
U.S. DEPARTMENT OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY

ASSOCIATES NAL TODAY

New Series vol.1,no.1/2 January/March 1976

THE INDISPENSABLE HONEY BEE

Apicultural Issue

The Associates of the National Agricultural Library, Inc. Beltsville, MD 20705

* * * * *

Guest editor of this issue is Julia S. Merrill

Cover photograph by the late James I. Hambleton, U.S. Department of Agriculture

Associates NAL, TODAY is mailed free to members of The Associates NAL, Inc. In addition to underwriting the cost of this quarterly journal, The Associates publish occasional monographs, sponsor symposiums, and initiate projects designed to supplement programs of the National Agricultural Library. Readers are cordially invited to join The Associates NAL, Inc. to receive these publications and participate in these activities. Categories of membership are: Personal, $10; Business, $500; Institutional, $100; NAL staff members (non-voting) $5. Please make your check payable to The Associates NAL, Inc., 10301 Baltimore Blvd., Beltsville, MD 20705.

MANUSCRIPTS

1. One copy should be sent to:

   Leila Moran
   National Agricultural Library
   Beltsville, MD 20705

2. Submission of illustrations is encouraged; authors are responsible for obtaining copyright permission

3. Manuscripts should be typed, double-space.

Associates NAL Today

New Series vol. 1, no. 1/2
January/March 1976

CONTENTS

GROWING IN SERVICE

Many of the friends and users of our National Agricultural Library have taken advantage of the opportunities to join with the Associates of the NAL to help our Library. Many useful ideas have been suggested and carried out. Then too, several of the dedicated members of the Library staff have received tokens of appreciation for their efforts.

Recently we have been explaining how more assistance could be provided by the many groups of scholars in the U.S. Department of Agriculture. Dr. Richard A. Farley, the Librarian and his staff would appreciate the advice of such groups, especially in several scientific and economic specialties, on the most important books to acquire for good service to the users of the Library.

We have been thinking of developing advisory groups of experts in each of the scholarly fields to advise Dr. Farley and his staff, in order to shape the collections effectively and to make the wisest use of available funds.

I hope that any readers of this note will cooperate if invited to do so.

Charles E. Kellogg
President

INTRODUCTION

This first Bicentennial Issue of *Associates NAL, Today* is devoted to a phase of agriculture which interests not only beekeepers but farmers, economists, hobbyists, scientists and the general reading public. The indispensable honey bee is of such widespread value and appeal that thousands of books, essays and research papers have been published extolling its virtue and worth.

Since there is so much information to choose from and so many knowledgeable persons to call on, we have, of necessity, limited the material contained here. We have confined ourselves to apicultural matters in the National Capital Area, with special emphasis on Maryland beekeeping, the University of Maryland and Federal research programs.

Julia S. Merrill
Guest Editor

A SPECIAL WELCOME

This issue of *Today* recognizes the literature of Apiculture, an outstanding segment of the collections of the National Agricultural Library. A special welcome and a grateful thank you is extended to Julia S. Merrill of the NAL Library Services Staff, who served ably and cheerfully as guest editor for apicultural material in this issue.

EDITORIAL REFLECTIONS

Beginnings . .

The Bee Culture collection was organized in 1925 as a unit of the United States Department of Agriculture Library and placed under the direction of the Bureau of Entomology Branch Library. During the 1940–42 library reorganization program, when the branch libraries were consolidated with the main library, the Apiculture Unit Library was designated as the Bee Culture Branch of the Department Library. It was not until 1975 that the Bee Culture Branch Library was merged with the National Agricultural Library.

The Bee Culture collection is perhaps the largest and most comprehensive collection of bee literature in the United States, if not the world. The collection, for the most part, is concerned with the honey bee, *Apis mellifera L.* but also includes materials on honey production and marketing. It is rich in rare materials – books, periodicals, and pamphlets – both domestic and foreign. A translation file is also part of the collection. An Annotated Beekeeping Bibliography, on cards, begun in 1905, has received world–wide recognition. The Bibliography contains citations to books, pamphlets, and periodicals covering the period 1905–1973 without interruption. This Bibliography together with the very complete apicultural collection comprises a most important and unique source of information on beekeeping.

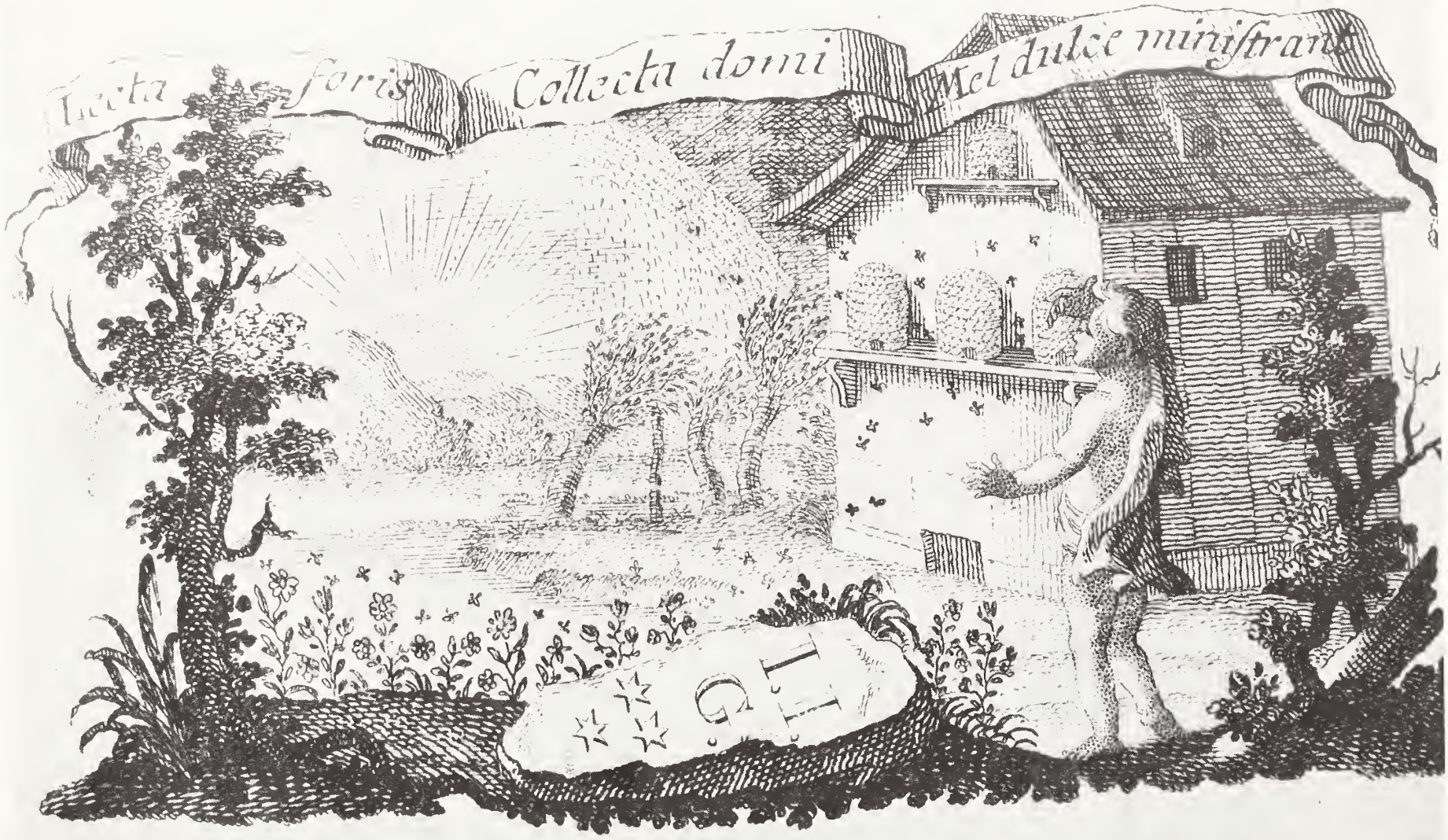
James I. Hambleton, director of bee culture activities in the Department from 1924 to 1958 was the undisputed organizer and promoter of the Bee Culture Collection. His keen interest and participation in library matters continued into his retirement years. Hambleton had a warm personality and an enthusiasm for his work, which endeared him to the scientific community, scholars, beekeepers, and students all over the world. His death in 1969 brought expressions of admiration, praise, and loss. Ohio State University, his *alma mater,* honored him with the establishment of the James I. Hambleton Award for Student Research Achievement in Agriculture in his memory.*

The actual development of this Branch Library exemplifies a successful cooperative undertaking by the users and the library administration as represented by Hambleton, Claribel Barnett, Department librarian 1907–1940, Mabel Colcord, librarian of the Bureau of Entomology Branch Library, 1915(?)–1942, Ethel L. Coon, Bee Culture Branch librarian from 1924(?)–1944, and Julia S. Merrill, librarian 1944–1973.

As a result of Hambleton's initiative books, pamphlets, and periodicals on beekeeping, filed in the offices of individual scientists and researchers of the Department were assembled, and, through the cooperative expertise of Barnett and Colcord, were processed, cataloged, and merged with the other beekeeping holdings of the Bureau of Entomology Branch Library. From these modest beginnings and subsequent aggressive acquisition policies emerged the Beekeeping Bibliography, a world–renowned information storage and retrieval system on beekeeping.

–Angelina J. Carabelli, Editor

*The award is granted annually to stimulate research in apiculture.



From Johann Jacob Griesingers' Vollstandiges Bienen = Magazin. 1796

A SPECIAL BEE LIBRARY AND A SPECIAL BIBLIOGRAPHY

by
Julia S. Merrill
National Agricultural Library
Beltsville, Maryland

This is an account of a library devoted to the subject of beekeeping and of a unique beekeeping bibliography which is of historical as well as current interest.

At its height, the Bee Culture Branch of the National Agricultural Library (NAL), was believed to be the largest and most complete apicultural collection in the United States. It was formed nearly 50 years ago when James I. Hambleton, Chief, Division of Bee Culture, Bureau of Entomology, U.S. Department of Agriculture, brought together the books and periodicals formerly kept in individual offices of the Division. Ethel L. Coon was assigned the task of maintaining and augmenting the collection for the exclusive use of the bee research staff.

At this time, the Division was located in Somerset, Montgomery County, Maryland – just over the District of Columbia line. The library and laboratories moved to the U.S. Agricultural Research Center at Beltsville, Maryland in 1936 and have remained there to this day.

In 1942, the Bee Library, along with other Bureau libraries of the Department of Agriculture, became a part of the Department Library – later the National Agricultural Library (NAL). After several title changes over the years, the bureau library finally became the Bee Culture Branch of the National Agricultural Library and will be referred to as such hereafter.

At one time, some 135 periodicals on bees were received by purchase, gift, or exchange. Most of these were, and still are, published by beekeeper's associations, although in the United States the two major journals are house organs of bee supply houses. In France and Germany, for example, there are numerous associations and many journals – and so it is throughout Europe. The countries of the Far East are also represented in the bee literature received by the library.

The Bee Library collection grew from its humble beginnings to contain over 7,000 bound periodicals and monographs; more than 2,000 reprints from scientific journals not filed in the Bee Library; and several hundred translations and a number of theses in the field of apiculture.

In addition to the most recently published books in the field of apiculture, a number of rare books graced the shelves. Among these were Charles Butler's *Feminine Monarchie,* published in 1632 and John Levett's *The Ordering of Bees,* published in 1634. Other items of historical interest are listed by Alan Fusonie elsewhere in this issue of *NAL TODAY.*

As the Division of Bee Culture grew and the literature became more voluminous, a card index of selected references from the world's bee literature came into being. It is known as the "Beekeeping Bibliography".

The Beekeeping Bibliography is prepared on 5" X 8" cards to allow for the addition of summaries and other pertinent information. The scheme of classification was evolved by the early research staff of the Division and consists of 28 major subject headings and over 200 sub–classes.

The material included in the Bibliography encompasses many fields. Medical, biological, agricultural, and other non–beekeeping periodicals and abstract journals were scanned regularly by the librarian. Articles selected were obtained from the original, if humanly possible, rather than being added unverified.

From The Management of Bees with a Description of the "Ladies' Safety Hive."

The librarians, Ethel L. Coon, and, later, the present writer, were kept informed of the changing interests of the apiculturists, bacteriologists, entomologists, and othere scientists employed by the Division of Bee Culture. They were, therefore, able to obtain material of substantial value pertinent to the needs of the workers.

Beekeeping covers a much broader area than honey production and apiary management. The bee business is an essential cog in the agricultural economy of the United States. In this country there are now some 200,000 persons keeping over 4 million colonies of bees. The value of bees for pollination is 20 times as great as for the annual return of honey, which averaged 50 cents for each of the 197 million pounds produced in 1975. In addition to their value to agriculture, bees have provided a source of pleasure and stimulation to the hobbyist, amateur, and back–lot beekeeper.

As field laboratories were added to the Division of Bee Culture, copies of the Bibliography cards were supplied to them on a monthly basis. There are copies of the Bibliography in various stages of completion at former Bee Culture Laboratories at Madison, Wis., Logan, Utah, Laramie, Wyo., Baton Rouge, La. and Tucson, Ariz. Approximately 87,675 cards are in the original Bibliography at Beltsville.

From the Bibliography, information can be located on almost any phase of apiculture. For instance, there are thousands references on bee pollination of plants; many hundreds of references on the toxicity of insecticides to the honey bee; numerous citations on bee behavior, pheromones, royal jelly, bee races, composition of honey, State and Federal regulations on beekeeping, etc.

The Bibliography was maintained by the Branch Library from 1942–1972. It was supported heavily by the Apicultural Research Branch of the Agricultural Research Service. This support included the provision of space, heat and light; the use of machines for copying the bibliography cards; the cost of the cards themselves and, most importantly, the provision of an assistant to the librarian. The assistant was chosen for language ability, essentially, and duties included the preparation of summaries from foreign articles selected by the librarian for inclusion in the bibliography. The last translator to be employed under this contractual agreement was Alfred D. Straughan, who was selected because of his knowledge of German, Spanish, Dutch, and French.

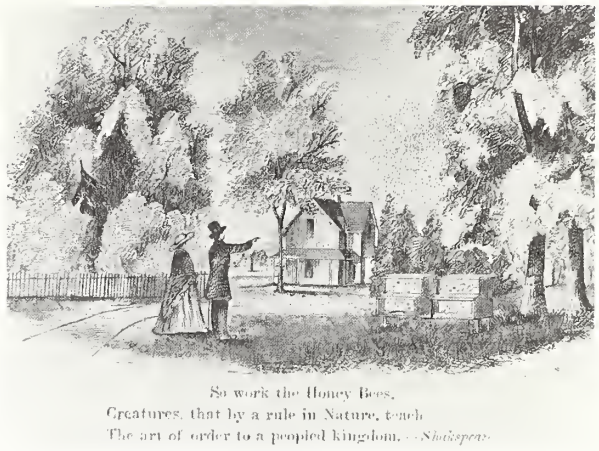
In addition to summaries, Straughan continues to prepare complete translations on demand from U.S.D.A. bee research personnel throughout the country. For many years, translations were exchanged with the Bee Research Association, Chalfont St. Peter, England; Canada Department of Agriculture, Ottawa; and the Bee Department of the University of Guelph, Canada. These translations were listed in *Bee World,* a publication of the internationally known Bee Research Association.

During the more than 75 years that the USDA has done work on bees, the Department research workers have enlarged their sphere of interest from the study of basic bee problems and apiary management to sophisticated bee behavior and an atomical and physiological studies, and has broadened into the wider areas of research reflected in other articles found in this issue of *NAL TODAY*. Such problems as bee diseases and pollination have always been of concern and continuing work will be done in these and other areas.

In 1972, the Bee Culture Branch Library began a gradual phasing out process, necessitated by the changing emphasis of the National Agricultural Library and the reorganizations within the framework of the Department of Agriculture itself. The Bee Culture librarian, the writer, transferred to NAL in the summer of 1972, but Straughan remained with the bee collection to maintain it, record incoming journals, prepare volumes for the bindery, and to continue the translation service to bee research personnel. Since it was impossible for one person to meet the demands for library service and because of an increasing number of requests for translations, additions to the Beekeeping Bibliography virtually ceased.

In June 1974, the bulk of the apicultural collection was removed to NAL, some 5 miles away. The Bioenvironmental Bee Laboratory, as the Division of Bee Culture is now called, was given the privilege of retaining on indefinite loan, certain publications which the staff requires as aids to research programs.

The Beekeeping Bibliography, an integral part of the Laboratory's resources, was retained at the laboratory. For several years prior to this writer's departure, some consideration had been given to automating or printing the Bibliography, but no firm decision was reached. Now, however, in order to preserve the vast store of information contained in the Bibliography, the Bee Laboratory is filming it in its entirety. Three copies are being made on 16mm film. Two copies will be retained by the Bee Laboratory – one for the current and future use of government bee research personnel and the other to be available for borrowing. The third filmed Beekeeping Bibliography will be



From A Practical Treatise on the Hive and Honey–Bee.

given to NAL, along with the original cardfile bibliography. These will serve research workers, scholars, students and the general beekeeping public as a basis for beginning research in any area of the apicultural discipline.

Though Straughan has been transferred to NAL, the Bioenvironmental Bee Laboratory has, by special contractual agreement, retained his services as a part–time translator and has obtained his assistance in organizing the remaining bee culture collection. This agreement terminates on June 30, 1976. At this time, the final phase of the dissolution of a very special library and a most unique bibliography will be complete. *Requiescant in pace.*

BEE CULTURE IN MARYLAND

by
Dr. Dewey M. Caron
Department of Entomology
University of Maryland

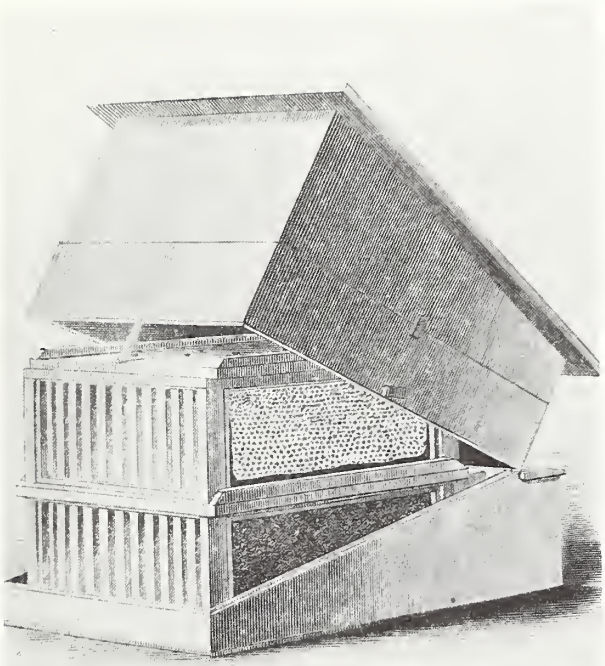
PART I: A GLANCE BACKWARD

It is not possible to pinpoint the exact date honey bees were introduced into Maryland. Honey bees were not native to North America. The colonists introduced honey bees early in their settlement. We have evidence leading us to believe that honey bees were brought to Jamestown, Virginia, in 1621 or 1622 and we know they were in New England in 1638. The first settlement in Maryland was at Clements Island in 1634. This area, where the Potomac River joins the Chesapeake Bay, is nearly identical to Jamestown and honey bees may have been brought to Maryland from Virginia or carried directly to Maryland from England. Undoubtedly, this occurred soon after settlement of Maryland.

Honey bees moved westward with settlement in Maryland as in the rest of North America. The bee colonies were a source of one of the few sweeteners in the early diet. Honey was a valuable and important component of the diet. Sugar, one of the major crops in the Americas, was not available in large quantity for many years and only the very rich could afford it. The abundant flowers of the Mid–Atlantic area yielded rich and flavorful honey.

Our records of beekeeping from the early introduction until the mid 1800's are very limited. Despite disease problems and lack of beekeeping knowledge, beekeeping did continue and some beekeepers were able to harvest honey. The early beekeepers yearly activity with the bee colonies was fairly simple. In the spring, the colonies that survived the winter would increase in size and the bees would swarm. The beekeeper captured these swarms and hived them in wooden boxes and crates and in hollow basswood, maple, and oak log gums. Hopefully, each colony would then store honey during the summer. In the fall, the beekeeper would smoke away or kill the adult bees from a number of these "hives" and rob them of their honey and wax. At harvest time there would be a great feast featuring honey as well as other agricultural crops. Surplus honey would be stored for the winter months. The colonies that weren't killed might be moved to a protected winter location in the woods or near a barn. All surviving colonies would start the cycle anew the next season with the beekeeper using the robbed "hives" to house his or her swarms.

In the last half of the 1800s, great events took place in American beekeeping. In 1851, a minister in Philadelphia, L. L. Langstroth, discovered the principle of the "bee space" and developed a superior movable comb hive which permitted free access to the interior of a bee hive. Honey harvests were taken by adding extra boxes ("supers") above a lower brood rearing area. The colony no longer had to be killed to rob them of their food. The beekeeper only had to examine the hives to insure that there were sufficient winter stores before collecting the "surplus". Improvements in the bee smoker, the honey extractor, and other equip–



Movable Comb Hive, with glass on all sides.

From The Management of bees, with a description of the "Ladies Safety Hive." By Samuel Bagster, Jun. London, 1834.

ment for efficient management of hives and manipulation of the bee population soon followed. Diseases were examined and measures developed to combat the worst of them. Beekeeping became more profitable with the introduction of the Italian bee race in the 1870s; this bee could fight the wax moth, a pest of the hive, and was much more resistant to the diseases that so ravaged earlier attempts at bee culture.

Information on bee culture and training in beekeeping also quickly developed. With the establishment of the Maryland Agricultural College in 1859; one of five faculty positions was that of Professor of Botany, Entymology (sic) and Ornithology. The first instructor was Townsend Glover who also was the first Entomologist in the United States Government. In the earliest years, beekeeping was part of entomology and was taught as a sophomore subject. In 1880, a new zoology course on "the raising of swine, sheep, poultry, and bees" was added as a senior course. Dr. A. Grabowski taught this course using a well–known beekeeping text by Moses Quimby entitled *Beekeeping.* In 1897, entomology acquired departmental status as the Department of Entomology and Zoology. Beekeeping was taught during some of these years and undoubtedly many of the entomology courses included some beekeeping.

Bee culture in Maryland at the turn of the century was not organized. It consisted, for the most part, of farmers using old–fashioned equipment and primitive management techniques. At the same time, a core of urban sideline and hobby beekeeprs practiced modern beekeeping management with modern hives. Nearly every farm had one or more bee colonies. Bee colonies were moved to the many fruit orchards to pollinate apples, pears, and cherries. The urban centers developing in Maryland provided an excellent sales outlet for the Maryland beekeeper.

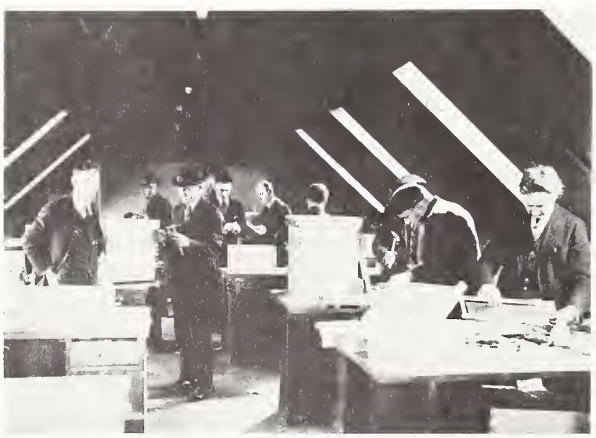
In 1908, an important event occurred in the development of Maryland bee culture. T. B. Symons, Maryland State Entomologist and a 1903 Maryland Agricultural College graduate, organized the Maryland State Beekeepers Association. He did so with the support of the urban core of beekeepers and some of the more progressive farmers. The first state–wide beekeepers meeting was held December 4, 1908 in the Fifth Regiment Armory in Baltimore. At this historic event, a vice–president was appointed for each Maryland county, a practice continued today by the same Association. The fledgling State Association pressed for state aid for bee culture and for a law to aid in the difficult struggles with bee diseases. Such efforts were partially realized in 1916, when the Maryland State Legislature enacted a law providing for the inspection of apiaries and for the disemination of information to promote the beekeeping industry. For the next fifteen years, progress was slow.

In 1916, Maryland combined colleges in College Park and Baltimore to create the Maryland State College. At this time, a College of Agriculture was formed which included a Department of Entomology. The name was changed to the Department of Entomology and Bee Culture during the 1920s.

One of the students in the Department of Entomology and Bee Culture was George Abrams. After graduation with an M.S. in 1929, Abrams was appointed the first Extension Apiculture Specialist for Maryland. Active promotion of Maryland honey was begun in the 1930s. Exhibition of honey and bee products was expanded to the state and county fairs. A standard premium list was established for honey. Honey judges were trained. Bee schools taught honey–handling, packaging, and marketing techniques. An important economic study was conducted on the Maryland honey industry during the 1934 to 1937 seasons. Since this time, Maryland honey has not been surpassed in its own markets and the market has remained a strong and excellent one.

In October 1937, Apiary Inspection work officially began in Maryland. The state legislature appropriated $2000 for this activity and several regional bee inspectors were hired. Due to George Abrams untiring efforts, and those of the Maryland beekeepers, an apiculture building was constructed on the University of Maryland campus. On April 1, 1950, more than 100 persons attended the ground breaking ceremonies for the structure. The apiary building was then, and for many subsequent years, the only building on a college campus in the United States that was devoted entirely to apiculture.

Today, although not a large beekeeping state,



Maryland University beekeeping students learn to make hive bodies – 1910.

From The Bee–keeper's Manual; or Practical Hints on the Management and Complete Preservation of the Honey–bee.

Maryland beekeepers are among the most knowledge–able and best informed in the United States. All beekeepers can sell their honey very readily in the urban areas, and Maryland honey always commands prices well above the national average. There are only a handful of Maryland beekeepers who rely on bee–keeping for their livelihood but several hundred supplement their income with honey and beeswax sales. Over 2,000 hobbyists benefit from beekeeping, harvesting small amounts of honey and large amounts of pleasure. Maryland's fruit and vegetable growers rely completely on the 50 or so beekeepers who rent bee colonies for pollination.

Maryland has a long growing season and a wide variety of honey plants. Prominent among these are tulip poplar, black locust, basswood, sweet clover, blueweed, and wild flowers – especially goldenrod and asters in the fall. It is a good state for beekeeping and with the early tradition of assistance from the Agricultural College continuing today with the University, Maryland beekeepers do as well as, if not better than, beekeepers across the United States. Maryland's bees are busy bees – then as now.

PART II: BEES AND BEEKEEPING AT THE UNIVERSITY OF MARYLAND TODAY

About 1 million honey bees attend the University of Maryland daily. They are part of the 50 bee colonies maintained on the College Park campus to teach students the art and science of beekeeping. The bees live in modern bee hives across from the football stadium among high rise dormitories. Many of the thousands of students who pass the bee hives daily scarcely take notice of the bees' presence. Likewise, with the bees.

The beekeeping efforts at Maryland are directed from the Apiary. In addition to the bee hives, a small Apiary building houses beekeeping equipment; a honey extracting outfit, a modern laboratory, a separate classroom and offices for a secretary, faculty member and students. The Apiary building serves as a hub of activity for the entire state of Maryland.

At the College Park campus, the University of Maryland student can select an introductory beekeeping course and an advanced laboratory course on beekeeping. The introductory course attracts over 200 students each year while the advanced course numbers only about 50 students due to the lack of adequate facilities for a larger number. Introductory Entomology and Economic Entomology courses with annual enrollments over 400 have a lecture and/or lab on bees and beekeeping and frequently use the Apiary facilities for this training. There is one bee oriented course for Maryland graduate students.

The University extends its programs through its Cooperative Extension Service. The Extension beekeeping program includes evening and short courses on beekeeping, a free newsletter, THE POLLEN BASKET, and distribution of numerous bulletins and publications. Best known are the beekeeping courses. Over 400 Marylanders attend a beekeeping course each year. Beginning courses offered at the University Apiary, in Baltimore County and at other locations are most frequently held early in the season to enable newcomers to start the same year. Intermediate and advanced courses are offered during the winter or summer seasons. One day courses cover specialized topics but the basic course covers two days. During the winter the courses are given in 5 or 13–week sessions.

When not in use by students, the University bees serve another important function – research. In addition to formal undergraduate/graduate courses, apicultural training is available for work towards the M.S. and Ph.D. degrees. Degree students use the same bee colonies for their studies. Currently one study involves the pollination of pear trees; cucumber pollination has been studied in the past. The behavior of bees preparing to swarm and the process whereby colonies raise new queens are also under careful scrutiny. The effects harmful pathogens and fly pest exert on the bee colony population also are under study.

Although a fairly recent program, the graduate degree training has already produced 1 Ph.D. and 2 M.S. degrees. The results of these studies are being published in major entomological and apicultural journals. Presently, 1 Ph.D. and 3 M.S. candidates are in various stages of their programs. As these students complete their studies and take positions in various research institutions and academic departments, the University bees cross–pollinate with ideas and training. What better legacy for the lowly worker bee to leave in her short life span of 6 weeks?

Participants in a recent Beekeeping Short Course, photographed before the Apiculture Building at Maryland.

A view from the Stadium – Apiculture Building and bee hives surrounded by high–rise dormitories.

BEEKEEPING COURSES AT LAND–GRANT UNIVERSITIES

Alfred D. Straughan
National Agricultural Library

Land–grant universities are federal–supported institutions, especially known for the unique role they play in agriculture and veterinary medicine. Not only is special provision made for agricultural instruction, but special appropriations are also made for the support of agricultural experimental stations.

The following universities offer courses in apiculture. In the few cases where the courses are taught in other cities, the professors may be contacted by writing in care of the main campus.

Dr. George H. Blake
Auburn University
Auburn, Alabama 36830

Dr. G. D. Waller
University of Arizona
Tucson, Arizona 85721

Phillips Wendal
University of Arkansas, at Bebee
Fayetteville, Arkansas 72701

Dr. Norman Gary.
University of California
Davis, California 95616

Dr. J. W. Brewer
Colorado State University
Fort Collins, Colorado 80521

Prof. Alfonse Avitabile
University of Connecticut, at Waterbury
Storrs, Connecticut 06268

Frank Robinson
University of Florida
Gainesville, Florida 32611

Dr. Alfred Dietz
University of Georgia
Athens, Georgia 30601

Dr. Elbert Jaycox
University of Illinois
Urbana, Illinois 61801

Dr. Todd Harris
Purdue University
Lafayette, Indiana 47907

J. W. Stocker, Richmond
University of Kentucky
Lexington, Kentucky 40606

Wm. B. Jordon, Portland
University of Maine
Orono, Maine 04473

Dr. Dewey Caron
University of Maryland
College Park, Maryland 20742

Dr. Henry H. Hagerdorn
University of Massachusetts
Amherst, Massachusetts 01003

Clarence Carlson
Michigan State University
East Lansing, Michigan 48823

Drs. Furgala & Noetzel
University of Minnesota
St. Paul, Minnesota 55101

C. A. Wilson
Mississippi State University
Mississippi State, Mississippi 39762

Dr. Kenneth E. Brown
University of Missouri
Columbia, Missouri 65201

C. J. Walstrom
University of Nebraska
Lincoln, Nebraska 68508

Dr. W. Harold Arnett
University of Nevada
Reno, Nevada 89507

Dr. Radcliffe B. Roberts
Rutgers University
New Brunswick, New Jersey 08901

Dr. Roger A. Morse
Cornell University
Ithaca, New York 14750

Dr. John Ambrose
North Carolina State University
Raleigh, North Carolina 27607

Dr. Walther Rothenbuhler
& L. J. Connor
Ohio State University
Columbus, Ohio 43210

Dr. Don Peters
Oklahoma State University
Stillwater, Oklahoma 74074

Dr. D. M. Burgett
Oregon State University
Corvallis, Oregon 97331

Dr. Robert Berthold
Delaware Valley College
Doylestown, Pennsylvania 18901

Dr. Allen Benton
Pennsylvania State University
University Park, Pennsylvania 16802

Dr. Jaime Moya
University of Puerto Rico, at Mayaguez
Rio Piedras, Puerto Rico 00931

Dr. S. B. Hays
Clemson University
Clemson, South Carolina 29631

Dr. Robert Walstrom
South Dakota State University
Brookings, South Dakota 57006

Dr. Harry E. Williams
University of Tennessee
Knoxville, Tennessee 37916

Prof. William P. Nye
Utah State University
Logan, Utah 84321

Enoch H. Tompkins
University of Vermont, at Shelburne
Burlington, Vermont 05401

Dr. Carl A. Johansen
Washington State University
Pullman, Washington 99163

Dr. F. E. Moeller
University of Wisconsin
Madison, Wisconsin 53706

Dr. Wm. T. Wilson
University of Wyoming
Laramie, Wyoming 82070

The beekeeping courses offered at land–grant universities range in length from short courses, often offered in the evening, to full–length, accredited courses, which generally must be taken as part of the regular undergraduate or, to a lesser extent, graduate curriculum. Similarly, the degree of difficulty varies from the more practical instruction of the short and evening courses to the more theoretical, involved courses at college level, and accompanying this is the wide variation in fees charged for the courses. With

the increase in cost of living of the last few years and the drop in college enrollment, the fees charged for university courses have become relatively high. These courses are intended to benefit the hobbyist, who constitutes the majority of beekeepers, the professional, and the specialist. The term professional is used here for the regular beekeeper, while the specialist includes persons prepared for employment in fields related to or serving apiculture.

It is of interest to note that, in the fall of 1975, the Agricultural Technical Institute, part of Ohio State's College of Agriculture, at Wooster, initiated the first 2–year degree program in beekeeping in the United States. The beekeeping technicians who graduate from this program can expect employment in commercial beekeeping firms, honey packing plants, bee supply companies, apiary inspection, research laboratories or can become apiarists on their own.

BRIEF HISTORIC ARTICLES BY NAL USERS

Irvin M. May, Jr., Research Historian, Texas Agricultural Experiment Station, is the author of, "Trailblazing in Agricultural Research" *Texas Agricultural Progress*,vol. 21, no. 4, (Fall, 1975) pp. 3–7.

John R. McGrew of the USDA, Agricultural Research Center, Fruit Laboratory has published a timely article entitled, "Thomas Jefferson Viticulturist and Enophile" *American Wine Society Journal,* vol. 7, no. 4, (Winter, 1975) p. 58.

Wayne D. Rasmussen of the USDA, National Economic Analysis Division recently edited *Agriculture in the United States A Documentary History,* vol. 1–4 (New York: Random House, 1975) 3651 pages; volume one contains an excerpt from "Memorandum in Husbandry on my own Plantation," by William Logan, a tenant of Matthew Potter, near Germantown, Pennsylvania, 1748–58 as well as an excerpt from the "Diary, 1826–1841" of George Cooke, of Hazelwood, Ellicott City, Maryland. The original manuscripts of both these documents are in the National Agricultural Library. They reflect on farming in Pennsylvania, 1752–1756, and plantation life in Maryland, 1826–1837. This monumental documentary on American agriculture contains additional source material spanning the past through to the present.

From Johann Jacob Griesingers . . .

Vollstandiges Bienen–Magazin.

ETHYLENE OXIDE FUMIGATION FOR THE BEE INDUSTRY

H. Shimanuki
Bioenvironmental Bee Laboratory
Agricultural Research Service, USDA
Beltsville, Maryland 20705

Over the past decade the Bioenvironmental Bee Laboratory has been studying the value of ethylene oxide in disease prevention and control, especially in regard to American foulbrood disease – probably the most dreaded honey bee disease throughout the world. Previously, in efforts to control the disease, honey bee colonies have been destroyed by burning. However, the financial loss due to burning of the bees and hive equipment is estimated at today's prices as $100 per colony. Then there is also the value of the honey in the hive. Fumigation is not a new way to salvage bees and hive equipment from diseased colonies, but fumigation appears to be more effective when it is combined with chemotherapy.

The early tests were conducted by constructing fumigation chambers of 6–mil black polyethylene sheets, but these chambers leaked badly, and gas–tight seals could not be constructed. A second introduction of gas compensated for the gas leakage due to poor seals and improved the effectiveness of the polyethylene chamber; recurrence of American foulbrood disease was prevented in 27 of 28 colonies.

Even though the polyethylene chambers could be used successfully, precise controls of temperature and gas levels were lacking. Consequently, the next step was to purchase a permanent, single–wall ethylene oxide fumigation chamber with the necessary controls.

At first the tests were designed to save only the hive equipment. Recently attempts have been made to save the bees also. The procedure is as follows: bees are shaken off the combs from diseased colonies, held in shipping cages, and fed sugar syrup containing oxytetracycline while the combs are being fumigated with ethylene oxide. Then the combs are decontaminated in an ethylene oxide chamber at a concentration of approximately 600 mg of ethylene oxide/liter and a temperature of approximately 100 degrees F; the 24–hour exposure period is followed by an aeration of equal duration.

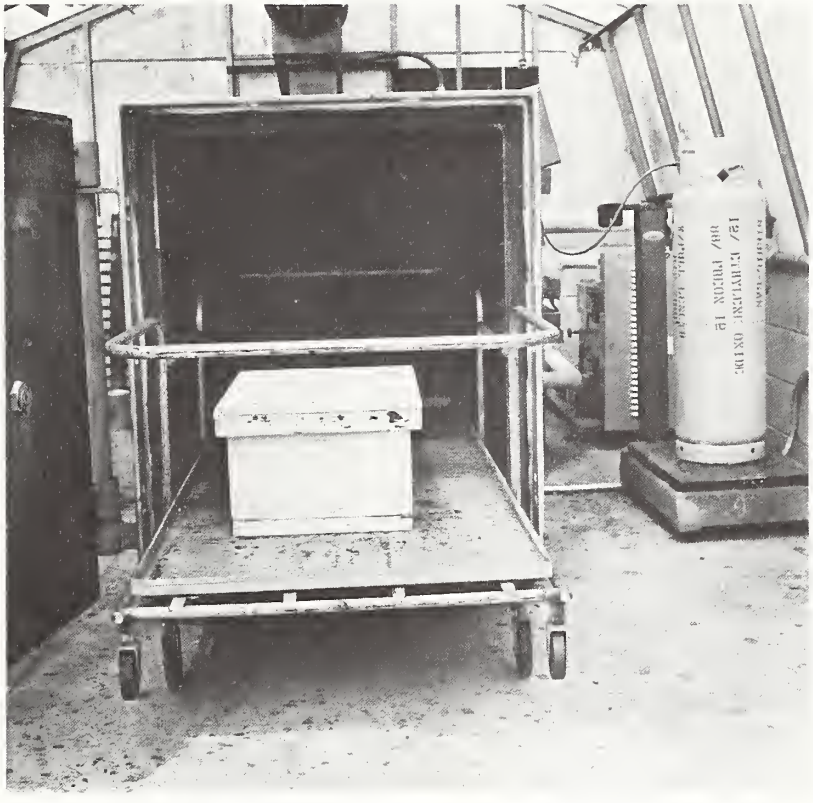
Over the years, ethylene oxide fumigation followed by one feeding of oxytetracycline has prevented recurrence in over 90% of the hives.The bees from the diseased colonies do not carry enough spores to initiate the disease when they are reestablished on fumigated equipment after being held for 24 hours on sugar syrup containing oxytetracycline.

However, in one test, the value of ethylene oxide in disease prevention was also investigated. The test colonies were obtained from a beekeeper who, for the past 10 years, had had an average of 6–10% American foulbrood diseased colonies. Two apiaries were established from these colonies, one treated and one untreated. In the first season, 12.5% of the colonies in the untreated apirary became diseased while none of the fumigated colonies showed any disease during the three year period.

The cost of fumigating an average hive excluding the initial cost of the chamber and labor would be less than $3, depending on the gas mixture used. A number

of eastern states are conducting tests to determine the feasibility of using ethylene oxide as a routine procedure to eliminate the costly practice of burning or rendering for wax American foulbrood diseased colonies.

Ethylene oxide promises to be a useful tool in combating many diseases and pests. In addition to preventing and controlling American foulbrood, ethylene oxide can be used to control European foulbrood, nosema, and chalk brood diseases. It will also destroy all stages of the greater wax moth, a most destructive pest of honeycombs.



"Ethylene oxide fumigation chamber."

BEE POLLINATION

E.C. Martin
Staff Scientist
National Program Staffs
Agricultural Research Service

Current interest in the quality of the environment is causing us to look more deeply at the factors upon which food production, health and aesthetic aspects of the environment depend. It is also alerting us to the need to conserve resources. Honey bees and many species of wild bees are resources of such great significance to human welfare that we must try to ensure that they will survive in the world of the future to carry on their important work. Problems and dangers confront the long–range survival of wild bees and also the keeping of honey bees as an agricultural enterprise. As human population increases, houses, factories and highways replace open fields of honey and pollen plants. Clean cultivation of farm land and large–scale mono–culture reduce the sequence of wild plants needed to provide bee food throughout the season. Pesticides take their toll of wild bees and honey bees. Honey crops are reduced. This presents an impending dilemena, with a reduction of profitable beekeeping and native pollinators on one hand and increased need for bees for crop pollination on the other.

THE VALUE OF POLLINATION BY BEES

At present, in the United States, about 200,000 people keep 5 million colonies of bees and produce about 250 million pounds of honey annually. Recent studies indicate that some 90 crops in the United States depend upon bees, at least to some extent, for pollination. Estimates of the value of bee–pollinated crops vary widely. The value of fruits, vegetables and seed resulting directly from bee pollination plus the value of crops grown from bee–pollinated seed in the United States total about 8 billion dollars. But the importance of pollination extends beyond the crop resulting directly from pollination. For instance, bee–pollinated alfalfa seed, in itself a valuable commodity, produces hay and pasture which in turn helps produce meat and milk. So pollination is an essential link in a chain of events contributing directly or indirectly to the production of about one–third of our total diet.

BEES AND FLOWERS

There are about 250,000 species of flowering plants on earth, many with an amazing complexity of relationships to bees. Basically, flowers provide nectar and pollen for bees and bees provide cross–pollination for plants. The movement of pollen is as essential to reproduction of most angiospherm plants as mating is for reproduction of most animals. Bees are not the only animal vectors of pollen, but they are the most important. Cross–pollination, the carrying of pollen from one plant to another, provides greater genetic variability in the plant offspring than self–pollination. This means that the plant has greater opportunity to produce mutations, to adapt to new environments, to compete and to occupy new ecological niches.

Mutual dependency has resulted in amazing co–evolution between bees and flowers. Bees have evolved branched hairs to which pollen adheres, intricate pollen baskets on their hind legs, specialized mouthparts and honey sacs for handling

nectar, beeswax honey comb for storing nectar and pollen, specialized behavior for communication etc., all related to their association with angiospherm plants. Plants have evolved flowers to attract cross–pollinating bees and flower mechanisms to prevent self–fertilization. Flowers have color, including a capacity to reflect ultraviolet light, which bees see very well; they have scent, nectar guides, shape and other identifying labels which are assets in competition for pollination services. Plants avoid self–pollination in various well–known ways such as having male and female parts on separate flowers on the same plant or on separate plants or by having morphological or timing barriers to prevent self–pollination.

There are also physiological barriers to self–fertilization. For example, most apple varieties require the pollen of another variety (clone) for successful fertilization. Growers must interplant an orchard with more than one variety, each having compatible pollen, i.e., you cannot plant out an orchard of your favorite variety only. If you do, you won't get a crop. Similar barriers to inbreeding occur in many plants.

The bee fauna of the world is quite large, possibly 15 to 20 thousand species with about 4,000 species and subspecies in the United States and Canada. The best known social bee, the honey bee, *Apis mellifera,* is not a native of this hemisphere but was brought here from Europe by the early settlers. Most species of bees are solitary and do not develop large populations like the honey bee, but in total the solitary bees constitute an enormous pollinating force throughout the world.

PRACTICAL ASPECTS OF POLLINATION

Beekeepers contract with growers for the use of bees to pollinate crops. The beekeeper transports colonies by truck, usually at night, from his permanent apiaries to the crop to be pollinated. The grower pays the beekeeper a rental fee of $10 to $20 per colony and some professional beekeepers may move several thousand colonies, often long distances, into the crop. The number of colonies involved may be rather surprising. For instance, California almond growers use over 200,000 colonies of bees during the blossoming period, some of which come from as far away as the state of Washington. All over the country as bee–pollinated crops come into bloom, there is an annual trek of honey bee colonies to "put the crop on". When the flowers begin to fall, the bees are quickly moved out so the grower can get on with spraying and other chores.

Making the right arrangements for pollinating a crop is not an easy job for the beekeeper. The crop may have rather precise requirements. For instance, it is best to move bees into sweet cherries as soon as bloom starts, but apples do best if the bees are moved in at 25% to 50% bloom. A beekeeper who moves many truckloads of colonies must go all out, day and night, to meet the deadlines, whether moving bees in or out of the crop. Colonies can be lifted onto trucks by hand, but most larger bee–keepers now use power equipment to lift colonies, sometimes four at a time on pallets.

The pollination of crops by bees is a very interesting story with too many ramifications to be adequately dealt with in this brief article. There are many hazards and pitfalls for the beekeeper and the grower. The weather may stay cold or windy all through bloom so the bees don't fly; the seed or fruit doesn't form and the crop may be a failure; some–times bees may be killed by pesticides; and colonies may be stolen --- bee rustling is all too common at present. On the other hand, things may go well, the weather may be bright and clear; the bloom may come out and the bees may do their age–old chore of "putting on the crop".

From William White. A Complete Guide to the Mystery and Management of Bees.

HYBRIDIZATION OF HONEY BEES IN SOUTH AMERICA

Dr. Marshall D. Levin – Deputy Assistant Administrator
National Program Staffs, Plant and Entomological Sciences
U.S. Department of Agriculture

INTRODUCTION

There have been numerous popular and technical reports recently about problems caused by hybrid strains of honey bees that have increasingly dominated the honey bee fauna in Brazil since the early 1960s. These reports, though sometimes greatly exaggerated, were stimulated by very real problems that arose from the introduction, hybridization, and spread of a productive, biologically successful, but vicious subspecies of honey bee imported into Brazil from Africa (Araujo 1971, Grout 1968, Nogueira–Neto 1964). There has been some concern in the United States about the possibility that these hybrid (or africanized) bees, with their undesirable characteristics, might disperse to the United States and affect honey bees throughout our country. If the problems encountered in Brazil were to materialize in the United States, there would be a serious impact on our use of bees in crop pollination--a little known but vitally important segment of our agricultural economy. Honey bees contribute to the production of several billion dollars worth of agricultural crops that depend upon or benefit from their pollinating activities.

HISTORY

The introduction of the subspecies of honey bee, *Apis mellifera adansonii,* from Africa into Brazil took place in 1956 (Kerr 1967). W. E. Kerr, University of Sao Paulo, imported about 40 queen bees that he hoped to use to develop a more productive strain of honey bee better adapted to Brazilian conditions than the indigenous strains which had been introduced from Europe many decades before. Through an unfortunate and unpredictable series of events, the bees escaped, increased undetected to a sizable feral population, and then dispersed and eventually "fixed" many of their undesirable and desirable qualities into the resident populations of honey bees, both domesticated and feral.

Concerned beekeepers, entomologists, and other scientists in the United States (McGregor 1970) stimulated the U.S. Department of Agriculture in 1970 to sponsor an investigation of hybrid bees in Brazil by the National Academy of Science–National Research Council. A committee of scientists and beekeepers[1/] conducted a three–week field survey in Brazil to assess the problem and to estimate its potential impact on the United States. The findings of the Committee appeared in a 1972 report (Anon. 1972) that described the activities of the members and their observations after they examined bees across 30 degree of latitude in Brazil.

The Committee report relates the problems created in Brazil since the introduction of the African subspecies of honey bees. It describes the characteristics, both good and bad, of pure *A. m. adansonii* and its hybrids in Brazil. The impact on beekeeping and agriculture in Brazil, was evaluated, and the anticipated spread and potential impact

in North America discussed. The Committee recommended several possible courses of actions. In response to some of its recommendations, quarantine efforts to prevent accidental or purposeful introduction of the undesirable hybrids have been increased by Animal and Plant Health Inspection Service (APHIS) and a revision of the Honey Bee Importation Act is currently being considered by Congress to broaden and extend the authority to restrict the importation of undesirable germ plasm.

The possibility that bees may be brought or carried into the U.S. is not remote. Plant Protection quarantine records show 43 interceptions of honey bees in international commerce at 14 different ports of entries in the last 5 years. There were probably many other unrecorded interceptions that the inspectors identified only as *Apis* species and did not submit for further identification. Two experimental importations of *A. m. adansonii* semen are known to have been made by scientists since 1960. In both cases the bees were destroyed when their impact on Brazil became known. There is reason to assume that other shipments of queens have been made to the U.S. from Africa over the years (Morse et al. 1973) but no recognizable effect on our bees has been detected. This lack of impact in the past does not eliminate possible danger from future importations.

In response to other recommendations, the Agricultural Research Service (ARS), which has research programs on honey bees at 6 locations in the United States, initiated new studies and redirected some of its resources to projects that will provide information potentially useful in coping with any africanization of bees in North America.

African bees (Apis adansonii) in a docile mood.

A PERSONAL ASSESSMENT

Most of the activity described took place while I served in my former capacity as Chief of the Apiculture Research Branch, Entomology Research Division. My current position on the National Program Staff of ARS keeps me involved in ARS efforts to assess and solve this problem. There was, therefore, a need for a firsthand understanding of the situation in Brazil. In the fall of 1973, I made a trip to South America to discuss the africanized bee problem with scientists, beekeepers, and officials in a number of countries. My purpose was to assess the need for additional efforts on the part of the USDA. For three weeks I traveled in Brazil, Colombia, Panama, Costa Rica, and Mexico City. Government officials in each country communicated to me their ideas and plans regarding the africanized bee. Beekeepers, bee research facilities, and laboratories were visited to determine how their knowledge and resources could contribute to research efforts concerning the africanized bee problem. Also, I had discussions with as many knowledgeable people as possible about their experiences with africanized bees over the last 15 years and visited a number of apiaries to evaluate the current state of the problems caused by africanization.

My findings verified those reported by the Committee after their trip to Brazil two years earlier.

CURRENT IMPACT ON RESIDENT HONEY BEE POPULATIONS

The africanized bees in the southern part of Brazil, from Sao Paulo where they were introduced and south toward Argentina, have changed considerably in behavior and amenability to management during the last 10 years or so. In many apiaries, they seemed to be as easy to handle as any bees we have in the U.S.; in others, heavy smoking of the colony is still required during manipulation, but control is easy to maintain. In addition, the swarming behavior that contributed so strongly to the rapid dispersion of *A. m. adansonii* hybrids is controlled in managed colonies by providing adequate intra–hive space; also absconding during periods of food scarcity is virtually eliminated by feeding and good management. Feral colonies are far fewer now in most of these areas because they have been out–competed by protected

domestic colonies and destroyed by armadillos and other predators. Much of this progress must be credited to the efforts of W. E. Kerr and his associates.

On the other hand, the africanized bees encountered in the northern part of the country, around Recife and Belem, still retain most of the highly undesirable traits that were characteristic of all the bees when they first became widespread in Brazil in the early 1960s. Swarming, absconding, and feral colonies are still problems in those areas.

It is generally accepted in South America that the changes in manageability so widely observed in the southern part of Brazil result from selection pressure by beekeepers. As a result, the bees now are considerably less aggressive than when the africanized bees first spread into the area, though they still present some problems. The superior productivity, however, has been retained. Indeed, visitors from other countries who go to these areas and are shown these improved lines find it hard to believe the extent of the problems that were faced when africanization first occurred. Such visitors frequently return to the United States to report that the whole africanized bee problem is vastly overrated and poses little or no threat to American beekeeping.

The bees that spread north from Sao Paulo have developed very differently. They dispersed into areas where beekeeping was much less developed and where there were fewer colonies, managed less effectively. Those that dispersed widely in the forests were able to retain most of their undesirable characteristics when they supplanted domesticated colonies. Their behavior is still very different from that of the bees I saw in the south. Almost no colonies in the north could be handled without exercising the utmost precautions to reduce vigorous and persistent stinging. The contrast, as noted, is presently attributed largely to good beekeeping management.

The bees that dispersed south entered zones where beekeeping is well–developed, but they also entered a temperate climate. Those that dispersed north are still in a tropical climate. An investigation is currently underway to determine the effect of climate on the africanized bee in Brazil, since climate–related variations in temper have been observed in Africa.

FUTURE ACTION

The officials in the several Central American countries with whom I discussed the africanized bee are aware of what has happened in Brazil. They are concerned that similar problems might develop in their countries. Also, some bee specialists are developing plans of action. All are most interested in cooperating in plans that may be developed by the United States to prevent or slow down the anticipated northward spread of bees with the undesirable characteristics.

A program to monitor and measure the impact of the northward spread of africanized bees is now under way to determine both the rate of dispersion and its effects on man, and resident populations of honey bees and other pollinators. The 4–year research project is being carried out by scientists of the University of Kansas with ARS support. They have followed the spread of africanization through French Guyana and Surinam.

Research in Brazil is also under way to determine the relative influence of genetics and environment on the marked differences in aggressiveness of the africanized bees in different parts of the country. A study of the factors that affect the behavior and biology of *adansonii* hybrids is also being conducted by Dr. Kerr and his associates (Michener 1974). This research could also have important "spinoff" since there are some highly desirable characteristics of *A. m. adansonii* that contribute to its well–deserved reputation as a superior honey producer. If these can be identified and separated from the undesirable traits, they could be utilized–thus ultimately achieving the purpose for which the bees were first brought to Brazil.

Since selection pressure by a well–developed and expert level of beekeeping management can contribute to increased manageability and decreased aggressiveness of africanized hybrids, the level of beekeeping expertise in northern South America and in Central America should be upgraded.

At the present time, it is difficult to predict how much of a threat the africanized bee poses to the established beekeeping and pollinating industry in the

United States. Through continual monitoring, research, and quarantine efforts, I believe the impact of the bee in the United States probably could be held to a minimum. If undesirable strains are not brought directly into the United States from South America or Africa in large enough quantitites so they become established, they can only get here by migrating through Central America. Such natural dispersion would expose the undesirable charac–teristics to such selection pressure and dilution that, with the help of research and the cooperation of beekeepers in those countries, most of the unde–sirable characteristics might be eliminated or altered long before the hybrids could reach our country. Also, because of our research programs and the high level of expertise attained by our American beekeepers, we are technically much better able to cope with whatever problems might develop. Most of the United States has a marginal climate for survival; the africanized strains do best in tropical areas. Nevertheless, these strains are very adaptable and can survive, even though they may not thrive, in a wide range of environmental conditions.

Africanization of American honey bees would not mean the end of beekeeping in the United States (such statements have been made). However, there is no question that an extremely unusual biological phenomenon took place in Brazil. Future developments in South and Central America are being watched very closely to minimize any likelihood that North American beekeeping might be exposed to similar biological pollution.

1/ List of Committee members: John Allred, Madera, Calif.; Harold E. Esch, Univ. Notre Dame; Norman E. Gary, Univ. Calif., Davis; Stephen P. Hubbell, Univ. Mich.; Charles D. Michener (Committee Chairman), Univ. Kansas; Walter C. Rothenbuhler, Ohio State Univ.; G. F. Townsend, Univ. Guelph; M. V. Smith, Univ. Guelph; J. Antonio Zozaya, Direccion General de Apicultura y Especies Menores, Mexico City.

SORGHUM AND MILLET INFORMATION

A cooperative one–year project between the National Agricultural Library, (NAL) the Agency for International Development, (AID) and four land–grant institutions should result in improved information to sorghum and millet researchers. The project evolved out of a Workshop for Development of an International Sorghum Information Network held May 12–13, 1975 in Washington, D.C. (Agricultural Libraries Information Notes 1:6/7, Je/Jl. 75). It will demonstrate and test methods for obtaining a better flow of infor–mation among sorghum specialists.

AID has dedicated $5,900 for partial assistance with service to sorghum and millet researchers and graduate students associated with land–grant institutions in Nebraska, Puerto Rico, Indiana, and Texas. NAL and the land–grant institutions will invest funds and labor in kind. All work will be conducted through the land–grant campus main or branch libraries.

Texas A & M, Purdue, and Nebraska will use the USDA Agricultural Research Service's Current Awareness Literature Service (CALS). These universities are responsible for drawing up profiles in the online mode and match them for effectiveness, timeliness, and coverage with the CAL S announcements. The Hume Library of the University of Florida is supplying a standard sorghum current awareness profile monthly to the University of Puerto Rico.

Further information on this project is available from Wallace C. Olsen, Liaison Officer, National Agricultural Library, Beltsville, MD (301) 344–3843.

HERITAGE OF APICULTURAL LITERATURE
A BIBLIOGRAPHY OF PRE–1870 MONOGRAPHIC IMPRINTS

Compiled by
Alan M. Fusonie
National Agricultural Library

and

Donna Jean Mason Fusonie
McKeldin Library
University of Maryland

INTRODUCTION

The heritage of pre–1870 Apiculture literature is quite substantial. At one time, beekeeping was looked upon favorably as an occupation in such civilized nations as Egypt, Babylon, Assyria and Palestine. It was not until the 16th century however, that beekeeping emerged as an industry. In the published work of Jan Swammerdam, a Dutch naturalist, can be found detailed illustrations of the anatomy of the bee – a contribution which advanced the practice of beekeeping to a more scientific level.

There was some argument as to the origin of the honeybee – that is, whether it came to America along with some of the first colonists or whether there may have been a native species on the Continent. The former seems to be the prevailing view. In this regard, Thomas Jefferson, pointed out in his, *Notes on the State of Virginia,* that the American Indian also concurred with the former view:

> The bees have generally extended themselves into the country, a little in advance of the white settlers. The Indian, therefore, called them the white man's fly, and considered their approach as indicating the approach of the settlement of whites.

(*Transactions of The American Philosophical Society (1793) 111, p. 243)*

In general, beekeeping received its major impetus from Reverend Lorenzo Langstroth's, invention of the moveable–frame hive in 1852, thereby enabling the practice to be a potentially profitable one. As time passed, Langstroth's hive won acceptance in one form or another in many parts of the world. And, as a result, the initial commercial aspects of beekeeping became increasingly more apparent.

This bibliography is a selective compilation of monographs from the National Agricultural Library's Historic Book Collection, concerning various aspects of the pre–1870 developments in apiculture. The works are arranged alphabetically by author. The references cited are those of the editions available to the authors at the time of compilation and are designated by using the appropriate NAL call number.

Adair, D. L. *A New System of Bee–Keeping; Adapted to the Habits and Characteristics of the Honey–Bee: with Descriptions of, and Directions for Managing Bees in the section Bee–Hives. Embracing also Improved Methods of Artificial Swarming, Whereby the Business of Bee–Keeping is Rendered*

More Profitable and Pleasant. Cincinnati: Robert Clarke & Co., 1867.
vi. 7–74 p. illus.
R 424 AdIN

Affleck, Thomas. *Bee–breeding in the West.* Cincinnati: E. Lucas, 1841.
xi, (13) – 70 p.) front., illus.
R 424 Af3

Assmuss, Eduard (Philibert). *Die Parasiten der Honigbiene under die Durch Dieselben Bedingten Krankheiten Dieses Insects. Nacli Eigenen Erfalirungen und dem Neuesten Standpunkt der Wiessenschaft.* Berlin: Ernst Schotte & Co., 1865.
2 p. 1., 56 p., 3 pl.
R 424 As7

Bagster, Samuel, Jr. *The Management of Bees. Witli a Description of tlie "Ladies' Safety Hive."* London: Samuel Bagster and William Pickering, 1834.
xx, 244 p., col. front., illus.
R 424 B14

_____ *The Management of Bees. Witli a Description of tlie "Ladies' Safety Hive."* London: Saunders and Otley, 1838.
xvi, 240, col. front., illus.
R 424 B14 2nd ed.

Balsamo–Criveili, Michele. *Storia Naturale e Coltivazione dell'Ape.* Milano: Gaetano Schiepatti, 1864.
xiv, 272 p., illus.
R 424 B21

Bastian, F(riedrich). *Les Abeilles Traite Theorique et Pratique d'Apiculture Rationnell. Ouvrage Orne de 53 Gravures.* Paris: Librairie Agricole de la Maison Rustique, 1868.
2 p. 1., iii, 328 p., illus.
R 424 B29

Battisti, Giacomo. *I1 Raffinato Metodo di Coltivare 1e Api.* Verona: Stamperia Tommasi, 1822.
2 v. in 1., charts.
R 424 B32

(Bazin, Gilles Augustin). *The Natural History of Bees. Containing an Account of Their Production, Their Oeconomy, the Manner of Their Making Wax and Money, and the Best Methods for the Improvement and Preservation of Them. Illustrated with Twelve Copper Plates. Tr. from the French.* London: J. and P. Knapton and P. Vailant, 1744.
8 p. 1., 452, (16) p. 12 fold. pl.
From the "Memoires pour Servir a l'Histoire des Insects. Par (R.A.F.) de Reaumur . . . t. 5"; an Adaptation in Form of Dialogue by Gilles Augustin Bazin of the "Memoires," the Fifth to Thirteenth, Concerning Bees.
R 424 B34

_____. *Histoire Naturelle des Abeilles.* Paris: Guerin, 1744.
2 v. 12 fold. pl.
Based on, Memoires pour Servira l'Histoire des insectes, par R.A.F. de Reaumur,
v. 5.
Original edition.
R 424 B34Af

Beaunier, Stanislas. *Traite–pratique sur l'Education des Abeilles. Ouvrage qui Renferme des Moyens Surs Pour Retirer un Grand Produit de ces Mouches sans les Faire Perir; pour les Soigner dans Toutes les Circonstances qui Dependent des Localites et des Annees Plus ou Moins Favorables; pour Former Tres–facilement des Essaims Artificiels; pour Preparer le Miel et la cire; etc. . . . Termine par un Abrege de l'Histoire–naturelle des Abeilles. Avec figures.* Vendome: L'auteur, 1806.
2 p. 1., iv, (5) – 340 p., pl. (3) (2 p. 1., iv, (5) – 18 p. missing from copy)
R 424 B382
2nd item in Serain, Pierre–Eutrope. *Instruction sur la Maniere de Gouverner les Abeilles; . . . .* (3 plates missing from copy)
R 424 Se6

Berlepsch, August, freiherr von. *Die Biene und die Bienenzucht in Honigarmen Gegenden Nach dem Gegenwartigen Standpunct der Theorie und Praxis.* Muhlhausen in Thurigen: Friedrich Heinrichshofen, 1860.
xv, 475, (1), front. (port.) illus.
R 424 B45

Die Biene und Ihre Bucht Mit Beweglichen Waben in Gegenden Ohne Spatsommertracht, von August Baron von Berlepsch. Zweite. Sehr Verbesserte und Mit den Genauesten Sachund Autorenregistern Vermehrte Auflage. . . .
Mannheim: J. Schneider, 1869.
xxxviii, 584 p. front. (port.) illus.
1860 edition has title: Die Biene und die Bienenzucht . . .
R 424 B45 Ed. 2

Berra, Francesco. *La Coltura delle Api Coll'uso dell'Arnia a Listelli del Geometra Francesco Berra.*
Novara: Girolamo Miglio, 1864.
132 p., illus., fold. pl. (1).
R 424 B454

Beven, Edward. *The Honey–Bee; Its Natural History, Physiology and Management.* London: Baldwin, Cradock and Joy, 1827.
xxvi, 2, 404 pp. front. illus.
R 424 B46

———. *The Honey Bee, Its Natural History, Physiology and Management.* London: Van Voorst, 1838.
xxiv, 447 p., front., illus.
R 424 B46 2nd ed.

———. *The Honey Bee; Its Natural History, Physiology, and Management.* Philadelphia: Carey and Hart, 1843.
viii, (9)–128 p., illus.
R 424 B46

———. *The Honey Bee, Its Natural History, Physiology, and Management.* Revised and enlarged edition. London: John Van Voorst, 1870.
21., xxiv, (1) 384, (72) p., illus., pl. (21: 1 fold., 12 color ed.)
R 424 B46 Ed. 3

Beyer, Moritz. *Illustrirter Neuester Bienenfreund. Eine Vollstandige Unterweisung in der Behandlung der Bienen zu Jeglicher Jahreszeit; so Wie Uberhaupt Zum Vortheilhaftesten Betrieb der Bienenzucht auf Grund der Neuesten Erfahrungen. Mit Besonderer Beruksichtigung der Bienenzucht–Methode vom Pfarrer Dzierzon.* Leipzig: Otto Spamer, 1851.
viii, 225 p., 6 p., illus., diags.
R 424 B466

———. *Illustrirter Neuester Bienenfreund. Eine Vollstandige Unterweisung in der Behandlung der Bienen zu Jeglicher Jahreszeit; so Wie Uberhaupt zum Vortheilhaftesten Betrieb der Bienenzucht auf Grund der Neuesten Erfahrungen. Mit Besonderer Berucksichtigung der Bienenzucht–Methode vom Pfarrer Dzierzon. Hrsg. von Prof. Moritz Beyer in Pray und Pfarrer J. F. O. Kuhner. Zweite, Verbesserte und Stark Vermehrte Auflage.* Leipzig: Otto Spamer, 1852.
x, 273 p., 5 p., front., illus., diags.
R 424 B466 Ed. 2

Bonner, James. *A New Plan for Speedily Increasing the Number of Beehives in Scotland; and Which May Be Extended, With Equal Success, To England, Ireland, America, or To Any Other Part of the World Capable of Producing Flowers.*
Edinburgh: J. Moir, 1795.
1 p., l., xx, 258 p. (2) p.
R 424 B642

———. *The Bee–master's Companion, and Assistant. Wherein is Set Forth the Properest Methods of Managing Those Insects, so as They May Turn Out to the Best Advantage. Shewing an Effectual Way to Preserve Them from Famine, Cold, Robbers, Mice, or other Enemies: Also How to Make All Your Hives Equal in Bees, so as Never to Have Any Weak Hive; With an Account of the Power the Working Bees Are Invested with, of Raising Any Egg in the Hive to Be a Queen, When the Community Stands in Need of One.*
Berwick: J. Taylor, 1789.
xi, (l), 225 p.
R 424 B643

Bromwich, Bryan Janson. *The Experienced Bee–Keeper, Containing an Essay on the Management of Bees: Wherein Is Shewn, from Long Practice, the Most Easy and Profitable Method of Treating Those Useful Insects; Particularly Interesting to the Keepers of Bees, and Useful to Every Family. Together with an Improved Method of Making Mead, and Other Wines, with Honey.* Second edition. London: Charles Dilly, 1783.

xiv, 66 p., pl.
R 424 B78 Ed. 2

Busch, F(erdinand) B(enjamin). *Die Bienenzucht in Strohwohnungen Mit Unbeweglichem Wabenbau.* Leipzig: J. J. Weber, 1862.
xiv, 204 p., 2 p., illus.
R 424 B96

———. *Die Honigbiene. Eine Darstellung Ihrer Naturgeschichte in Briefen.* Gotha: Hugo Scheube, 1855.
vi, (l), 282 p.
R 424 B96H

Butler, Charles. *The Feminin Monarchi', Or The Histori Of Bees. Shewing Their Admirable Natur', and Propertis', Their Generation and Colonis; Their Government, Loyalti, Art, Industri; Enimi'a, VVars, Magnanimiti, &c Together With the Right Ordering of Them from Him to Him; and the Sweet Profit Arising Ther' of. Written Out of Experienc'.* Oxford: William Turner, 1634.
14 p., 182 p., illus., diagrs.
R 424 B973 Ed. 3

Caneva, Antonio. *Instruzioni e Regole di Apicoltura per Formare gli Sciami Conservarli ed Aumentarne il Prodotto.* Seconda Edizione *Corretta ed Aumentata.* Piacenza: A. Del Majno, 1866.
v, 242 p.
R 424 C163 Ed. 2

Carey, Elie. *Manuel Pratique sur l'Education des–Abeilles, Contenant Liste des Plantes qui Leur Conviennent, Ainsi que Celles Qui Leur Sont Nuisibles ou Qui Donnent un Mauvais Miel et un Calendrier Apricole.* Troisieme edition, Revue et Augmentee. Geneve: E. Carey, 1865.
2 p. l., 176 p., illus.
R 424 C18 Ed. 3

Carmagnola, Giuseppe. *La Cultura Delle Api, del Geometra.* Torino: Presso Gaetano Balbino • Librajo, 1821.
90 p., 3 p., fold., pl. (1)
R 424 C21

Christ, J(ohann) L(udwig). *Anweisung zur Nutzlichsten und Angenehmsten Bienenzucht fur Alle Gegenden; Bei Welcher in Einem Mittelmassig Guten Bienenjahr von 25 Guten Bienenstocken 100 fl. und in Einem Recht Guten Bienenjahr 200 fl. Gewonnen Werden Konnen, und Dennoch Ieder Stock in Guten Stande Bleibet; Geprufet, und zum Gemeninen Nutzen und Vergnugen Herausgegeben. Zweite Vermehrte und Verbesserte Auflage.* Frankfurt und Leipzig: Fleischerischen Buchhandlung, 1783.
xlviii, 354, (14) p. 6 fold., pl.
R 424 C46 Ed. 2

———. *Anweisung zur Nutzlichsten und Angenehmsten Bienenzucht fur Alle Gegenden Bey Welcher in Einem Mittlemassig Guten Dienenjahr von 25 Guten Bienenstocken 100 fl. und in Einem Recht Guten Bienenjahr 200 fl. Geworben Werden Konnen, und Dennoch Jeder Stock in Gutem Stande Bleibet; Geprufet und zum Gemeinen Nutzen und Bergnugen Herausgegeben. Dritte Sehr Vermehrte und Verbesserte Auflage.* Leipzig: Johann Benjamin Georg Fleischer, 1798.
xlviii, 372, (12) p., v pl. (part fold.)
R 424 C46 Ed. 3

———. *Anweisung zur Nutzlichsten und Angenehmsten Bienenzucht fur Alle Gegenden Bey Welcher in Einem Mittelmassig Guten Bienenjahre von 25 Guten Bienenstocken 100 fl. und in Einem Recht Guten Bienenjahre 200 fl. Gewonnen Werden Konnen, und Dennoch Jeder Stock in Gutem Stande Bleibt; Geprufet und zum Gemeinen Nutzen und Vergnugen Herausgegeben. Vierte. Sehr Vermehrte und Vesserte Auflage.* Leipzig: Johann Benjamin Georg Fleischers Buchhandlung, 1803.
xlviii, 374 p., v pl. (part fold.)
R 424 C46 Ed. 4

———. *Anweisung zur Nutzlichsten und Angenehmsten Bienenzucht fur Alle Gegenden, Bey Welcher in Einem Mittelmassig Guten Bienenjahre von 25 Guten Bienenstocken 100 fl. und in Einem Recht Guten Bienenjahre 200 fl. Gewonnen Werden Konnen, und Dennoch Jeder Stock in Gutem Stande Bleibet; Geprufet und zum Gemeinen Nutzen und Vergnugen Herausgegeben. Neueste Vermehrte und*

Verbesserte Auflage. Frankfurt. Leipzig: n. p., 1826.
(v)–xlvi, 342, (12) p., fold., pl. (1)
R 424 C46 1826

———. *Bienenkatechismus fur das Landvolk. Dritte, Stark Vermehrte und Verbesserte Auflage.* Leipzig: Johann Benjamin George Fleischers Buchlandlung, 1807.
vi, (2), 210, (6) p., fold., pl. (1)
R 424 C46B Ed. 3

Chylinski, Dobrogost. *The Beekeeper's Manual: Founded on the Experience, During Many Centuries, of the Apiarians in Poland. Dedicated to the Agriculturists of Great Britain.* London: Wm. S. Orr and Co., 1845. viii, 75, (1) p. 7 front., pl. (3)
R 424 C47

Clement, A. *Apiculture Moderne. Le Role des Abeilles – Le Mobilisone – La Ruche, Les Cadres, Le Rucher – Diuers Types de Ruches – Conduite du Rucher – Les Maladies et les Ememis des Abeilles – Utilisation du Miel et de la Cire.* Deuxieme Edition. Paris: Larousse, (18–).
126 p., illus.
R 424 C59A

Coltivazione delle Api pel Regno D'Italia. Alvisopoli: Nicolo E. Giovanni Bettoni, 18ll.
8 p. 1., 88 p., pl. (2)
R 424 C72

Cotton, William Charles. *My Bee Book.*
London: J. G. F. & J. Rivington, 1842.
3 p. 1., xvii–lvi p., 1 1., (59)–368 p., illus., plates.
Part of plates are included in paging.
"A list of bee books": p. xxii–xxx.
Includes selections from the following works, each selection preceded by copy of t.–p. of work from which it is taken: Englands Interest . . . 4th ed. By Sir J. More, London, 1707: . . ; or The Female Monarchy . . . By . . . John Thorley. London, 1744: Treatise on bees . . . By R. Sydserff. Salisbury, 1792.
R 424 C822

———. *A Short and Simple Letter, From a Conservative Bee Keeper.* 1st American ed.
Boston: Charles P. Bosson, 1841.
24 p., illus., diags.
R424 C822S

(Cumming, John). *Bee–Keeping.* London: Sampson Law, Son & Marston, 1864.
(v)–xx, 224 p., 16 p., illus.
R 424 C91

Cutting, James A. *A Short Treatise on the Care and Management of Bees, and the Construction of the Changeable Bee–hive.* Manchester: Printed for the inventor, 1849.
16 p., illus.
R 424 C98B

Dathe, G. *Lehrbuch der Bienenzucht; ein Vorzugsweise die Praktische Richtung Verfolgender Leitfaden, als Vereinswerk fur die Hessischen Bienenzuchter–vereine.* Bensheim: Verlag der Lehrmittelanstalt von John. Ehrhard & Co., 1870.
(iii)–viii, 252 p., illus., diags.
R 424 D26

———. ———.
Bensheim: Verlap der Lehrmittelanstalt von Joh. Erhard & Co., 1871.
x, (1), 280 p., illus., diags.
R 424 D26 Ed. 2

———. *Anleitung zum Italisiren oder Zuchtung der Italienischen Biene in Kasten und Korben.* Nienburg a. W. : Selbstverlag des Verfassers, 1867.
84 p.
R 424 D26A

Debeauvoys, (J B). *Guide de l'Apiculteur.* Troisieme Edition. Paris: Librairie d'Agriculture et d'Horticulture de Mme Ve Bouchard–Huzard, 1851.
(v)–xvi, 256 p., illus.
R 424 D35G

Della Roeca. *Traite Complet sur les Abeilles, avec une Methode Nouvelle de les Gouverner, Telle qu'elle se Pratique a Syra, Ile de l'Archipel; Precede d'un Precis Historique et Economique de Cette Ile.*
Paris: Bleuet Pere, 1790.
3 vols. I: xxii, 464 p. (p. 464 misprinted as 462), pl., (2 fold.); II: viii, 500, (3) p.; III : (Paris: Bleuet Pere; Regent et Bernard, 1790), xii, 532, (4) p., pl. (1 fold.), (p. 517 misprinted as 715).
R 424 D382 v.l–3

Dubost, J. F. *Methode Avantageuse de Gouverner les Abeilles, Fondee sur de Nouvelles Observations et de Nouvelles Experiences.* Bourg: P.F. Bottier, 1800.
1 p. l, (v)–xii, 139 p., fold., pl. (2)
With this is bound: Beville, P. C. G. Traite de l'Education des Abeilles et de Leur Conservation. Paris: Demonville, 1804.
R 424 D852

Dzierzon, (Johann). *Besste Bienezuchts–methods nach Pfarrer Dzierzon, Enthalten 1. Die Aufsatze des Vorstehers des Schlesischen Bienenzuchter–vereins Wilh. Bruchisch. 2. Das Bienenbuch des Pfarrer Dzierzon. 3. Erfahrungen des W. Bruchisch Durch Seine 12Jahrige Praxis in Amerika. Letztere Sind am Passendsten Sogleich an die Betreffende Buch–stelle Gesetzt Worden.* Hortentown, Texas: Selbstverlag des Herausgebers W. Bruckisch, 1866.
3 p. l.; 216., fold., pl. (2)
R 424 D99B

———. *Neue Verbesserte Bienen–zucht des Pfarrers Dzierzon. Herausgegeben und Erlautert vom Bienen–vereins–vorsteher rent–meister Bruckisch. Dritte Verbesserte Auflage.* Neisse: Druck von M. Wangenfield, 1849.
3–304 p., fold., pl. (5)
R 424 D99N Ed. 3

———. *Rationelle Bienenzucht, oder Theorie und Praxis des Schlesischen Bienenfreundes.* Brieg: Fulch' schen Buchoruckerei, 1861.
iv, 314 p., front., (port.), illus.
R 424 D99Ra 1861

Eddy, Henery. *Eddy on Bee–Culture, and The Protective Bee–Hive; A Guide to a Successful and Profitable Method of Bee–Culture; The Results of Many Years' Experience and Observation in Bee–Keeping.* Boston: Damrell and Moore, 1854.
x (i.e. xii), (11)–58, (2) p., front. illus., chart
(3rd item bound with Cutting, James A. *A Short Treatise on the Care and Management of Bees . . .*, 1849)
R 424 C98B

The English Bee–Keeper; or, Suggestions for the Practical Management of Amateur and Cottage Apiaries, on Scientific Principles. With an Appendix of Notes, Chiefly Illustrative. By a country curate. London: Francis & John Rivington, 1851.
(v)–xvi, 212 p., illus.
R 424 En3

The Cottage Bee–Keeper; or Suggestions for the Practical Management of Amateur, Cottage and Farm Apiaries, on Scientific Principles. By a Country Curate. New York: C. M. Saxton, 1851.
2 p. 1., (v)–xii, 119 pp., 24 p., illus.
London ed. has title: The English bee–keeper.
(Saxton's cottage and farm library)
R 424 En3 1851a

Feburier, (Charles Romain). *Traite Complet Theorique et Pratique sur les Abeilles; Cet Ouvrage, Approuve dans la Seance de l'Institut de France du 22 Janvier 1810, Contient l'Histoire Naturelle des Abeilles, la Culture de ces Insectes Applicable a Toutes les Especes de Ruches et a Toutes les Temperatures de la France, la Comparaison des Methodes et des Ruches Adoptees Jusqu'a ce Jour avec Cells Proposees par l'auteur, Enfin l'Etat des Connoissances des Grecs et des Romains et celles des Peuples Modernes dans le XVII. Siecle sur les Abeilles.* Paris: De l'imprimerie de Madame Huzard, 1810.
iv, 460 p., fold., pl., (1)
R 424 F31A

Fontana, Luigi. *Del Governo delle Api Trattato Inedito.* Milano: Societa Tipog. de' Classici Italiani, 1847.
107, (1) p., pl., (fold. front.)
R 424 F73

(Formanoir de)Plateau, (Guillaume Louis). *Nouvelle Construction de Ruches de Bois, avec la Facon d'y Gouverner les Abeilles, . . . ; et l'Histoire Naturelle de ces Insectes. Avec des Figures en Taille–douce.* Metz: Joseph Collignon, 1756.
2 p. 1., iii–xxviii p. 1 1., 422, (2) p., fold., pl., (5)
R 424 F76 2 cops.

Johann Jacob Griesingers,

Stadt-Organisten in Münsingen,

vollständiges

Bienen-Magazin,

in welchem

von der Bienenpflege überhaupt, der Bienen natürlichen Generation, Ursprung und Präparation ihres Honig- und Waabenbaues, denen Gebrechen, und was der Bienenzieglung hinderlich und schädlich, hingegen derselben verträglich und beförderlich seye; wie durch Natur gemäße Tractation die sicherste Producta von einer wohlangelegten Bienenhaltung erlanget werden können, von dem Bienen-Recht, und dem gesamten Bienenwesen,

wie auch

vom Honig und Wachs, aus eigener und anderer gegründeter Erfahrung, durch Exempel mit ganz neuen Entdeckungen erläutert, auf das vollständigste gehandelt wird.

Mit Herzogl. Würtembergl. und Churfürstl. Pfälzischen Höchstgnädigsten Concession.

Mit vielen Kupfern.

ULM,
bey Albrecht Friederich Bartholomäi. 1769.

Fuckel, Christian Friedrich Ludwig. *Meine Bienenzucht, Oder Ausfuhrliche Anleitung zur Behandlung der Bienen in Jeder Jahreszeit. Mit 6 Figurentafeln und Einem Anhange, Nutt's und von Morlot's Bienenzucht Betreffend. Zweite Verbesserte und Vermehrte Auflage.* Darmstadt: Carl Wilhelm Leske, 1846.
4 p. l, xvi, 303 p., 1 l., fold., pl. (5)
R 424 F95 Ed.2

Gedde, John. *The English Apiary: or, The Compleat Bee–master. Unfolding the Whole Art and Mystery of the Management of Bees. Being a Collection and Improvement of What Has Been Written by All Authors, Relating to This Subject, as Well Antient as Modern. With a New Discovery of an Excellent Method for Making Bee–houses and Colonies, to Free the Owners from the Great Charge and Trouble That Attends the Swarming of Bees, and Is Much More Advantageous Than Any Method Hitherto Practised.* London: E. Curll, W. Mears, and T. Corbet, 1721.
v–ix, (15) 108 p., front.

Pages (85)–108 have special t.–p.: *A New Discovery of an Excellent Method of Bee–houses and Colonies, to Free the Owners from the Great Charge and Trouble That Attends the Swarming of Bees, and Delivers the Bees from the Evil Reward of Ruin for the Benefit They Brought Their Masters; Advantaging Their Owners Manyfold Above Whatever Any Method Heretofore Practic'd Doth. Experienced Seven Years by John Gedde . . .* London: Printed in the year 1675. And reprinted in 1722.
424 G262

Gelieu, Jonas de. *The Bee Preserver; or Practical Directions for the Management and Preservation of Hives. Translated from the French of Jonas de Gelieu . .* Edinburgh: John Anderson Jun.; London: Simpkin and Marshall, 1829.
2 p. l, (iii)–vi, 134 p., illus.
R 424 G28

Goroldt, F. *Futterung der Bienen.* Berlin: C. W. Mohr &Co., 1860.
10 p.
R 424 G68

Griesingers, Johann Jacob. *Johann Jacob Griesingers . . . Vollstandiges Bienen–Magazin, in Welchem von der Bienenpflege Uberhaupt, der Bienen Naturlichen Generation, Urspring und Praparation Ihres Honig–und Waabenbaues, denen Gebrechen, und Was der Bienenzieglung Hinderlich und Schadlich, Hingegen Derselben Vortraglich und Beforderlich Seye; wie Durch Natur Gemasse Tractation die Sicherste Producta von Einer Wohlangelegten Bienenhaltung Erlanget Werden Konnen, von dem Gesamten Bienenwesen, wie Auch vom Honig und Wachs, aus Eigener und Anderer Gegrundeter Erfahrung, durch Exempel mit Ganz Neuen Entdeckungen Enlauterf, auf das Vollstandigste Wird.* Ulm: Albrecht Friederich Bartholomai, 1769.
(28), 542 p., front., fold., pl. (9), incl., diags.)
R 424 G87

Haarlander, P. *Wohlmeinender Rath fur Freunde der Bienenzucht, Oder Kurze Anleitung zur Zweckmassigen Behandlung der Bienen nach Dzierzon's Methode.* Regensburg: Friedrich Pustet, 1859.
136 p., illus.
R 424 H11

Harbison, J(ohn) S. *The Bee–Keeper's Directory, or, The Theory and Practice of Bee Culture, in All Its Departments, the Result of Eighteen Years Personal Study of Their Habits and Instincts.* With an introductory essay by O. C. Wheeler. San Francisco: H. H. Bancroft and Company, 1861.
1 p. l., (vii)–xxiii, (1) p., 1 l., (27)–440 p., front., 47 pl.
R 424 H21

Harbison, W C. *Bees and Bee–Keeping: A Plain, Practical Work; Resulting from Years of Experience and Close Observation in Extensive Apiaries, both in Pennsylvania and California. With directions How to Make Bee–Keeping a Desirable and Lucrative Business, and for Shipping Bees to California.* New York: C. M. Saxton, Barker & Co., 1860.
x, (11)–288 p., illus.
R 424 H22

Hermann, H C. *Die Italienische Alpenbiene oder Die Goldgrube der Landwirthschaft. Kurze und Praktische Anleitung, um sich Fruchtbare Achte Italiener Koniginnen zu Erziehen, in Wenigen Monaten zu Verhundertfaltigen und Deutsche Bienenstocke in Italiienische Umzuwandeln.* Chur, (n. p.), 1859.
53, (3) p.
R 424 H42

Hermann, H C. *Il Cultivatur d'Aviuls u Metoda Simpla e Practica per Bein Cultivar Ils Aviuls e Trer da Quels in Gron Profit.* 1860.
100 p., pl. (2 fold.)
In the Romansh dialect of the upper Rhine Valley.
R 424 H42C

Hirsch, Johann Christoph. *Der frankische Bienen–meister, oder Grundliche Nachricht von der Bienenzucht/samt Einem Vorbericht von Denen Ehmahligen Zeidel–gerichten, aus denen Bewahrtesten Schriften und Eigener Erfahrung, dem Landmann zum Besten, in Druck Gegeben, mit Kupfern von Hof–, Crammer – und Landschafts–rath Johann Christoph Hirsch.* Anspach, 1767.
xii, 4 l., 264 p., pl, (1 fold.) (Bound with Werner, Dieterich. Anleitury zur Bienenzucht, 1766)
R 424 W492

The Hive and Its Wonders. Written for the American Sunday–school Union. Philadelphia: American Sunday–school union (1851)
126 p., front., illus.
R 424 H64

Hoffler, Caspar. *M. Caspar Hofflers Rechte Bienen–kunst, aus Nicolai Jacobi Schlesiers Tractat, und Eigener Erfahrung, in Drey Bucher Zusammen Geschrieben, mit Schonen Kunststucken und Figuren Gezieret, Woraus ein Fleissiger Haus–vater Grundlich Erlernen Kan, Wie er eine Bienenzucht Anlegen, Solche in Person Wohl Abwarten, und Fruchtbarlich Geniessen Konne; Anietzo Aber in Richtigcre Ordnung Verfasset, in Vielen Merklick Vermehret und Verbessert. Durch M. Christoph Schrot.* Leipzig: In Verlag Friedrich Lanckischens Erben, 1741.
14 p. l., 446 (i.e. 346), (6) p., fold., front.
Page 346 incorrectly numbered 446.
R 424 H672

Hoffler, Caspar. *M. Caspar Hoflers Vollstandige Anweisung zur Bienenzucht, Nebst Allen Hieher Gehorigen Kunstgriffen, Anmerkungen, und den Beygefugten Betrachtungen uber die bienen des Herrn Maraldi. 6. und Vermehrte Auflage.* Leipzig: Bey Friedrich Lanckischens Erben, 1753.
3 p. l., 346, (6) p., fold., pl., (1)
R 424 H672 Ed. 6

De Honingbijenteelt; Behelzende een Volledig Onderricht van de Natuur en Huishouding der Honingbijen, Derzelver Voordeelige Behandeling en Onderhoud, Benevens der Onderschèiden soorten van Korven, Enz. Dordrecht: A. Blusse en Zoon, 1797.
4 l., 139, (5) p., pl., (2 fold.)
R 424 H752

Huber, Francois. *Fragments d'Hubert sur les Abeilles, Avec une Preface et une Introduction par M. le D Mayranx.* Paris: Bureau de la Bibliotheque Choisie, 1829.
xii, 322 p., 4 p. (Half–title: Bibliotheque Choisie par une Societe de Gens de Lettres, Sons la Direction de M. Laurentie. I Section.
R 424 H86F

———. *Nouvelles Observations sur les Abeilles, Adressees a M. Charles Bonnet, . . . , Suivies d'un Manuel – pratique de la Culture des Abeilles, Contenant les Moyens Economiques d'en Tirerile Meilleur Parti, et les Recettes pour Faire l'Hydromel, la Fiere d'Epicia et de Genieure.* Paris: Debray, 1796.
10 p. l., (11)–280, illus.; 6 p. l., 7–32 p.
R 424 H86N

———. 2 ed., revue, corrigee et considerablement augmentee. Paris: J. J. Paschoud, 1814.
2 vols.: I. 362 p., pl. (2); II. 479, 3 p., pl. (12)
R 424 H86N

———. *New Observations on the Natural History of Bees, by Francis Huber. Translated from the original.* Edinburgh: Printed for J. Anderson; London, Longman, Hurst, Rees, and Orme, 1806.
viii, v. 4, 300 P., fold., pl. (1)
R 424 H860 1806

———. *New Observations on the Natural History of Bees, by Francis Huber. Translated from the original. 2d ed.* Edinburgh: J. Anderson; London: Longman, Hurst, Rees, and Orme, 1808.
xxv, 314 p., fold., front.
R 424 H860

———. *New Observations on the Natural History of Bees. By Francis Huber.* 3rd ed. Edinburgh: W. & C. Tait; London: Longman, Hurst, Rees, Orme, and Brown, 1821.
2 p. 1., (vii)–xv, 440 p., fold., pl. (5)

———. *Observations on the Natural History of Bees. By Francis Huber. A New Edition, with a Memoir of the Author, Practical Appendix, and Analytical Index.* London: Thomas Tegg, 1841.
4 p. 1., (iii)–xxiv, 352 p., fold., pl. (5)
R 424 H860 1841 2 cops.

Huish, Robert. *Bees: Their Natural History and General Management: Comprising A Full and Experimental Examination of the Various Systems of Native and Foreign Apiarians; With an Analytical Exposition of the Errors of the Theory of Huber; Containing, Also, The Latest Discoveries & Improvements in Every Department of the Apiary, With a Description of the Most Approved Hives Now in Use.* London: Sherwood, Gilbert, and Piper, 1842.
xxvii, (9)–458 p., 20 p., front., port.; illus.
R 424 H87BE 1842

———. New edition, greatly enlarged. London: Henry G. Bohn, 1844.
xxvii, (9)-458, 2 p., front., port., illus.
R 424 H87Be

———. *A Treatise on the Nature, Economy, and Practical Management, of Bees; In Which the Various Systems of the British and Foreign Apiarians Are Examined, and the Most Improved Methods Laid Down for Effectually Preserving the Lives of the Bees. Containing also, An Accurate Description, Illustrated by Plates, of The Hives, Invented* by Lombard, Ducouedic, Huber, L'Abbe Della Rocca, and other foreign apiarians; *And of a Newly Invented Hive, for the Purpose of Depriving the Bees of Their Honey, with Safety and Expedition: Forming the Most Complete Guide to the Study and Management of Those Valuable Insects.* London: Baldwin, Cradock, and Joy, 1815.
xxiii, (1) 414 p., 6 pl. (1 fold.)
R 424 H87T

———. *A Treatise on the Nature, Economy, and Practical Management, of Bees . . . guide to the study and management of those valuable insects.* By Robert Huish . . . *2d ed., with additions* . . . London: Baldwin, Cradock, and Joy, 1817.
xxxvii p., 1 l., 396, 2 p., 6 pl. (1 fold.)
R 424 H87T Ed. 2

Issac, J(ohn). *The General Apiarian, Wherein A Simple, Humane & Advantageous Method of Obtaining the Produce of Bees without Destroying Them, Is Pointed Out in a Series of Letters to a Friend.* Exeter: R. Trewman & Son; London: J. Johnson, 1799.
108 p., pl. (1)
R 424 Is1 1799

———. ———
Exeter, R. Trewman & Son; London, Cadell & Co., 1803.
2 p. 1., iii–v, 5–128 p., illus., fold., pl. (1)
R 424 Is1 1803

(James, Thomas) *The Honey Bee.* London: John Murray, 1852.
2 p. 1., 99, (1) p.
The third of five essays. Reprinted from the "Quarterly review".
R 424 J23

Janisch, Joseph Anton. *Praktische Bienenpflege fur den Landmann im Konigreiche Boheim.* Thure: Geriaber, 1789.
3 l., (1)–9–(14), 261 p., pl., fold. (2)
R 424 J252

(Jones, John) *The Eclectic Hive; Or, Directions for the Management of Jones's Herefordshire Collateral Bee–boxes, Including Practical Instructions Applicable to Every System of Bee–cultivation.* Hereford: The Times Office, 1843.
v p., 1 l., 54, 4 p., illus., pl. (2)

424 J72

Kastner, Abraham Gotthelf. *Sammlung einiger die Bienenzucht Besonders in den Churfurstlich–Braunschweig–Luneburgischen Landen Betreffenden Aufsatze und Nachrichten auf Hohe Veranstaltung Herausgegeben von Abraham Gotthelf Kastner.* Gotha und Gottingen: Johann Christian Dieterich, 1766.
9 p. l., (3)–360, (16) p., pl. (2 front.)
R 424 K15

Keys, John. *The Practical Bee–Master: In Which Will Be Shewn How to Manage Bees Either in Straw Hives or in Boxes, Without Destroying Them, and With More Ease, Safety, and Profit, Than by Any Method Hitherto Made Public, Viz. I. To Manage Bees in Straw Hives, With New Constructed Tops, at a Small Expence, as Profitably and Easily as With Boxes. II. In Boxes of an Improved and Cheap Construction, Easily to Be Managed, and With So Little Disturbance to the Bees, That All the Necessary Operations May Be Performed Without Any Danger. III. To Catch and Secure the Queen, Or to Fix Her and a Swarm to Any Place You Please. IV. To Cause Bees to Quit a Hive, and to Be So Tractable as to Suffer Themselves to be Handled Without Stinging. V. Several Methods of Swarming Bees Artifically. VI. To Cause a Swarm to Work in Separated Glasses, Without Any Hive; Or in Globular or Other Glasses, So that Pure Virgin Honey May Be Taken When in Its Utmost Perfection. VII. To Prevent or Cause Bees to Swarm. VIII. To Take the Honey and Yet Preserve the Bees, with Common Hives Only. IX. To Unite Casts, Swarms, and Stocks. X. A Catalogue of, and Observations on, the Most Proper Flowers or Pasturage for Bees. XI. An Easy and Certain Method of Preserving Stocks in Winter and Cold Springs. XII. Several New and Improved Methods of Extracting the Wax from the Combs, Two of Them Without Either Straining or Pressing; and Each by a Single Operation: But More Perfectly, and with Far Less Trouble and Expence of Fuel Than Hitherto Practiced. Together with Such Full and Plain Directions That the Meanest Cottager May Attain This Profitable Art Without Difficulty, and at a Samll Expence: Interspersed with Occasional Strictures on Mr. Thomas Wildman's Treatise on Bees: With Several New Discoveries and Improvements, The Result of Long Experience, and Deduced from Actual Experiments.* London: Printed for the Author, (1780).
x, 390, (2) p., pl. (1 fold. front.)
R 424 K52

———. *The Antient Bee–master's Farewell; or, Full and Plain Directions for the Management of Bees to the Greatest Advantage; Disclosing Further Improvements of the Hives, Boxes, and Other Instruments, to Facilitate the Operations; Especially that of Separating Double and Treble Hives or Boxes, with certainty and Safety, without Injurying the Bees; Interspersed with New but Important Observations: The Whole Studiously Adapted to General Use: With an Appropriate Method for the Curious. Also Brief Remarks on Schirach, and Other Distinguished Apiators on the Continent. Deduced from a Series of Experiments During Thirty Years.* London: G. G. and J. Robinson, 1796.
xvi, 273 p., pl. (2)
R 424 K52 1796

———. *A Treatise on the Breeding and Management of Bees, to the Greatest Advantage. Interspered with Important Observations, Adapted to General Use. Deduced from a Series of Experiments During Thirty Years.* F. C. and J. Rivington; Longman, and Co.; C. Law; J. Walker and Co.; R. Baldwin; B. and R. Crosby and Co.; Sherwood and Co., and T. Hamilton. A new edition. London: Lackington, Allen, and Co.: 1814.
xvi, 1 p. l., 272 p., pl. (2 inc. 1 front.)
R 424 K52T

Kidder, K. P. *Kidder's Guide to Apiarian Science. Being A Practical Treatise, In Every Department of Bee Culture and Bee Management. Embracing the Natural History of the Bee, from the Earliest Period of the World, Down to the Present Time; Giving the Anatomy and Physiology of the Different Species of Bees that Constitute A Colony, &c.* Burlington, Vt.: Samuel B. Nichols; Chicago: Rufus Blanchard, 1858.
175 p. (168–171 missing) port., illus.
R 424 K54

———. *Secrets of Bee–keeping. Being a Practical Treatise in Every Department of Bee Culture & Bee Management Embracing the Natural History of the Bee, From the Earliest Period of the World Down to the Present Time. Giving the Anatomy and Physiology of the Different Species that Constitute a Colony.* &c., &c. Fourth edition. Burlington: Vt: The Claremont Manufacturing Company, (1868).
192, (1) p., illus.
R 424 K54S

King, N. H. and King, H(omer) A. *The Bee Keeper's Text Book; Or Facts in Beekeeping, With Alphabetical Index, Being A Complete Reference Book, On All Practical Subjects Connected With the Culture of the Honey Bee, for Both Common and Movable Comb Hives, Giving Minute Directions for the Management of Bees, in Every Month of the Year and Illustrating the Nucleus System of Swarming.* Cleveland: Viets & Savage, 1864.
xiii, (14)–128, (3) p., illus.
R 424 K58

———. *The Bee-Keeper's Text–book With Alphabetical Index, Being a Complete Reference Book on All Practical Subjects Connected With the Culture of the Honey Bee in Both Common and Movable–comb Hives, Giving Minute Directions for the Management of Bees in Every Month of the Year, and Illustrating the Nucleus System of Swarming and Italian Queen Rearing.* 9th revised edition. New York: H. A. King & Co., 1869.
xii, (13)–140, (2) p., illus.
R 424 K58 Ed. 9

Kirby, William. *Monographia Apum Angliae; Or, An Attempt to Divide Into Their Natural Genera and Families, Such Species of the Linnean Genus Apis as Have Been Discovered in England: With Descriptions and Observations. To Which are Prefixed Some Introductory Remarks Upon the Class Hymenoptera, and a Synoptical Table of the Nomenclature of the External Parts of These Insects.* Ipswich: J. Raw, 1802.
2 v. in 1: I: xxii, 258 p.; II: 388 p., 18 pl. (4 col.)
R 426 K632

Kirsten, Gottlieb. *Vollstandige und Deutliche Anweisung zur Zweckmassigsten und Eintraglichsten Betreibung der Bienenzucht. Gegrundet auf die Mehr als Dreissigjahrigen Beobachtungen und Erfahrungen Seines Vaters, Friedrich Kirsten, und Seine Eignen. Nebst einem anhange uber die Verbesserte Nutt'sche Luftungsbienenzucht. Zum Nutzen Aller Bienenfreunde herausgegeben von Gottlieb Kirsten.* Weimar: B. F. Voight, 1837.
vi, 198, (4) p., pl. (11 fold.)–pl. 3 and 5 multilated.
R 424 K63

Kleine, G. *Die Bienenzucht. Vollstandige und Fassliche Anleitung zur Vortheilhaften zucht der Bienen Nach der Dzierzon'schen Methode.* Berlin: Ernst Schotte & Co., 1864.
vii, 164 p., illus.
R 424 K672

Kurzgefaster Unterricht vor den Nassauischen Landmann Wegen der Bienenzucht in Magazinen. Worin Gezeiget Wird, Wie Man Bienen mit Weniger Muhe Halten und auf das Dreifache Benutzen Konne, Ohne sie zu Toden, zu Schneiden, zu Futteren und Ohne sie Schwarmen zu Lassen. Mit Einer Kupfertafel: (n.p.), 177l.
62 p., pl. (fold front.) (Bound with Werner, Dieterich. *Anleitung zur Bienenzucht,* 1766)
R 424 W492

Kurze Anleitung fur das Landvolk, in Absicht auf die Bienen–Wirthschaft, wie Solche mit Nutzen Gefuhret Werden Soll. Pressburg: Leipzig: Lowen, 1773.
150 p., pl. (4 incl. front.)
R 424 K962

Lagrenee, C. L. *L'Art de Gouverner les Abeilles, et de Fabriquer le Miel et la Cire; Ouvrage Contenant des Instructions Propres Principalement aux Gens de la Compagne. Pour Tirer des Abeilles tout le Profit Possible. Avec un Abrege de ce que ces Insectes Offrent de Plus Curieux.* 2nd edition. Paris: Serviere, 1784.
4 p. l., 5–250, (1) p., front., pl. (3)
Added title page has imprint: Paris: Lamy, 1784.
R 424 L132

Langstroth, L(orenzo) L(orraine). *Langstroth on the Hive and the Honey–bee, A Bee Keeper's Manual.* Northampton: Hopkins, Bridgman & Company, 1853.
xvi, (13)–384 p., front. (2)
R 424 L26L

———. *A Practical Treatise on the Hive and Honey–bee.* 2nd edition, enlarged. New York: C. M. Saxton & Co., 1857.
xii, (13)–534 p. front. (2), illus., pl. (18)
R 424 L26H Ed.2

——— . ———.
R. Colvin's edition, revised. New York: A. O. Moore & Co., 1859.
xii (13)–408, (12) p., front., illus., pl. (24)
2nd identical copy has third edition revised for author.
R 424 L26H 1859

——— . ———.
3rd edition revised. New York: C. M. Saxton, Barker and Co.; San Francisco: H. H. Bancroft and Co., 1860.
xii, (13)–412, (8) p., front., illus., pl. (24)
R 424 L26H 1860

——— . ———.
3d edition revised. Philadelphia: J. B. Lippincott & Co., 1865.
xii, (13)–409 p., front., illus., pl. (24)
R 424 L26H 1865

———. ———.
3d edition revised. Philadelphia: J. B. Lippincott & Co., 1870.
xii, 13–409 p., front., illus., pl. (24)
R 424 L26H

(Lapoutre, J. – B.). *Traite Economique sur les Abeilles. Par un Cure Comtois.* Besancon: J. M. Couche, 1763.
2 p. 1., (iii)–ix, 272, (4) p.
R 424 L31

Le Blon, Ch(arles). *Nouvelle Methode pour Elever les Abeilles.* Paris: Parmantier, 1857.
iv, (5)–36 p., illus.
R 424 L49

Levett, John. *The Ordering of Bees: Or, The True History of Managing Them from Time to Time, with Their Hony and Waxe, Shewing Their Nature and Breed. As Also What Trees, Plants, and Hearbs Are Good for Them, and Namely What Are Hurtfull: Together with the Extraordinary Profit Arising from Them. Set Forth in a Dialogue, Resolving All Doubts Whatsoever.* London: Thomas Harper, for John Harison, 1634.
20 p. l., 71 p., front.
R 424 L57

(Liger, Louis). *Traite Curieux des Mouches a Miel, Contenant la Maniere de les Bien Gouverner, pour en Tirer un Profit Considerable par la Recolte de la Cire & du Miel; avec un Traite des Vers a Soye.* Paris: Claude Prudhomme, 1734.
10 p. l., 418, (4) p., pl. (2)
R 424 L62

Lombard, (Charles Pierre). *Manuale per il Proprietario delle Api, che Contiene i Precetti Sopra il Modo di Moltiplicarle, di Governarle, e di Trattare i Loro Prodotti.* Traduzione Sopra la Quarta edizione francese, rivista, corretta, ed aumentata. Firenze: Presso Guglielmo Piatti, 1811.
xix, 148 p.
R 424 L83 Ed. 4

———. *Manuel des Proprietaires d'Abeilles, Suivi de Notes Historiques.* Cinquieme edition, revue, corrigee et augmentee. Paris: L'auteur; Renouard; D. Colas, 1812.
xx, (2), 131 p., pl. (2 fold.)
R 424 L83M

———. *Manuel Necessaire Au Villageois, pour Soigner les Abeilles, et en Tirer du Profit sans Leur Nuire.* Troisieme edition, revue, corrigee et augmentee. Paris: l'Auteur; Migneret; Ant. Aug. Renouard, 1806.
x, 1 1., 156 p., pl. (2)
(2nd item bound with Beaunier, Stanislas. *Traite–pratique sur . . . les Abeilles . . ., 1806).*
R 424 B382

Lukas, Johann Gottfried. *Anweisung zur Ausubung der Bienenzucht, oder Naturgemasse Behandlung, Pflege und Benutzung der Bienen, Durch Nachdenken Erforscht, Durch Vieljahrige Ferfahrung Gepruft und Bewahrt, mit Prucksicht auf die Verschiedenheit der Gegenden und Jahre Fasslich Vorgetragen.* Prag: Friedrich Tempsky, 1820.
xxvi, 516, (6) p.
R 424 L962

Magerstedt, Adolf Friedrich. *Der Praktische Bienenvater, oder Anlcitung zur Kenntnise und Behandlung den Bienen, Besonders in Honigarmen Gegenden.* 3., Vermherte Auflage. Sondershausen: Friedrich August Eupel, 1856.
xv, 520 p., illus.
R 424 M27 Ed. 3

Manuel, B. *Histoire Particuliere de l'Abeille Commune; Consideree dans tous ses Rapports avec l'Histoire Generale de l'Homme.* Paris: H. Agasse, 1805.
2 vols. in 1: I. (v)–xxiv, 324 p., pl. (2); II. 352 p., pl. (2)
R 426 M31

Martini, Christian Friedrich. *Das Ablegen der Bienenstocke nach den Neuesten Ferfahrungen Ausfuhrlich Erklart.* Leipzig: Johann Philipp Haug, 1781.
10 p. l., 138 p.
R 424 M36

Melicher, Ludwig Josef. *Die Bienenzucht in der Weltausstellung zu Paris 1867, und Die Bienencultur in Frankreich und in der Schweiz.* Wien: Wilhelm Braumuller, 1868.
xiv, 198 p., illus.
R 424 M48

Metcalf, Martin. *A Key to Successful Bee–keeping: Being a Treatise on the Most Profitable Method of Managing Bees, Including the Author's New System of Artificial Swarming, Whereby All Watching for Swarms During the Swarming Season Is Done Away With, and All Loss by Flight to the Woods Prevented.* New York: C. M. Saxton, 1862.
ix, (11)–96, illus.
R 424 M562

Mills, John. *An Essay on the Management of Bees. Wherein Is Shewn The Method of Rearing Those Useful Insects; and that the Practice of Saving Their Lives When Their Honey and Wax Are Taken from Them Was Known to the Antients, and Is, in Itself, Simple and Easily Executed.* London: J. Johnson and B. Davenport, 1766.
x, 2 l., 157, (2) p., pl. (front. and 1 fold.)
(Bound with White, Stephen. *Collateral Bee–Boxes: . . .* , 1764, as second essay)
R 424 W584

Milton, John. *The Practical Bee–keeper; or, Concise and Plain Instructions for the Management of Bees and Hives.* A new edition. London: John Milton, 1851.
xvi, 63 p., front.
R 424 M64P

———. *Bees and How to Manage Them or The Practical Bee–keeper.* (New ed.) London: Houlston and Wright, 1865.
iv, 63 p., front.
R 424 M64

Miner, T. B. *The American Bee Keeper's Manual; Being a Practical Treatise on the History and Domestic Economy of the Honey–bee. Embracing a Full Illustration of the Whole Subject, with the Most Approved Methods of Managing This Insect Through Every Branch of Its Culture, the Result of Many Years' Experience.* 2nd edition. New York: C. M. Saxton, 1849.
iv, (5)–349 (10) p., front., illus.
R 424 M66 Ed. 2

———. 4th edition. New York: C. M. Saxton, 1852.
iv, (5)–349, (11) p., front., illus.
NAL also has 1857 and 1859 4th edition copies.
R 424 M66 1852

Molin, Raffaele. *L'Educaziono Razionale delle Api Insegnata. ai Contadini.* Padova: R. Molin, 1866.
94 p., illus.
R 424 M73

Mona, A. *L'Abeille Italienne. Instructions Pratiques sur l'Art d'Italianiser les Ruches Communes et de les Multiplier, a Peu de Frais, au Moyen d'Une Mere Italienne.* Paris: Bureaux du Journal des Fermes, Librairie Agricole de la Maison Rustique, 1870.
44 p.
R 424 M74

———. *Del Governo delle Api Catechismo Teorico–pratico di Angelo Mona.* Bellinzona: Tipolitografia di Carlo Colombi, 1862.
2 p. l., 61 p., pl. (7)
R 424 M74G

Monticelli, Teodoro. *Del Trattamento delle Api in Favignana, Isoletta all'Ovest della Sicilia.* Milano: Dalla Tipografia di Gio. Silvestri, 1845.
vi, 216 p., fold. front.
R 424 M76 1845

Neighbour, Alfred. *The Apiary; Or, Bees, Bee–hives, and Bee Culture: Being A Familiar Account of the Habits of Bees, and the Most Improved Methods of Management, with Full Directions, Adapted for the Cottager, Farmer, or Scientific Apiarian.* London: Kent and Co., Geo. Neighbour and Sons, 1865.
xi, 134 p., illus.
R 424 N31

———. ———.
2d ed. London: Kent and Co.; Geo. Neighbour and Sons, 1866.
xxiii, 274, (3) p., pl. (2–1 is front. and part. col.)
R424 N31 Ed. 2

Nutt, Thomas. *Humanity to Honey Bees: Or, Practical Directions for the Management of Honey Bees upon an Improved and Humane Plan, by which the Lives of Bees may be Preserved, and Abundance of Honey of a Superior Quality may be Obtained.* Wisbech: H. and J. Leach, 1832.
2 p. l., (iii)–xxiii p., 1 l., 240 p., fold. front., illus.
R 424 N96H

———. *Humanity to Honey–bees: or, Practical Directions for the Management of Honey–bees upon an Improved and Humane Plan, by which the Lives of Bees may be Preserved, and Abundance of Honey of a Superior Quality May Be Obtained.* Second edition. Wisbech: H. and J. Leach; London: Longman and Co., 1834.
xxii, 269 p., front., illus., pl. (1 fold.)
R 424 N96H Ed. 2

———. ———.
Fourth Edition, Revised, Enlarged, and Edited by the Rev. Thomas Clark. Wisbech: John Leach; London: Longman and Co.; London: Effingham Wilson; New York: J. Sholl, 1837.
xxx, 281 p. front., illus., pl. (1 fold.)
424 N96H Ed. 4

———. ———.
Fifth Edition, Revised, Enlarged, and Edited by the Rev. Thomas Clark. Wisbech: Printed by John Leach; London: Longman and Co.; New York: J. Sholl, 1839.
xxx, 281 p., fold., front., pl. (2 fold., incl. front.)
R 424 N96H Ed. 5

———. ———.
Sixth Edition, Revised, Enlarged, and Edited by the Rev. Thomas Clark. Wisbech: John Leach; London: Longman and Co.; New York: J. Sholl, 1845.
xxxiv, 306 p., illus., pl. (2 fold. incl. front.)
424 N96H Ed. 6

Oettl, J(ohann) N(epomuk). *Klaus de Bienenvater Aus Bohmen.* (2, Aufl.) (Saaz): Schonfeld, 1853.
viii, 6 l., 398 p., illus.
R 424 Ot82 Ed. 2

Payne, J. H. *The Apiarian's Guide, Containing Practical Directions for the Management of Bees upon the Depriving System.* London: W. Simpkin and R. Marshall, 1833.
xii, 71 p., pl. (2)
R 424 P29

(Peralta, Pablo de). *El Colmenero Instruido, Medios de Lograr en la Republica el Mayor Producto de las Colmenas. Como se Separa la Miel de la Cera y Modo de Blanquear Esta.* Puebla: Joaquin Martines, 1838.
2 p. l., 5–71, (2) p., front.
R 424 P41

Pettitt, W. J. *The Management of Bees, . . . With A Catalogue of Hives and Apiarian Furniture.* Second and enlarged edition. Dover: W. Brett, (1866).
iv, 48, (2) p., illus.
R 424 P452

Pina, Felix Valois della. *Praktisches Handbuch zur Einfachsten Nationalbienenzucht fur die K. K. Osterreichischen Deutschen Staaten. Nach Eigenen Fortgesetzten Beobacktungen und Wiederholten Erfahrungen.* Wien: Ben Franz Joseph Rotzel, 1797.
14 p. l., 130, (2) p., pl. (1 fold.)
R 424 P65

Posel, Joseph. *Grundlich– und Vollstandiger Unterricht Sowohl fur die Wald– als Gartenbienenzucht, in den Churpfalz–Bayerischen Landern.* Munchen: Joh. Bapt. Strobl, 1784.
15 p. l., (3)–288 p., pl. (4 fold.)
424 P753

Purchas, Samuel. *A Theatre of Politicall Flying–insects. Wherein Especially the Nature, the Vvorld, the Wonder, and the Manner of Right–ordering of the Bee, is Discovered and Described. Together with Discourses, Historical, and Observations Physical Concerning Them. And in a Second Part are Annexed Meditations, and Observations Theological and Moral, in Three Centuries upon that Subject.* London: R. I. for T. Parkhurst, 1657.
13 p. l., 387 p.
R 424 P97

Quinby, M(oses). *Mysteries of Bee–keeping Explained: Being A Complete Analysis of the Whole Subject; Consisting of the Natural History of Bees, Directions for Obtaining the Greatest Amount of Pure Surplus Honey with the Least Possible Expense, Remedies for Losses Given, and the Science of "Luck" Fully Illustrated – The Result of More Than Twenty Years' Experience in Extensive Apiaries.* New York: C. M. Saxton, 1853.
11, 376, 11, (9) p.
R 424 Q4B 1853

———. ———.
New York: C. M. Saxton, 1854.
11, 376, 8 p.

———. ———.
New York: C. M. Saxton & Company, 1858.
11, 377, 6 p., illus.
R 424 Q4B 1858

———. *Mysteries of Bee–keeping Explained. Containing the Result of Thirty–five Years' Experience, and Directions for Using the Movable Comb and Box–hive, Together with the Most Approved Methods of Propagating the Italian Bee.* New York: Orange Judd & Company, 1866.
x p., 1 l., (17)–348 (4) p., illus.
R 424 Q4B

Radouan, J. *Nouveau Manuel Complet Theorique et Pratique des Proprietaires d'Abeilles, Contenant: 1. La Ruche Villageoise ou Lombarde, et les Ruches a Hausses Perfectionnees au Moyen de Petits Grillages en Bois Tres Faciles a Executer; 2. Des Procedes pour Reunir Ensemble Plusieurs Ruches Faibles, afin d' Etre Dispense des les Nourrir; 3. Une Methode Tres Avantageuse de Gouverner les Abeilles, de Quelque Forme que Soient Leurs Ruches, pour en Tirer de Grands Profits.* Troisieme edition, carrigee Suiui de l'Art Eleuer et de Soigner les Vers a Soie, et de Cultiver le Murier; par M. Morin.
Paris: Roret, 1828.
xvi, 344 p., pl. (1 fold.)
R 424 R11 Ed. 3

Radouan, Jacques and Radouan, Auguste. *Nouveau Manuel Complet pour Gouverner les Abeilles et en Retirer Grand Profit, Contenant la Description de Plusieurs Ruches de Nouvelle Invention 1 Les Ruches Villageoises et a Hausses Perfectionnees, 2 Les Ruches du Naturaliste, de l'Amateur et du Cultivateur, Trespropres a la Formation des Essaims Artificials et a Satisfaire la Curiosite des Proprietaires d'Abeilles; 3 Des Procedes pour Reunir Ensemble Plusieurs Ruches Faibles, afin d'Etre Disponse de les Nourrir; 4 Une Methode Tres–avantageuse pour Soigner les Abeilles, de Quelque Forme que Soient Leurs Ruches; 5. Enfin l'Historie Naturelle des Abeilles, d'Abord Tres – detaillee, et Ensuite Analysee.* Cinquieme edition, revue, corrigee et augmentee, par m. F. Malepeyre. Paris: Roret, 1860.
2 vol.: I. 72 p.; II. 396 p., pl. (8 fold.)

R 424 R11 Ed. 5

Redares, J. – M. – M. *Des Abeilles et de Leurs Produits, ou Considerations Generales sur les Moeurs et la Culture de Ces Insectes, et sur le Miel, la Cire et le Propolis.* Paris: Emler Freres; Raynal, 1828.
xv, 359 p., pl. (6)
R 424 R24

Richardson, H. D. *The Hive and the Honey–bee; with Plain Directions for Obtaining a Considerable Annual Income from This Branch of Rural Economy. To Which is Added, an Account of the Diseases of Bees, with Their Remedies; also, Remarks as to Their Enemies, and the Best Mode of Protecting the Bees from Their Attacks.*
Dublin: J. McGlashan, 1847.
107 p., illus.
R 424 R39 1847

New York: C. M. Saxton, 1852.
72 p., 1 l., illus.
R 424 R39 1852

Riem, Johann. *Der Praktische Bienenvater, in Allerley Gegenden: Oder: Allgemeines Hulfsbuchlein furs Stadt– und Landvolk, zur Bienenwartung, in Korben, Kasten und Klossbeuten, Mit Anwendung der Neuesten Erfindungen, Beobachtungen und Handgriffe. Bearbeitet vom Commissionsrathe Riem in Dresden und Pastor Werner in Noba, und voneinigen Bienenfreunden Berichfiget.* Dierte Auflage. Leipzig: Bei Gerhard Fleischer, 1820.
1 p. l., (v)–xxxiv, 242 p., fold. pl.
Numbering irregular: p. v–vi repeated; p. ix numbered xxii; p. xviii numbered xxiii.
R 424 R44

Robin du Vernay, Lambert Antoine. *Culture des Abeilles dans une Nouvelle Ruche a Etages.*
Grenoble: Prudhomme, 1856
156 p. pl.
R 424 R55

Comprenant: *l. L'Histoire Naturelle de Ces Insectes, Leur Curieurs Trauvaux & Leur Admirable Instinct; 2. La Construction d'une Ruche a Etages, dans Laguelle, par des Recoltes d'Ete, On Peut se Procurer du Miel Parfaitement Blanc; 3. La Maniere de Gouvemer les Ruches, & les Soins a Donner aux Abeilles Durant le Cours de l'Annee, Suivie du Calendrier de l'Apiculteur; 4. La Manipulation d l'Usage du Miel & de la Cire.*

Royal Dublin society. *Instructions for Managing Bees. Drawn up and Published by Order of the Dublin Society.* Dublin: A. Rhames, 1733.
47 p. pl.
R 424 R81

Rusden, Moses. *A Further Discovery of Bees. Treating of the Nature, Government, Generation & Preservation of the Bee. With the Experiments and Improvements Arising from the Keeping Them in Transparent Boxes, Instead of Straw–hives. Also Proper Directions (to All Such as Keep Bees) as Well to Prevent Their Robbing in Straw–hives, as Their Killing in the Colonies.* London: n.p., 1679.
143 p.
R 424 R892

Sagot, l'Abbe. *Petit Traite Special de la Culture des Abeilles avec l'Aumoniere Ruche a Cadres et Greniers Mobiles.* Paris: Simon Racon et Co., (1860's).
4 p., illus. (2nd item bound with Cutting, James A. *A Short Treatise on the Care and Management of Bees, ..., 1849)*
R 424 C98B

Samuelson, James. *The Honey–bee; Its Natural History, Habits, Anatomy, and Microscopical Beauties.* By James Samuelson, Assisted by J. Braxton Hicks. Also Two Chapters on Instinct and Reason; Being an Introduction to the Study of Comparative Psychology, by the same author.
London: John Van Voorst, 1860.
xvi, 166 p., front., 8 pl.
R 424 Sa4

Sartori, Lugi. *Trattato di Apiculture Razionale, di Luigi Sartori di Primiero.* Vicenza: Tip. Nazionale Paroni, 1866.
248 p., illus.
R 424 Sa7T

Savani, Luigi. *Modo Pratico per Conservare le Api e per Estrarre il Mele Senza Ucciderle dell'Avvocato Luigi Savani.* Milano: Dalla Tipografia di Gioranni Silvestri, 1811.
xiv (2), 152, (1) p., 4 fold., pl.
R 424 Sa9

Schmidt, Friedrich Trauegott. *Der Bienenbau in Korben, Oder Niedersachsischer Bienenvater. Ausgefertiger von Friedrich Trauegott Schmidt.* Leipzig: Siegfried Lebrecht Crusius, 1768.
230 p.
R 424 Sch5

Scudamore, Edward. *Artificial Swarms. A Treatise on the Production of Early Swarms of Bees by Artificial Means; Wherein is Shown the Method of Multiplying These Useful Insects and the Means of Taking the Honey Without Destroying the Bees.* Second edition, revised and enlarged. London: Longman, Brown, Green, & Longmans, 1848.
vi p., 1 1., 53, (1) p.
R 424 Scu2 Ed. 2

Serain, Pierre Eutrope. *Instruction sur la Maniere de Gouverner les Abeilles; Ouvrage qui a Obtenu le Premier Accessit de la Societe d'Agriculture du Departement de la Seine, dans sa Seance Publique du 30 Fructidor an 9.* Paris: A. J. Marchant; Samson, 1802.
xvi, 168 p.
(Bound with this is Beaunier, Stanislas. Traite—pratique sur l'education des Abeilles. . . 1806.)
R 424 Se6

Siehold, Carl Theodor Ernst von. *On a True Parthenogensis in Moths and Bees; A Contribution to the History of Reproduction in Animals.* Translated by William S. Dallas. London: John Van Voorst, 1857.
vii, 1 l., 110 p., pl. (1)
R 422 Sil

Simon, Jean Baptiste. *Le Gouvernement Admirable ou la Republique des Abeilles, et les Moyens d'en Tirer une Grande Utilite.* Nouvelle edition, revue, corrigee, & considerablement augmentee.
Paris: Thiboust, 1742.
lxiv, 390 p.
R 424 Si5 1742

Paris: Nyon, 1758.
xiii, 410 p., front., 5 pl.
R 424 Si5 Ed. 2

Smith, Jerome Van Crowninshield. *An Essay on the Practicability of Cultivating the Honey Bee, in Maritime Towns and Cities, as a Source of Domestic Economy and Profit.* By Jerome V. C. Smith, M.D. Boston, Perkins and Marvin; New York: J. Leavitt, 1831.
/ 9/ – 106 p. incl. front., illus.
424 Sm62

Spitzner, Johann Ernst. *M. Johann Ernst Spitzner's . . Ausfuhrliche Theoretische und Braktische Beschreibung der Korbbienenzucht, nach Ausgemachten Grunden der Naturlehre und Langer eigener Erfahrung.* Hrsg. von Friedrich Pohl
Leipzig: J. C. Hinrichsche, 1823.
xxiv, 327, /1/ p. III pl.
424 Sp4 Ed. 3

Kritische Geschichte der Meinungen von dem Geschlechte der Bienen, von der Begattung und Befruchtung der Konigin, der Erzeugung der Verschiedenen Arten und Andern Merkwurdigkeiten in der Bienenrepublik.
Leipzig: Johann Gottlob Feind, 1795.
2 v. in 1. 326 p., 1 fold., pl.
R 424 Sp4K

Sprenger, Balthasar. *Einleitung in die Neuere Bienenzucht Nach ihren Grunden.* Stuttgart: Johann Benedict Mezlern 1773.
294 p.
R 424 Sp7

Taylor, Henry. *The Bee–keeper's Manual; or Practical Hints on the Management and Complete Preservation of the Honey–bee.* 2d edition, enlarged, and with additional illustrations. London: R. Groombridge, 1839.
viii, 126 p., front., illus.
R 424 T21 Ed. 2

———. ———.
London: Groombridge, 1849.
166 p., front., illus.
R 424 T21 Ed. 3

———. ———.
London: Groombridge and Sons, 1850.
viii, 184 p., front., illus.
R 424 T21 Ed. 4

———. ———.
London: Groombridge, 1855.
216 p., front., illus.
424 T21 Ed. 5

———. ———.
London: Groombridge, 1860.
xiv, 224 p., illus.
R 424 T21 Ed. 6

Thacher, James. *A Practical Treatise on the Management of Bees, and the Establishment of Apiaries, with the Best Method of Destroying and Preventing the Depredations of the Bee Moth.* Boston: Marsh & Capen, 1829.
162, (2) p.
R 424 T32

Thorley, John. *An Enquiry into the Nature, Order, and Government of Bees, Those Instructive and Useful Insects. With a New, Easy, and Effectual Method to Preserve Them, Not Only in Colonies, But Common Hives. A Secret Unknown to Past Ages, and Now Published for the Benefit of Mankind.* London: J. Waugh, 1765.
x, (11)–158 p., front., pl.
First edition, 1744, published under title: *Melisselogia.* Or, *The Female Monarchy . . . .*
Bound with 2d ed.
R 424 T39 Ed. 2

———. *Melisselogia.* Or, *The Female Monarchy. Being an Enquiry into the Nature, Order and Government of Bees, Those Admirable, Instructive, and Useful Insects. With a New, Easy, and Effectual Method to Preserve Them, Not Only in Colonies, but Common Hives, from that Cruel Death, to Which Their Ignorant, Injurious, and Most Ingrateful Owners So Commonly Condemn Them. A Secret Unknown to Past Ages and Now Published for the Benefit of Mankind. Written Upon Forty Years Observation and Experience.* Illustrated with Copper–Plates. London: N. Thorley, 1744.
xliii, (3), 206, (2) p., front., 3 pl.
R 424 T 39

Townley, Edward. *A Practical Treatise on Humanity to Honey Bees; or, Practical Directions for the Management of Honey Bees, upon an Improved and Humane Plan, by Which the Lives of Bees May Be Preserved and Abundance of Honey of a Superior Quality Obtained.* New York: William S. Dorr, 1843.
xi, (13)–162 p.
R 424 T66

Varani, Antonio. *Utilissimo Metodo di Custodire le Api Ricavando da Loro la Maggiore Utilita Possibile col Preservarle in Vita Ogni Anno Levando Dagli Alveari la Cera ed il Mele.* dato in luce. Verona: Per gli Eredi Carattoni Stamp. Vescovili, 1793.
39 p.
R 424 V422

Varembey, J. *Education des Abeilles et Ruche Francaise avec Appendice sur la Legislation Conccernant les Abeilles, Deuxieme edition.* Paris: Librairie Agricole de la Maison Rustique, (186–).
192 p., pl. (4)
R 424 V42 Ed. 2

Verein zur Forderung der Bienenzucht in Statuten. (1860)
15 p.
R 424 V58

Vogel, Friedrich Wilhelm. *Handbuch der Bienenzucht Oder Vollstandige Anleitung zur Naturgemass–rationellen und Eintraglichen Pflege der Honigbiene in Allen Praktischen Stockformen.* Berlin: E. Schotte & Co., 1867.
xv, 208 p., illus.
R 424 V86

Wallbrecht, Ch. *Die Bienenwirthschaft. Ein Handbuch zur Forderung der Neuesten Zuchtmethode Mit Beruksichtigung der Verschiedenen Betriebsweisen als: Schwarm–, Zeidel–, Garten–und Wander–bienenzucht Nach den Besten Hulfsquellen und den Neuesten Erfahrungen Fur Angehende Bienenfreunde Bearbeitet. Zweite, Ganz Umgearbeitete und Vielfach Vermehrte Auflage.* Gottingen: Vandenhoeck und Ruprechts, 1860.
xi, (1), 310 p., illus.
R 424 W15

Warder, Joseph. *The True Amazons: or, The Monarchy of Bees: Being a New Discovery and Improvement of Those Wonderful Creatures. Wherein Is Experimentally Demonstrated. I. That They Are All Governed by a Queen. II. The Amazing Beauty and Dignity of Her Person. III. Her Extraordinary Authority and Power. IV. Their Exceeding Loyalty and Unparallelled Love to Their Queen. V. Their Sex, Male and Female. VI. The Manner of Their Breeding. VII. Their Wars. VIII. Their Enemies, With Directions Plain and Easy How to Manage Them, Both in Straw–hives and Transparent Boxes; So That with Laying Out but Four or Five Pounds, in Three or Four Years If the Summers Are Kind, You May Get Thirty or Forty Pounds Per Annum. Also How to Make the English Wine or Mead, Equal, If not Superior to the Best of Other Wines.* London: I. Dawks, 1712.
xii, (4), 166 p.
R 424 W21

———. ———.
3d edition with additions. London: John Pemberton, William Taylor, 1716.
xiii, (2) p., 120 p., illus.
R 424 W21 Ed. 3

———. ———.
Seventh edition. London: T. Longman, T. Astley, 1742.
7 p., (13)–164 p., front. (port.), illus.
R 424 W21 Ed. 7

———. ———.
Eighth edition. London: T. Longman, T. Astley, 1749.
8, (13)–164, (4) p., front. (port.) diagr.
R 424 W21 Ed. 8

———. ———.
Ninth edition. London: R. Baldwin and T. Longman, 1765.
8, (13)–164, (4) p., front. (port.) diagr.
R 424 W21 Ed. 9

Weeks, John M(oseley). *A Manual: or An Easy Method of Managing Bees, in the Most Profitable Manner to Their Owner, with Infallible Rules to Prevent Their Destruction by the Moth.* Middlebury, (Vt.): Knapp and Jewett, 1836.
73 p.
R 424 W41

———. ———.
Third edition. Middlebury, (Vt.): Hamilton Drury, 1838.
93 p.
R 424 W41 Ed. 3

———. ———.
Fourth edition. Brandon: Vermont Telegram Office, 1839.
96 p.
R 424 W41 Ed. 4

———. ———.
New edition revised and enlarged. Boston: Weeks, Jordan & Co., 1840.
iv p., 1 l., 128 p.
R 424 W41 1840

A

COMPLETE GUIDE

TO THE

Myſtery and Management

OF

BEES.

CONTAINING

Inſtructions how to manage them with reſpect to their BREEDING, GATHERING, SWARMING, HIVING, FEEDING, *&c.* to conſiderable Advantage:

ALSO,

Directions whereby the GOVERNOR or QUEEN-BEE may be diſtinctly known;

TOGETHER WITH

Several curious Matters concerning them, deduced chiefly from Experience.

Being the moſt valuable Diſcovery hitherto found out.

BY

W. WHITE, Sen. of *Shutford*, near *Banbury*, *Oxon.*

Who, in the Year 1766, was honoured with a Premium, by the SOCIETY OF ARTS AND SCIENCES, for his ſingular Abilities therein.

LONDON:

Printed for the AUTHOR; and Sold by RICHARDSON and URQUHART, at the Royal-Exchange; ISAAC TAYLOR, near Chancery-Lane, Holborn; H. TURPIN, St. John's-Street, Weſt Smithfield; T. GOODACRE, Brewer-Street, Golden-Square; and W. TODD, Adam and Eve Court, near the PANTHEON, Oxford-Street.

[Pr. 2s. 6d. bound.]

Werner, Dieterich. *Anleitung zur Bienen–zucht.* Hannover: In der Forsterischen Buchhandlung, 1766.
6 p.,112 p., (2) p.
Bound with 2 other works.
R 424 W492

Werner, Johann Ernst. *Handbuch zur Einfachsten Behandlung der Bienen Nach den Neuesten Grundsatzen und Erfahrungen fur den Land–lichen Hausvater in Diskursen Abgefast und Herausgegeben.* Leipzig und Gera: Wilhelm Heinsius, 1795.
6 p. 1, 136 p.
R 424 W49

White, Stephen. *Collateral Bee–boxes: or, A New, Easy, and Advantageous Method of Managing Bees. In Which Part of the Honey is Taken Away, in an Easy and Pleasant Manner, without Destroying, or Much Disturbing the Bees; and Early Swarms are Encouraged.* The third edition, improved. London: L. Davis, C. Reymers, 1764.
1 p. 1., ix, 47 p., front.
R 424 W584

White, William. *A Complete Guide to the Mystery and Management of Bees. Containing Instructions How to Manage Them with Respect to Their Breeding, Gathering, Swarming, Hiving, Feeding, &c. to Considerable Advantage: Also, Directions Whereby the Governor or Queen–bee May be Distinctly Known; Together with Several Curious Matters Concerning Them Deduced Chiefly from Experience. Being the Most Valuable Discovery Hereto Found Out.* London: The author (1771).
xvi, 94 p., 1 1., front.
R 424 W58

Wighton, John. *The History and Management of Bees, with Notice of a Newly–constructed Hive.* London: Longman and Co.; Norwich: Bacon, Kinnebrook, and Bacon, 1842.
2 p. 1., xii, 103, (1) p., front., illus.
R 424 W63

Wildman, Daniel. *A Complete Guide for the Management of Bees Throughout the Year. Containing 1. A Description of the New–invented Hives, and the Manner of Using Them, So As to Take the Honey and Wax without Destroying the Bees. 2. Description of the New–invented Bee-house, and Its Properest Situation. 3. The Proper Method of Swarming and Hiving Bees. 4. Of Separating the Honey from the Wax. 5. Of Feeding Bees in the Winter. 6. Of the Enemies and Diseases to Which Bees Are Subject, and Their Remedies. 7. Of the Queen Bee, Working Bee, and Drone. 8. Of the Generation of Bees. 9. Directions to Make Mead.* The Third Edition, with Additions. Illustrated with Copper–plates. London: the author, 1780.
vii, 9–48 p., 2 fold. front.
R 424 W643 Ed. 3

———. ———.
The Eleventh Edition with Additions. Illustrated with Copper–plates. London: the author, 1780.
vii, 9–48 p., 2 fold. front.
R 424 W643 Ed. 11

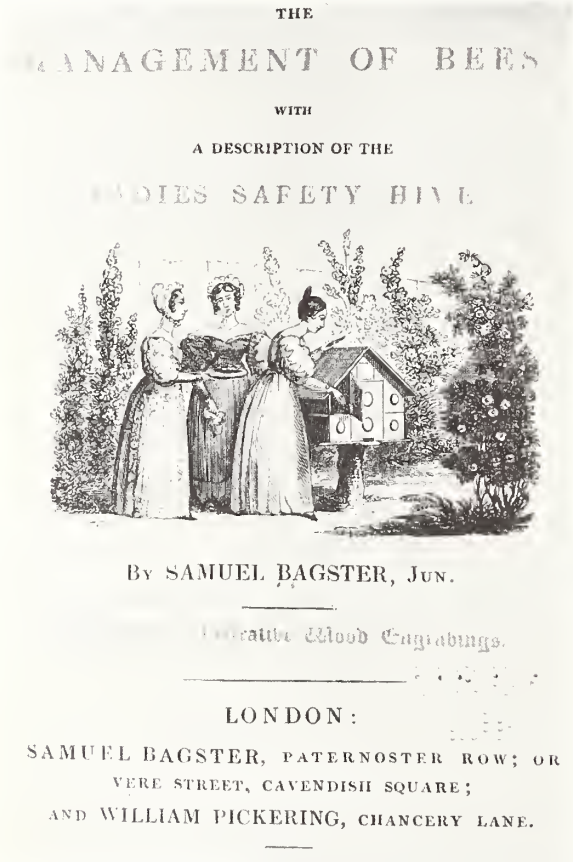
———. ———.
The Sixteenth Edition, with Additions. Illustrated with Copper- plates. London: T. Jones, 1802.
viii, 9–48 p. 2 fold. front.
R 424 W643 Ed. 16

Wildman, Thomas. *A Treatise on the Management of Bees; Added the Natural History of Wasps and Hornets, and the Means of Destroying Them.* London: Cadell, 1768.
(1), xix, (1), 189, (7) pp., fold., plates.
R 424 W642

———. *A Treatise on the Management of Bees; Wherein Is Contained The Natural History of Those Insects; With the Various Methods of Cultivating Them, Both Ancient and Modern, and the Improved Treatment of Them. To Which Is Added, The Natural History of Wasps and Hornets, and the Means of Destroying Them.* 2nd edition. London: W. Strahan; T. Cadell, 1770.
xvii, 3, (1)–311, (7) p., Appendix (1)–16 p. pl. (3 fold.)
R 424 W642 Ed. 2

Third edition. London: W. Strahan; T. Cadell, 1778.
xvii, 3, (1)–318, (7) p., Appendix (1)–16, (2) p., pl. (3 fold.)
R 424 W642 Ed. 3

Wurster, S(imeon) F(riedrich). *Vollstandige Anleitung zu Einer Nutzlichen und Dauerhaften Magazin–Bienenzucht.* Tubingen: Jacob Friederich Heerbrandt, 1790.
lvi, 520 p., 2 p., 6 fold., pl.
R 424 W96


THE
ANAGEMENT OF BEES
WITH
A DESCRIPTION OF THE
BEES SAFETY HIVE
By SAMUEL BAGSTER, Jun.
LONDON:
SAMUEL BAGSTER, PATERNOSTER ROW; OR
VERE STREET, CAVENDISH SQUARE;
AND WILLIAM PICKERING, CHANCERY LANE.

NEW ENGLAND MICROFILMING PROJECT COMPLETED

A major accomplishment in the microfilming of research publications has been achieved with the completion of a project involving the state land–grant publications of six New England states. (Agricultural Libraries Information Notes 1:11, Nov. 75). The cooperating states are Connecticut, New Hampshire, Maine, Massachusetts, Rhode Island, and Vermont. The documents filmed include those of the agricultural experiment stations, extension services, colleges of agriculture, forestry and home economics. Prime emphasis was given to filming long serial runs of those organizational units from their inception through 1969. A total of 340,000 pages of publications for the New England states have been filmed producing 182 rolls of films. However, not every title from the land–grant agricultural publications of these states has been filmed. Broken and difficult to complete sets were excluded in many cases.

The film is for sale by Graphic Microfilm, Inc., 1560 Trapelo Road, Waltham, Massachusetts, 02154. Available film includes 16 mm reduced by special photographic technique from the 35 mm film. It will be available in regular as well as cassette cartridges. Individual titles as well as sets will be sold for any of the six states.

NAL HAPPENINGS

CAIN ONLINE COURSE OFFERING

From May 10-14, the National Agricultural Library will be sponsoring a workshop to train librarians and information specialists in the utilization of its CAIN bibliographic data base in an online mode. The course will be held at the Steenbock Library, University of Wisconsin, Madison.

WORLD OF CAIN

Following the American Society for Information Science (ASIS) Bicentennial Conference on April 14-16, a CAIN data base seminar will be held at the Sheraton Park Hotel in Washington, D. C. The purpose of this seminar is to train CAIN data base users and relate CAIN use to available software vendors. The CAIN training session will be lead by a team consisting of Ronald J. Walton, Head, Computer Applications, Mr. Charles Bebee, Head, Reference, Mr. Harry Kemp, Reference, and Mrs. Maydelle Stewart, Indexing.

NAL ACCEPTS HISTORICAL RECORDS

On October 3, 1975, Dr. Richard Farley, Director of the National Agricultural Library, and Mr. Early W. McMunn, Director of Public Affairs for the Harvest Publishing Company and Chairman of the American Agricultural Editors Association History Committee, signed an "Instrument of Gift" donating the historical records of the Association to the National Agricultural Library. On February 4, 1976 records relating to the Association's activities 1964-1970 arrived at the Library. Earl McMunn has contracted appropriate officials of the Association and additional materials are anticipated. Once processed, these materials will provide an added dimension to the Library as a research institution.

A FOREIGN VISITOR TO NAL

Early in January, Mr. D. B. Eswara Reddy, Librarian, Andhra Pradesh Agricultural University, Hyderabad, India, visited the Library. Mr. Reddy, upon his return to India, will be responsible for establishing at the University a central library collections for the state of Andhra Pradesh. During his visit to NAL, he observed operations in both technical and public service areas. Arrangements, were also made for him to acquire selected publications for the University Library.

The Associates of the
National Agricultural Library, Inc.
10301 Baltimore Blvd.
Beltsville, MD 20705

THIRD CLASS MAIL

PRINTED MATTER