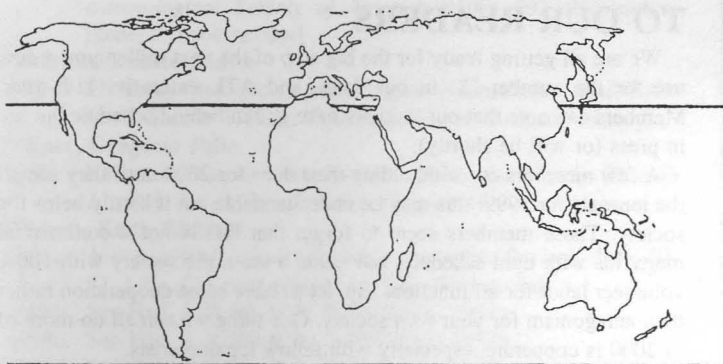




LEPIDOPTERA NEWS

September 1999

No. 3

VLADIMIR NABOKOV'S TROPICAL LEPIDOPTERY: A WINDOW ON THE PAST, A WARNING ABOUT THE FUTURE by Kurt Johnson

"Nightmares cannot be measured with statistics, but they can be precisely described" — V. Nabokov, *The Lepidopterists' News* (1950: 4(6-7): 75).

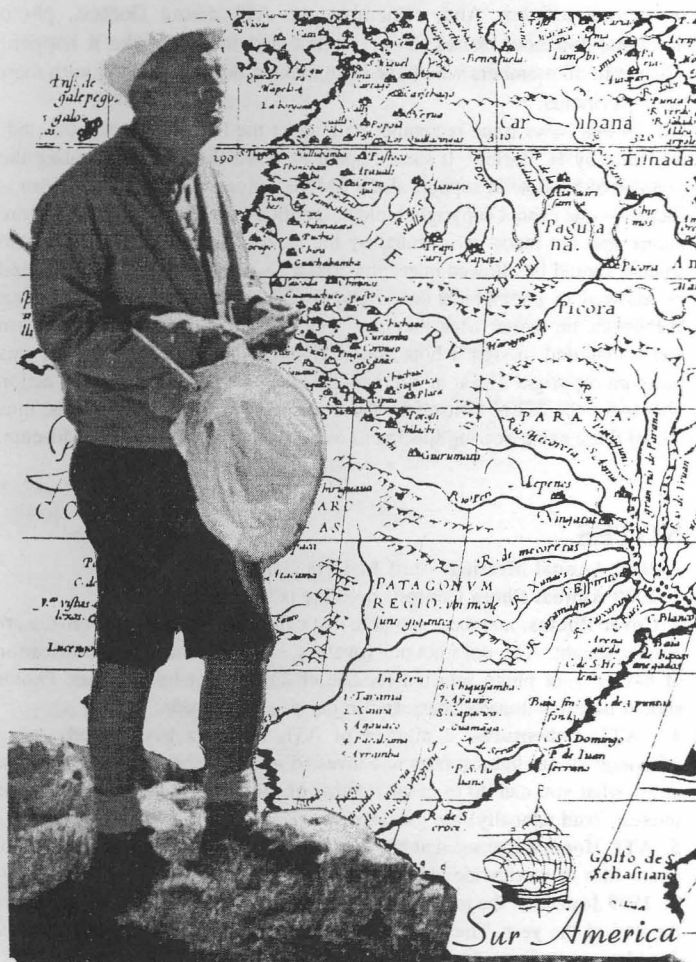


Fig. 1. Vladimir Nabokov in Switzerland, 1971, fronting an early map of South America (from the Age of Exploration, 16th Century). Like many pioneer taxonomists, Nabokov based his studies of Latin American butterflies (in his case, "blues") on the surviving specimens of early expeditions and explorer/collectors of the 18th and 19th centuries. In retrospect, the baseline taxonomies for most Latin American butterflies derive from similar efforts by early "northern" scientists working from old museum material.

As events of the 1999 Nabokov Centenary year have unfolded, scientists and aficionados of the arts as well have both been somewhat surprised by the amount of "hoopla" heaped upon the writer/scientist from both sides of the celebratory arena — that is, both art and science. The coverage in the media has been rather astounding. Brian Boyd, in a recent article in *Natural History* magazine (July/August 1999) revealed much of the reason for this, that one of the functions of the Centenary year has been to put the implications of Nabokov's scientific work in focus for the first time. The greatest emphasis in this effort has been on Nabokov's pioneering work on Lepidoptera of the Neotropical realm, specifically Latin American "blues", to which he contributed the seminal generic names for what is now an extremely substantial fauna, both as to species numbers and their evolutionary and biogeographic implications.

In proper focus — as a substantial temperate Latin America fauna whose conservation problems are now only beginning to be appreciated (major environmental organizations to date have but two exploratory projects bearing on preservation or sustainable use in South America's temperate habitats) — there is obviously something "special" and "new" about "his blues," many only named in the last five years. However, the general hoopla of the Centenary also raises the question of whether there is anything special about Nabokov's lepidoptery in and of itself.

A number of answers to this question have been proposed in the new books of the Nabokov Centenary: *Nabokov's Blues*, *Nabokov's Butterflies* and *Vera's Butterflies*. The most general of these suggests that Nabokov's entomological career is an icon of two great transitions that have made modern biology what it is today. The first is the transition from 19th to 20th century science, what Stephen Jay Gould (in *Vera's Butterflies*) recalls as the era of the "upper class" aristocrat-naturalist (a tag that brought Nabokov some derision among less friendly colleagues at Harvard) and its speedy, nearly dizzying replacement by the complexification and specialization of modern science. The second transition is the rapid (and sometimes cataclysmic) transformation the world's tropical biotas have undergone during this same time period—what results in today's "biodiversity crisis."

(continued on page 4)

LEPIDOPTERA NEWS

Editor: J. B. Heppner

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Published by the

Association for Tropical Lepidoptera, Inc.

Publication Office: P. O. Box 141210

Gainesville, FL 32614-1210, USA

Tel: (352) 392-5894 FAX: (352) 392-0479 www.troplep.org

Frequency: Quarterly (March, June, September, December)

e-mail: jbhatl@aol.com

ISSN: 1062-6581

The Association for Tropical Lepidoptera, Inc., is a non-profit corporation for the study and conservation of tropical and subtropical Lepidoptera of the world. Contributions are tax-deductible. Advertising is accepted.

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CONTENTS for the journals are issued every two years.

EXPEDITIONS:

ARGENTINA (Tucuman and Iguazu Falls)

Aug/Sep 2000

Please write for details.

TO OUR READERS

We are all getting ready for the big step of the next millenium: a new use for the number "2" in our dates, and ATL enters its 11th year. Members can note that our journals have gotten behind schedule but are in press (or will be shortly).

A few members are withholding their dues for 2000 until they see all the journals for 1999: this may be understandable but it hardly helps the society. These members seem to forget that this is not a commercial magazine with tight schedules but rather a scientific society with 100% volunteer labor for all functions. So, let us have some cooperation rather than antagonism for your own society. One thing we can all do more of in 2000 is cooperate, especially with fellow lepidopterists.

On page 8 you can note a long list of members for whom we have lost current addresses. There is a much longer list — over 400 — of members who are in arrears in their dues, and not just for 1999. Some may have dropped their interest in Lepidoptera but we urge fellow members to encourage these past members to renew their interest in ATL. New members are always welcome, too!

So, with the New Year fast approaching, an ATL goal will be to maintain our journal schedule! The *News* is also late, but issue 4, with the annual literature review, is shortly to follow. Finally, with the New Year, let us know your news and new projects; send your letters, notes or journal articles. And, remember the ATL Photo Contest, photo archives, and book series. Your support and interest make it happen! Thanks to all members who have been making donations along with their dues payments.

P.S. In this *News* issue is another note about the BMNH copyright matter, this time by H. Barlow. It should again be noted that, notwithstanding the premise of the note in support of the BMNH actions, this "copyright" idea is illegal — one cannot copyright biological entities, species, or specimens from nature and not made or invented by the hand of man. Every scientist and student should be allowed unencumbered access to scientific specimens and be allowed to photograph them. The BMNH action does encumber their specimens, no matter what they say, simply by their illegal copyright form one is required to sign. I hope the ICZN will take action and declare this museum copyright illegal in international law. One possible course of action also is for the ICZN to itself be the depository of all type specimens, thus taking these name-bearing specimens out of the hands of the British Museum.

J. B. Heppner

Executive Director

NOTES

1. **2000 Annual Meeting:** April 14-16 in Gainesville.
2. **2000 Annual Photo Contest:** deadline is March 15, 2000.
3. **Cover Photos:** members can note that color photos for journal covers are always sought. ATL does not pay royalties, but you do have the gratification of having your photo selected for one of the front or back covers. Photos should be exceptionally sharp and in our page proportion.
4. **ATL Debentures:** a number of ATL members have already taken advantage of our interest rates and invested in ATL debentures. Please let us know what you can do to help! Returns of principal (at end of period) and interest (paid annually) are guaranteed.
5. **ATL Home Page:** see it at <http://www.troplep.org>. Coming in 2000: color photo files of worldwide butterflies and moths!
6. **1999 Journals:** the journals are late this year but all will be mailed before the end of the year. There is at least one supplement coming for *Holarctic Lepidoptera* and one for *Tropical Lepidoptera*.
7. **Supplement Sale:** the backlog of orders has finally been mailed. Thus, anyone who ordered a supplement set at the special sale price and has not received it, please let us know.
8. **ATL Photo Archives:** Do not forget to consider ATL as the ultimate depository for your valued color slides of moths and butterflies and larvae. Do not let your investment of time and effort go to relatives who may not appreciate photographs of Lepidoptera; donate them to the ATL Photo Archives. You are also welcome to send listings of your holdings to add to the ATL Photofile database: let others know what species you have recorded on film. You may have unique life history photos never seen before.

LETTERS

Once again I find some interesting items in the June *Lepidoptera News*. As always, the printing of H. B. Weiss' history is a major contribution and interesting reading. I was especially pleased to learn about Benedict Jaeger in Chapter VI, a man about whom there seems to be next to nothing in the botanical literature. In the last paragraph, Weiss mentioned Jaeger's request for one of botanist John Torrey's publications. Some 40 years ago I bought from a dealer in New England a copy of Vol. 1, part 1 of Torrey and Gray's *Flora of North America*. My copy of this part, published in 1838, has the original paper cover, on which is inscribed in Torrey's hand: "Professor B. Jaeger from the Authors." Ever since, I have wondered who B. Jaeger was; now I know, thanks to Weiss. I evidently have the very copy mentioned in the correspondence he found in New York.

On p. 3, you suggest that Holland's *Moth Book* was often reprinted "until about 1955." I wonder if there is any evidence for that date? I have a printing dated 1941 and have been under the impression that it was the last. My parents gave it to me for Christmas in 1941. Forgetting that, they tried to give it to me for my birthday in February of 1942 but were told that it was no longer available. They later gave me a 1942 printing of the 1931 revised *Butterfly Book*; the price of \$10.00 is still in it (it mentions that over 65,000 of the original edition had been sold).

The little 1915 *Butterfly Guide*, which has such charming advice and which started your item, I have in a 1935 printing, which I used considerably before being given the larger work. It seems identical to the original, including a dedication to the Boy Scouts, although there is no statement that it was designed especially for them, and there is no mention whatsoever of the Scouts in the pre-1915 pocket guides in same series, on flowers, trees, and birds.

ED VOSS
Ann Arbor, Michigan

[Editor's Note: Glad to note later printings of Holland's *Butterfly Guide*. His *Moth Book* I believe was reprinted in the 1950s, but I do not have a copy at hand (there also was the Dover Press paperback reprint). The notes about the Jaeger book are most interesting: Jaeger was much maligned by critics of his little insect book, although it must have been of interest to the lay-man, and his illustrations were not as bad as the critics made out, being especially noteworthy for those times in any case by being in color (which in those years had to be hand-colored over printed outlines and details). Although revised in the 1859 and 1864 editions, the 1854 edition is much superior, being also more interesting for us today in having the biographical account of Hans Sloan (the founder of the British Museum) added to it at the beginning of the book; later editions dropped this introduction and changed the format of the book. His book was about the only guide to common insects in America written for the general public at that time.]

BMNH COPYRIGHT DECLARATION

[NOTE: Henry Barlow kindly made available to ATL the following note first published in the *Friends of the Natural History Museum Newsletter*, June 1999 issue, for which he serves as editor. We reprint his article about the Natural History Museum, London, copyright controversy with permission and in the interest of our members. He begins with a reprinting of the NHM copyright declaration: this is omitted here as it has already been printed recently and can be read in our *Lepid. News*, March 1999 issue.]

The announcement has produced a strong reaction, chiefly from entomological researchers round the world who use material from The Natural History Museum. There is however evidence of more heat than light.

The background to this development is of course the historical quirk by which as a result of Britain's colonial expansion in the last century the NHM became custodian of vast collections of natural history specimens passed to the Museum by professional collectors and colonial administrators. With those collections came the responsibility, which the donors assumed to have been accepted by the Museum to make these collections available internationally for scientific study. This of course remains the case, but times have now changed, and the NHM is a nationally funded institution, shouldering formidable international responsibilities for the maintenance of a vast collection of 68 million specimens. Of these only a small fraction are directly relevant to Britain's reduced political role in world affairs. The remainder are

effectively curated, until recently at no expense to the world scientific community, through the inexorably diminishing generosity of Her Majesty's Government. Yet they form one of the two or three major world resources for the study of biodiversity, not just today, but the biodiversity such as has been preserved of the world in geologically distant eras. Closer to the present, the data on the abundant nineteenth century material offer a series of snapshots, valuable both from the historical and biodiversity points of view, of the distribution of organisms in the not so distant past, before *Homo sapiens* unleashed on the natural environment the forces of destruction with which he has armed himself in the last century.

The problem has been compounded over the last five years by the electronic revolution. Scanning and photographic technology has reached the stage where it is possible to create and reproduce in digital form thousands of copies not simply colour images of specimens, but also images of existing photographs, in every case with minimal deterioration in the reproduction. Add to the 68 million physical specimens the vast number of paintings and drawings, mostly previously unpublished in the incomparable NHM Library, and you have some idea of the potential within the NHM.

A further issue is that raised by the Convention on Biological Diversity (CBD). It is more than possible that museums may be held responsible to countries of origin for how their specimens are used. This is already the case for plant specimens that might be used for bioprospecting. Many herbaria already require users to sign a loan statement detailing what cannot be done to their specimens. It is thus evident that owning specimens, whether type or otherwise, will probably carry an increasing responsibility not only to provide access, but also to protect the rights of the country of origin.

It is against this background that the recent announcement by NHM referred to above must be considered. Certain researchers worldwide who rely on the NHM collections have expressed grave concern. They fear that the requirement to pay for each image from the NHM, whether of a complete specimen, or even a small detail captured on a microscope photograph of the internal structure of a specimen will be fully implemented. This, they argue would effectively put an end to taxonomic work using the NHM's collections, and would dissuade most taxonomists from lodging further type material with the Museum.

Dick Vane-Wright, the Keeper of Entomology at NHM has found himself at the sharp end of many of these late comments. He has responded by explaining that the regulation has been introduced to establish a record of the use of images, to be in a position to control their future use, and place the Museum in a position to act if it has evidence that such use has been exploited for commercial gain.

"It is not our aim to prevent academics from using any resources legitimately. But, not to try to protect against abuse would be negligent on our part."

he writes. It is a view echoed by Christopher Mills, Head of Collections and Reader Services, Department of Library and Information Services. He also points out that this step has been taken merely to safeguard the NHM's position, and in fact reflects the policy of the NHM Library which has been implemented for some years.

It is also necessary to add that the NHM has been at the leading edge amongst world museums in declaring that they will repatriate specimen information to countries of origin, subject to the costs of this exercise being covered. They have already made major efforts to do this in a number of collaborative projects.

In this connection I consulted Dick Vane-Wright about a possible plan to develop software which would facilitate the development of virtual museums, based on images derived from Museum material. I received a prompt and encouraging response that provided the developers of the software signed the form above there would be no trouble about using the images in this way. Not said, but mutually understood was that if having developed the necessary software we attempted to exploit it for maximal personal gain, using NHM derived images, we could expect to be asked to pay copyright fees.

[continued on p. 8]

NABOKOV (continued from page 1)

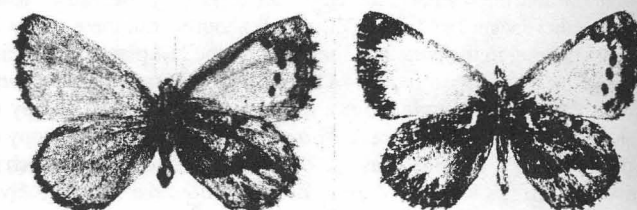
Nabokov's entomological career has all the marks of pioneer taxonomists who typified this transitional era: he had little or no formal training yet held, for a time, a paid position of some prestige (Harvard 1942-1948); he published research today considered the basic "alpha taxonomy" for his study groups; and, the frontier of his research was in the world's tropical regions — the home of biotas about which science fears it may well know "too little too late." A recent "Overview" of the demands placed on taxonomy by the biodiversity crisis, by Dr. A. Townsend Peterson in the ornithological journal *The Auk*, called particular attention to these characteristics in Nabokov's career. In "New Species and Species Limits in Birds," Peterson (of the Natural History Museum at the University of Kansas) outlined a four-step plan for taxonomy's confronting the biodiversity crisis. The piece is introduced by the statement: "theoretical issues aside, the real issues are how many species are there, where are they concentrated, which regions are highly unique, and what are the best strategies for conserving them?"

There is both general and specific (sometimes personal) resonance between Peterson's "Overview" and the career and research path of Vladimir Nabokov. The general resonance comes from the near perfect fit of Peterson's first three steps: (1) inventory and study of faunas from remote areas, (2) assembling research samples, (3) alpha systematics — and Nabokov's lepidoptery. Nabokov, like many other pioneer taxonomists of the transitional era, fulfilled the first three steps of Townsend's plan in his own personal work. When early taxonomists like Nabokov pioneered the nomenclature of entire groups for entire biogeographic realms, the fourth step outlined by Townsend, that of "synthesis" — knowing organisms in their environment and discovering their overall position in the larger ecologic and evolutionary picture — is all that remains for modern workers to accomplish. This last step is also the one that bears most on helping such organisms survive, in light of the biodiversity conundrum.

The specific, and rather personal, resonance between Peterson's "Overview" and Nabokov comes from the former's link to a position articulated by ornithologist Ernst Mayr. Mayr and Nabokov were contemporaries on the circuit that included working tenures, and attention to collections, at both Harvard and the American Museum of Natural History. It was Mayr, as readers of *Nabokov's Blues* and *Nabokov's Butterflies* will come to learn, with whom Nabokov often took public exception. Their jousts also interestingly reflect their era. Mayr was a trained and professionally acclaimed scientist, Nabokov a self-taught and confident intellect. The sometimes conflicting ideas of the two men met head-on occasionally, on the then rather level playing field of the Cambridge Entomological Club. Nabokov argued in 1944 (soon to be published) that many of Mayr's views on the emerging Neo-Darwinian synthesis, based on his knowledge of "warm-blooded" birds, were not particularly applicable to the "cold-blooded" realm of insects, especially for the work-a-day taxonomist. Particularly, Nabokov argued that species diversity was vastly underestimated in many groups of organisms, where refined studies of anatomy, like those he undertook himself, continued to discover many new species. In retrospect Nabokov, although sometimes appearing audacious at the time, won the day on several points.

As Peterson notes, Mayr attempted to write an epitaph on bird diversity in 1946 when he stated (Mayr, 1946) that 95% of the world's bird species were then known and that he expected less than 100 still remained to be named. According to Peterson, there

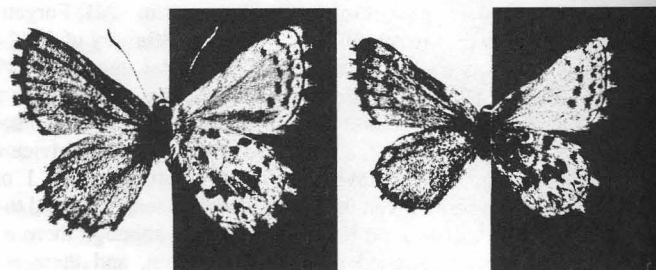
Fig. 2. Endangered South American Blues. Examples of butterflies from temperate South America (some named only in the last decade) whose life histories have only recently become known and which are also now extinct at their type localities and/or other major parts of their ranges.



P. benyamini ♂ D/V

P. benyamini ♀ D/V

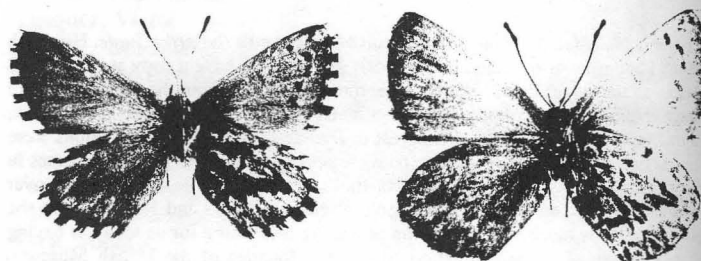
A. *Pseudolucia benyamini* Bálint and Johnson, 1994, extirpated from its coastal dune type locality (and adjacent dune regions) near Santiago, Chile, and surviving only on limited parcels of currently unused military land nearby.



P. argentina ♂ D/V

P. argentina ♀ D/V

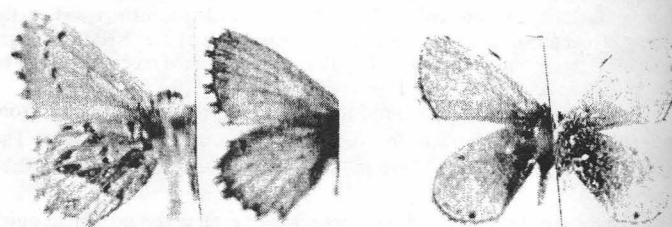
B. *Pseudolucia argentina* Balletto, 1993, unrecorded in the last decade from Aconcagua National Park, where it was once well-known from old specimens.



P. neuqueniensis ♂ D/V

P. neuqueniensis ♀ D/V

C. *Pseudolucia andina* (Bartlett-Calvert, 1894), sensu lato. Dubi Benyamini has documented additional species in this group from studies of life histories coupled with anatomical work by Johnson and Bálint. *P. neuqueniensis* Bálint and Johnson, 1995 (shown here) was one of the first of these named. Efforts have been thwarted, however, by disappearance of the study populations due to grazing off of their *Astragalus* foodplants by the ever expanding rabbit population.



D. *Pseudolucia scintilla* Balletto, 1993 (left, ♂ V/D), represented only by old museum specimens from 1954. Its shrubland habitats in Coquimbo have undergone extreme desiccation in the last decades and the species has not again been recorded, despite many efforts.

E. *Pseudolucia oligocyanea* (Ureta, 1956) (right, ♂ V/D), not locatable at its Antofagasta type locality or anywhere in Chile since its description.

resulted a "lapsing into the complacency of thinking that bird diversity [was] already well documented." Peterson says that Mayr actually erred by a large margin. To date, some 200 additional bird species have been named with, in Peterson's



F. *Pseudolucia sibylla* (Kirby, 1871), ♂ V/D (the old Paris Museum types of *L. endymion* Blanchard, which required the replacement name). Its *Adesmia* foodplant is a favorite of all the wandering livestock. Benyamini was lucky to rear it, especially since it is known from only about a dozen geographically scattered specimens from northern Chile. While it is arguable that in far-flung regions like Chile butterflies like these may well survive somewhere, it must be noted that the above species have been pursued through a rigorous geographic network set up by Dubi Benyamini and his co-workers (see *Nabokov's Blues*) and have "turned up" only to the extent noted.

words, "no sign of exhausting the supply." Lepidopterists will identify with the reason why. Nearly all the new species have resulted from the discovery of new taxonomic characters (e.g., bird life histories and songs) which distinguish otherwise similar-looking species, and the sorting out of long-entrenched problems of para- and polyphyly. Sound familiar?

It is Peterson's fourth methodological step for attacking the biodiversity crisis that frames Nabokov's life's work in the clearest perspective. Nabokov's tropical blue butterflies, typical of many other groups of organisms pioneered by early taxonomists (but thereafter sometimes long-neglected), are a group of organisms becoming known nearly simultaneously with their being documented as ecologically threatened. Nabokov's blues are also a group whose historical lack of study caused them to be officially "written off" in the biogeographical literature as small (even "depauperate") in diversity, a view which is entirely false. There has been extremely little emphasis on the fate of temperate insects in montane or low latitudes of South America. Conservation studies have concentrated almost solely on biota of the tropical habitats of that continent. Part of the reason, as noted by Arthur Shapiro in 1989 (Shapiro, 1989) is simply ignorance. Luis Peña and Alfredo Ugarte, in their *Butterflies of Chile* (which, in various stages, was "in press" for many years) appear to say that no butterflies of South America's southern cone are ecologically threatened or endangered. However, these authors' view of this question changed radically after Dubi Benyamini's meticulous field work and rearing of Lycaenidae, Hesperiidae, and Satyrinae (Nymphalidae) in their region. Although Peña and Ugarte's book included some of Benyamini's new species (at the last minute and subsequent to Peña's death), it did not accurately convey the view all three men eventually came to share concerning conservation dilemmas in South America's southern cone. In his scientific work, Nabokov used the word "nightmare" to express the complexity of variation and infraspecific relationships he studied in detail among the Holarctic blues. When he ventured south of the equator in his pioneering work on the Neotropical blues, this complexity, heightened by the intricacy of tropical ecosystems, increased exponentially. Concerning Latin American blues,

Nabokov expressed astonishment, calling their variety "surprising," "unusual," "peculiar," "unexpected" and "unparalleled" (Nabokov, 1945). In fact, to decipher it, Nabokov commented the taxonomist would need a "Wellsian time machine."

In his pioneer work as a seminal classifier, Nabokov was playing the role of the traditional 19th century taxonomist—the absentee or armchair scientist circumscribing far-reaching classifications from series of dead specimens collected a continent away from his own personal experience. But, also typical of the 19th century taxonomist, he was simultaneously laying an important groundwork—creating new tools by exploring unknown morphologies and noting new taxonomic characters. Eventually, Nabokov also started asking questions about the life cycles of his blues (in his correspondence with many lepidopterists after he left Harvard in 1948 and even in his fiction, for instance *Ada* and *Pale Fire*). This focus appears to have developed from Nabokov's growing understanding of the importance of immature stages in determining the taxonomic status and fragile ecological niche of his endangered Karner Blue (*Lycaeides melissa samuelis* Nabokov, 1944). This same kind of fragility, in Nabokov's South American blues, has recently been discovered by achieving Peterson's fourth methodological step—knowing the organism in its environment. Dubi Benyamini's studies of the life histories of South American blues (so many only recently named) signal a clear warning concerning their precarious futures as well. Summarizing the results of his rearing of temperate Latin American blues (and many other butterflies from that region), Benyamini stated to me recently, "the general decline in butterfly diversity and abundance in the high Andes and southern South America is not a question, it is a fact"—a view that is consistent not only with his own results but a spectrum of historical and botanical literature reviewed during the preparation of the book *Nabokov's Blues*.

Behind the decline in temperate South American butterflies is a near millennial history of agricultural and other economic usage of temperate South American biomes which is often not fully appreciated. To begin with, the Inca-ruled native tribes of the Andes, as well as more primitive tribes of South America's lower latitudes, were agriculturally active for several centuries (historians say at least since the 1200s). Their agricultural methods were sophisticated, including water diversion (irrigation), hillside terracing, erection of flatland "raised-fields" (surrounded by complex moat systems), regular habitat burning, and widespread grazing of domestic herbivores (both avian and mammalian). These agricultural activities greatly eclipsed those of North American native tribes, mostly due to South America's lacking the vast temperate areas which readily accommodated nomadic lifestyles in many natives of the north. Recent anthropological studies in South America have produced many surprises. For instance, for centuries, Inca-ruled tribes not only cultivated vast areas but moved from place to place as local ecological collapses followed. Tribes in the southern cone, according to Argentine studies, had been regularly burning the pampas long before the arrival of the Europeans. Compared to North America, native agronomy in the south was both far more intensive, and on a grander scale.

As a consequence, when the Spaniards arrived in the early 16th century, habitats across temperate South America were already long-disturbed, and their butterfly faunas already remnant. Certainly, widespread areas remained as margins, and for harboring relict-maintaining metapopulations, but the pre-colonial centuries had already had extensive environmental consequences. The subsequent European encroachment, often assumed by

laymen as the first agricultural incursion into uplands and low latitudes in South America, actually initiated a second era of great disturbance. With the arrival of Europeans, the Andes region was immediately exploited. However, South America's southern cone was at first generally ignored. Deserts along the northern Chilean coast cut it off from easy exploration, impeding immediate annexation by lieutenants of the Spanish Viceroy at Cuzco who sought to establish fiefdoms of their own. However, by the late 16th century, central Chile and eastern Argentina were both found readily accessible by sea. Settlement by ship brought rapid agronomic transformation to central Chile, whose Mediterranean climate was compatible with Spanish agricultural methods. Then, in the 18th and 19th centuries, Spain's power in Europe waned. In the decade following 1810, when Napoleon's victories in Europe temporarily deflated Spanish power over Latin America, settlers from other European nations began flooding the southern cone. A rapid influx of farmers, cattlemen, lumbermen, and fishermen from central and northern Europe rapidly transformed areas of southern Chile. By the late 19th century, further encouraged by Chilean governmental support in quelling local natives and felling forests for agriculture, the southern region was already bearing immense pressure from farming, grazing, fishing, and lumbering. These enterprises thereafter expanded exponentially in the modern era.

To appreciate the pressure of competing herbivores on South America's temperate habitats, one must consider millennial activities of both native and domestic herbivores, vertebrate and invertebrate. Furthermore, due to an oddity of southern temperate agronomy, public land policy in southern South America has perennially allowed unrestricted livestock grazing, even in national parks and preserves. The problem is that southern latitudes are too dry and cool to grow corn, the standard seasonal feed crop for livestock in the Holarctic. Alfalfa, which easily grows in the warmer months in the southern cone, must therefore be relied upon for virtually all livestock feeding, allowing no other alternative in the summer but the wholesale release of livestock to feed on surrounding grasslands. The herds move upland with the season, following the path of fresh foliage—precisely the path Benyamini has documented for populations of butterfly herbivores (what he calls their annual "upslope shift"). If one adds cattle, horses, mules, donkeys and goats to feral rabbits, chinchillas, and various camelids, there results tremendous pressure on grassland environs in these regions. Considering this history, lepidopterists who sometimes question "authenticity" in butterfly records from these regions when specimens have not been collected in the last 50 years should probably rethink their "take" on this issue. Certainly, some old specimens may be mislabelled, but many northern workers tend to think of the agricultural history of the Andes and southern cone along lines similar to North America, a comparison which is simply not valid.

Benyamini first began assessing the problems of habitat destruction and butterfly losses in the Andes and southern cone in his studies of Nabokov's blues. When he arrived in Chile in late 1993, Luis Peña told him he suspected that the long history of agricultural and forest exploitation in the region, coupled with continuous climatic desiccation over the last three decades, had finally produced a "winning combination" on the side of destruction, initiating a possibly irreversible decline in the native insect fauna. Consistent with this fear, butterfly losses in Chile first became apparent to Chile's lepidopterists in the central "Mediterranean Region." Here, Peña reported to Benyamini, a dozen butterfly species named from the region (mostly lycaenids) had

not been caught in decades, some not in fifty years. Peña also reported a similar decline in beetles of Chile's central region, another group of insects that he collected rigorously.

Benyamini's intensive fieldwork after 1993 not only confirmed this fear but compounded it. Benyamini, too, was unable to locate many species once familiar from the central region, and his almost immediate discovery of a new species of *Pseudolucia* there (*P. benyamini* Bálint & Johnson, 1994) revealed its restricted coastal dune habitats already endangered by the proliferation of seaside hotels and homes within easy driving distance from Santiago. By 1995, only one of the original colonies of *P. benyamini* discovered by Benyamini was extant and the species' existence appeared to hinge on survival of its foodplant (*Chorizanthe*, Fabaceae) in a few small areas of thus-far undeveloped military land.

Peña, Ugarte and Benyamini's collections in the north (Region 1, Tarapacá) indicated a similar predicament. Although some butterflies of that region are "buffer" species (coming and going from Peru along the coast), 11 species have not been reported from Tarapacá in the last six years (including 6 lycaenids, 3 skippers, and 2 nymphalids). These comprise 20% of the butterflies once reported from the region. In Antofagasta (Chile's Region 2), 10 species endemic to the high mountains of the region have not been observed there for many years, most still known only from the type series collected in the 1950s by the Peña and others. Since many of these are good indicators of healthy southern Andean habitats, they are worth mentioning individually. They include: *Pyrgus barriosi* Ureta (Hesperiidae), *Tatochila mariae* Herrera, *Tatochila inversa rasmilici* Herrera, *Hypsochila penai* Ureta, *Pierphulia rosea maria* Field & Herrera, *Pierphulia isabella* Field & Herrera (Pieridae), *Argyrophorus penai* Hayward (Satyrinae), *Eiseliana flavaria* (Ureta), *Eiseliana rojasi* (Ureta) and *Pseudolucia oligocyanea* (Ureta) (Lycaenidae). Many visits to the region by Peña and Ugarte, and concerted efforts by Benyamini in the last five years did not turn these species up. Benyamini's efforts to locate a newly named blue from Coquimbo, *Pseudolucia scintilla* Balletto (simultaneously named *P. kinbote* by Bálint and Johnson from specimens collected by Peña in the 1950s) found its shrubland habitats extremely desiccated, perhaps the only hope being rediscovery during deserts "blooms" (which have become more and more infrequent in recent decades). Benyamini also corroborated Peña's fear that *Colias flaveola* Blanchard was disappearing in the montane areas of Coquimbo. Peña had once considered the species common above 3000m (along the Paso de Agua Negro between La Serena, Chile, and San Juan, Argentina) but reported his latest trips to the region found it curiously missing. Benyamini sampled the area for the ensuing five years and caught only ten scattered specimens. Its *Astragalus* foodplant (Fabaceae) was extremely rare on the Chilean side of the pass, a region in which he saw tens of thousands of cattle in vast, wandering, herds.

East of the central region of Chile, along the Andean spine shared with Argentina, Benyamini was surprised at the year to year destruction of habitats where he was seeking the life history of *Pseudolucia argentina* Balletto (simultaneously named from Aconcagua National Park in 1994 by Bálint and Johnson as *P. aconcagua*). He eventually discovered its foodplant to be *Adesmia* (Fabaceae) but observing the destruction of this plant within the national park by grazing animals was an "eye-opener." Along the trails used by the commercial climbing trade, mule trains are a staple and proliferation of rabbits (due to a die-off of their natural predators, pumas, eagles, and foxes) a looming problem. Throughout the park, *Adesmia* plants had been reduced to nothing,

many eaten completely into the roots. *Pseudolucia argentina*, its types series being from older museum specimens, was nowhere to be found. Frequent collections within the park throughout the 1990s convinced Benyamini that the species was extirpated there. He was able to document its life history from a few specimens caught in fenced areas around a railway tunnel outside the national park. He also learned that *Adesmia* (which is also the foodplant of blues of the *sibylla*-group of blues treated by Nabokov) was a favorite of cattle, goats, donkeys, horses, and mules. He timed a goat digging into one *Adesmia* plant, eating it to the roots in under two minutes. Benyamini also reported the disappearance of *Colias mendozina* Breyer from the region, an observation also shared by Arthur Shapiro in recent publications, and linked it to the same habitat destruction. Benyamini discovered that its foodplant is an *Astragalus* species, which is the favorite food of the locally proliferating rabbit population. The sulphur consumes the *Astragalus* leaves, while a blue, *Pseudolucia andina*, burrows into the pods, an economical "resource partitioning." However, the rabbits consume everything. The blue is also now absent from the park, although once well-known from there in old museum specimens. Benyamini was able to rear both species from small samples gathered along the fenced railway areas where he had also located *P. argentina*.

Similar evidence of disappearing butterflies was apparent south of the central region in Chile's temperate forest regions. Here, massive forest destruction is the problem. Logging began with the establishment of the first settlements in the region and grew rapidly in the 19th century when the Chilean Government, in part out of fear of possible Argentine incursion, promoted immigration from central and northern Europe and transformation of the landscape along European lines. Settlers established vast cattle ranches and forested areas were rapidly cut for timber and replaced with cultivation. Today, driving along the Pan-American Highway 5 from Concepción to Puerto Montt, Benyamini reports the dominant tree is Oregon "plantation" pine, which has replaced the native forests. There is international demand for high quality insect-free Chilean wood and the recent flourish in uses for wood chips has only escalated the process. Peña told Benyamini that, historically, attempts by Chile's government to regulate lumbering had been widely disregarded. He recounted how he was almost killed after reporting violations he had observed to the police. Someone mistaken for him was attacked and severely injured. It is an unfortunate fact of life that wood, and wood chips, are still the staple for all heating needs across the region.

Benyamini came to this region searching for the life history of the cluster of blues collectively referred to in common usage as *Pseudolucia andina*. Benyamini's research has documented different biological species in this cluster whose "arrowhead"-shaped wing patterns confused even Nabokov into thinking they belonged to the Holarctic genus *Scolitantides*. Nabokov was never able to locate a specimen to dissect and consequently did not know that *P. andina*'s genitalia were typical of his genus *Pseudolucia*! Benyamini's research has already been thwarted by the loss of these entities at their type localities before the work can even be completed. Benyamini notes that among the butterflies with the greatest loss in the south are satyrids endemic to the southern forests. Their population decline is so great that most of them have disappeared completely from the region where, particularly on the farm and ranchlands, *Colias vauthieri* Guérin-Ménéville (adapted to domestic *Trifolium*, Fabaceae) is now the common butterfly. Benyamini reports that Chile's "Giant Golden Skipper", *Argopteron aureum* Peña (named only in 1968 and endemic to the southern forests) also now appears to be extinct. In a foreboding,

but informative, development from his studies, Benyamini's rearings indicate that South American blues cannot prolong diapause in response to hostile climatic conditions (a trait the Israeli lepidopterist documented as relatively common in desert butterflies of the Middle East). Benyamini suggests this information may buttress the view that the ecological pressures now threatening temperate South American butterflies are of relatively recent origin.

During his tenure in Chile, Benyamini spent many hours with personnel of the governmental authority, CONAF (Corporación Nacional Forestal), which manages Chile's environmental protection, parks and preserves. Benyamini has little doubt that CONAF officials understand the urgency of the situation in Chile. The problem seems to be the larger question of the agency's overall power and influence. Benyamini suggests that only some wedding of the environmentally favorable instincts of CONAF and the world's various "green forces" may eventually wield some influence across the region. However, it is difficult to speculate on the probability of this at present. Arthur Shapiro, whose work on southern pierids was especially showcased in *Nabokov's Blues*, assessed the situation there for me as "depressing."

Consistent with the words of Vladimir Nabokov in the epigram introducing this commentary, the dimensions of the ecological nightmare in South America's temperate regions cannot presently be measured or characterized with statistical accuracy. Many of the butterflies involved have been known to science less than five years, their ecological problems only elucidated by habitat and life history studies during that same time period. But the potential nightmare can be more or less precisely described, as I have hoped to do herein, based on the important work of Dubi Benyamini. Hopefully, problems of language and relative isolation of Israeli lepidoptery aside, Benyamini will find the resources for further publication of his important discoveries.

Benyamini went to Chile in 1993 in search of the Nabokov's blues being named by Zsolt Bálint and me. He, Alfredo Ugarte and the late Luis Peña became fast friends. It is fitting that as the Centenary year for Vladimir Nabokov closes, lepidopterists can begin to have a bit of A. Townsend Peterson's "synthesis" in their understanding of South America's temperate region butterflies, a diverse component of which is comprised of blues. For their pointing out the potential nightmare that may ensue in those poorly known habitats and faunas, lepidopterists owe each of these pioneer workers a great debt.

Notes and Sources

In preparing this general interest note, I drew from Dubi Benyamini's publications on life histories of temperate South American butterflies (*Reports of the Museum of Natural History, University of Wisconsin*, 1994, Nos. 51 & 52) and additional notes kindly provided by him (including botanical comments by Dr. E. Gomez-Sosa, Darwinian Botanical Institute, Buenos Aires, Argentina). Also utilized was a large body of miscellaneous literature concerning temperate South American habitats and history gathered during the writing of *Nabokov's Blues*, including books or papers by such writers as (abbreviating all but surname) W. D. Beatty, I. J. Cox, G. J. Butland, P. E. James, R. Levine, J. A. Mason, K. P. Schmidt, J. R. Scoble, J. L. Tigner, and A. P. Whitaker, and "inhouse" environmental publications provided by The Nature Conservancy and The World Wildlife Fund. Peña and Ugarte's *Butterflies of Chile* (1997, Editorial Universitaria, Santiago) and the books of the Nabokov Centenary (Funke's *Vera's Butterflies* (1999, New York: Glenn Horowitz Bookseller), Johnson and Coates' *Nabokov's Blues* (1999, Cambridge, Ma: Zoland Books), and Boyd and Pyle's *Nabokov's Butterflies* (2000, Boston: Beacon Press) need no further introduction to lepidopterists. Other, less familiar, citations require the following specific

listings:

- Nabokov, V. 1945. Notes on Neotropical Plebejinae (Lycaenidae, Lepidoptera). *Psyche*, 52:1-61.
- Peterson, A. T. 1998. Overview. New Species and New Species Limits in Birds. *Auk*, 115:555-558 (originally brought to my attention by George T. Austin).
- Mayr, E. 1946. The Number of Species of Birds. *Auk*, 63:64-69.
- Shapiro, A. 1989. Ignorance in High Places. *Paleobiology*, 15: 61-67.

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TAIWAN NEWS

Mr. Hsiao-Yue Wang, of the Taiwan Museum (now called the Taiwan National Museum), has informed ATL that all insect collections in Taiwan are safe following the recent earthquakes on the island state.

The most massive damage occurred in central Taiwan, especially around the former butterfly business city of Puli, near Sun-Moon Lake. Even there, however, the Wu family butterfly museum and the Lo family butterfly farms and entomologists' hotel are all safe. Past lepidopterist visitors to Taiwan will be familiar with these two sites.

Mountain roads, however, are in damaged condition in many areas. The Chingshan Hostel site in the central mountains was completely destroyed, along with the entire mountain-side forest which all fell into the valley below (this is on the main cross-island road from Taichung to Lishan). The Taiwan engineers, will quickly repair damaged roads but the central highway will certainly take some time yet. Other sites in Taiwan appear to not have experienced much damage.

MEMBERS WITH UNKNOWN ADDRESSES

The following ATL members have not sent in address changes. If anyone knows these persons, they could help by sending us the correct addresses or have the persons involved do so. In some cases, we have journals and newsletters to send but do not have a corrected address. Listed are names and last known city of residence.

Abey, Matthew O. - Topsfield, MA
Ahola, Matti - Hämeenkoski, Finland
Basa-Mauri, Esteve - Granollers, Spain
Bito, Naruto, Nagoya, Japan
Boardman, S. A. - Pacific, MO
Busby, George W., III - Houston, TX
Bruha, Don - San Carlos, CA
Caine, Laurence - Newburgh, NY
Cushing, David - Richmond, TX
Daggy, Tom - Davidson, NC
Deering, Mark - Lake St. Louis, MO
Dion, Yves-Pascal - Charlesbourg, PQ, Canada
Do Val, Francisca C. - São Paulo, Brazil

Edmonds, William M. M. - Toronto, ON, Canada
Endo, Hiroshi - Motosu-gun, Japan
Finch, Elizabeth - Pompano Beach, FL
Fortner, Gretchen L. - Pasco, WA
Gerardo, Nicole - Houston, TX
Golia, Vince - Delray Beach, FL
Guppy, Chris - Quesnal, BC, Canada
Hart, Len - Boldon Colliery, T&N, England
Hayashi, Joe - San Jose, CA
Hecker, Thomas - St. Louis, MO
Higgins, Dixie T. - Dade City, FL
Kondla, Norbert - McBride, BC, Canada
Kunuklovich, Kyrill - Charlottesville, VA

Lamy, Jean R. - Trois-Rivieres, PQ, Canada
Lane, John - Santa Cruz, CA
Loertscher, Mathias - Berne, Switzerland
Orioli, Chris - Fairfield, CT
Parker, Patrick H. - State College, PA
Quinn, Michael A. - College Station, TX
Rock, William B., Jr. - Chicago, IL
Rosche, Richard C. - Chadron, NE
Schulze, Christian H. - Würzburg, Germany
Vaglia, Thierry - Montreal, PQ, Canada
Watson, Charles N., Jr. - Franklin, TN
Willmott, A. P. - Cambridge, England

BMNH Copyright (continued from p. 3)

If it is the policy of the NHM not to impose fees on those using the NHM for academic research, why is this not explained in the NHM statement? This was the question I asked Chris Mills. He responded that the policy had been introduced simply to safeguard the position of the Museum, adding that he believed that all museums should now be seriously considering this issue.

It would appear that the policy adopted by the NHM is similar to that announced several years ago over the introduction of bench fees. It will be recollected that this policy also raised a storm of criticism. The NHM gave itself the right to charge bench-fees, but in practical application free access continues to be available to bona fide academic researchers who are not grant-supported. In the case of those supported by grants, the NHM requests that provision be made for bench fees at the project preparation stage. In practical terms it is hard to argue that the policy has had a discriminatory effect in respect of bona fide and worthwhile research. It has in the meantime produced modest but useful income for the whole NHM of the order of £50-75,000 per annum.

There is every indication that the recent copyright regulation will be implemented in a similar discretionary fashion.

So what of the comments? One of the most forceful attacks on the new copyright policy came from the US based *Lepidoptera News* which ran an article by its editor, John Heppner. However he also printed a reply from Dick Vane-Wright part of which has been quoted above. Amongst a number of fiery letters of support from entomological researchers round the world, the most measured and balanced came from the well-known Prof. Paul Ehrlich, of Stanford University, USA. His comments in part read as follows:

"... one can be sympathetic to the plight of those trying to keep the BMNH going in the face of extreme cutbacks and the utter ignorance of most of the public and decision makers of the importance of biodiversity in general and museums in particular. In their current straits it is not unreasonable for the administration of the BMNH to attempt to get the systematic community to help pay to keep the collections functional. If dermestids eat them (as they did the Stanford collections, which were not maintained in the period between Gordon Ferris' death and my arrival), the loss will be incalculable. Therefore charging desk fees for those that can afford them and royalties from those (like the publishers of butterfly books) who profit from pictures of BMNH specimens, seems a sensible way to try to raise funds.

Above all, it is the responsibility of all scientists to try to educate the public to the importance of the work they do. We need a new ethic in which scientific work is not considered complete until the public is informed about the results. Then the value of institutions like the BMNH will be appreciated and people will feel their tax money well spent supporting them ..."

The sentiments seem eminently sensible, and assuming the policy is applied with the same degree of discretion as applies to bench fees, it is difficult to believe it will lead to any hardship.

HENRY BARLOW
Kuala Lumpur, Malaysia

POLYOMMATINE ADDITIONS TO BERNARD D'ABRERA'S NEOTROPICAL LYCAENID VOLUME

ZSOLT BÁLINT

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Publishing part VII Lycaenidae of the *Butterflies of the Neotropical Region* in 1995, Bernard D'Abrera has completed his grandiose *Butterflies of the World* series (D'Abrera, 1995). The large folio pages will serve as an unavoidable basis for taxonomists of the next century. I praise D'Abrera's effort, because through his series a large amount of information is made available to the public: the famous BMNH (British Museum of Natural History, London; now called the Natural History Museum) card index, historical determinations and misinterpretations, historical specimens and their data. All of this can be now on a single bookshelf.

I was waiting for this last volume very much. As I knew that the BMNH polyommata material was very weak in blues, I compiled a small collection of my very recent findings and sent these to Bernard D'Abrera for his purpose, once I knew that the volume was in preparation. The material could be photographed in the last minute and be attached to the main body of the book as an Appendix. Unfortunately some inconsistencies appeared in the text of this Appendix concerning scientific names, authors and localities. A list is provided here to correct all of them.

I split the data into Section 1, BMNH material, and Section 2, material from various sources. I keep the original numerical sequence of the taxa listed in the Appendix, giving the combinations and authors according to D'Abrera. After the equals sign (=), I list the correct scientific name with the authors and year of description in bold typeface. Citations for original descriptions are not added, remaining consistent with the original body of the Appendix text. References can easily be taken from the recent publications of Gerardo Lamas, if necessary (Lamas *et al.* 1995; Lamas, 1997, 1998, 1999). After the scientific name, a note concerning the status of the specimen follows; where it appears to be a type, then with the acronym of its deposition (according to Heppner and Lamas, 1982). Where incorrect spelling of a locality occurs, or any other similar matter deserving correction, the original is always cited first between, then after the equals sign (=) the correct spelling is given.

Section 1. BMNH Material

Nos. 1-19, p. 1254

1. ? Gen. *syphris* Draudt, 1921 = *Eldoradina syphris* (Draudt, 1921)
2. ? Gen., ? sp. Balint M/S = *Eldoradina cyanea* (Balletto, 1993), holotype, and also holotype of *Polytheclus cincinnatus* Bálint & Johnson, 1993
3. *Nabokovia faga* Dognin, 1895 = *Nabokovia cuzquenha* Bálint & Lamas, 1996, 'Turco' = Cuzco
4. *Pseudolucia chilensis* Blanchard, 1852 = *Pseudolucia chilensis* (Blanchard, 1852), 'Valdavia' = Valdivia, region in Chile
5. *Pseudolucia parana* Balint, 1992 = *Pseudolucia parana* Bálint, 1993, 'Castro Parana' = Castro, Paraná, Brazil
6. *Pseudolucia collina* Phillipi, 1860 = *Pseudolucia lyrnessa* (Hewitson, 1874)
7. *Paralycæides vapa* Staudinger, 1894 = *Paralycæides vapa* (Staudinger, 1894), 'Coca' = Staudinger's manuscript name for the taxon
8. *Madeleinea moza* Staudinger, 1894 = *Madeleinea moza* (Staudinger, 1894), 'Cocopata' = Cocapata, locality in Bolivia

9. *Madeleinea pelorias* Weyermer, 1890 = *Madeleinea pelorias* (Weyermer, 1890)
10. *Madeleinea pacis* Draudt, 1921 = *Madeleinea pacis* (Draudt, 1921)
11. *Madeleinea* ? sp., Balint M/S = *Madeleinea ludicra* (Weyermer, 1890)
12. *Madeleinea koa* Druce, 1876 = *Madeleinea* sp. n. p. *ludicra*, this is still an undescribed taxon
13. *Madeleinea* ? sp., Balint M/S = *Madeleinea nodo* Bálint & Johnson, 1995
14. *Madeleinea* ? sp., Balint M/S = *Pseudolucia argentina* (Balletto, 1993), lectotype (designated by me, see Bálint 1999), also holotype of *Pseudolucia sirin* Bálint, 1993, 'Reconte Inca' = Puente del Inca, the border station between Chile and Argentina
15. *Pseudolucia andina* Calvert, 1894 = *Pseudolucia andina* (Bartlett-Calvert, 1894)
16. *Itylos titicaca* Staudinger, 1894 = *Itylos titicaca* (Weyermer, 1890)
17. *Itylos fumosus* Balletto = two taxa are involved: v = *Itylos titicaca* ssp. n.; r = *Itylos fumosus* (Balletto, 1993), holotype and also holotype of *Itylos luzhin* Bálint, 1993, 'Paramo' = paramo above Coronges, locality in dep. Ancash, Peru
18. *Itylos bogotana* Draudt, 1922 = *Hemiargus bogotanus* (Draudt, 1921), 'Puerta de Boyacá' = Puente de Boyaca
19. *Itylos* ? sp., Balint M/S = *Echinargus huntingtoni* Rindge & Comstock, 1953

Nos. 42-54, pp 1257-1258

42. *Leptotes marina* Reakirt = *Leptotes marina* (Reakirt, 1896)
43. *Brephidium pseudofea* Morrison = *Brephidium pseudofea* (Morrison, 1873)
44. *Brephidium* ? sp. = *Brephidium exilis yucateca* Clench, 1970
45. *Echinargus huntingtoni* Rindge & Comstock = *Echinargus huntingtoni* Rindge & Comstock, 1953
46. *Echinargus isola* Reakirt = *Echinargus isola* (Reakirt, [1867])
47. *Echinargus martha* Dognin = *Echinargus martha* (Dognin, 1887)
48. *Cyclargus (Hemiargus) dominica* Moschler = *Cyclargus dominica* (Möschler, 1886)
49. *Cyclargus (Hemiargus) thomasi* Clench = *Cyclargus thomasi* (Clench, 1941)
50. *Cyclargus ammon* Lucas = *Cyclargus ammon* (Lucas, 1857)
51. *Cyclargus hanno* Stoll = *Hemiargus hanno* (Stoll, [1790])
52. *C. gyas* Edwards, 1871 = *Hemiargus ceraunus* (Fabricius, 1793), 'W. Yacatan' = W. Yucatan
53. *Cyclargus ramon* Dognin = *Hemiargus ramon* (Dognin, 1887), 'Limato Moisca' = Lima to Chosica
54. *Pseudolucia lyrnessa* Hewitson = *Pseudolucia tamara* Bálint & Johnson, 1995, 'L. Nahuel, Hupi' = Lake Nahuel Huapi

Section 2. Material from Various Sources

Nos. 20-41, pp 1255-1256

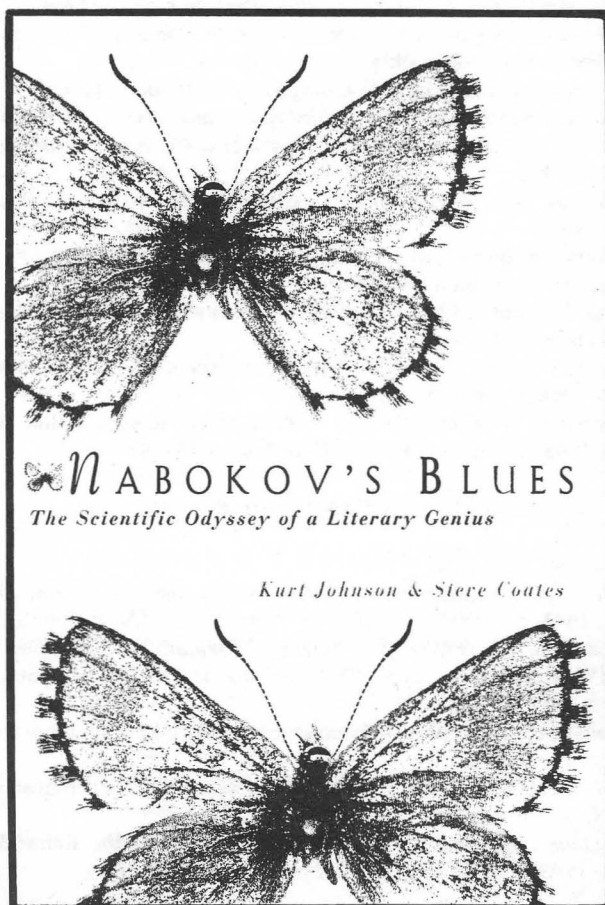
20. *Pseudolucia aureliana* Balint = *Pseudolucia aureliana* Bálint & Johnson, 1993, r = HNHN paratype (= allotype), v = AMNH holotype
21. *Pseudolucia oligocyana* [sic] Balint = *Pseudolucia oligocyana* (Ureta, 1956), HNHN paratype, 'Tumbre Carol de Antofag.' = Tumbre, Cordillera de Antofagasta
22. *Pseudolucia penai* Balint = *Pseudolucia penai* Bálint & Johnson, 1993, UMCE holotype
23. *Pseudolucia vera* Balint = *Pseudolucia vera* Bálint & Johnson, 1993, HNHN paratype
24. *Pseudolucia benyamini* Balint = *Pseudolucia benyamini* Bálint & Johnson, 1993, HNHN holotype and paratype (= allotype)

25. *Pseudolucia charlotte* Balint & Johnson = *Pseudolucia charlotte* Bálint & Johnson, 1993, HNHN male and female paratype, 'Pucaru, Patagonie' = Pucará, Patagonia
26. *Pseudolucia annamaria* Balint & Johnson = *Pseudolucia annamaria* Bálint & Johnson, 1993, HNHN male and female paratype
27. *Pseudolucia hazeorum* Balint & Johnson = *Pseudolucia hazeorum* Bálint & Johnson, 1993, HNHN male and female paratype
28. *Pseudolucia clarea* Balint & Johnson = *Pseudolucia clarea* Bálint & Johnson, 1993, HNHN specimens
29. *Pseudolucia shapiro* Balint & Johnson = *Pseudolucia shapiro* Bálint & Johnson, 1993, AMNH holotype
30. *Pseudolucia lanin* Balint & Johnson = *Pseudolucia lanin* Bálint & Johnson, 1993, HNHN material
31. *Pseudolucia collina* Philippi = *Pseudolucia collina* (Philippi, 1859), HNHN material
32. *Pseudolucia* [sic] *talina* [sic] Balint = *Pseudolucia talia* Benyamini, Bálint & Johnson, 1993, HNHN holotype male, HNHN paratype (= allotype) female
33. *Pseudolucia nequenensis* [sic] Balint = *Pseudolucia neuquensis* Bálint & Johnson, 1993, ZMK holotype male, HNHN paratype (= allotype) female, 'Neaquen' = Neuquén
34. *Pseudolucia avishai* Balint = *Pseudolucia avishai* Benyamini, Bálint & Johnson, 1995, HNHN holotype male, HNHN paratype (= allotype female)
35. *Pseudolucia* [sic] *andina* Barlett-Calvert = *Pseudolucia andina* (Bartlett-Calvert, 1894), HNHN material
36. *Paralycaeus shade* Balint = *Paralycaeus shade* Bálint, 1993, MNHN holotype and paratype (= allotype) female
37. *Madeleinea nodo* Balint & Johnson = *Madeleinea nodo* Bálint & Johnson, 1995, HNHN paratype
38. *Madeleinea lea* Balint = *Madeleinea lea* Benyamini, Bálint & Johnson, 1995, HNHN holotype

39. *Madeleinea vokoban* Balint = *Madeleinea vokoban* Bálint & Johnson, 1995, AMNH holotype
40. *Madeleinea sigal* Balint = *Madeleinea sigal* Benyamini, Bálint & Johnson, 1995, HNHN holotype
41. *Madeleinea cobaltina* [sic] Balint = *Madeleinea cobaltana* Bálint & Lamas, 1994, v = HNHN material, r = AMNH paratype female, 'Erlich' = Ehrlich

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THE PIONEER CENTURY OF AMERICAN ENTOMOLOGY

by H. B. Weiss

Continued from Chapter VI (see *Lepidoptera News*, June 1999) - J. B. Heppner, Editor

CHAPTER VII

THE GLOVER AND OSTEN-SACKEN PERIOD (1855 to 1860)

JOHN KIRKPATRICK

John Kirkpatrick of Cleveland, Ohio, from 1855 to 1861, wrote for the *Ohio Agricultural Reports* accounts of various economic insects such as bot flies, the plum curculio, armyworm, the pea weevil, the apple buprestid, rose chafer, Hessian fly, the grain aphid, etc. These appeared in volumes 10, 12, 13, 15 and 16. For the most part, Kirkpatrick's accounts were sound and orderly for the time, as he was familiar with the writings of Fitch, Harris, Kirtland and Say. Kirkpatrick also wrote entomological articles for the *Ohio Farmer*, and in 1864 the Entomological Society of Philadelphia printed in its *Proceedings* (vol. 3, pp. 328-330) his "List of diurnal Lepidoptera found in the vicinity of Cleveland, Ohio," in which he presented a list of species, with notes on their abundance.

FERDINAND HEINRICH STRECKER (1836-1901)

Although his publishing activities fall outside the period covered by this book, the entomological activity of Herman Strecker took place before 1865 and it is proper to mention them at this time. He was born in Philadelphia, March 24, 1836, of German parentage, his father having come to this country in 1835, locating first in Philadelphia and then in Reading (1846) where he engaged in business as a sculptor. In 1856, the elder Strecker died and Herman succeeded him in business, having worked with his father since his twelfth year. His hobbies were literary and scientific work, and the collecting of butterflies, all of which he did in his spare time. In time he owned the largest, most valuable and most remarkable collection of butterflies and moths on the American continent, comprising over 200,000 specimens from every part of the globe. In his early days, he visited Philadelphia and studied, at the library of the Academy of Natural Sciences, all branches of natural history, but finally narrowed down to insects, and then to Lepidoptera only.

In 1872, he commenced his work entitled *Lepidoptera*, *Rhopaloceres* and *Heteroceres*, *Indigenous and Exotic, with Descriptions and Colored Illustrations*, with which all lepidopterists are familiar. It was published in an edition of three hundred and illustrated by Strecker, who made the drawings on stone and colored them by hand. Eighteen parts appeared between 1872 and 1900. The plates were excellent and they appeared at a time when good figures of American insects were none too common. In 1878, he published his *Butterflies and Moths of North America* with directions for collecting, classifying, breeding, preparing, packing, etc., a catalogue of Macrolepidoptera, a bibliography and glossary.

In consideration of his knowledge, Franklin and Marshall College conferred the degree of Doctor of Philosophy upon him, in 1890. At one time Strecker traveled considerably and in 1855-56 he visited many islands in the West Indies. He also traveled in Mexico and Central America, examining Aztec monuments and adding to his collection. He was acquainted with some of the dead languages and a master of many living foreign ones. He eventually became one of the most eminent authorities in America on the Lepidoptera. At one time his collection contained upwards of three hundred types and as many co-types. He was constantly visited by scientific men from all parts of the world and his correspondence was considerable.

Dr. Ferdinand Heinrich Strecker died November 30, 1901, after a stroke of apoplexy. In his home at Reading, one entire floor of his house was devoted to his collection, arranged in glass-top drawers. His entire collection represented forty years of effort and an expenditure of \$30,000.00.

HANS HERMAN BEHR (1818-1904)

At a meeting of the Academy of Natural Sciences of California held August 27, 1855, Dr. Hans Herman Behr donated to the cabinet a specimen of *Saturnia ceanothi* and exhibited specimens of insects from Honolulu, saying that fifty per cent of them appeared to be American, twenty-five per cent East Indian, and twenty-five per cent native to the islands.

At the April 21, 1862 meeting, Behr read a paper on "Our California Argynnidæ," describing nine species in Latin with notes in English calling attention to their similarities and localities. This was published in the *Proceedings* (vol. 2, pp. 172-177). This was the beginning of a series of papers on California Lepidoptera that appeared in volumes 2 and 3 of the *Proceedings of the Academy of Natural Sciences of California*. These papers dealt with food plants, distribution, descriptions of new species (in Latin), identities and relationships. Doctor Behr wrote also upon other natural history subjects.

Doctor Behr was born August 18, 1818, at Coethen, in the German duchy of Anhalt. He studied at the Prince's college in Zerbst, at the gymnasium in Coethen and at the universities of Halle and of Würzburg, finally graduating as an M.D., from Berlin University in 1843. Medicine and natural science occupied his interest and at the time of his graduation entomology was receiving his attention. Upon the advice of Alexander von Humboldt and other prominent scientists, he traveled all over the world, visiting Australia, Brazil, Java and living two years in the Philippines. Returning to Berlin he practiced medicine, but after a while he visited the East Indies and in 1851 San Francisco, California, where he remained, except for a trip to Germany in 1853 to bring back his Polish bride, Miss Agnes Omylska. In 1854, he joined the California Academy of Sciences, eventually becoming curator and second vice-president. For many years he was professor of botany at the California College of Pharmacy and during that period he wrote two small books on the *Flora of San Francisco* to assist the students. He brought to the Academy, at a time when its founders were mostly amateurs, his solid background of learning and the rich experience of his foreign travels. He spoke more than six modern languages; he was well informed on comparative philology, and on the mythology and religion of East India; he knew Hebrew and Sanskrit, and of course Latin and Greek. During the meetings of the Academy he invariably had something of interest to say on almost every subject that was discussed.

In addition to his scientific work, Doctor Behr wrote several volumes of prose and poetry. A novel of his life in California was published in a magazine in Germany, and some of his poems appeared in the leading magazines there. His adventures in the Philippines were embodied in an article published in the *Atlantic*

Monthly. He was one of the early members of the Bohemian Club of San Francisco and the papers written by him for the amusement of the members were collected and printed under the title *The Hoot of the Owl*.

Behr was an active enemy of medical and scientific quacks and often expressed his opinions of them quite frankly, to the disadvantage of the financial success of his medical practice. As a result, he made enemies, one in particular, who started in his paper the popular Lutheran pastime of Jesuit baiting, as Behr was a Catholic. As a result Behr lost many of his German tradesmen-patients and he found it necessary to move into another German neighborhood where the residents were more intelligent. It is recorded that at one time Doctor Behr named a louse after his enemy but no record of this appears to be available.

Doctor Behr died in San Francisco on March 6, 1904, in his eighty-sixth year. His large and valuable collection of Lepidoptera was presented to the California Academy of Sciences previous to his death, but later it was unfortunately destroyed by fire. At his death, California lost a many-sided physician, a keen scientist, an author, poet, humorist and a cultured citizen.

PHILIP REESE UHLER (1835-1913)

While Doctor Behr was publishing on the Lepidoptera of California, a young man of twenty years, the son of a well-to-do philanthropic merchant of Baltimore, published his first paper in the *Proceedings of the Academy of Natural Sciences of Philadelphia* in 1856 (vol. 7, pp. 415-418). This was Philip Reese Uhler and the title of his work was "Descriptions of a few species of Coleoptera, supposed to be new." His next paper also appeared in the *Proceedings of the Academy* (vol. 9, pp. 87-63) and was entitled "A contribution to the Neuropterology of the United States." This included descriptions of new species from Maryland, Nebraska and California. This was followed the next year by "Descriptions of New Species of Neuropterous insects collected by the Rodger's North Pacific Expedition" (*Proc. Acad. Nat. Sci.*, vol. 10, pp. 29-31). His first publication on the Hemiptera appeared in 1862 and was devoted to the Hemiptera of the North Pacific Exploring Expedition. This too was published in the *Proceedings of the Academy* (vol. 13, pp. 282-284; 286-287). From this time on nearly all his papers related to the Hemiptera. In 1903, Samuel Henshaw published a list of these in *Psyche* (vol. 10) in which fifty-two titles are mentioned, only seven of which were published before 1865. Many of Uhler's papers relate to collections made during surveys of western areas. Numerous collectors and institutions sent their Hemiptera to Uhler for identification. He had a broad grasp of the entire group and he described many new species. In the *Standard Natural History*, the chapter on Hemiptera was written by Uhler.

Along with Harris and Fitch, Uhler realized the practical importance of economic entomology. Under the title "Insects Injurious to Vegetation," Uhler was the author of a paper that appeared in the *United States Commissioner of Patents Agricultural Reports for 1860* (pp. 312-322), in which he spoke of the millions of dollars' worth of damage that was done to fruits and vegetables by insects. He insisted that attention should be paid to the practical side of entomology. His paper dealt with the insect enemies of pears and apples and gave life-history, notes, types of injury, remedies, etc. Much of the information was probably drawn from the works of Harris and Fitch. Uhler also translated and edited with the help of Osten-Sacken, Hagen's *Synopsis of the Neuroptera of North America*, published by the Smithsonian Institution in 1861.

Uhler was born at Baltimore, Maryland, June 3, 1835. When he was ten years old, his father purchased a farm near Reisterstown, and at that time his interest in insects was discovered and encouraged by J. F. Wild, a German entomologist, and by John G. Morris, pastor of the First English Lutheran Church, which Uhler's grandfather assisted in founding. His early education took place at the Latin school of

Daniel Jones and at Baltimore College. In 1863, he became assistant librarian of the Peabody Institute at Baltimore, but early in 1864 he went to Cambridge, Massachusetts, at the request of Professor Agassiz. Here he was librarian in the Museum of Comparative Zoology, assisted Professor Agassiz, and taught entomology to the undergraduates. At the same time he was a regular student in the Lawrence Scientific School of Harvard University and attended the lectures by Agassiz, Asa Gray, Jeffries Wyman, Alexander Agassiz, and N. S. Shaler. Uhler joined the Academy of Natural Sciences of Philadelphia in 1858 and the Entomological Society of Philadelphia in 1859.

After leaving his position at Harvard, which was filled by H. A. Hagen, he returned to Baltimore and became assistant librarian of the Peabody Library. In 1870, he was made librarian. Regardless of his official duties, he studied entomology all his life, and geology interested him as well. His life was that of a student and he disliked publicity. When Johns Hopkins University was organized, he was the first associate professor who was appointed and in that position he remained until his death. He was curator of the Maryland Academy of Sciences, vice-president and later president. And in 1900, he was given the honorary degree of LL.D. by New York University.

This cultured and charming personality, tireless worker and typical naturalist died at his home in Baltimore, October 21, 1913. His large and valuable collection was divided between the Museum of Comparative Zoology and the United States National Museum.

TOWNEND GLOVER (1813-1883)

Another entomologist who started his entomological publishing career about the middle of the nineteenth century was Townend Glover, the first entomologist of the United States Department of Agriculture. It would be highly desirable to reprint here the very interesting account of the life and entomological work of Glover written by Charles R. Dodge and published in 1888 as Bulletin 18 of the Division of Entomology, United States Department of Agriculture, but as this is not possible it will be necessary to extract and summarize from Mr. Dodge's account the main facts about that unique personality, Townend Glover.

Before doing so, however, something should be said about Glover's published writings. His earliest works of which there is record were upon pomological subjects and appeared in 1853. He wrote, once in a while, for the *Fishkill Standard*, but not upon entomological subjects. In the *American Agriculturist* for November 9, 1853, there is a short article entitled "Popular Fallacies," that is devoted to the impracticable remedies that appear periodically in the farm press, usually unchallenged. Most of his writings on insects appeared in the various annual reports of the United States Commissioner of Patents (1854, 1855, 1858, 1859), in the monthly reports of the Department of Agriculture (1866, Jan. 1867, Jan. 1868, 1871, 1872, 1873, 1874, 1875, 1876) and in the annual reports of the Commissioner of Agriculture (1863 to 1877 incl.). In these reports, Glover covered insects injurious to cotton, wheat, grape, orange, the plum curculio, codling moth, peach borer, the hang [bag] worm, the potato beetle, destructive grasshoppers in California, the Utah cricket, the chinch bug, thrips, twig-borers, the Phylloxera, the grape gall louse, beneficial insects, etc., and various statements relative to the progress of the Museum.

In addition, Glover wrote "On Destroying Injurious Insects" for the *American Agriculturist* of October, 1856, and "A Vindication of the Entomological Division of the United States Department of Agriculture." This latter paper of six pages was privately printed in 1872 and was published as a reply to certain statements that had appeared in a pamphlet, issued in 1872, by the chief clerk of the Department, entitled "The Department of Agriculture, its History and Objects."

Of considerable interest, however, is Glover's ambitious work on insects, known as *Illustrations of North American Entomology*. In a letter which he wrote to Mr. Clapham in 1856, he expressed his idea

as follows:

"Another idea is to go on with my work on in sects—to have large engravings of our staple agricultural productions, such as cotton, corn, wheat, potatoes, and so forth. On the wheat root, place the cut-worm, chrysalis, and moth; on the ear place the wheat midge, etc., in short, to place every insect that destroys wheat upon the part injured, natural size and magnified, the plates to be issued by the Government, and distributed to every leading society, to be placed in their agricultural rooms. By looking at the place affected the farmer can see the insect in all its stages, and at the same time, by referring to the Patent Office Agricultural Reports, can find out the remedies in general use."

As early as 1847, Glover spent some time in Albany, New York, with Gavitt, the engraver, perfecting himself in copper engraving, and as time went on he made various plates both upon copper and upon stone. Notes accumulated, unfigured specimens were obtained from various entomologists, drawings were made and the work continued on and on. By the time a large number of plates had been made, his observations became more extended, entomological papers were increasing, and his notes all had to be recopied and extended. As time went on, his ideas changed. A complete reference book on entomology was his ideal, with appropriate and exhaustive text, that could be supplemented by new discoveries. But as time still went on, the publication of the work in its entirety became more and more remote. And so, in order to obtain recognition of the importance and usefulness of his work, he decided upon preliminary publication of some of the plates. So in 1871 he brought out an author's edition of 250 copies of 13 plates on the Orthoptera with letterpress, which included an introduction, arrangement of families, notes on habits and food of orthopterous parasites, food of the Orthoptera, list of genera and species. The work was imperfect and incomplete, and in addition it was a poor sample of what Glover had really done in the twelve or more years he had devoted to the undertaking. Fifty copies were given to prominent entomologists and the remainder eventually found their way to destruction as waste paper. However, Mr Glover received many favorable notices and letters about his publication and in 1874 he brought out a small edition of the Diptera, treated along the same lines but with more complete text. This was a work of one hundred and thirty-three pages printed from stone on plate paper, the letterpress being a facsimile of Glover's handwriting. Ten plates and their explanations accompanied the text. This was entitled *Manuscript Notes from my Journal or Illustration of Insects Native and Foreign Diptera or Two-winged Flies*. The title of his former publication on the Orthoptera was *Illustrations of North American Entomology*. Of his work on the Diptera, only forty-five copies were printed for gratuitous distribution. In 1876, he published an edition on the Hemiptera that was uniform with that on the Diptera and distributed fifty copies to almost the same persons and institutions which had received the former volumes. At the same time he was adding to his plates and text dealing with other orders of insects.

In 1878, he issued his last publication entitled *Illustrations of North American Entomology in the orders of Coleoptera, Orthoptera, Neuroptera, Hymenoptera, Lepidoptera, Homoptera and Diptera*, in an edition of twelve copies of his entire set of 273, plates, with 6,179 figures, with a printed title page, several pages devoted to classification and catalogues of species with references accompanying each order. This ended what had started out as a very ambitious undertaking. Walton has stated that while Glover's drawings are good, they are by no means strictly accurate or of the highest quality. Many of his figures have a flat and poorly modeled appearance. At one time Glover frescoed an oval or circular centerpiece on the ceiling of a room, in the old Department of Agriculture building in Washington, the design consisting of lepidopterous insects.

Townend Glover was born at Rio de Janeiro, Brazil, on February 20, 1813, at which time his father was engaged in commercial work in that city. When he was about six weeks old his mother died and

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he was sent to relatives in England. Six years later his father died and Townend was then placed in charge of his paternal grandmother and maiden aunt in Leeds. His early education took place in a good private school, and following this he was apprenticed to Thompson, Scarf & Company, a firm of woolen merchants in Leeds, whose business he had no desire to learn and from which he divorced himself as speedily as possible when he was twenty-one.

His father had left him sufficient funds, but according to Glover, these had been dissipated through his father's business partners, and when he became of age he had only a small patrimony which had been held in trust for him by relatives in Leeds. Glover kept a diary at this period and from it one learns of his liking for art, his study of painting in Munich, his extreme individuality and his indifference to country or home and of his distrust of mankind and their motives.

After traveling in Europe he returned to Leeds, fitted up a room as a studio and painted industriously, surrounded by pets of every description. At this time he was about twenty-three years old. On June 24, 1836, he sailed for America and after arriving in the United States he traveled leisurely through various parts of the country, especially in the southern part, making New Rochelle, New York, his headquarters, where he finally settled in the spring of 1838 and where, with his gun and dog and boat, he devoted himself to pleasure. During a visit to Fishkill, New York, he met Miss Sarah T. Byrnes, whom he married in September, 1840, at New Rochelle. The following year they moved to Fishkill. For the next five years he interested himself in floriculture, natural history, taxidermy, painting, and with living the life of a country gentleman, cultivating his orchard and garden. During this period, he met A. J. Downing, the horticulturist, and became enthusiastic over pomology. This led to a desire to do something practical and hence was born his idea of illustrating American pomology by a series of facsimile models, designed so as to show the changes produced by various soils and climates. The formation of this collection occupied him for several years, and at different times between 1849 and 1852 his collection of fruits was exhibited at various state fairs and prizes were given to him. He judged fruits and wrote for the *American Agriculturist* on pomological subjects. In the winter of 1853-54, the models were taken to Washington for exhibition and about that time the new Bureau of Agriculture in the United States Patent Office was established and Glover was appointed to it June 14, 1854, "for collecting statistics and other information on seeds, fruits, and insects in the United States." Although his name is not noted in the official reports of the Commissioner of Patents, he was really the entomologist and special agent, and his duties required traveling upon agricultural missions. Charles Mason was Commissioner and the chief clerk in charge of the Bureau was D. J. Browne of New Hampshire.

In 1854, he studied grape and cotton insects in South Carolina; in 1855 he was in Florida working on various insects, including the enemies of cotton. During the winter of 1856-57, he was in British Guiana and Venezuela in charge of an expedition organized to restock Louisiana sugar plantations. In 1857 he was in Mississippi visiting cotton plantations; in 1858 in Florida working on orange insects. During these times he became acquainted with Uhler, Morris, Baron Osten-Sacken, Baird, Ulke, Girard, Cooper and others, and he also had rows with D. J. Browne, his chief, whom he did not regard highly and who insisted upon writing Glover's reports in a manner highly unsatisfactory to Glover. At the same time his sketching and etching and entomological note-making continued.

Early in 1859, Glover left the service because he could not get along with Mr. Browne, whom he considered unable and a man who shone only by reflected light.

In the fall of 1859, Glover became professor of natural sciences in the Maryland Agricultural College at a nominal salary and when not teaching or lecturing he worked on his *Illustrations of American Entomology* and made collections of birds and insects. In April,

1863, he was appointed United States Entomologist under Hon. Isaac Newton, the new Department of Agriculture having been established in 1862. His early reports were mostly popular discussions of the more important insects and their control, although they contained, as well, information on seeds, grains, silkworms, buds, domestic animals, etc. At this time his museum occupied his attention. In August and September, 1865, he attended the entomological convention held in Paris, at which he received the grand gold medal for his original work in entomology. In 1867, his collection of fruit models and birds and other materials was sold to the government for the museum, and Glover was busy on his book of manuscript notes and in corresponding with Walsh, Uhler, Riley, Sanborn, Grote, Robinson, and other entomologists. From 1872 to 1878, he issued and distributed his work, to which reference has been made. His last years were characterized by illness and inactivity. He died September 7, 1883, and was buried in London Park Cemetery, Baltimore.

Various friends and acquaintances of Mr. Glover have recorded their impressions of him. He was peculiar and at times eccentric. He made few friends and many acquaintances. He was thoroughly absorbed in his own work and numerous friends would have occupied time that he preferred to spend upon his own self-imposed tasks. He was generous in many ways but he was not interested in the work of others. Of a serious disposition, his sense of humor was keen and his remarks were to the point. This usually took the form of satire and verse. He was quick tempered, never forgot a kindness, and always remembered an injury. Upon himself he imposed a routine that was rarely broken, and early realizing the difficulties of students of nature in obtaining a knowledge of insects, his aim was to remedy the matter the best he could and in his own way. Much more could be written of his personality and work and all entomologists should read Dodge's fascinating account of this early entomologist.

WILLIAM F. ROGERS (1820-?)

In the *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1856 (vol. 8, pp. 29-39) there was published a technical paper entitled "Synopsis of the species of *Chrysomela* and allied genera inhabiting the United States" by W. F. Rogers. A William F. Rogers was born in Northampton County, Pennsylvania, March 1, 1820, and followed the trade of printer until he was forty. In 1846 he moved from Easton, Pennsylvania, to Buffalo, New York, and in succeeding years he became a captain of militia, then colonel of the 21st Regiment New York Volunteers, then provost-marshal of the 30th district of New York, then comptroller of the city of Buffalo in 1866, then mayor of Buffalo in 1868 and finally a major general of the 4th Division, National Guard. I hope he also was the author of the chrysomelid paper.

VARIOUS ENTOMOLOGICAL STUDIES

Dr. James C. White, at the November 4, 1857, meeting of the Boston Society of Natural History (vol. 6, pp. 290-291), exhibited the eggs of what he called the "itch insect, *Sarcoptes hominis* and said that only the females burrowed, making their way "transversely" downward through the skin, but never to a great depth. Each day as she moved onward, she left an egg behind her and after fourteen had been deposited, the larva from the first laid egg matured and crept out upon the surface, there to ramble with other young until maturity. Doctor White made other observations and showed the spores of a parasitic plant.

At the October 7, 1857, meeting, Dr. B. S. Shaw, secretary of the Boston society, showed specimens of the larva of a species of fly (*Musca* or *Oestrus*) which had been found in the skin of the scalp, face, neck and back of a seven-year-old child. At the same time, he made remarks relative to other insects found infesting human beings, which he had collected from the literature. A full account was read before the Boston Society for Medical Improvement and published

in the *Boston Medical and Surgical Journal* for October 8, 1857.

In the *Cincinnati* in 1857, a journal devoted to scientific agriculture, horticulture, education, and the improvement of rural taste and edited by the faculty of Farmers' College, College Hill, Ohio, there appeared (vol. 2, Nos. 5, 7, pp. 212-216, 269-295) an anonymous article on the "Honey Bee" divided into three parts, "The Honey Bee," "Economy of Bee Keeping," and "Swarming." It was a general account covering the entire field briefly. In the first volume of this journal (vol. 1, No. 8, pp. 392-396, 1857) there were printed extracts from a paper that Glover had read before the National Agricultural Society on the subject of entomology as applied to agriculture, Glover's paper was general and contained numerous observations and statements on the ravages of cotton insects, the wheat midge, wheat joint worm, curculio, bees, birds, etc., together with the advice that farmers both for profit and pleasure should study insects.

Descriptive and diagnostic papers on entomology sometimes appeared in unexpected places. In 1858, there appeared in the *Annals of the Lyceum of Natural History of New York* (vol. 7 art. 2, pp. 11-12) "Descriptions of several new hymenopterous insects from the North West coast of America," by J. W. Greene. In this paper, Mr. Greene described *Bombus interruptus* and *Bombus occidentalis* from Washington Territory, Oregon, Ft. Vancouver, etc. In 1860, Mr. Greene published a more ambitious paper in the same journal (vol. 7. art. 21, pp. 168-176) entitled "Review of the American Bombidae, together with a description of several species heretofore undescribed, being a synopsis of the species of this family of hymenopterous insects thus far known to inhabit North America," thereby becoming at least the despair of bibliographers. In this paper, twenty-five species are listed, with brief diagnostic characters and indefinite localities.

A Dr. John W. Greene graduated in 1846 from the medical college in Cincinnati and practiced for many years in Greene County, Ohio. This Doctor Greene was also a member of the state legislature of Ohio from 1877 to 1879 and he served on the Fairfield village council and was also treasurer. He may have been interested in entomology. Definite proof is lacking.

In view of the interest in the grasshopper plagues of the West, Mr. Alexander S. Taylor of Monterey, California, furnished for the Smithsonian Institution in 1856 a fifteen-page paper entitled "An account of the grasshoppers and locusts of America." This was published as a *Smithsonian Report* (vol. 13, pp. 200-214). Mr. Taylor summarized the accounts of damage and flights, which had appeared in various newspapers, and from such press statements it was apparent that up to October 11, 1855, the insects had extended themselves over an area greater than ever before. This area included the territories of Washington and Oregon, every valley in the state of California, the territories of Utah and New Mexico, the dry mountainous areas of Mexico, the countries of Lower California and Central America, and the parts of Texas that resembled Utah and California physically.

The habits of the grasshoppers were noted and also the observations of numerous persons. In this connection, it is stated that the Indians swept the insects into holes or piles by surrounding them with fire. Later they roasted and pounded them into a meal, after the eating of which they were always sick. In addition, Mr. Taylor incorporated into his account extracts from published writings on the food habits of the grasshoppers, damage, species involved, enemies, etc. At the end it is suggested that collections should be made by intelligent observers and amateurs in different parts of the country, of all stages from egg to adult and the specimens forwarded to the Smithsonian Institution, so that the various species might be determined.

Grasshopper outbreaks in the West attracted considerable attention at times and brought forth recommendations from various people who were convinced of the effectiveness of their particular remedies.

Dr. Edward P. Vollum was the author of "Notes on the wingless grasshopper of Shasta and Fall River Valleys, California, and a plan for keeping them out of fields," appeared in a *Smithsonian Report* in 1861 (vol. 15, pp. 422-425). Doctor Vollum refers to the use of grasshoppers as food by the Digger Indians, and mentions their migratory habits. He gives a method of control, naming a mixture of strychnine, arsenic, corrosive sublimate, croton oil and lamp oil, which had been tried and which the grasshoppers had devoured with "perfect immunity." He recommends and describes a "tin protective" as the only successful method of keeping wingless grasshoppers from fields. If tin was not obtainable or the soil too crumbly, a ditch was to be dug around the field eighteen inches wide and two feet deep, shelving inwards toward the field and having holes two feet deep in the bottom, at intervals of a few yards. The grasshoppers collected in great numbers in the holes and died.

Another grasshopper paper, published in 1860 by the Smithsonian Institution (*Misc. Contr.*, vol. 2, art. 9, pub. no. 139) was entitled "Circular in reference to the history of North American grasshoppers," and was issued over the signature of Joseph Henry, secretary of the Institution. It really was a questionnaire and not a scientific paper. In view of the injury to crops by various species of grasshoppers, sixty-one questions, designed to furnish life-history facts, information on migrations, control, etc., were asked. These had been drawn up by Mr. P. R. Uhler and the circular was sent out to friends and correspondents of the Smithsonian Institution. The answers to many of the questions required careful study and observation if they were to be of value. Such a method of acquiring entomological information would be looked upon unfavorably and the replies would be discounted unless they came from persons having entomological training or experience.

Jacob Stauffer, to whom reference has been made previously, contributed in 1853 and 1859 some six articles on entomology to the *Cincinnati* (vol. 3, pp. 504-507; vol. 4, pp. 30-35; 105-109; 164-167; 310-313; 488-491), under the general title "Entomology—the natural history of insects." In the introductory matter of the first article, Stauffer mentions the fact that he is contributing monthly and that it is important for farmers to know something of the habits and history of beneficial insects. Accordingly, his first article deals particularly with the tiger beetles, after he has split the Coleoptera into the Pentamera, Heteromera, Pseudotetramera, and Pseudotrimeria, and after he has divided the Pentamera into tribes, etc., finally reaching the family Cicindelidae. He also presents a table for the identification of twenty-one species of *Cicindela*. The editor in a footnote promised "rich treats" in the future, from the pen of Mr. Stauffer. Nowadays, fresh and budding entomologists are led up to the subject more gracefully and are not plunged at once into the cold water of technical terminology.

In the same volume (*Cincinnati*, vol. 3, No. 4, pp. 145-153; No. 7 pp. 316-322, 1858), Mr. H. Y. Hind has "Description and classification of insects," a paper on which is a popular and general account of the characters of the orders and something about some of their members. Twelve orders are named, Coleoptera, Orthoptera, Neuroptera, Hymenoptera, Trichoptera, Strepsiptera, Hemiptera, Lepidoptera, Diptera, Aphaniptera, Thysanoura and Parasita. The material is presented in an orderly way, and was no doubt informative at a time when popular works were none too plentiful.

Mr. H. Y. Hind was professor of chemistry at Trinidad College, Toronto, Canada. He once wrote an essay on "The Insects and Diseases Injurious to the Wheat Crop," which was awarded the first prize by the Bureau of Agriculture and Statistics of Ontario. Extracts from this essay were printed in the *Cincinnati* (vol. 3, No. 4, April, pp. 145-153) under the title, "Importance of Entomology." According to one of the statements, the yearly cost of maintaining the wheat midge in the United States in 1854 was estimated as more than \$16,000,000. If to this figure there was added the annual amount of damage due to the chinch bug, Hessian fly, and fruit tree insects, the

annual cost was estimated as over \$30,000,000.

In 1858, A. R. Pope contributed to the *Magazine of Horticulture and Botany* (vol. 24, No. 5, May, pp. 219-222) an article on the "Pea Weevil" (*Bruchus pisi*), in which he mentioned the crow, blackbird and Baltimore oriole, as the chief bird enemies of the weevil. Of more interest, however, is his method of controlling the weevil. He stripped the peas, when ripe, from the pods and dried them for a day or two in the sun. They were then placed in a colander and covered with a plate. The colander was then placed over a vessel of boiling water and the peas thoroughly steamed. After this they were spread out to dry for a few minutes, and then put away. In this way every insect was destroyed.

In the same year, Professor J. B. Turner, of Jacksonville, read a paper entitled "Microscopic Insects," at the inauguration of the Illinois State Natural History Society at Bloomington, Illinois, on June 30. This was printed in the *Transactions of the Illinois State Agricultural Society* (vol. 3, pp. 644-650) but it contains no entomology to speak of.

For the *Report of the Smithsonian Institution, 1858* (vol. 13, pp. 214-228), Professor William W. Turner translated from the Russian V. Motschulsky's article "On the Means of Destroying the Grasshopper." This included the means of control in various Old World countries (Hungary, Russia, France, China, etc.) and various illustrations of collecting nets, rollers for crushing the grasshoppers, etc. It is concluded that the most effective and easiest method consisted of crushing the nymphs when they collected in swarms on their breeding grounds.

Silk culture still continued to appear to offer possibilities to some people. In 1861, the Academy of Natural Sciences of Philadelphia published Dr. Thomas Stewardson's remarks "On the Ailanthus silk-worm" (*Proc. Acad. Nat. Sci. Phila.*, Vol. 13, p. 525). At the March 5, 1861 meeting, Doctor Stewardson mentioned the recent introduction of the Ailanthus silk worm into France and its probable adaptation to our own country. He exhibited a case containing specimens of the silk-worm (*Bombyx cynthia*), of cocoons and of cloth woven from the silk, all of which he had obtained from France. He had obtained eggs from France and a manufacturer living near Philadelphia, Mr. Evans, had succeeded in rearing a few worms which spun cocoons in July. Toward the middle of August, moths appeared and their eggs hatched from August 30 to September 3. The larvae from these eggs were placed on ailanthus in different situations, such as in open-air, in a room, etc. Nearly all of those placed upon city trees matured and spun cocoons, about eighty. Many of those placed in the open air were destroyed by birds. The ailanthus silk worm was brought from China to Turin in 1857, was introduced into France by M. Guérin-Méneville in 1858, and Doctor Stewardson thought that it would do well in the latitude of Philadelphia, where two crops of "worms" could be raised.

DANIEL JAY BROWNE (1804-?)

D. J. Browne, the chief clerk for whom Glover had no use, wrote in the *Agricultural Report of the United States Commissioner of Patents for 1854* (pp. 58-59) a brief introduction to Glover's article "Insects Injurious and Beneficial to Vegetation" and made a general statement about the habits, transformations, etc., of insects. In the Commissioner's report for 1857, there were articles by Browne on the "Nature and habits of the honeybee" (pp. 107-121) and on "Persian Insect Powder" (pp. 129-130). The latter is a small article on the various species of *Pyrethrum*, its preparation and first use in the Russian Caucasus against injurious insects and the secrecy surrounding it until an Armenian merchant discovered the secret and began its manufacture in 1828. It is stated that the plant was introduced into Alexandropol and later into Germany. When Browne wrote his account, there were more than twenty villages in the district of Alexandropol engaged in cultivating the plant and collecting its flowers and leaves. Plants grown upon eighteen square

rods furnished one hundred pounds of powder.

An earlier article by Browne on "Bees, Wax and Honey-Bee-Culture in Russia" was printed in the Commissioner's report for 1855. Although Browne's productions were mostly compilations, they were probably useful in their day. Daniel Jay Browne was born December 4, 1804, at Fremont, New Hampshire. Although he took some courses at Harvard University, he was a practical farmer. His "literary" career started when he was twenty-six by the publication of a journal called *The Naturalist*. By the time he was twenty-eight he was the author of two books, *Sylva Americana* and *Etymological Encyclopaedia of Technical Words and Phrases Used in the Arts and Sciences*. During 1833-35, he traveled extensively in foreign countries. Later, he was engaged in engineering projects in New York and Cuba; he was secretary to various agricultural associations, assistant editor of the *American Agriculturist*, and from 1846 to 1851 he published four books on trees, birds, poultry, and muck. In 1852, he became connected with the United States Census Office and in June, 1853, he was made chief in the Patent Office and edited their *Agricultural Reports*. During his later years, his activities in this office, particularly those connected with the distribution of seeds, were the subject of much controversy in the agricultural press. The Agricultural Committee of the House of Representatives made an investigation and published their results entitled "Vindication of the Agricultural Division of the Patent office." Browne was found by this committee to be fully qualified for his duties. However, the criticism continued and later an agricultural advisory board was appointed for the Patent Office. This board approved the general operations, but Browne's appointment terminated October 10, 1859. Later, or in 1861, Browne was sent to Europe by the Patent Office to investigate the cultivation and manufacture of flax. It has been stated that the criticism of Browne's activities came mostly from persons in the seed business and from those who objected to any national department of agriculture.

JAMES DWIGHT DANA (1813-1895)

J. D. Dana, who in 1858 published in the *American Journal of Science and Arts* on Agassiz's "Contributions to the Natural History of the United States," was the author in 1863 of a paper "On the homologies of the insectan and crustacean types" in the same journal (vol. 86, pp. 233-235). This was a short paper on the relation between the segmentation of insects and crustaceans. Previously, Dana had written a paper on "Fossil larvae in the Connecticut River Sandstone" (*Amer. Jour. Sci. Arts*, vol. 33, pp. 451-452, 1862).

James Dwight Dana was a geologist and zoologist who was born in Utica, New York, February 12, 1813. He was associated with Silliman and in 1840 he was made editor of the *American Journal of Science*. When the United States exploring expedition to the South Seas under Captain Wilkes was organized in 1837, Dana was made geologist and mineralogist of the expedition. For thirteen years, following his return in 1842, he was engaged in writing up his reports in Washington. Dana was the author of various text books on geology and mineralogy. He died April 14, 1895.

ALEXANDER SMITH TAYLOR (1817-1876)

In the same report (*Rep. Smithsonian Inst.* 1858, vol. 13, pp. 200-214), preceding Mr. Turner's translation, there appeared "An account of the grasshoppers and locusts of America, condensed from an article written and furnished by Alexander S. Taylor, Esq., of Monterey, California."

Alexander Smith Taylor, an ethnologist, was born in Charleston, South Carolina, April 16, 1817, and died near Santa Barbara, California, July 27, 1876. He left Charleston in 1837 and traveled for several years in India, China, and the West Indies. In 1848, he went to California from China and lived at Monterey until 1860. Here he was clerk of the United States district court. Then he moved to a ranch near Santa Barbara. Taylor was the author of various magazine

and newspaper articles on the history of California, on Indians, and on natural history.

BARON OSTEN-SACKEN (1828-1906)

The first catalogue of North American Diptera was published in 1858 by the Smithsonian Institution (*Smithson. Inst. Misc. Contr.*, vol. 3, art. 1, 20 + 95 pp.). It was by Baron Osten-Sacken and was entitled "Catalogue of the described Diptera of North America." In the preface, the author states that his catalogue was planned the same as Melsheimer's *Catalogue of the Coleoptera of the United States* as revised by Haldeman and Leconte. It was intended to be a checklist of the described species and not a synonymical catalogue. Species are included from the United States, Mexico, Central America and the West Indies. Localities are given also, this feature having been omitted from the Melsheimer catalogue. Completeness was the first consideration and systematic arrangement the second. Osten-Sacken generally retained the generic groups adopted by Meigen and Wiedemann, and avoided the subdivisions of modern authors. For certain groups, he followed Walker's *Supplement to the List of Diptera of the British Museum*, and he also used Macquart's *Dipteres Exotiques*. Within the genus, the species are arranged alphabetically. Of Harris's *Catalogue of the Insects of Massachusetts*, Osten-Sacken stated that it contained the names of many species of Diptera never described or since described under other names. He expressed the wish that the study of the Diptera would proceed as rapidly, after the publication of his catalogue, as did the Coleoptera after the publication of a catalogue.

Osten-Sacken came to this country from Russia in 1856 and upon getting settled, he immediately began collecting a large amount of material in the Diptera, and making the acquaintance of many collectors in various parts of the country. Most of the material he accumulated was sent to Loew, in Guben, Prussia, for description. However, for himself, he retained a few families, principally the Tipulidae and Tabanidae.

As Osten-Sacken's entomological career in North America extends far into the period not covered by this book, it is not possible to refer specifically to his numerous papers. Up to 1865 he described new genera and species of North American Tipulidae, Ctenophorae, Limnobia, and Cynipidae. These descriptions appeared in the *Proceedings of the Academy of Natural Sciences* and in the *Proceedings of the Entomological Society of Philadelphia*. In addition, he wrote papers on the larval characters and habits of the Mycetophilidae, on Lasiptera reared from a golden-rod gall, on the Cynipidae of the North American oaks and their galls, and at one time he described fourteen coleopterous larvae, belonging for the most part to genera of which no preparatory states were known. These papers all appeared in the *Proceedings of the Entomological Society of Philadelphia*, mainly in volume 1.

In 1861, he wrote "On the sex of Cynipidae" (*Proc. Acad. Nat. Sci. Phila.*, vol. 13, pp. 150-152) and called attention to the total absence of males in some genera of Cynipidae. He mentioned Hartiz who had the patience to collect about 28,000 galls of *Cynips divisa*, and to rear and examine the flies, some nine thousand or ten thousand, one by one, only to find that all were females. Other investigators had similar results. At first Hartiz thought they were androgynous, but he soon gave up that idea. In view of the knowledge that the galls frequently produced Cynipidae of two different forms, the true gall flies and the inquiline, the latter of both sexes, Erichson suggested that the two forms, however different, might be the same species, that the male inquilines were in reality the males of *Cynips* and that their females might be considered as a second form of the gall producing female *Cynips*. Erichson's idea was not the result of investigation, but was advanced as a starting point for future work.

In addition, Siebold's hypothesis of parthenogenesis was mentioned. Osten-Sacken then gave the results of his own observations

on the galls on the leaves of red oak, namely that male and female occur in galls of two altogether different forms. He believed that the male which he reared from the spindle-shaped gall was specifically identical with the female from the common oak apple. He noted points of resemblance between the two insects and believed that his theory was strengthened because of the fact that both types of galls occurred on the same tree, the red oak, and because the adults appeared at the same time. He offered his theory as a starting point for future research.

In 1862, there was published by the Smithsonian Institution part 1 of *Monographs of the Diptera of North America* by Hermann Loew, edited by R. von Osten-Sacken. This work was in four parts and to Osten-Sacken fell the laborious task of translating the first three parts written by Loew. The second appeared in 1864, the third in 1872, due to a delay on the part of Loew, and the fourth, Osten-Sacken's monograph on the Tipulidae, in 1869. The fourth was delayed because of a fire in the Smithsonian Institution on January 24, 1865, which destroyed the original manuscript. Additional references to Osten-Sacken's work will be made in the account of his life, which follows, but for a bibliography one is referred to other sources.

According to Osten-Sacken's own account of his entomological life, published at Cambridge, Massachusetts, in 1903, under the title *Record of My Life Work in Entomology*, he divided his career into three periods, each of them being connected with his place of residence at a particular time. He was born in St. Petersburg, Russia, on August 21, 1828. During a temporary stay in Baden-Baden (1838-1839), he became acquainted with a young Russian, Joseph Nikolaievitch Schatilloff, who introduced him to the mysteries of collecting beetles, and later on, in St. Petersburg, where he was educated and where in 1849 he entered the service of the Imperial Foreign Office, he made a collection of insects in all orders except the Lepidoptera, which culminated in the publication of three papers in later years, one of which was devoted to a general survey of the insect fauna of the vicinity of St. Petersburg and included a list of the species except those of the Lepidoptera. Thus ended what Osten-Sacken was pleased to call the first period of his entomological career.

In 1856, he was appointed Secretary of the Russian Legation in Washington, and for twenty-one years he lived in the United States. From 1856 to 1862, he lived in Washington. In 1862, he was appointed Consul General of Russia in New York, which place remained his residence until 1871, when he resigned. Between 1871 and 1873, he made several journeys to Europe, finally settling as a private citizen in this country in 1873, where he remained until 1877. Most of the twenty-one years were spent, as regards entomology, in collaborating with Dr. H. Loew on the Diptera of North America and in forming his own collection of Diptera. An enormous part of his time was occupied in acting as a clearing house for material for Loew and in correspondence, identification, and translation. His purpose was to form a collection of North American Diptera, containing the type specimens described by Loew, as well as specimens identified by him from earlier authors. He expected that such a collection would eventually be returned to the United States and this actually happened. Through the activity of Professor Louis Agassiz, this collection containing about 1,350 species described by Loew and 350 species described by earlier authors, together with a large number of undescribed species, found its way in 1877 to the Museum of Comparative Zoology, in Cambridge, Massachusetts. After this second period of his entomological life, which ended in 1877, he returned to Europe and lived at Heidelberg, where he continued to publish papers on the larger phases of classification, on insect habits, on historical entomology, etc. He died at Heidelberg, May 20, 1906.

From his *Record of My Life Work in Entomology*, one may learn of his controversies with other entomologists, of Loew's persistent disregard of brother dipterologists, of the rise in public esteem of the

order Diptera during the nineteenth century, and of his impressions of various American and European fellow entomologists. Much of his *Record* is devoted to Loew, his work, his collection and his controversies, and at times he is quite critical. Osten-Sacken wrote in various languages, Russian, German, French, Italian, English and Latin. His English was clear, forceful and accurate. He corresponded with many collectors and his letters were frequently delightful. He was a master of detail, a characteristic which is necessary for a successful entomologist. His bibliography lists one hundred seventy-nine titles, fifty of which represent his writings while he was in this country, and twenty-three of these were written before 1865.

FRANCIS GREGORY SANBORN (1838-1884)

A collector who should be mentioned here is Francis Gregory Sanborn, at one time widely known to the entomologists of eastern United States by reason of his care in the preparation of insect collections and other objects of natural history.

Sanborn was born January 18, 1838, at Andover, Massachusetts. Following his graduation at Phillips Academy in Andover in 1853, after a six-year course of study, interrupted by ill health, he was employed in October of that year in the Massachusetts State Cabinet of Natural History, at the State House in Boston. He remained here until the summer of 1865, building up the collection, and at the same time acting as clerk to C. L. Flint, the secretary of the Massachusetts State Board of Agriculture. In the *Fifth Annual Report of the Secretary of the Massachusetts Board of Agriculture* (Boston, 1858, pp. 197-201), Sanborn commented on the increased interest of scientific men, students of nature, and farmers, in insects. Sanborn believed that if, after doing all he could and after spending money to produce a crop, the farmer still found his efforts nullified by insects, he should either study the creatures or employ someone to do it for him. He recommended the employment of one or more entomologists by every town or village,

"who should be prepared to describe the destroyers of agricultural products, to classify and name each specimen brought to them for examination, and direct the best means of treating it."

In 1865 and 1866, Sanborn was doing miscellaneous work in the museum of the Boston Society of Natural History. From 1867 to 1873, he was a regular assistant charged with the care of the insects, in addition to his general duties, lecturing and acting at times as secretary. In 1872, he was a justice of the peace and a member of the school committee of West Roxbury, Massachusetts. At this time he also taught at the Bussey Institution in Jamaica Plain and lectured in the Museum of Comparative Zoology in Cambridge. Becoming afflicted with a mental trouble, it was necessary for him to remain in seclusion for seven months at the state hospital in Worcester, Massachusetts. After recovery, he entered into relations with the Worcester Society of Natural History and afterwards became curator, holding this position until his death. In 1874, he was assistant in the Kentucky state geological survey, and in 1876 he was hired to prepare the entomological exhibit of the United States Department of Agriculture at the Centennial Exposition at Philadelphia. He belonged to various scientific organizations including the Cambridge Entomological Club, Entomological Society of Ontario, New York Entomological Society, etc. He died June 4, 1884, at Providence, Rhode Island.

CYRUS THOMAS (1825-1910)

On June 30, 1859, Cyrus Thomas read before the Illinois State Natural History Society (*Trans. Ill. St. Agric. Soc.*, vol. 3, pp. 665-670) at Bloomington, Illinois, a paper on "The study of Natural History" in which he spoke of the advantages to be gained from the study of insects and of the entire field of natural history. He spoke generally, and of the best method of teaching it in schools and of books for beginners in zoology, botany, geology and mineralogy.

And his talk was somewhat tinged with religion and with references to the Creator. During the same year, he wrote his list of the "Orthoptera of Illinois," which was published in the *Transactions of the Illinois State Agricultural Society* (vol. 3, pp. 662-685). This annotated list contained four species of Blattellidae, one of Mantidae, two of Phasmidae, seven of Achetidae, seven of Gryllidae and twenty of Locustidae. Thomas realized the incompleteness of his list, but excused himself on the basis of having no copy of Say's *Entomology*.

In 1862, the Illinois State Agricultural Society published in their *Transactions* (vol. 5, pp. 401-468) Thomas's "Insects Injurious to Vegetation in Illinois." This is a lengthy account containing descriptive statements about various injurious species, their classification in a general way, recognition of the various orders, examples of the more injurious species in each order and methods of control. Harris, Fitch, LeConte, Haldeman, Melsheimer, and others are frequently cited.

Cyrus Thomas has been characterized as an archaeologist, ethnologist and entomologist. Born at Kingsport, Tennessee, July 27, 1825, he was educated in the schools and academies of eastern Tennessee, where he also studied law. In 1849, he moved to Jackson County, Illinois, and was county clerk there from 1850 to 1853. From 1851 to 1864, he practiced law at Murphysboro in the same county. He entered the Evangelical Lutheran ministry in 1864 and in 1866 received his Ph.D. degree from Gettysburg College. From 1869 to 1874, he was the entomologist and botanist on the government geological survey of the territories, under Ferdinand V. Hayden. When the Southern Illinois Normal University opened at Carbondale, Illinois, in 1874, he was made professor of natural sciences, a position he held until 1876. From 1875 to 1882, he was state entomologist of Illinois, and for five years within that period he was also a member of the United States Entomological Commission, named to investigate the destruction caused by grasshoppers in the west. In 1882, he became archaeologist to the United States Bureau of Ethnology.

He began to publish entomological articles, mainly in the *Prairie Farmer* of Chicago, as early as 1859. In the fifth volume of the *Transactions of the State Agricultural Society of Illinois*, printed in 1864, is his prize essay on entomology, and also the prize essays of Walsh and LeBaron. He died at Washington, D.C., June 27, 1910.

JAMES BRACKENRIDGE CLEMENS (1829-1867)

American Tineina began to be seriously studied when Dr. J. Brackenridge Clemens appeared upon the entomological scene. His first paper, however, was not devoted to microlepidoptera but to the Sphingidae, being entitled "Synopsis of the North American Sphingidae." This appeared in 1859 in the *Journal of the Academy of Natural Sciences of Philadelphia* (n.s. vol. 4, pt. 21 pp. 97-189, illus.). In it, he defined species, genus, family, etc., gave a synoptical table of genera, and then took up the species within each genus. Notes on larvae, distribution, food plants, eggs, etc., are included, and the entire paper which exhibited great ability and research was the foundation for subsequent revisions of the species. On the microlepidoptera, Clemens published some seventeen papers in the *Proceedings of the Academy of Natural Sciences of Philadelphia* (vols. 11, 12) and in the *Proceedings of the Entomological Society of Philadelphia* (vols. 1, 2, 3, 5) in which he described thirty-one genera and about two hundred new species, giving at the same time notes on the larval habits of many. In 1872, H. T. Stainton, F.R.S., Secretary of the Linnaean Society of London, collected the writings of Clemens and republished them in book form under the title *The Tineina of North America by (the late) Dr. Brackenridge Clemens*. Included in the work, which appeared in London in 1872, are nine letters which Stainton had received from Clemens, showing him to be a man of unusual culture and a keen observer.

Doctor Clemens was born in Wheeling, Virginia, in 1829 or 1830. He attended the Virginia Military Institute for three years and then

the University of Pennsylvania, graduating from the Medical Department in 1849. Apparently he did not actively practice medicine. He married Susan Burke Wagner of Easton, Pennsylvania, in 1850, and four children were the result of this union. In 1859, he was elected a corresponding member of the Entomological Society of Philadelphia. Doctor Clemens died of typhoid fever on January 11, 1867, at his home in Easton, and his short but brilliant entomological work ended. His types were presented by his widow to the American Entomological Society in 1867.

DAVID HUMPHREYS STORER (1804-1891)

It may surprise some to know that Dr. David Humphreys Storer, known for his work on the fishes and reptiles of Massachusetts, at one time took a keen interest in entomology. As a successful physician of Boston, he was loved by his patients. The early meetings of the Boston Society of Natural History were attended by him along with Gould, Cabot, Jackson, Agassiz, Pickering, Gray, Brewer, Bryant and the brothers Roger, with Jeffries Wyman presiding. Doctor Storer was recording secretary during the first six years of its existence, having joined in 1830 immediately after it was founded, and was one of the seven members appointed to give lectures. In addition, he helped to raise funds for a building and he was generous in donating to the collections of the society. His interest in natural history started early in his life, and entomology occupied much of his interest. He gave popular lectures on insects at a time when lyceum lectures were first inaugurated. He was interested in birds, minerals, and shells, in establishing a private medical school, and in his practice.

At the January 5, 1859, meeting of the Boston Society of Natural History, he read a paper "On the power possessed by the larvae of various flies, of consuming without apparent injury to themselves the flesh of animals which have died from the effects of arsenic," (*Proc. Boston Soc. Nat. Hist.*, vol. 7, pp. 1-3). He mentioned the development of blow flies on the bodies of rats killed by arsenic and said that the pupae of the blow flies yielded metallic arsenic upon analysis.

Doctor Storer was born at Portland, Maine, March 26, 1804, and died at Boston, September 10, 1891, after a busy and successful life, during which he received many honors. His name will always be associated with the history of medicine and natural history in Massachusetts. His work on fishes and reptiles, to which he devoted his leisure time for twenty-five years and more, was published by installments in the *Memoirs of the American Academy*. He graduated from the Harvard Medical School in 1825 and after a hard struggle in his early days, became one of Boston's leading doctors.

CHARLES THOMAS JACKSON (1805-1880)

Another Boston physician, Charles T. Jackson, M.D., was also interested in insects, but from a somewhat commercial angle. He discovered that a permanent yellow dye could be made from the "red-bug," *Phyrrhocoris saturellus*, which infested the cotton plants of Florida. In the *Agricultural Report of the United States Commissioner of Patents for 1858* (pp. 272-273) he gives the process of making the dye and says that at first it was supposed that a red dye could be extracted, but it was found that no color of that kind was forthcoming. Instead, the whole substance of the insect could be converted into a rich orange-yellow dye that was readily fixed on woollen or silk fibers by the alum mordant liquor.

Dr. Charles Thomas Jackson was born at Plymouth, Massachusetts, June 21, 1805. He graduated from the Harvard Medical School in 1829 and then went to Paris and Vienna. He was interested in the utilization of electricity for telegraphy and on his return voyage in 1832 one of his fellow passengers was Samuel F. B. Morse, to whom, so he always said, he made known "the general idea of the magnetic telegraph and of the principles on which it depended." In 1834, he exhibited and successfully operated a telegraphic apparatus

similar to the one patented a year later by Morse. In addition to practicing medicine, he was a chemist and mineralogist and published reports on the geology of Maine, Massachusetts and Rhode Island. He was a member of the Boston Society of Natural History and contributed over four hundred titles on geological topics to various publications. He is considered by some to have been the discoverer of the anaesthetic properties of ether, but credit was claimed by his pupil, Dr. W. Thomas Green Morton, during a long, bitter controversy. He died at Somerville, Massachusetts, August 28, 1880.

ENTOMOLOGICAL BOOKS

In the catalogue of Bailliere Brothers, 440 Broadway, New York City, issued about 1859, very few American works on insects were offered for sale, for the reason that such works did not exist. As will be noted, European books on insects continued to circulate in this country. In Bailliere's catalogue, *The Natural History of the Rarer Lepidopterous Insects of Georgia* (London, 1797) is quoted at \$55.00; *Histoire Naturelle des Insectes Hemipteres* (Paris, 1843), \$3.25; Burmeister's *Manual of Entomology* (London, 1836), \$4.50; Catesby's *Piscium, Serpantum, Insectorum, &c de Carolinae, Floridae, et Bahamensium, Insularum* (Noremburgae, 1777), \$25.00; *British Entomology* by Curtis (1824-1840), \$120.00; Dejean's *Catalogue de la collection des Coleopteres de Dejean* (Paris, 1835), \$4.00; five volumes on the *Coleoptera of Europe* by Dejean, Boisduval and Aube, \$45.00; *Illustrations of Foreign Entomology* by Drury and Westwood (London, 1837), \$40.00; the first volume of Fallen's work on the Diptera (1814), \$2.00; Gravenhorsts *Monographia Coleopterorum Micropterorum*, \$1.25; and Kirby and Spence, *Introduction to Entomology* (London, 1857), \$1.50. Other works by Lacordaire, Latrielle, Linnaeus, Macquart, Mulsant, etc., were included. As for American works, we find only Say's *American Entomology*, 3 vols., \$30.00; *Insects of the State of New York* by Emmons, \$7.50, and Fitch's first and second reports (Albany, 1856), \$1.25.

CHARLES PICKERING (1805-1878)

Charles Pickering, best known as an anthropologist and botanist, was not impartial to the collection and study of insects although his publications on the subject were very few. In 1860, he spoke on the subject of the geographical distribution of species (*Proc. Amer. Acad. Arts Sci.*, vol. 5, pp. 81-82) at the Academy meeting of December 11, and Asa Gray supplemented his remarks with some critical observations. Doctor Pickering said that his experience led him to conclude

"that the main limiting cause in the diffusion of species is to be found in the envelope of the ovum; in other words, the shell of the ovum governs the diffusion of the species."

"When the shell of the ovum breaks before exclusion, as in animals called viviparous, the species cannot be diffused by means of ova."

"Other organic beings capable of locomotion are diffused both by ova and a wandering progeny; but plants are diffused exclusively by ova."

He believed that if the order of Nature were changed, if insect eggs were borne about by winds and waves, insects would disappear from the earth; and if the seeds of plants were hidden away in places where insects deposit their eggs, plants in time would become extinct.

Doctor Gray said that the aptitude for dissemination was only one of several elements and that by no means was it the determining element, at least not in the vegetable kingdom. He said that although the seeds of the Compositae were endowed with unusual facilities for dispersion, the species on the whole were not remarkable for their wideness of range.

Pickering corresponded with Say, Harris and others about entomological matters, although his chief interests were in other

fields. Of New England stock, he was born in Pennsylvania, November 10, 1805. He received three degrees from Harvard, one of them being M.D. In 1829, he settled in Philadelphia, joined the Academy of Natural Sciences and became librarian and one of the curators. In 1838, he was the principal zoologist of the United States Exploring Expedition to the South Seas. He was interested in the geographical distribution of animals and after the return of the expedition, he traveled extensively in foreign countries. He was a member of the American Philosophical Society and a fellow of the American Academy of Arts and Sciences, to both of which he made contributions. Some of his writings appeared in the *Smithsonian Contributions to Knowledge* and others were brought out at his own expense. He was not a prolific writer. He died in Boston March 17, 1878.

CHARLES WRIGHT (1811-1886)

At the meeting of the American Academy of Arts and Sciences held on May 8, 1860, Mr. Charles Wright made some remarks on the architecture of bees, and referred particularly to the symmetry of their cells. He said in part,

"these symmetries show how the cell might be the natural result of simple or sensible economy, as applied to the building of simple nests, the common type of which is a cylindrical cavity with a hemispherical base."

He stated that the construction of a series of nests, side by side, would, by the removal of interstitial material, result in cells like the normal ones in honeycomb.

Mr. Wright was born at Wethersfield, Connecticut, October 29, 1811, and died at the same place on August 11, 1886. He graduated from Yale College in 1835 and while there acquired a fondness for botany. He surveyed and botanized in Texas in 1837 and was connected with several expeditions, which took him to Georgia, Cuba, the southern states, etc.

SAMUEL BOTSFORD BUCKLEY (1809-1884)

Another author who wrote his first entomological paper in 1860 was Samuel Botsford Buckley. This was on "The Cutting Ant of Texas" and it appeared in the *Proceedings of the Academy of Natural Sciences* (vol. 12, pp. 233-236), being a general account of its life-history story and habits. In 1862, Mr. Buckley's paper dealing with observations on the tarantula and its destroyer was printed in the *Proceedings of the Entomological Society of Philadelphia* (vol. 1, pp. 138-139). This account, written somewhat popularly, appeared under the title "The tarantula (*Mygale hentzii* Girard) and its destroyer (*Pompilus formosa* Say)." A third entomological paper by Buckley, which also appeared in the *Proceedings of the Entomological Society of Philadelphia* (vol. 1, pp. 212-215, 1862), described two new species of termites from Texas and included a few notes about their habits.

Mr. Buckley was born May 9, 1809, in Yates County, New York, near Seneca Lake. He graduated from Wesleyan University, Connecticut, in 1836 and from that time on he traveled much in the southern states, collecting plants, shells and insects. In 1866, he was appointed State Geologist of Texas and lived at Austin. The skeleton of a *Zenglodon*, at one time in the Warren Museum at Boston, was discovered by Buckley in 1841 in Clarke County, Alabama. In the preparation of Mrs. Young's *Flora of Texas*, Buckley gave considerable aid. He belonged to the Academy of Natural Sciences of Philadelphia and to societies in New York, Buffalo and New Orleans. His death occurred February 18, 1884, at Austin, Texas.

PHILIP HENRY GOSSE (1810-1888)

Notice should be taken here of Philip Henry Gosse's *Letters From Alabama* published in London, 1859. This small book contains, in a series of letters, Gosse's impressions during a residence of seven or

eight months in the hilly regions of Alabama. It is devoted to birds, plants, mammals, insects, manners of the inhabitants, etc. A large share of it is concerned with butterflies, fireflies, dragonflies, cicadas, bees, beetles, wasps, moths, male cricket, mantids, walking sticks, robber flies and other insects, and nearly every letter describes the appearance and habits of several species, giving in most instances their scientific names. And all of this is in very readable prose. A fuller account of the work of Gosse will be found in the chapter devoted to entomology in Canada.

GEORGE HENRY HORN (1840-1897)

In 1860, there appeared the first paper of an author who was a born systematist, whose genius for arranging things, for discovering relationships and for consistent unification was developed to a remarkable degree. This was Dr. George H. Horn, by whom the study of the Coleoptera in this country was advanced enormously. Doctor Horn's first contribution to entomology was apparently written in 1860 and published in the *Proceedings of the Academy of Natural Sciences of Philadelphia* (vol. 12, p. 233). It was entitled "Descriptions of three new species of Gorgonidae, in the collection of the Academy." This was followed by his title "Descriptions of new North American Coleoptera, in the cabinet of the Entomological Society of Philadelphia" (*Proc. Acad. Nat. Sci. Phila.*, 1860, pp. 569-571). His next contribution consisted of observations on the habits of *Dermestes lardarius*, *Anthrenus destructor*, *Snoxydon basilaris*, *Anobium paniceum*, *Clytus erythrocephalus*, and ten other species of Coleoptera, under the title "Notes on the habits of some coleopterous larvae and pupae" (*Proc. Ent. Soc. Phila.*, 1861, vol. 1, pp. 28-30). His fourth publication, "Monograph of the species of *Trogosita* inhabiting the United States" (*Proc. Acad. Nat. Sci. Phila.*, 1862, vol. 14, pp. 82-08) suggested itself to him by reason of the neglected condition of the genus, because of the scattered descriptions of half the described North American species and because some descriptions had been published by Pal. de Beauvois in his *Insects of Africa and America*. In Horn's paper his new species were obtained mostly from LeConte's collection.

In Horn's fifth paper, which completes the list of those appearing before 1865, he described a new species in each of the following genera: *Trogosita*, *Margarinotus*, *Languria*, and *Triplax*, some of his specimens having been received from Uhler (*Proc. Ent. Soc. Phila.* 1862, vol. 1, pp. 187-188).

In the chronological list of the published writings of Horn by Samuel Henshaw (1898) there are 265 titles from 1860 until 1896, a period of thirty-six years. During that time Horn proposed 154 generic names, 144 of which were still retained in 1908. In the same period, he described 1,582 new species of Coleoptera, 1,493 of which retained the name given, 37 of which were considered varieties and 52 of which were considered as synonyms in 1908.

Doctor Horn, in his work on the Coleoptera, set an example of thoroughness that has since been followed by numerous workers and his influence is apparent in the numerous coleopterous papers by writers who followed him. Doctor Horn's papers are not widely scattered. The greater proportion of them may be found in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, the *Proceedings of the American Philosophical Society*, and the *Transactions of the American Entomological Society*. Few of his titles represent short notes. All represent original research and many of his titles cover one hundred printed pages and more. In many of his papers appear careful drawings made by himself. Horn will always be associated with Dr. John L. LeConte. They worked together. LeConte was the broader student of nature. Doctor Horn was narrower, but he had more knowledge of detail. His descriptions are models of clarity in which essentials are emphasized, structure given first rank, and minor details mentioned as incidents. The important thing to him was the combination of characters.

George Henry Horn was born in Philadelphia, April 7, 1840. His

early education took place in private and public schools in Philadelphia, and in July 1853 he entered the Central High School of Philadelphia. After leaving high school, he entered the Medical Department of the University of Pennsylvania, from which he graduated on March 14, 1861, with the degree, Doctor of Medicine. His zoological work began while he was a medical student, and at that time he studied the Coelenterates and Bryozoa, his papers on these subjects being written in collaboration with Mr. William M. Gabb and appearing previous to 1863. In July, 1860, Horn became a member of the recently organized Entomological Society of Philadelphia, and soon met Dr. John L. LeConte. In June, 1862, Horn went to California where he was commissioned by Governor Leland Stanford, Assistant Surgeon in the Second Cavalry, California Volunteers. On July 14, 1864, he was made surgeon of the First Infantry Regiment, California Volunteers. His Civil War service included additional commissions and finally terminated with the rank of Major in the Second Infantry Regiment, California Volunteers, on April 16, 1866. During the war he continued to collect and observe insects as opportunity afforded. He returned to Philadelphia in 1866, where he established himself as a physician and was elected president of the Entomological Society. In the spring and summer of 1874 he visited Europe, spending time in London and Paris, where he examined collections and became acquainted with European entomologists. Other visits were made to Europe in 1882 and 1883. In 1889, he was elected Professor of Entomology at the University of Pennsylvania, but he never gave any instruction under that title. Another visit to California took place in 1893. In 1895, his health began to fail rapidly and he died suddenly on November 24, 1897, in Philadelphia. Much more could be said of Doctor Horn, his ability, his personality, his friendships and his work, but this lies without the scope of the present volume.

HERMANN AUGUST HAGEN (1817-1893)

Another entomologist whose activity in this country started during what I am pleased to call the pioneer century was Dr. Hermann August Hagen. In 1861, the Smithsonian Institution published in its *Miscellaneous Contributions* (vol. 4, art. 1, 20 + 347 pp., Pub. No. 134) Hagen's *Synopsis of the Neuroptera of North America with a list of the South American species*. His synopsis was prepared at the special request of the Smithsonian Institution from material, in considerable part, from their own collections. Hagen was in Königsberg, East Prussia, at the time, and his manuscript, in Latin, was translated into English by P. R. Uhler, of Baltimore. The proofs were corrected by Uhler and Baron Osten-Sacken. The synopsis contained all the species known at that time to have been found in the United States, in the English and Russian colonies, Mexico, Central America and the West Indies. Various collections are listed as furnishing specimens and the synopsis was prepared from specimens which Hagen himself had examined. At the time it was written, Hagen stated that it contained only a fraction of the neuropterous fauna of America. In 1863, the Entomological Society of Philadelphia published in its *Proceedings* (vol. 2, pp. 167-272) a joint paper by Hagen and B. D. Walsh entitled "Observations on certain North American Neuroptera by H. Hagen of Königsberg, Prussia; translated from the original French MS. and published by permission of the author, with notes and descriptions of about 20 new North American species of Pseudoneuroptera by Benj. D. Walsh, M.A." In September 1862, Walsh had published in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, a paper on the Pseudoneuroptera of Illinois, in which he described over forty species thought to be new. Later, he forwarded the duplicates to Doctor Hagen and the outcome was the joint paper referred to, and the development of the fact that Hagen's views, in most cases, coincided with those of Walsh. Nearly all the new species described by Walsh in the joint paper were collected within four miles of Rock Island, Illinois.

Doctor Hagen was born at Königsberg, East Prussia, on May 30,

1817. After graduating from the Kneiphofische Gymnasium in 1836, he studied medicine at the University of Königsberg. His interest in natural history was stimulated by such outstanding teachers as von Baer and von Siebolt, and his entomological interests were furthered by his father and grandfather, the latter a professor of natural history in Königsberg. He received his M.D. degree in 1840 and afterward studied in Berlin, Paris and Vienna, returning to Königsberg in 1843 where he practiced as a physician and surgeon. His first entomological paper was a "List of the Dragon Flies of East Prussia, which was published in 1839, and from then until within three years of his death his contributions amounted to over four hundred, many of them appearing in German periodicals before he came to this country.

While studying in Paris in 1842, he met Baron de Selys-Longchamps, of Liege, and this friendship resulted in their joint papers on the Odonata of Europe. Hagen also wrote on termites and on fossil Neuroptera, and his well known and widely used *Bibliotheca Entomologica* appeared in 1862 and 1863.

On October 12, 1867, Doctor Hagen arrived in Cambridge, Massachusetts, to take charge of the entomological department of the Museum of Comparative Zoology. This was upon the solicitation of Prof. Louis Agassiz, who desired to fill the vacancy caused by Mr. Uhler's departure to Baltimore to become superintendent of the library of the Peabody Institute. From 1868 to 1890, Doctor Hagen's reports show the volume of work accomplished in arranging the large and growing entomological collection of the Museum, a large amount of which he did himself.

Just before coming to America, Doctor Hagen (1863-67) was vice-president of the City Council of Königsberg and a member of the School Board of that city. His most important publications during his residence in America were on crayfishes, color mimicry of insects, and monographs and synopses on the Odonata, psocids, the butterfly genus *Colias*, embids, etc., many of which were illustrated by his own hands. In 1879, he gave his entomological library to the Museum. And during the summer of 1882, he made an economic survey along the line of the Northern Pacific Railroad, especially in Washington. In addition to his duties at the Museum, he gave at long intervals lectures to advanced students. Doctor Hagen was a man of marked character, simple tastes and sympathetic disposition. Many entomologists enjoyed his friendship and hospitality, and he was one of the outstanding entomologists of his time. His death occurred from paralysis, at Cambridge, Massachusetts, November 9, 1893.

SAMUEL HUBBARD SCUDDER (1837-1911)

Still another distinguished entomologist who started his career before 1865 was Samuel Hubbard Scudder, conceded at the time of his death to be the greatest orthopterist America had produced. The present classification of Orthoptera was built on the basis of Scudder's work. His first natural history contribution was a list of twenty species of terrestrial mollusks found at Williamstown, Massachusetts, which was printed in the *Williams Quarterly*, June, 1858 (vol. 5, p. 359). In the *Proceedings of the Boston Society of Natural History* for July, 1859 (vol. 72) appeared his report to the society on the collection of the insects of the late Dr. T. W. Harris. At the January 18, 1860, meeting of the Boston Society, he presented a chronological index to the entomological writings of Doctor Harris, listing ninety-nine titles, mostly in agricultural publications (*Proc. Boston Soc. Nat. Hist.*, vol. 7, pp. 213-222). At the May 2, 1860, meeting, Mr. Scudder reported on the supposed damage to grape vines by the American white ant (*Proc. Boston Soc. Nat. Hist.*, vol. 7, pp. 287-283). His first paper on Orthoptera was, "On the genus *Raphidophora*, Serville; with descriptions of four species from the caves of Kentucky and from the Pacific coast." This was published by the Boston Society in their *Proceedings* (1861, vol. 8, pp. 6-14). Up to 1865, and for that matter afterward, Doctor Scudder wrote on varied entomological topics, such as the synonymy of butterfly species, destructiveness of aphids, army worms, insect classification,

egg parasites, distribution of butterflies, the insect fauna of the White Mountains [N.H.], fossil insects and even on ancient pottery. Most of these contributions were printed in the *Proceedings of the Boston Society of Natural History*. In addition to his numerous papers on the Orthoptera, Doctor Scudder contributed extensively to the literature on diurnal Lepidoptera, his writings covering nearly all phases of the subject and numbering about one hundred or more papers, books and memoirs all involving extensive labor and research. His work *Butterflies of the Eastern United States and Canada with Special Reference to New England*, published (by the author), Cambridge, 1889, is well known as a valuable source of information about distribution, habits, life-histories and descriptions of the various stages of numerous species. Many other books on butterflies came from his pen. Doctor Scudder was also the foremost student of fossil insects in America, and in addition he contributed to the literature of classification, distribution, genitalic study and minute anatomy. His writings on American Orthoptera run well over one hundred papers. Some of them were published in the *Proceedings of the Boston Society of Natural History*; others appeared in *Entomological News*. His *Catalogue of the Orthoptera of North America described previous to 1867* (Washington, 1868) and his *Catalogue of the Described Orthoptera of the United States and Canada* (Davenport, 1900) are known to many workers in the general field of entomology.

For many years he edited *Psyche*, the organ of the Cambridge Entomological Club, and from 1883 to 1885 he was the editor of *Science*. Many journals, both American and foreign, published Doctor Scudder's contributions.

Samuel Hubbard Scudder was born April 13, 1837, in Boston, Massachusetts. He graduated from Williams College in 1857, and from the Lawrence Scientific School, in 1862. The work done in the Museum of Comparative Zoology attracted him, and he became an assistant to Professor Agassiz, in which position he remained until 1864. He served as secretary of the Boston Society of Natural History from 1862 to 1870, as custodian from 1864 to 1870, and as its president from 1880 to 1887. From 1879 until 1885 he was assistant librarian of Harvard, and in 1886 he became paleontologist of the United States Geological Survey in the division of fossil insects. Professor Cockerell has said that Scudder was the founder of American Paleontomology and by far the largest contributor to that subject.

Doctor Scudder was active as an officer and as a member in many scientific societies, among other things, serving as general secretary of the American Association for the Advancement of Science in 1875 and as a vice president in 1894. In 1902, he definitely abandoned scientific work, being then sixty-five years of age. Nine years later, on May 17, 1911, he died. He was a man of culture, of refinement and of great scholarly attainments, whose ability was recognized at home and abroad. He added luster to the study of entomology in America.

FREDERICK ADOLPHUS WISLIZENUS (1810-1889)

At the July 1, 1861, meeting of the Academy of Science of St. Louis (*Trans. Acad. Sci. St. Louis*, vol. 2, pp. 159-160), Dr. Frederick Adolphus Wislizenus called attention to the "army worm" then devastating the neighboring fields of St. Louis. He referred to it as the grass caterpillar, *Bombyx graminis*, and spoke of its destructiveness in the north of Europe. In Sweden and Norway, in some years this species destroyed practically the entire crop of grass. Doctor Wislizenus then gave the life history of the species and recommended plowing while the insect was in the soil. He thought that the digging of ditches and the driving of hogs and chickens into the meadows might do some good. If a timothy field were invaded, he recommended the construction of ditches and the mowing of the timothy so that the caterpillars would either die or go in search of fresh food.

Doctor Wislizenus was primarily a botanist, physician and traveler, rather than an entomologist. Born May, 1810, in a German principality, he was forced to leave Germany because of his participation in an unsuccessful attempt to overthrow the monarchical government. Fleeing to Zurich, he became interested in the cause of Italy and joined an expedition to aid Mazzini in his struggle against Austrian rule, but he was forced to resume his studies and he graduated in Zurich in 1834 as a physician. In 1835, he was practicing in New York and writing verse and political pamphlets. In 1837, he set out for the west and joined Körner and other exiles who had founded a home in St. Clair County, Illinois. Until 1839 he practiced in Mascoutah and then moved to St. Louis where he joined one of the expeditions of the St. Louis Fur Company for trading with the Indians. He penetrated toward the source of the Green River, and when the rest of the party returned he joined a band of Indians and crossed the Rocky Mountains. Returning to St. Louis in 1840, he resumed his practice and became identified with the rapidly growing city. But he soon joined a trading expedition to Mexico where, because of the war between Mexico and the United States, he was taken a prisoner and not liberated until the spring of 1847. In the summer of that year, he returned to St. Louis. Congress requested him to publish his memoirs and these appeared in 1848. His later activities included a trip to Constantinople, where he married, a trip to Panama and the Pacific Coast, his return to St. Louis in 1852, where he settled down, his interest as one of the founders in the St. Louis Academy of Science, as an officer of the St. Louis Medical Society, and as president of the German Medical Society of St. Louis, and in the collection of botanical and mineralogical specimens and the making of barometrical observations. He died September 22, 1889, in his eightieth year.

THOMAS BEVERIDGE ASHTON (1826-1895)

On April 25, 1859, a letter from T. B. Ashton, of Washington County, New York, was read before the Entomological Society of Philadelphia. This dealt with his observations on *Podura nivicola* Fitch. At the meeting of February 10, 1862, another of Ashton's letters was read, this one dealing with his observations on *Aphis avenae* Fitch, on oats (*Proc. Ent. Soc. Phila.*, vol. 1, p. 32, pp. 141-142).

T. B. Ashton, one of the pioneer entomologists of Kansas, died December 28, 1895, aged sixty-nine, at Tonganoxie, Kansas. A native of Washington County, New York, Ashton was always interested in insects, especially the Coleoptera. He was one of the charter members and helped to found the Entomological Society of Philadelphia, the latter part of February, 1859. He was a skilled and persistent collector of Coleoptera and gathered a large and valuable collection. At times he contributed articles to eastern journals. On February 8, 1895, he wrote a letter to the late H. W. Wenzel, of Philadelphia, in which he mentioned some of his activities. This letter was printed not so many years ago by the late Warren Knaus, of McPherson, Kansas. In this letter, Ashton mentions visiting James Ridings, of Philadelphia, in 1852, and examining his collection and making exchanges with him. In 1853 in the same city, he met George Newman. His visits to Philadelphia continued every other fall, until the winter of the year in which the Entomological Society of Philadelphia was organized. During these years he made friends with all the collectors in the city. In the spring of 1869, he went to Kansas where he stayed the balance of his life, always interested in insects. He knew Dr. Asa Fitch, who was friendly to him from boyhood up, and at one time he received a rather curt letter from Dr. G. H. Horn, who objected to the drudgery of naming insects without even receiving a few specimens for his labor.

JAMES H. B. BLAND (1832-1911)

In 1861, James H. B. Bland published his first, paper on the Coleoptera, a "Catalogue of the Longicorn Coleoptera in the Vicinity

of Philadelphia." This was suggested to him by the large number of Cerambycidae, etc., which could be collected in the vicinity of Philadelphia. In view of the numerous wooden wharves and the commerce between Philadelphia and other coast cities, many species were introduced from other areas. Henry Feldman and George Newman, who collected extensively around Philadelphia, helped Bland with his list.

Bland, all together, published seven papers, all on Coleoptera. They appeared in the *Proceedings of the Entomological Society of Philadelphia* (vols. 1 to 4) and, except for the list referred to, consisted of the descriptions of new species in various genera. Bland's writings all appeared before 1865.

Mr. Bland was born in North Carolina about 1832. He died in Philadelphia, November 12, 1911. He became an organization member of the Entomological Society of Philadelphia on February 22, 1859, and was actively interested in the Society, serving as vice-president for two years (1861-62) and as president for three years (1863-65). His entomological work was encouraged by Dr. Thomas B. Wilson, who was such a friend and patron of science in the 1850s and early 1860s. During the last forty years of Bland's life, his interest in entomology was spasmodic, although he helped to organize the Feldman Collecting Social in December 1887, and was its first president.