their shining filaments she spun and wove a glimmering, strong and supple fabric called silk. By 1000 B.C., silk-making was flourishing in China and India.

Silk! The western world, clad in cotton and linen, wool and skins, was agog. Where did this mysterious fiber grow? Could it be spun from spiderwebs or milkweed fluff? How was it made into cloth? Whoever discovered the answers would make a fortune! But the closely guarded secret stayed in the Orient for another thousand years. Then, in 552 A.D., two Nestorian monks smuggled silkworm eggs from China to Constantinople, now known as Istanbul.

Emperor Justinian I monopolized the culture of silk, but the Greeks soon learned the inscrutable truth: the cloth of kings is spun by *moth caterpillars* dining on mulberry leaves!

The Greeks maintained silkmaking supremacy until the 13th century, when—with the aid of captured Greek silk weavers—the nation-states of Italy took the lead. By the 16th century, cocoons were raised in France.

The French silk industry expanded until 1685, when about 400,000 Huguenots, many of whom were silk workers, were driven into exile. They carried their knowledge to England and America. As a consequence, English silks captured the European market after 1718, and Napoleon had to impose a tariff on imported silk to save the French industry.

In the American colonies, French Huguenot silk workers established a settlement known as Silk Hope. With their assistance, the colonies were exporting an average of 500 pounds of raw silk a year by 1776.

Soon after the Revolutionary War, many states offered bounties for planting mulberry trees and producing silk. In 1826 Congress ordered the preparation of a manual on the manufacture of silk. Conventions were held from Maryland to Massachusetts. But the problem with growing silkworms and reeling silk was labor. Domestic labor costs were far higher than in Europe and Asia.

Manufacturing fabric from imported raw silk looked more promising, but American mills were hard pressed to meet foreign competition. Then, with money needed to fight the Civil War, duties as high as 60% were imposed on imported silk, and American mills prospered. The New England mills specialized in silk thread and, later, hosiery and gloves. In Needham a millowner named Lemuel Cobb owned silkworms and mulberry trees, and in West Needham, now Wellesley, a spool silk mill operated for seven years.

Commercial silk moths and silkworms

By World War I, silk production was booming. Silk stockings typified the Flapper generation and the Roaring '20s. Then rayon was invented, followed by nylon in 1940. These uniform man-made fibers were much easier to handle than natural silk. With raw silk from the Orient unavailable due to the war with Japan, nylon stockings displaced silk, becoming for a time a kind of currency in luxury-starved post-war Europe.

And where do Léopold Trouvelot and gypsy moths fit into the story of silk?

Well, Monsieur Trouvelot was a French naturalist and astronomer at Harvard Observatory, a member of the American Academy of Arts and Sciences. But M. Trouvelot is remembered as the man who in 1869 imported European gypsy moth eggs to Medford, Massachusetts in order to experiment with hybridizing a more vigorous silkworm.

Didn't he know that in 1508 the Bishop of Nice had been called upon to exorcise an invasion of these caterpillars? He *did* know about their characteristic outbreaks—yet somehow the insects were allowed to escape and multiply. In 1889 a biblical plague of caterpillars struck Medford. A famous photograph shows a crew of 40 men attempting to clear *two* trees of caterpillars. It didn't work.

With no natural enemies, gypsy moths spread fast and far. Their name, "Gypsy," means "Wanderer": the young caterpillars are blown by the wind on silk lifelines as much as six miles; the adult caterpillars travel on every moving object; and the egg masses glued to firewood, lawn furniture and vehicles are dispersed by humans wherever they go.

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