= Apiary Laboratory =

The Apiary Laboratory , more often referred to as the Apiary , is a research laboratory at the University of Massachusetts Amherst . Originally built for the study of honey bees and apiculture , today it is primarily used to study native pollinator species and the chemicals and pathogens impacting their populations . This academic building is unique in that it is credited as being the first in the United States to be erected exclusively for the teaching of beekeeping .

Prior to the construction of the building , the Massachusetts Agricultural College had maintained a beekeeping program for a number of years as one of the first land @-@ grant agricultural colleges to teach the subject in the United States . In time , techniques in apiculture progressed , leaving beekeeping as no longer simply a hobby , but rather a viable agricultural business . The college 's program had remained limited to a single short @-@ course for a number of years but was expanded however , when in 1911 , a bill passed establishing the office of " state apiary inspector " . Dr. Burton N. Gates , the man first appointed to this position was also the college beekeeping lecturer at the time , and would oversee the expansion of the program as an asset to the college and a service to the state in the years to come . Construction began on the apiary in February 1911 and with its completion in June of the following year for a total cost of $ 3000 . At the time the building contained a laboratory , a wintering cellar , a wood workshop , an office with a comprehensive library of apicultural books , honey and wax extraction rooms and a two @-@ person apartment used by student tenants . It was also the first structure built in the college orchard , a section of campus now known as the Central housing area .

In the time that Gates was there , research focused mainly on honey production , brood diseases , wax extraction and horticultural pollination in the cucumber and cranberry industries . From 1913 to 1920 the laboratory was also operated by a superintendent , John L. Byard , hired on by Gates to maintain the facilities from day to day as well as perform wax extractions and other services to beekeepers from around the state . Following Gates ' resignation in 1918 , the school ceased to offer its summer beekeeping school , many of its state extension services , and the college went through several different professors before hiring Frank R. Shaw as the new professor of beekeeping in 1931 . With Shaw 's retirement in 1969 , the laboratory was rededicated to urban and medical entomology research , with the former beekeeping program falling into relative obscurity .

At the present time the apiary is used exclusively for research on native pollinator decline and ecology , with the last beekeeping classes taught at the university nearly a decade ago . The building is currently on the university 's " defer and do not reinvest list " , suggesting that it will ultimately be dismantled at some point in the near future .

= = History = =

= = = Origins of the beekeeping program = = =

Since the early days of its founding as the Massachusetts Agricultural College , UMass Amherst has maintained apiculture and ecological studies of bees throughout much of its history . In 1870 the first short courses on beekeeping were taught at the college by Alonzo Bradley Esq . , an expert on honeybee behavior and the president of the Massachusetts Beekeepers ' Association at the time . These lectures were given for several of the years that followed and appear to be " the first instruction in the subject given in any agricultural college in this country " as indicated by H.T. Fernald in his account of the college 's history . Only two decades earlier western Massachusetts had been home to Lorenzo Langstroth , a man considered to be the father of modern apiculture . Although he had spent much of his time developing his innovative hive (now considered an international standard) in Philadelphia , in 1852 he moved to Greenfield , Massachusetts to recover from illness and further his study of honeybee behavior . In the following year he published his widely acclaimed primer , The Hive and the Honey @-@ Bee at the Hopkins , Bridgman & Co. press of Northampton . ; this book , having gone through several editions since , has become a mainstay

of American beekeeping literature . One of Langstroth 's own apprentices , James Fitts Wood , would go on to serve as the lecturer of beekeeping at the agricultural college for several years . During this time he continued to make significant contributions in queen @-@ rearing and became known in the apicultural community for developing a strain of notably docile Italian honeybees . Despite his success in academia and apiculture , Wood unfortunately would not live to see the establishment of the college apiary , he died after a period serious illness on February 15 , 1905 at the age of 44 .

= = = Construction of the apiary = = =

The idea of a campus apiary was first conceived for the sole purpose of pollinating the campus orchard . However , by the time the facilities had been built , President Kenyon L. Butterfield and his administration had seen and realized a much greater purpose and potential in it than was previously considered . Around this time beekeeping was considered a new business venture which had otherwise been thought of as a hobby or side business of farmers for many decades prior .

Just as much of the pioneer work in beekeeping originated in New England , Massachusetts was one of the first states to create a " State Inspector of Apiaries . " The man who first led UMass ? s beekeeping program , a Dr. Burton N. Gates , was also the first to fill this position . As the apiary ? s first professor , he was originally hired part @-@ time to give a series of lectures as a guest speaker during the spring semester of 1906 . This would continue until 1910 when the administration hired him as a permanent faculty member , and concurrently built the new apicultural laboratory , equipped with all modern amenities of its time . They saw the opportunity they had , to further research on the diseases and ecology of the honey bee , something that up to that point had never been pursued so thoroughly by a public organization of higher education .

In 1911 , ground was broken on the site of the " old creamery building " at the foot of Mount Pleasant for the new apiary building and yards , and by June of the following year the building had been completed for a total cost of $ 3000 . At the time of its completion , the grounds contained several species of native nectar @-@ yielding flowers and were home to fifty bee colonies of multiple races . The building itself contained wax and honey extraction rooms , a wintering cellar , an office with an extensive library of beekeeping books , a wood workshop , a laboratory and a two @-@ person apartment occupied by student caretakers .

As the apiary became a research laboratory , classroom and an extension service to the state , the demand increased for these services and thus it became necessary to maintain additional hives . It is for these reasons that , in 1913 , Dr. Gates hired John L. Byard as superintendent of the apiary . Some of Byard 's responsibilities included performing wax extractions , running the college 's apicultural exhibit at fairs and maintaining the hive yard from day to day .

He would continue to maintain the building , the equipment and the hives until his death in 1920 ; professors Henry T. Fernald and Arthur I. Bourne would continue his work until his successor arrived the following year . Gates had been promoted from an assistant to an associate professor in 1915 , and had continued to work both as a lecturer and as the apiarist of the experimental station . From 1913 to 1914 he was made president of the National Beekeepers ' Association , twice hosting conventions in Amherst concluding the college 's winter and spring sessions of the college beekeeping school . However , in 1918 he left Amherst for a professorship at the Ontario Agricultural College in Guelph , leaving his former position open for the two years that followed . Gates ' and Byard 's duties would be taken up by several different people in the next decade . From 1921 to 1923 all beekeeping and apiology work at the Experimental Station was taken up by Professor Norman Phillips , who soon resigned for a job at a commercial apiary . He was replaced by Professor Morton H. Cassidy , an alumnus of the college , who stayed for 3 more years but ultimately had to resign due to his severe asthma . In 1926 , a Mr. Clayton L. Farrar was made instructor of beekeeping . Farrar , a graduate of Kansas Agricultural College , also performed extensive work on several entomology projects as a research assistant before leaving in 1931 to work at a Federal laboratory .

= = = Contemporary history = = =

In the span of only a decade the apiary laboratory had been run by 4 different faculty members until finally , in 1931 , a new and more permanent apiology instructor , Frank R. Shaw , was hired . Shaw , a student at the time , had previously been hired on in 1930 as assistant entomologist to the college Experimental Station , but with the resignation of Farrar , his responsibilities would shift as he began to teach courses in beekeeping and pollinator ecology . In 1935 , he was made an " Instructor in Economic Entomology and Beekeeping " while concurrently finishing his Ph.D. of entomology at Cornell University . In 1944 , Shaw left to serve in the Second World War . Eventually , he would be promoted from being an instructor to an assistant professor in 1954 . UMass would continue to offer beekeeping courses and maintain a beekeeping section of the entomology department right up through the 1970s , however it appears there was never another superintendent hired to replace Byard and much of the extension work to state beekeepers seems to have ceased . Professor Shaw went on to coauthor a comprehensive beekeeping and ecology textbook with UC Davis apiologist John Eckert . This textbook , intended to replace the beekeeping text of the same name by renowned apiculturalist E. F. Phillips , would be published for a total of seven editions from 1960 through 1977 . Shaw retired in 1969 at the age of 61 , he would be the first and last " Professor of Beekeeping " to do so as the position was abolished immediately after . Following his retirement , a student scholarship fund for the department of entomology was set up by the department in Shaw 's name .

From the late 1970s through the mid @-@ 1990s the laboratory was rededicated to medical and urban entomology , with Professor John Edman running projects on mosquitos as vectors and Professor Ron Prokopy focusing on orchard pest control . In 1982 , the wintering cellar in the basement of the lab was converted into laboratories , and the workshop was relocated to the garage adjacent to the building that was constructed that same year .

Since 2005 , the Apiary has housed part of the Laboratory of Medical Zoology (LMZ) under direction of Dr. Stephen Rich . LMZ uses the lab space for studies of ticks and mosquito vectors of infectious disease .

= = Research = =

The department of entomology has done several studies in apiculture , chemical ecology , horticultural pollination , and the behavior of honeybee and bumblebee colonies . Although some research was done in the apiary yards , the majority of data had to be collected with higher numbers of colonies at different experimental stations . Today the laboratory is used to conduct research on native pollinator decline for the Managed Pollinator Coordinated Agricultural Project .

= = = Selected publications = = =

Gates , Burton Noble (1908) . Bee Diseases in Massachusetts . Massachusetts Agricultural Experiment Station . OCLC 632090550 .

Ferrar , Clayton Leon (1931) . A measure of some factors affecting the development of the bee colony . Massachusetts State College . OCLC 14982766 .

Shaw , Frank Robert (1938) . Bees for the beginner (in Massachusetts) . Amherst , MA : Massachusetts State College Extension Service . OCLC 18718351 .

Savos , Milton George (1954) . A study of some of the physical factors influencing the sugar concentration of nectar . Amherst , MA : University of Massachusetts . OCLC 15183228 .

Sutherland , Donald J. (1957) . The effect of certain modern pesticides on Apis mellifera L. and Bombus spp . Amherst , MA : University of Massachusetts . OCLC 15187508 .

Lupien , John R. (1960) . The effects of Sevin , alone and in fungicidal combinations , and DDT on the honey bee , Apis mellifera L. Amherst , MA : University of Massachusetts . OCLC 14960318 .

Grahame , Robert Edward (1967) . The comparative toxicity of selected organic phosphate and carbamate insecticides to the honey bee . Amherst , MA : University of Massachusetts . OCLC

15037242 .
Pan , Zhiliang (1997) . The culture of bee forage crops . Amherst , MA : University of Massachusetts Amherst . OCLC 39669471 .

= = Coursework = =

In the decade following the building 's construction , multiple courses were taught in apiculture and honeybee behavior . In 1911 , there were 20 college @-@ owned bee colonies as well as several lent by the faculty , and a five course program taught in the summer semester at the college . Within five years the college had assembled 50 hives and an extensive collection of apicultural books and equipment . In the year that followed , a summer beekeeping school was held , composed of five courses taught in previous years with the addition of a class in horticulture :

1 . Practical beekeeping . Lectures : laboratory practice in the general work of the beekeeper ; beekeeping equipment , practices in the preparation of materials , location of the apiary ; commencing with bees , handling of bees , practice in beeyard procedure ; spring manipulation , fall preparation , wintering ; extracted honey production ; bee diseases and their treatment , apiary sanitation ; making increase , elements of queen rearing , etc .

Burton N. Gates , Associate Professor of Beekeeping

John L. Byard , Superintendent of the Apiary

2 . Life of the honeybee . Lectures .

Henry T. Fernald , Professor of Entomology

3 . Special problems of the beekeeper . Lectures : demonstrations in requeening , the races of bees , the introduction of queens ; swarming and handling swarms , comb honey production , enemies of bees .

James B. Paige , Professor of Veterinary Science

4 . Crops foraged by bees . Lectures : field excursions .

William P. Brooks , Director of the Experiment Station

5 . The relation of bees to the pollination of plants , including coloration , odor , nectar secretion . Lectures : laboratory work in blossom structure and dissection .

A. Vincent Osmun , Associate Professor of Botany

6 . Bees in horticultural practices ; fruit production , market gardening , cranberry culture and greenhouse cucumber growing ; beekeeping as affected by spraying practices . Lectures : field work .

Walter W. Chenoweth , Associate Professor of Pomology

From the 1920s through the 1970s the laboratory was used mainly for faculty and graduate research , with two courses offered to undergraduate students in introductory and advanced beekeeping as well as a single course offered to the public in the summers . There was a brief time in the spring semesters of 2001 and 2002 that an introductory course in beekeeping was offered , however , with the reorganization of the department of entomology these classes have since ceased .

= = Architecture and landscape = =

Although now encompassed by trees and other academic buildings , the apiary was surrounded by fields and orchards at the time of its construction . Early photographs show the hive yard was originally 2 acres in size , extending several hundred feet south of the property 's present @-@ day boundaries in what has since been developed into a residential neighborhood . The building itself was built into the side of Mount Pleasant , with the entire east side of its basement completely covered by the ground . This " banked barn " design was likely used to allow pallets of beehives to be transported with ease from the yards to the wintering cellar , while alternatively making the temperature of the building more easily controlled for their storage .

The building currently has two dormers on opposite sides of the roof , but neither seems to be part of the original structure . Older photos as late as 1918 show the roof without any windows implying

they were added at some later date . Being the building 's most prominent design feature , the Gambrel roof would later influence Louis Warren Ross , architect and an alumnus of the college , in his design of the Butterfield dormitory which , for a time , was the only other building on the hill . Since the Apiary and Butterfield Hall are the only two buildings on campus to exhibit this architectural motif , it seems likely that this was incorporated in the latter 's design to compliment the former .