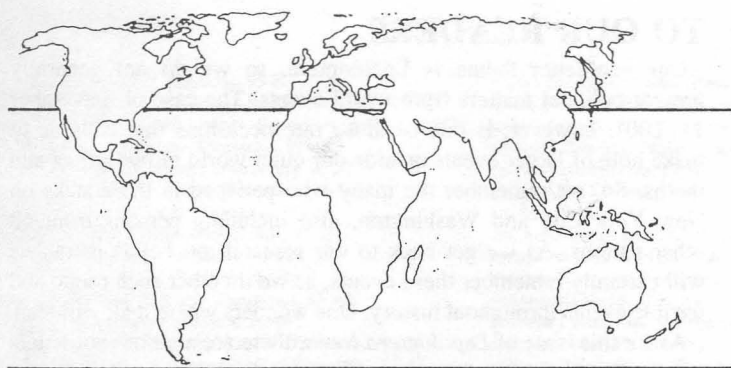
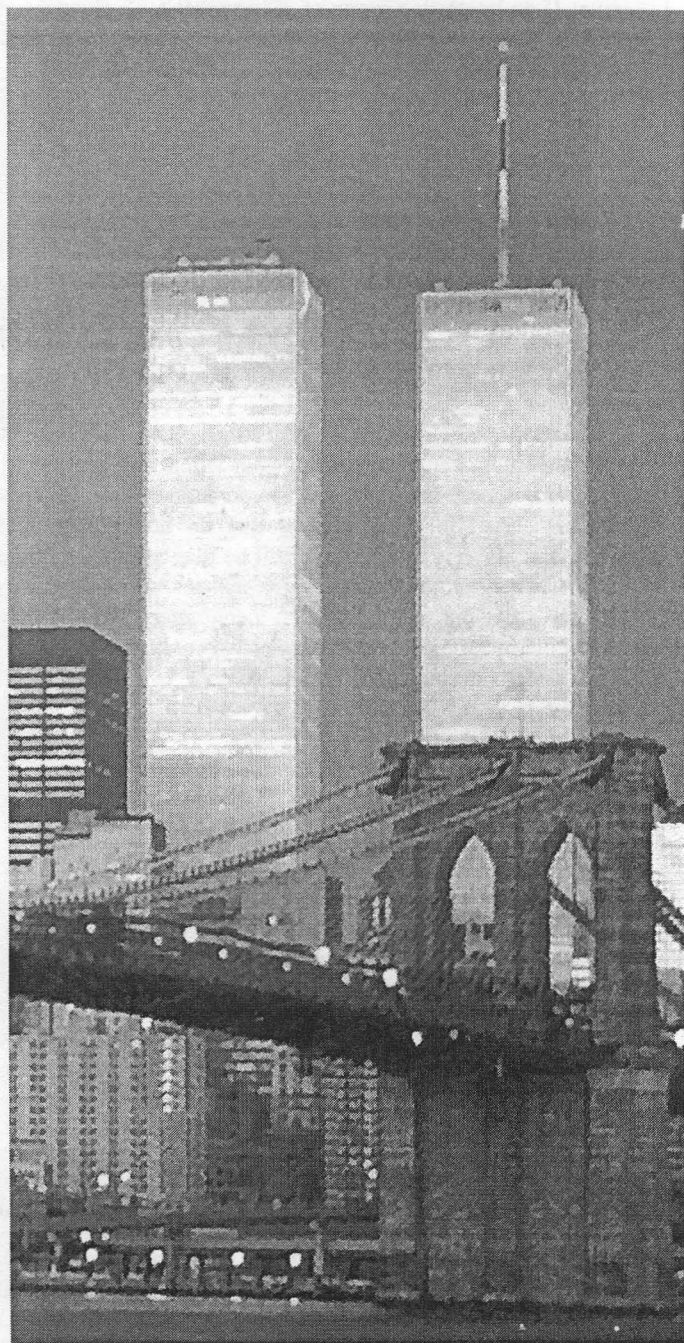




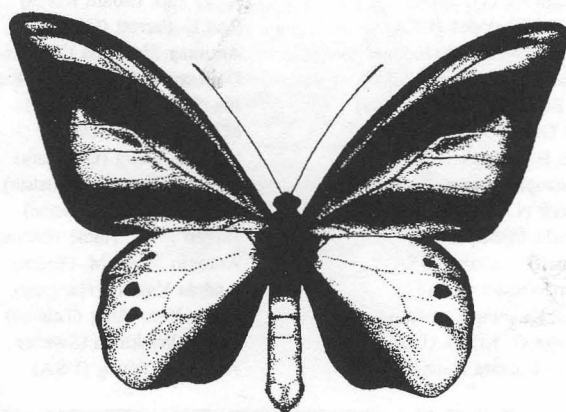
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IN MEMORIAM



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TO OUR READERS

Our newsletter theme is Lepidoptera, so we do not generally present political matters from world events. The case of September 11, 2001, however, is one of those rare occasions that calls us to make note of larger events outside our quiet world of butterflies and moths. So, we remember the many who perished in the attacks on New York City and Washington, also including persons from 68 other nations. As we get back to our research on Lepidoptera, we will certainly remember these events, as we do other such tragic and terrible events throughout history. One wonders where it all will lead.

As for this issue of *Lepidoptera News*, there are a number of letters (unfortunately mostly from myself: your own letters and comments are always welcome) that discuss issues we need to address in our area of interest. We also have new reprint series beginning with this issue: 1) an interesting group of reports that J. D. Gunder published back in 1929-30 on some North American collections, with notes on the current status of these museums; and 2) reprinting of the *Exotic Microlepidoptera* series of Edward Meyrick, first published from 1912-37. The latter series may be of less interest to many in our society but Meyrick described almost 6,900 species of micro-moths in the pages of his journal, yet the series is virtually unavailable (most of the original stock was destroyed in London during WWII) and even the 4-volume reprint edition from 1969 is out of print. Corrections to the names Meyrick used, including their current generic placement, will be noted as far as these have been investigated up to the present time. This Meyrick series will take a number of years to complete, since we cannot devote too many pages to it in each issue.

In regard to *Lepidoptera News* itself, members are reminded that our newsletter is always open for your letters and comments (which more of you will hopefully send in sometime) but it is also now a regular journal for your articles that do not require color. The advantage of *Lepidoptera News* will be that because of low printing costs when no color is used, we need not have page charges for authors. Like our color journals, *Lepidoptera News* will also be abstracted by BIOSIS and *Zoological Record*, and scientific articles will undergo normal peer review so they can be as error-free as possible.

J. B. HEPPNER

Executive Director

NOTES

1. **2002 Annual Meeting:** April 6-8 in Gainesville.

2. **2002 Annual Photo Contest:** deadline is March 15, 2002. Note that the prize awards now include only a Grand Prize winner (award may be cash or a book). We only had 12 photos entered for 2001, so could not have any photo contest with such a small number: if there is no interest in a photo contest, then none can be had. It is up to you — lets make 2002 better.

3. **Cover Photos:** members can note that color photos for journal covers are always sought. ATL does not pay photo fees, 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 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.

6. **Life memberships:** life member dues total \$2,000 (or \$400 per year for 5 years).

NABA CALLS COLLECTORS IMMORAL

The matter involved herein compels one to speak up, thus the following essay. This may surprise many ATL members, perhaps anger those that also are NABA members, but if they do not understand what is involved, they may believe all they read and not know the truth. Thus, I note below the truth of the situation for those willing to listen. My apologies for strong language, but one must combat the so-called "big lie" wherever it rears its ugly head, even in our otherwise tranquil world of butterflies and moths. One could ignore the problem or remain silent and let it simmer, but something needs to be said or it will become increasingly unmanageable. Please read to the end of this essay and not just the first few paragraphs: your thoughts and replies are welcome.

The North American Butterfly Association (NABA) has Jeffrey Glassberg, its founder, as its spokesman: a man of great vision for the development of presenting butterflies as a new nature sport for so-called butterflyers (butterfly watchers), bringing many over from bird watching to butterfly watching. An underlying trend of NABA, however, has always been an anti-collecting philosophy, usually kept in the background but nonetheless a basic element of NABA's tenets. Glassberg has often articulated this anti-collector view and in recent years proclaimed this more and more, perpetuating the myth that collectors — calling them "immoral" — are the cause of the disappearance of certain butterflies. This distorted view also conforms quite well with many in the conservation movement who do not understand the difference between insects and birds, in that as breeding biological animals they are extremely different, both in biology and in numbers of individuals: collecting birds does present problems due to their slow breeding, but collecting butterflies has almost imperceptible effects among their populations, due to abundant breeding, oviposition potential, unexploited reserve hostplants, habitat resources, multiple broods per year, and other common factors.

The vast majority of NABA members may believe the "immoral" collector myth presented by Glassberg and others, or at least consider it credible, since it seems so logical on the face of it and makes so easy a scapegoat: after all, if persons are taking specimens from nature, sometimes in large numbers, it seems only "logical" that they must be destroying the butterfly species being collected. While many studies and reports have completely exonerated collectors from any such evil results (see Opler and others, who even made an experiment of this question by trying to exterminate butterflies from a certain location, but the next year found more numbers of butterflies than ever before in the same location — this is the power of insect biology that many birders seem incapable of comprehending), the myth continues among such groups as NABA, primarily because the contrasting studies are not mentioned to their members and because of what can be called the "big-lie." The "big-lie" has been a favorite technique of demagoguery many times in history, and continues today in the political world among tyrannical regimes around the world: continually write and talk about something, which in reality is a lie, and sooner or later enough people will believe it and it will become part of truth in the minds of these people. Such is the situation with the "lie" perpetuated by Glassberg and others, particularly persons in the conservationist movement who are not knowledgeable about insect biology, that collectors are to blame for the disappearance of butterflies and butterfly species.

Glassberg's latest ravings about collectors (2001. *American Butterflies*, 9(3), [Editorial]) is another such case that needs to be addressed, where he states that "obsessive collectors are a threat." Spurred by the lack of emergency protective listing of a butterfly species in south Florida by the U.S. Fish & Wildlife Service (USFWS) that he and NABA were actively seeking, Glassberg blames collectors for the probable extirpation of the Miami blue in the near future. If one continues to ignore the lies talked and written about by persons such as Glassberg, then these lies will become the "truth" for many who listen and know no better. So, one must speak up about it and tell everyone what the truth is: like in Nazi Germany, if one does not expose what is being lied about, sooner or later one will suffer the consequences, as the German

people discovered years later when it was too late. Glassberg calls collectors "criminal" if collecting in protected parks, which is true if no permits have been secured, but his underlying theme is that he considers all collectors in that way no matter where they collect. Eventual NABA policy no doubt will be to actively seek legislation to keep "immoral" collectors away from all lands, both public and private, throughout the United States. This anti-collecting philosophy meshes well with many who look on anti-collecting (anti-hunting) conservation agendas as the main avenue to "saving" butterflies or other wildlife, inasmuch as many think everything is already known about butterflies, much as it really almost is for birds and mammals, but actually not for butterflies and even less so for moths and other insects (we have several 1000s more moth species in the United States that as yet have no names, and more have not even been discovered): better to blame the "immoral" collectors (or hunters) than to look for the real causes of species decline.

Glassberg notes in his editorial that collectors are to blame for the extirpation of Mitchell's satyr (*Neonympha mitchelli*) in New Jersey. There are a few unsavory collectors, as there are in all walks of life, but whatever collectors may have done to remove the last known specimens of this butterfly in New Jersey (it is still a common butterfly in other areas of the northeastern United States, thus is not extinct), they are not to blame for its disappearance in New Jersey: they only took the last specimens from populations that had for years been crowded out by suburbanization and destruction of their habitats. Glassberg makes no mention of this, only that collectors did the evil deed. This is the same hypocrisy one sees in some of the laws in tropical countries, where collecting is forbidden but lumber contracts are greedily awarded to anyone willing to pay bribes to government officials, and where the forests are then clear-cut to the bare earth of all trees, other plants, animals, and virtually all living things except underground worms and microbes, never mind what endangered animals and plants there may have been: then, in reports to international conservation organizations, these governments blame "collectors" as the evil doers who extirpated some rare plant or animal in the area, rather than the clear-cutting lumber companies and the governments who eagerly allow them to operate. One could not even legally collect specimens from the fallen trees and other debris from such clear-cut areas in some countries without a special permit, even though the next day everything would be incinerated so crops could be planted on the newly cleared land.

Let us set the record straight: collectors are not to blame for species declines, it is habitat destruction that is the cause of butterfly decline and extirpation. One can see no better verification of this than the decline of the Karner blue in New York State: here is a butterfly that is under full protection, and has been protected against the "illegal" collectors (and most collectors honor the ban on collection of this species), yet it is still declining — why?; because no government agency in New York has the will to set aside enough undisturbed habitat for this butterfly to survive in, and not because some collectors are sneaking in and taking the last adults flying around, as Glassberg would have us believe. Glassberg also mentions removal of rare orchids from public lands by orchid collectors, as written about by Susan Orlean in her book, *Orchid Thief*, yet fails to mention that the orchids would not be so rare, were all the habitat still around as it was 200 years ago — the collectors are just the scapegoat for the last few surviving specimens, while the decline of the species is caused by our own development over the years, for farms and all those nice suburban houses in woody subdivisions so many of us like to have in America. One should note also that Glassberg's other article, on the discovery of Mitchell's satyr in northern Alabama (2001. *American Butterflies*, 9(3):16-21), shows how little we know about this supposedly endangered butterfly which is now more widespread than previously known about: usually it has been the amateur collector who has made such discoveries over the years. Due to Mitchell's satyr being on the USFWS endangered species list, no one has been able to touch it for many years, since even observing it without a permit is illegal according to USFWS regulations ("bothering endangered wildlife in nature" clauses), something even the butterflyers do not realize when they go out

and stalk butterflies to observe them, all the while interfering with the courtship or feeding behavior of the endangered species. Fewer discoveries have been made as a result of these regulations, since the active amateur collectors have largely had to ignore the species in nature, and most butterflies just observe species and do not report scientific results that help our understanding of the species.

Glassberg's main focus in his editorial, however, is on his view of the fate awaiting the Miami blue (*Cyclargus thomasi bethunebakeri*), once collectors find out where it is, now that the USFWS has temporarily refused to decide on NABA's listing proposal, or any other listings of endangered species in the United States. The Miami blue, no matter how rare it may be becoming in south Florida, is no "species" anyway: it is a subspecies of a widespread West Indian species, *Cyclargus thomasi*. It is in no danger whatsoever: it is widespread and common in the eastern Caribbean. It is just the named Florida population that has only a foothold in the Florida Keys; a possibly dubious naming anyway since these populations undoubtedly get "reinoculated" periodically from nearby areas from populations with other "subspecies" names, and are not permanently isolated as most valid subspecies should be over longer time periods to be rationally termed as subspecies. The NABA agenda for butterfly protection also appears to include the fabrication of subspecies so they may be listed as endangered species: recent efforts to "find" a valid subspecies for eastern populations of the Idalia fritillary (*Speyeria idalia*), now largely extirpated in the Mid-Atlantic states and in New England but where there never has been a valid subspecies name proposed, is such a case of pseudo-science — the species is still abundant in some well-preserved tall-grass prairie habitats in the Midwest.

The history of the Miami blue, its waxing and waning in numbers of individuals over time, is probably a natural situation that has recurred countless times over the last 100,000 years: a continual introduction from the Bahamas, with subsequent short-term survival and decline in Florida, with later reintroduction, as part of the continual cycle of life in south Florida of some species. Decline of the Miami blue population in Florida may also be caused by interspecies competition, now that a population of the Ammon blue (*Cyclargus ammon*) is known to be in the same habitat: see Calhoun (2001. *Holarctic Lepidoptera*, [in press]) for more on this. The Miami blue would not even be "different" in name had not someone given a name to this population in Florida, which is otherwise little different from what one finds nearby in the Bahamas, so the "species" certainly is in no danger. The same scenario is typical of the Florida atala butterfly (*Eumaeus atala*), also with a Florida subspecies (*E. a. florida*) which also was thought to be extirpated from south Florida in recent decades, even though it is common in the Bahamas. Yet, today it is so common in the Miami area that some wish to spray it, since the caterpillars regularly eat through homeowners' zamia plants: this butterfly would certainly have come under Glassberg's eye for protection against the "immoral" butterfly collectors, had it not recovered on its own (despite extensive collecting as a prized south Florida butterfly!). It is not the collectors who are to blame: in the case of the Florida atala, there is absolutely no doubt that the development of Miami is the cause of its earlier decline, due to the removal of vast numbers of its hostplants, the Florida zamia (or coontie), from all the pine woodlands around Miami now covered with houses, streets, and office buildings. Its current numbers are being maintained only due to the horticultural plantings of zamia plants in numerous residential gardens in the Miami area. Prior to the expansion of Miami that began after 1950, the Florida atala was abundant in the local pine-palmetto woodlands that formed the main habitat for its hostplant: no hostplants, no butterflies.

Are we to have a national law against collecting butterflies in the United States? NABA and Glassberg probably would favor such laws and probably will eventually actively seek legislation to do just that, at least for butterflies if not for all insects. This will be the inevitable result of the continued perpetuation of the "big lie" by Glassberg and others, that collectors are the cause of the decline of various butterflies. Blaming collectors is an easy scapegoat, instead of the true causes of overdevelopment, habitat loss, greed, and the overpopulation of humans, which would hit closer to home. Yet, if all collecting stopped, butterfly decline

would continue unabated, due to our lifestyles and the resultant inevitable encroachment on remaining natural habitats. One need only look to some countries in Europe for the results of ill-advised anti-collecting laws to see the results, or lack of results: Germany, Austria and some others do not allow collecting of butterflies or other insects, thus prohibiting even young school children from making small collections of insects, yet their butterflies are still declining — why?, because of continued habitat destruction, not the "evil" collectors. The long-term result of these incredibly ignorant "laws" is to completely shut out a generation of school children from nature studies, often enhanced in the past through the natural childhood collecting instinct: one can argue that the rearing of caterpillars to witness the transformation to the adult is sufficient but there is something about active collecting — getting outdoors over a period of years to find butterflies and moths, rearing various species and noting their behavior and hostplants, carefully preparing specimens, identifying the species and arranging a collection into their systematic order — that inspires more awareness of nature and the science of lepidopterology than a simple laboratory exercise can do. The results of these laws will be a generation of adults ignorant of the nature of Lepidoptera, who then will readily believe the "big lie" that collectors were to blame for the extirpation of butterflies, not the building of more and more houses and factories, and the removal of every last natural habitat in sight by greedy profiteers — no, it was the collectors who did it. NABA members who do not believe this should study the theme in George Orwell's 1984.

The hypocrisy involved in putting the blame on recreational collectors — who are the main ones who have discovered most of the biology we know about in butterflies over the past 200 years (and not for "shallow amusement," as Glassberg claims in his Mitchell's satyr article) — always reminds me of the national park laws where one cannot touch anything for science (i.e., collecting a few specimens for study) without a permit, yet the park rangers actively will kill millions of mosquitoes and other "undesirable" wildlife so the tourists will have a pleasant visit (can there be such a thing as an "undesirable" species in a natural habitat if one wants to keep it truly natural — other than imported species, of course — I think not). If one collected a single mosquito in a national park in the name of science (it might even be a species new to science) a ranger could fine and imprison the "criminal" collector for such a deed, yet tourists are allowed to set up campsites, kill any number of mosquitoes, ants and other nasty pest species (and "ugly caterpillars"), no matter if these were even more rare and endangered than some butterflies flying about. In some natural areas one can even hunt bear and deer, and other large mammals, or large birds like ducks and geese, with permits, yet "hunting" butterflies is considered "immoral" by some. Many naturalists in the conservation movement have similar views, not thinking anything about killing innumerable mosquitoes, which are not as beautiful as birds and butterflies, thus forgetting the fact that all plants and animals in a habitat may need protection, and also need to be studied. Remember that only about 60% of the estimated 245,000 species of Lepidoptera in the world have been discovered and named thus far, so much still needs to be collected in order to be studied: one cannot "watch" a new species, photograph it and give it a new scientific name, one must collect some specimens and make them holotypes for museum deposit after a careful description. Scientific collecting of butterflies is even needed in such relatively well known areas as North America and Europe: there still are many species complexes and biologies that are poorly known, and there are some undescribed species about, all things that the recreational amateur collectors have been in the forefront of discovering over the years. Yet, hypocrisy abounds — blame the decline of butterflies on "immoral" collectors trying to do scientific studies by sampling some specimens, rather than work on changing all the factors going into habitat destruction, which are the really "immoral" reasons for butterfly decline.

The lack of logic and accurate knowledge of the natural world of insects is only enhanced by the lack of active nature pursuits that collecting also is a part of, as is butterfly watching, so blaming collectors for butterfly declines does not help protect them. We are talking here about amateur and scientific collecting, usually only taking a few individuals from any one population at any one time, not commercial

collectors who may take too many. Even in cases of commercial collecting, however, it has not been proven that permanent damage has occurred to any butterfly species — this again is only the "logical" conclusion made by those who see all collecting as "immoral." For example, each year millions of butterflies are collected in Taiwan for the commercial butterfly-art trade. While I personally do not approve of this, such harvesting of butterflies in Taiwan has been going on for decades, yet butterflies are as common in Taiwan today as ever, at least in natural areas (the only decline evident is in developed areas due to too many people and the resultant destruction of nearby natural forests) — and, the new listing of two endemic butterfly species for protection in Taiwan involves butterflies actually still abundant in their natural habitat, and not in danger of going extinct. One needs accurate knowledge, not scapegoats. I have more than once discussed caterpillars with gardeners who wanted to remove those "nasty ugly caterpillars" from their butterfly garden, the gardener not even knowing the basic fact that butterflies come from caterpillars! If we are not to have future generations that have no real knowledge of butterflies and nature in general (which knowledge can easily be fostered in the pursuit and collection of butterflies), then no matter what laws are made against collectors, there will be no more butterflies when the last habitat is covered over or clear-cut, or the last national park is sprayed against mosquitoes or gypsy moths, or the last crop field is genetically engineered to the point that visiting butterflies die when coming into contact with the plants, unless people know the truth and know nature.

What we need is sanity, and the understanding that collectors — especially the vast majority who are building scientifically valuable collections for the study of the biology and taxonomy of butterflies and other insects — are not to blame. What we need is to fight unplanned development, constant removal of habitat (especially habitat that seems so "useless" to many because it is not beautiful, exotic, or rare), clear-cut lumbering (rather than selective removal of needed trees, thus leaving the underbrush largely intact), and a host of other destructive practices worldwide that can be altered to enhance habitat survival. And, one also needs to fight hypocrisy, wherever it may reside.

Sensible and scientific collecting (not commercial harvesting) has never, and will never, harm any population of butterflies, no matter how endangered it may appear in nature: protection of habitats and the hostplants that the butterflies need to propagate their offspring will ensure their survival, not endangered species listings and ill-advised laws against collectors. One may see only a few butterflies at a time but like many other insects, there are usually 1000s of individuals of any given species in any given habitat (excepting only a few rare cases where habitats are now so eroded that a species has declined to small numbers in any one spot). Even in Europe, where the apollo butterfly (*Parnassius apollo*) is protected, it is still abundant in many areas and was so even when collectors were actively collecting them in numbers year after year: again, it has been habitat destruction that has extirpated the species in some areas, not "immoral" amateur collectors, or even those engaged in overcollecting — the "common knowledge" that the apollo butterfly is an endangered species because it was decimated by collectors is in reality a myth — widespread habitat destruction is the real culprit.

Allowing amateurs and children interested in nature to make collections of butterflies has over the years only enhanced the knowledge of the next generation to appreciate and protect nature, and has had no significant effect on butterfly populations: all the entomologists I am familiar with started out as children or teens collecting insects, taking nature in their hands, so to speak, to foster their enthusiasm. This is the same understanding hunters have of nature, even though they "harvest" some wildlife with their hunting. Unfortunately, it becomes the fodder of the ultra-conservationists who want absolute bans on all hunting everywhere, whether big game or butterflies, yet who loudly complain when the deer get so numerous that they eat all their garden tulips (which is avoided with selective hunting of overpopulated deer) and wonder where all the butterflies have gone, all the while sitting in their homes among the formerly natural woodlands (newly transformed into housing developments that removed all the understory plants the butterflies used to feed on), where mosquito and gypsy moth spraying is done frequently so they can sit on outdoor patios in the summer and look

at their remaining trees (not realizing the large numbers of butterfly caterpillars that also succumbed to all this insecticide spraying): but, it is much easier to blame the conspicuous "immoral" collectors for declines in butterflies, rather than all those relatively unseen causes that hit closer to home. It is so much easier and more convenient to blame "immoral" collectors for the lack of butterflies or extirpation of certain species, rather than our own lifestyles that actually contribute to the destruction and ignorance of nature. Let us see the real causes and fight those, and not blame recreational amateur collectors, who love butterflies as much as anyone and actually want to learn something about them (possibly even discovering new species), rather than to just take their pictures, as nice an outdoor hobby as that may be. Butterflies should note that another agenda among some in the ultra-conservationist movement, as well meaning as these people may be, is to totally exclude people from some wildlands — even butterfly watching would be "illegal" if such laws were promulgated to their ultimate conclusion, since having 20 or 30 butterflies crowding around a butterfly on a flower, and trampling the hostplants nearby while trying to photograph it, interferes with the breeding and behavior of any butterfly, especially an endangered species (note again the "bothering wildlife" clause of USFWS regulations already in place for endangered species); thus, eventually even butterfly watching could be made "illegal" if one took some conservation ideas to their ultimate bizarre conclusions — something to think about when calling collectors "immoral."

This essay may annoy some persons, but I hope readers will learn from it and not listen to calls of scapegoats and "immoral" collectors: we need to know what the big "lies" are and learn the truth about butterfly biology, rather than pass laws that will in the end have absolutely no effect on the protection of species if the habitats and hostplants of those butterflies are not also protected. Revisit Germany and see the complete lack of progress in butterfly enhancement from their anti-collecting laws: the progress evident there has all been due to habitat protection, not from getting collectors off the land. Changes in lifestyles, where we make sure some part of a forest is retained intact between new housing construction (and not buying houses built on clear-cut former forest lands), and other such intelligent conservation decisions that each person needs to be cognizant of, such things will change the futures of our butterflies and other wildlife, not anti-collecting laws to stop those "immoral" collectors; collectors who in fact want nothing more than to study our butterfly species and make sure they also are there every year so future generations of amateurs can also make collections that eventually will end up in museums around the country as part of our continued specimen base, on which the real knowledge of our butterflies actually rests.

J. B. HEPPNER
Gainesville, Florida

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RELATIONSHIP BETWEEN THE GIANT SWALLOWTAIL AND CITRUS

Residents of the Miami area of Florida have voiced concerns that the giant swallowtail, a known citrus-feeder and one of our largest North American butterfly species, would be severely impacted with the continued removal of citrus trees. Due to the outbreak of citrus canker, a devastating viral disease that scars citrus fruit, making it unsaleable, the State of Florida has in place a program to remove all infested citrus trees in southern Florida wherever canker infestations are found, including all homeowner citrus in the Miami area. In studying the status of the giant swallowtail in North America, it is clear that no significant impact to the species can be expected even if all citrus were removed from the Miami region.

The giant swallowtail (*Papilio cresphontes* Cramer, family Papilionidae), sometimes also included in the subgenus *Heraclides*, is one of the commonest swallowtail butterflies in Florida. It is found in the southeastern United States and also northwards to southernmost Ontario, with strays along the coast as far north as Nova Scotia, and also ranges west to Texas and to southern California. Its occurrence in southern California apparently is due to spreading out from citrus areas of west Texas, New Mexico and Arizona, being first recorded in California about 1963. Its presence in northern areas like Ontario and New York, however, demonstrates its ample supply of native hostplants and its cold-hardiness for an otherwise tropical species. It also occurs throughout the Caribbean and from Mexico south to Colombia and French Guiana, and probably also to northernmost Brazil as well. This butterfly has found citrus as a widespread hostplant in Florida, whereby the other common name, orange dog, stems from, since it is considered a minor pest of citrus leaves.

The giant swallowtail has a long list of hostplants that it utilizes, mostly among citrus-related plants of the plant family Rutaceae, including the genera *Amyris*, *Atalantia*, *Casimiroa*, *Citrofortunella*, *Dictamnus*, *Fortunella*, *Limonia*, *Ptelea*, *Ruta*, *Triphasia*, and *Zanthoxylum*, besides *Citrus*. The caterpillars have also been recorded as feeding on other plants from a variety of plant families, including *Anethum* (Umbelliferae), *Aralia* (Araliaceae), *Nyssa* (Nyssaceae), *Persea* (Lauraceae), *Piper* (Piperaceae), *Populus* (Salicaceae), *Staphylea* (Staphyleaceae), and *Thalictrum* (Ranunculaceae). Some of the recorded hostplants are tropical but there are many available native hosts in natural habitats of Florida. The preferred native hosts are hoptree (*Ptelea*) and various species of prickly ash (*Zanthoxylum*), including Hercules'-club (*Zanthoxylum clava-herculis*), all abundant in Florida. In the Miami area, the principal native hosts of the giant swallowtail are torchwood (*Amyris elemifera*) and wild lime (*Zanthoxylum fagara*), as well as Biscayne prickly ash (*Zanthoxylum coraceum*), all still abundant in such natural enclaves within the city of Miami as in the remnants of Brickell Hammock at Barnacle State Park and in nearby sites like Fairchild Tropical Gardens and Matheson Hammock State Preserve. Likewise, nearby hammocks of Everglades National Park, Dade County Parks, and state preserves, all have abundant growths of native hosts for the giant swallowtail. And, likewise hostplants are to be found in state preserves in the nearby Florida Keys.

The giant swallowtail is an opportunistic feeder and will deposit eggs on any of the noted hostplants. It has over the years undoubtedly utilized the abundant orange groves in Florida to its advantage, but there also are abundant sources of native plants, as noted above, that have been used in the past and are still currently available as hostplants. Citrus is not native to the New World, so the introduction of citrus to Florida has enhanced the food sources of the butterfly, but the giant swallowtail has always been here long before citrus was introduced.

William Holland, in the first edition of his well-known *Butterfly Book* (1898) notes that the giant swallowtail was becoming more common northwards at the time he was writing the book, where previously it was mainly in the Southeast, but there is no citrus grown north of coastal Georgia so that was not a factor involving citrus as a host. Cramer first described the species in 1777, originally from specimens collected in Surinam. A subsequent extra name was also described for it in 1819 by J. Hübner, probably also from South

American specimens. G. H. French, in his 1885 book, *Butterflies of the Eastern United States*, notes the range as throughout the southern states and in the Ohio Valley, including many regions far removed from any citrus, where it clearly is feeding on its preferred native hosts as already noted above. Morris, in his 1862 catalog, *Synopsis of the Described Lepidoptera of North America*, notes the giant swallowtail (calling it *Papilio thoas*, a name it was sometimes mixed up with) as throughout the southern states. Scudder, in his extensive work entitled *Butterflies of New England* (1889), has a lengthy section on the giant swallowtail, noting its breeding as far north as southern Ontario, there feeding on native hostplants like prickly ash and the more northerly poplars (*Populus*).

This butterfly certainly has been present in North America long before Columbus arrived in the New World. It had abundant hostplants to feed on throughout the Southeast and especially in more subtropical Florida, long before citrus was introduced. Evidently, the earliest notes on the species for North America are by Gosse, noting the giant swallowtail in central Alabama as he saw it during his visit there in 1838, as written in his well-known travel book, *Letters from Alabama* (not published until 1859), and with no citrus being grown in the area. The giant swallowtail was also painted by Abbot, probably in the late 1790s from specimens he had from eastern Georgia (painting preserved in the Gray Collection, Boston), but this figure was not published, not even by J. E. Smith, in his collaborative work with Abbot on Georgia butterflies, *Natural History of the Rarer Lepidopterous Insects of Georgia* (1797).

In Florida, the species appears to have been common even before orange groves and homeowner citrus trees were extensively planted after 1880. The species is also a strong flier and can easily cover many miles during a typical day of flying about, thus is also well suited to colonization of new habitats, as can also be verified with its wide distribution from the USA to Colombia. Any reduction of citrus in local areas, such as the Miami region would have no significant effect on this butterfly: it is abundant throughout the southeastern United States. Even if locally reduced in numbers in an urban area, the species is abundant in nearby hammocks that are under protection as state or federal parks, and could easily re-colonize areas where fewer individual butterflies were active just by flying there in search of hostplants. It undoubtedly also re-colonizes such areas as the Florida Keys from nearby populations in Cuba, as do other species in the Keys from time to time.

The giant swallowtail is in no possible danger of being affected by even large-scale reductions in citrus, has abundant native hosts to feed on, and can easily re-colonize areas. Even if it were reduced in numbers in an urban area such as Miami, this would have no effect on the species in Florida due to its abundance in nearby natural areas outside of the Miami region. Although a striking butterfly, it also is a pest of citrus and many grove owners routinely request information on how to exterminate it from their citrus groves. As a native butterfly, on the other hand, it has no population concerns that would conceivably ever allow a case for protection to arise, due to its abundance, widespread distribution, and numerous available hostplants other than citrus, some of which are also horticulturally grown by homeowners in the Miami area. Whatever changes occur in its status in Miami would actually be of no significance to its status in Florida as a whole, and it would in any case quickly re-colonize Miami even if it were exterminated there for a period of time, although such a fate would not occur even if all citrus were removed from the Miami area, due to the native hostplants still present in protected areas like Matheson Hammock, as already noted above.

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SOME COMMENTS ON THE SOCIOLOGY OF LEPIDOPTERISTS

Some of the things readers got a "kick" out of the recent book *Nabokov's Blues* were the sometimes amusing, and usually convoluted, stories of infighting and intrigues among lepidopterists through the years. On this front, little seemed to change with time, causing Nabokov to observe, "entomologists are the most gentle people on earth — until a taxonomic problem crops up; it then transforms them into tigers" (letter to Michael Walter, 1971). Every lepidopterist has his favorite anecdotes and, of those Steve Coates and I were able to gather, many still did not get into the book. One involved Nabokov himself, and showed that even this great man was not above allying himself with another lepidist in the cause of helping put another fellow lepidist "down." Letters between Nabokov and C. F. dos Passos indicated that they agreed on a certain way to characterize Frank Chermock to their fellow lepidopterists — and that characterization was not exactly favorable.

Sometimes these kinds of stories defy history, in the sense that, contrary to impressions some of us may have about what was true "back when," these impressions turn out not to be true at all. I always assumed dos Passos and F. M. Brown were friends (they were both research associates with adjoining offices at the American Museum of Natural History (AMNH), in New York, yet the letters from their later years indicate quite the opposite.

As humans, we lepidopterists sometimes live in the fantasy that there is actually a "neutral" or "objective" point or person "out there" from whom we will get the real scoop. We trust "experts" and we trust "peer review," etc. But, there are always problems. Even in this piece, the observations I express, though meant to be useful, undoubtedly also represent some kind of partisanship. Well, relax, lepidopterists are not alone in this quandary. Look at the recent controversy raging in anthropology over the book *Darkness in El Dorado: How Scientists and Journalists Devastated the Amazon*. This feud (for the juicy details, do an internet search of any key word from above or below) has engulfed the National Book Award review board, the National Academy of Sciences, and several academic institutions (not to mention several "ad hoc" committees). One thing has become painfully clear to all in that controversy: the sides line up *not* on views about facts *per se* but views about "facts" as interpreted by this or that feuding "expert." The battle has become about which "facts" are, in fact, true.

To set your mind further at ease, one can recall a similar juicy skirmish about a decade ago that engulfed the National Institutes of Health, the Rockefeller and Carnegie Mellon universities, and the Nobel Prize committee, when it came to the accusations of fudged data in certain genetics studies. As this controversy played out, one "neutral" committee vindicated accused perpetrators while the other, just as "neutral," found fraud. Since both committees represented prestigious organizations, the matter floundered and people hoped to soon cultivate very short memories. In retrospect, many analysts point out today that the so-called "neutral" boards really represented the constituencies of the feuding parties. Those stakes were big — the Nobel Prize — lepidopterists are small taters by comparison.

There are several recent developments in our own field that invite similar attention to what Francois Truffaut's character in *Close Encounters of the Third Kind* called, for lack of a decent English equivalent, a "phénomène sociologique." Yes, the phrase translates as "sociological phenomenon" but it is only "in-the-French-in-the-film" that it holds that special meaning as "one of those crazy things that only human beings can do." Now, none of us is exempt from prejudice. Thus, in writing this note I will confess I was tempted at first to mention specific people and give specific literature citations. However, since that would probably be perceived as operating in the "attack mode" (and because I have been trying to train myself, as I urge others, to enjoy this tongue-in-cheek world of "sociological phenomena" simply for what it is), the worst I will do here (and mostly for the sake of focus) is mention organizations or taxa from time to time.

Two of the great myths that seem to be making their way back into lepidopterology are these: the phenomena of (1) "official lists" and (2) the idea that there is something objective, that is, "right" versus "wrong,"

about the idea of what a genus or species is. Recently, the lepidopterist community has seen quite a proliferation of ad hoc groups and people — or organization-sponsored committees working on "official" lists — first of the English names of butterflies and now, more recently, "official" lists of scientific names of butterflies. We not only have ad hoc committees (composed of friends and allies of this or that specialist or advocate whose nomenclatorial preference lies somewhere along that venerable linear scale historically referred to as "lumping" versus "splitting"), we also have organizations aiming towards lists, among them the Association for Tropical Lepidoptera (ATL) and the North American Butterfly Association (NABA). Now, the Lepidopterists' Society has also had its lists and, to be historically accurate, while some of these organization-sponsored lists are specifically touted as "official" (for influence-related purposes), others are more properly advertised as simply the contribution of an appropriately recruited expert. In the case of Lepidopterists' Society lists, its first one, by dos Passos, got a fairly good reception (probably because of its being an historic event). The subsequent Miller and Brown list did not enjoy such an even response. If one goes along (for shock value) with its labeling by some in the 1980s as "the Blue Bomb" — called so due to having a blue cover (a caricature which can be taken negatively or positively), one might suggest that all the subsequent lists brewing today simply parallel the world's problem with nuclear weapons, that is, list "proliferation." We are soon going to have *many* lists, and, we must unfortunately anticipate they will most likely represent extremes of lumping versus splitting reflecting the "ilks" of the particular group (or, for lack of a better term, "cliques") their adherents represent.

From this problem of lists emanates another problem — these list's objectivity (or lack thereof) when it comes to defining genera and species. It is this problem over which people are bound to go "ballistic." The truth is there is *no* bottom line, universally agreed upon, regarding defining species and genera. Even though there is a general *concept* of species that most biologists find palatable, it is the question of how to translate this into practice that causes the perennial controversies. In fact, this is sad because nothing would be more healthy than a good amount of unanimity among lepidopterists on these questions concerning the status and rank of taxonomic names. Unfortunately, we cannot hope for that unanimity; we can only hope the inevitable backlash to each list is not too devastating.

One group has announced that it will have no taxonomists on its committee. The basic reason, they say (if I may paraphrase) is that taxonomists are "too close" to their own work and cannot be objective. Yet, the idea that trained taxonomists are specifically excluded has a disconcerting ring to it (I would think). However, and this is what bothers me, that ring is not so strange if one considers what has generally been going on in the pursuit of butterfly taxonomy in recent years. The number of trained taxonomists has dwindled, the number with taxonomy-related jobs is even fewer and, along with a general move by many institutions away from collections-based research, there has been a movement away from a lot of things — (as tools) away from type specimens, away from the *International Code of Zoological Nomenclature*, and away from the International Commission for Zoological Nomenclature (ICZN).

I used to wonder feverishly why type specimens were so seldom consulted in several difficult groups of butterflies, other than perhaps the collecting of some color slides or photos of random syntypes. At least everywhere I went over the last two decades (and as recently as even last fall), I was often (often "always") the only person in the logbooks to have borrowed or dissected these specimens. However, my questions were answered to a great degree (in fact, in quite a series of epiphanies) by some recent publications on the South American fauna. In these publications the taxa were so incredibly lumped I realized that, at that broad a level of circumscribing species and genera, types did not really matter any more. You can, in fact, paint species and genera with such broad strokes that the historical types simply become irrelevant — they will just inevitably "fit in" somewhere (e.g., if you can allow some hyperbole: "if it's green it's a parrot; if it's black it's a crow").

I also had some epiphanies about the Code. I had had some problems with old names where the original descriptions or figures by 18th or 19th

century authors did not fit any known, actual, butterfly. Now I realize that this problem resulted because I was overly worried about detail. What these new lists do is simply *tell* you what the original author meant. No need to petition the Commission for the suppression of a name that fits no known butterfly. You simply tell people what the original author meant (without even a neotype) and it is all solved. Many people seem to be satisfied with this. One fellow who does a lot of tropical fieldwork dropped through the AMNH a few years back to discuss the identification of a thecline with me. I pointed out to him that although his specimen did match the picture in the Trinidad-Tobago field guide he was carrying, his specimen *and* the guide's photo did not match in any way the British Museum's type specimen of that name. From our discussion I then realized he did not know what a type specimen was. Moreover, when I tried to explain it to him he was not interested and went off still assuming he was right (I think because his bug was in the guidebook). He then published several articles on his collecting region, in peer reviewed journals, using his names of preference and I am sure people have since recorded those species erroneously from that area. Recently, I did check to see if he was one of the non-taxonomists working on a "list committee" and felt some relief when I did not find his name mentioned.

Another epiphany I had in reading some recent papers, is that these new directions actually parallel where taxonomy seems to be going — towards simplicity. Now, there is nothing wrong with simplicity *per se*, and this is what is compelling about it. If you synonymize at the species level *everything* that looks in *anyway* like a certain taxon (using the oldest name) and then list everything else looking anything like it as a synonym, this has many advantages: (1) you can easily identify everything and (2) there is no problem with variants. This is an extremely compelling way to go. If you go to a museum or a book using this method, you can get quick identifications; it also fits the need of rapid biodiversity assessment. You do not get bogged down with difficult complexes. It is not only in difficult groups in the tropics that this seems to be the trend. Even in the United States fauna, we see it — one ad hoc committee advocates broad synonymies over large geographic areas. In fact, it *does* take many problems away. This does not necessarily mean that the "problems" will not occur again if you do some dissecting or some biological studies but, at the level of sorting specimens, it has a level of efficiency and comfort. Also, think of how short the new field guides can be — you will not have to deal with all those subspecific entities, possible sibling or sympatric species, or the status of allopatric entities. Well, one group says that you will not unless the data is *published*; unpublished data, no matter how well known generally, will not be included as criteria and, also, it will depend on *where* these data were published, e.g. the "reputation" of the journal (real objective, huh?). God help the person who finds evidence of a similar-looking sympatric species (they may end up walking through that "valley of the shadow of death," as has the recent author of elegant studies concerning life histories in *Celastrina*).

At the level of genera, simplicity in methodology is equally compelling — you put tens, or hundreds, of species into an old generic name and list everything published since about 1950 as a synonym. No matter that the new list's "species groups" (if you even take the time to list them) exactly parallel the other list's generic or subgeneric groupings; you simply stick them all as "synonyms" up at the top. You have a simple system that anyone can use: for example, in Lycaenidae you can have a big "*Strymon*", *Mithras*, *Lamprospilus*, etc., a big "*Calycopis*" (so who needs to even worry about *Calystryma* Field, 1967, anymore — "is it blue? is it brown? what the hell is it?" etc. — *that's* too confusing). You certainly have no problem identifying to genus — if it has the discrete "W" on the ventral hindwing band, it is *Calycopis*; no problem.

You can take an old lycaenid name like *Arawacus* and put a bunch of things in there that do not have much (or any) external or genitalic homogeneity as long as you point out one unique character that appears to unite them. Never mind that that unique character might only be acceptable to some systematists *if* it was shown to be highly corroborated as a synapomorphy. Never mind that, lacking that, a computer program might suggest that single character may be a parallelism or convergence. (I have a computer generated analysis that "says" it is parsimonious, as

if to make it credible, showing some of those groups reliably linked elsewhere by constellations of other characters. I doubted the veracity of that test, even if done by a computer, so I never published it). However, if groups are to be formulated that way (such that *no* amount of difference in genitalic shape is construed as meaningful, and *no* amount of divergence in external appearance or secondary sexual characteristics is deemed significant), it is *not* that that author may be wrong — indeed, when the "votes" are tallied in this subjective game he may win the day; but, it is just that taxonomy has then regressed to the point that *no one* can objectively decide where to put a taxon except by consulting the list authored by this or that "expert" (e.g., "Where will it be? Let's wait and see"). Now, I too have used a papillae anales character — in my computer study of *Nesiostrymon* and *Terra* published by the AMNH — and, I know that some want to put *Terra* back into *Nesiostrymon* — but, here is the "rub" regarding consistency: *that* papillae anales character occurs in a few other far flung eumacinae externally looking nothing like *Nesiostrymon*. Should all of them then go into *Nesiostrymon* so that it is configured like *Arawacus*? My computer program indicated that, in the larger group, that anales character was, again, a parallelism.

There was a day when George Gaylord Simpson mediated where everything "went" in the mammals and Ernst Mayr mediated where everything "went" in the birds. In retrospect, over fifty years later, A. Townsend Peterson pointed out recently that Mayr erred by a factor of some 200%. This is not to belittle Mayr. It's just as likely, given the tricks of history, that Mayr might have turned out to be right. With Simpson (and I only tell this story because it is both enlightening and amusing), there was a session of the AAAS (American Association for the Advancement of Science) a few decades ago in North Dakota, called "Continental Drift Survivors," where various scholars whose careers had been destroyed because they believed in continental drift too soon, had the chance to reflect on their experiences. One mammalogist recalled being invited to Harvard where he thought he was going to have a chance to debate GGS on the relative possibility of continental drift, based on mammalian phylogenies and distributions. Accordingly, he came armed to the teeth with diagrams and illustrations. He was slated to speak first. He got up and combed through all his phylogenies and distributions to argue that this or that landmass must have once been connected. Feeling he had presented quite a good set of arguments, he then sat down and waited for GGS's turn. He reports that he was flabbergasted when GGS arose, went to the microphone and said one sentence: "Well, of course Dr. _____ has his views; but, as you know, so do I." That was the end of the "debate."

There is a problem with just taking someone's word for it, a subject I will belabor only briefly. Some things have not changed since the era I mentioned above. I have read recently, in a peer reviewed journal, that in my case as one taxonomist, some of my characters "don't exist." None of several earlier papers of mine discussing those characters were cited and thus my terminology was misconstrued (no wonder they could not be found!). But what if someone, at that journal or elsewhere, would have simply asked me? Would not that have saved a lot of journal space? I also read awhile back, in a peer reviewed journal, that some of my material was mislabelled — "proven" because of problematic range disjunctions. But, again, those range disjunctions only exist if one forces those specimens into that taxon in the first place, based on the single character one claims unites them: never mind that, across that genus, there are not only other places that character exists, but two other species groups into which genitalic characters could readily place those specimens if one paid attention to those instead of the single character chosen. In another case, numerical numbers of taxa I and two co-workers had named were either incorrectly counted, or misrepresented, by a factor of up to 9x. Well, a worker can thus create a "track record" of having "disproved" someone else's work in a peer reviewed journal; but does that necessarily give it veracity? In one of these cases a journal has recently agreed to a correction; so, there is hope.

These are the kinds of things that get taxonomists down. There is also recently a circle in which any taxonomist authoring a new name promptly receives a letter, on one or another of prestigious letterheads, curtly telling them their new name is a synonym (and usually, except for one case that I know of, never told a synonym of what). Apparently, the

strategy is that we are supposed to lose sleep over it until "the list" comes out. But there are serious ramifications to this kind of thing, as reflected in an e-mail I received from a South American lepidopterist soon after he received one of these letters. It was yet another motivation for my comments here. He said, and this reflects poorly on us who live "up north:"

"if we contact the GREAT AMERICANS [sic] from here there is no answer or the answer just postpones our work and it [c]hides that they are the BEST, the GREATEST, the RICHEST, and there is no place for us [in] the fields of South American [butterflies], [shouldn't we be shown] the same willing collaboration and help as an other worker? They have the moral responsibility to balance this misleading activity. But they do not take the burden. What is this? This is science? This is a game? This is a war? Time is running [out]."

I replied that, if the intent of the letter was to get this lepidopterist "down," it had certainly succeeded. In another more recent case, a prominent researcher (with a Ph.D.) was told by another researcher (who considers himself the "expert" for his group of Lepidoptera) that his work was no good, and that he should leave the group being worked on to others and pursue larger butterflies he might have more specimens of in his own museum, rather than study the specimens in the home museum of the "expert."

Again, it seems that when it comes to our sociology of infighting, not much has changed. We also need to remember, with some soberness, that the young taxonomists we nurture and motivate today may well also have to walk down the road we have created. In sum, I do not think Lepidoptera taxonomy wants to reach a point where any of us who have authored taxa (and there are many of us) have to wait and see where our taxa "end up" in some person's or group's list because we have not, in the meantime, a clue what criteria are going to be flouted therein as "objective." Of course, we can simply ignore the list, or form our own committee and make our own (thus the humor in it all) but that precisely defeats the purpose of any hope for mutual agreement on these very fundamental matters.

It will be sad if forthcoming lists by this or that person, this or that organization, or the various ad hoc committees, end up representing great "extremes" of lumping and splitting. I have actually been on both sides of this issue. I can be viewed as a splitter in Theclinae (Lycaenidae), but in Charaxini (Nymphalidae) my papers with Descimon are lumping papers and, in Polyommata (Lycaenidae), the work I have published with Bálint is readily accusable as *precisely* that where there are huge genera and lots of synonyms (cutting across broad areas) with the "species groups" equivalent to other people's genera or subgenera. In fact, a recent reviewer of *Nabokov's Blues*, in the journal *Nature*, said exactly that — my lousy work applied only to theclines; with blues (where I was a lump) I had done great work (but, since I used the same methods throughout, what was I doing wrong the rest of the time?). Why the differences in my own published work? Well, again, its phenomenological — in any particular study you end up "calling it" as you see it and, as well, co-authors weigh in. What disturbs (or alternatively amuses) me is the phenomenon itself. Perhaps what is demonstrated here is that what we can expect with the new lists is inconsistency and controversy, not unity. But, is this much different than the past? Not really and, for perspective and comfort, that is something for us to all hold on to.

As long as people are not deluded into thinking that any of these methods are objective, or "right" versus "wrong," we will probably be OK. But, hey, a lot of religions have made that mistake and the result was conflict. With the biodiversity crisis staring us in the face, the last thing we need is more conflict.

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[Editor's note.— Kurt Johnson's essay presents some thoughtful views for readers, but arguments among specialists are nothing new; however, there is a difference between arguments and censorship, the latter also still being around. If one reads some of the correspondence among specialists from a century ago, one can be surprised at the frank language sometimes used as the letters flew back and forth. An interesting example is Edward Meyrick, the well-known British microlepidopterist who was active from 1875 to 1938: he actually published replacement names for dozens of species names he thought undesirable in their latinization and syntax, particularly those named by the American specialist, W. D. Kearfott. In 1907 and later, Kearfott began to use some simplified species names with name endings like *-nana*, *-vana*, *-tana*, and sometimes with just such short 4-letter names. Meyrick considered these to be abhorrent ("based on a barbarous and unmeaning gibberish, and in my opinion must be rejected as null and void"), so he just proposed new names for these Kearfott species in a paper in 1912 (of course, all these Meyrick replacement names are now listed as synonyms). Meyrick then went on to comment on some other researchers: for example, "American entomologists who accept the illiterate orthography of Chambers . . . are unable to remember which misspelling is the original one . . . I refuse to accept these names, and shall quote them as synonyms"). Another case was the particularly vehement exchange in 1905 when the American lepidopterist Henry Skinner noted the following about some genera of H. G. Dyar: "If anyone familiar with the Hesperidae will consult Dr. Dyar's review of the family he will find generic fantasies to satiation." Clearly, what is needed is better cooperation among researchers, and also by specialists with regard to amateurs. Most researchers are trying to find what the correct relationships are among species and what genera they belong to, so tolerance for varied ideas is necessary until it becomes a consensus of all.

As to "official lists," it should be noted that new catalogs, by ATL or others, are not "official" — they merely offer the latest view of our knowledge (usually based on the expertise of the contributors and editor, and eventually with a consensus between so-called "lumpers" and "splitters") of the taxa listed, but there is no such thing as an "official" list or catalog: even the so-called official lists of the ICZN are valid only as far as the scientific community wishes to follow them.]

PAPILIO EURYMEDON CONSERVED

The papilionid butterfly, *Papilio eurymedon* Lucas, is the well-known pale swallowtail of western North America, ranging from Colorado to British Columbia, and in the mountains of the West Coast, south as far as northern Baja California. Since 1852 when Lucas described the species, all North American literature has only used the name *eurymedon* for this species. A paper by Upton (1985, *J. Lepid. Soc.*, 38:165-170), brought to our attention that an obscure supposedly Australian species named by Donovan in 1805, called *Papilio antinous* Donovan, actually is the same as the American *P. eurymedon*; Donovan evidently having had the origins of his specimen mixed up. Strict priority would have us replace the name *P. eurymedon* with that of this old unknown Donovan name. However, according to the current *Zoological Code* (1999), authors presented with such a case can themselves put the old Donovan name in synonymy under *P. eurymedon*, as a nomen oblitum (or forgotten name), rather than disturb 150 years of universal usage in all pertinent literature, and thus end the nomenclatural problem. It is only due to planned usage of the old Donovan name by authors who prefer to apply absolute priority in all cases, even in disregard to 150 years of prevailing usage of *P. eurymedon* and in circumvention of the stated goals and rules of the *Code*, that a formal application has been made to the International Commission on Zoological Nomenclature so the name *Papilio antinous* Donovan will be officially suppressed. The use of the Donovan name by Upton (1985) is, of course, not normal usage according to the *Code*, since he only stated the problem to be resolved. Since 1985, no one has bothered to clarify the scientific name for *P. eurymedon*, but since use of the old Donovan name is being threatened, the formal application is being made.

Hopefully, all authors and researchers will only use the current name, *Papilio eurymedon* (or in the subgenus *Heraclides* if preferred) for the pale swallowtail of western North America (at least as long as it is clear that it is a distinct species), and not confuse the literature with an old, forgotten name. If someone dug up another name for the monarch (*Danaus plexippus* (Linnaeus)), does that mean we need to blindly follow rules and change the name of so common a butterfly as the monarch as used for the past 243 years? No, we need common sense for our nomenclature.

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WALLS KEEP RISING: RESEARCH IN INDIA EFFECTIVELY CLOSED

India is the latest country to effectively isolate itself from the world's scientific researchers, all in the name of protecting its biological resources from unauthorized biotechnology prospecting. Genetic and biotechnology research needs to be controlled by each country, but when appropriate laws are enacted they invariably include all other wildlife and plant research, thus putting even insect collecting in the same category as searching for plant chemicals that may have medical properties.

India's new Biological Diversity Bill 2000 provides for a new National Biodiversity Authority. The key points of this new law are the following:

1. Only Indian citizens will be allowed to obtain any biological resource or knowledge associated with biological resources for commercial use, survey or utilization without prior approval from the National Biodiversity Authority.

2. No individual is permitted to transfer results of any research relating to any biological resource obtained from India to anyone who is not a citizen of India, or to a corporate body not registered in India without prior approval from the National Biodiversity Authority.

3. The National Biodiversity Authority will have to approve all exports of biological resources.

These restrictions will effectively keep researchers from working on Indian fauna and stop most research on Indian species, not just the search for plant chemicals this law is designed to protect for the use of Indian citizens. There will likely be fees for the Indian National Biodiversity Authority to provide research permits and exit permission for any specimens, not to mention possibly interminable red-tape; thus most researchers will not want to bother trying to get through this quagmire of regulations. One can see examples of this kind of policy in Mexico, where collecting permits were \$750 until recently and often did not materialize after payment (now somewhat reduced in price but still unreliable), and Venezuela, where continued political instability has stopped any governmental agency from even formulating new permitting regulations and thus making further studies in Venezuela virtually nonexistent by researchers from elsewhere in the world; likewise in Brazil and the Philippines. What will happen to on-going research is unclear. Also, amateurs will likely be completely frozen out of doing any work in India (as is true in many other countries), since permits require that one have a valid research project, not just mere sampling to make a collection (but which will later be used for biodiversity and biogeographical studies when eventually donated to a museum). Authorities do

not know that most of the biological knowledge we have since Linnaeus has been the result of years of dedicated study by amateurs, most of whom do this work only with the reward of obtaining some specimens for their collections (and most such collections are eventually preserved in a public museum, so ultimately these collections are for science, not for commercial gain).

Legal and red-tape walls that isolate countries from needed biodiversity studies are becoming more and more common, or studies are only permitted by museum researchers and not by amateurs. Never has it been more difficult to do biodiversity surveys, even of insects, than it is now — exactly when tropical forests are being impacted more and more by logging and agriculture every year, thus making the need for biodiversity surveys ever more the last resort to just discovering what species are present in the world, let alone understanding their biologies. Yet, such basic surveys, even for insects (let alone mammals and birds), are being effectively halted in many regions by ill-advised, sometimes xenophobic governmental regulations, and then even more so once rule-making is formulated by the bureaucracies that are charged with actually implementing these laws.

Added to all this, one must realize that most of these countries like India have very few (if any) trained taxonomists, and fewer still that are working on Lepidoptera (I am talking here about trained museum taxonomists, not those engaged in some agricultural or biological studies): I know of only one Indian having described some micro-moths in recent years, for example (perhaps a few others worked on macro-moths and butterflies), and he is now retired. So, it has been the "foreigners" who have discovered and described most of the biodiversity we know about in most of the tropical countries like India. Perhaps part of the xenophobic trends in some countries are to purposely keep the foreigners out, especially environmentalists; then, there is no need to worry about "endangered species" that might be discovered where logging is to occur (like in the Amazon), since no one will know what fauna is there, and once it is clear-cut and replanted with a biological desert of oil palm or Caribbean pine monocultures, nothing will be left to discover anyway. Thus, all political and commercial problems are solved: a few corporations and well-placed individuals reap huge profits, while the natural world goes up in smoke, along with whatever biodiversity there was, and all done in the name of protecting the home country and in keeping those "foreigners" out who would remove and supposedly commercialize biological resources on their own.

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Gainesville, Florida

ANNUAL MEETING, 2001



Annual Meeting 2001 Group, Gainesville, Florida

LEPIDOPTERA MUSEUM COLLECTIONS, 1929-30

by J. D. Gunder

1. San Diego Natural History Museum
2. Natural History Museum of Los Angeles County
3. California Academy of Sciences

J. B. HEPPNER, Editor¹

Florida State Collection of Arthropods
FDACS, DPI, P. O. Box 147100, Gainesville, Florida 32614, USA

Jeane Daniel Gunder (1888-1948), a collector of Lepidoptera who lived in Pasadena, California, published a series of informative articles on the main Lepidoptera collections in North America, in the years 1929-30 in the journal *Entomological News*. It is not clear if he visited all the collections he wrote about, although his text seems to corroborate this, but he did get the salient information on each collection and the staff curators. Gunder finished 19 articles during 1929 and 1930, including one on Cuban collections, one on collections in Mexico, and three about Canadian collections.

Through the kind permission of the American Entomological Society, of Philadelphia, Pennsylvania, publisher of *Entomological News* and other series, we are able to reprint Gunder's articles. His texts were mostly rather brief, but he illustrated his articles with photographs of each museum building and the entomological staff at the time. These photographs present images of lepidopterists and other entomologists during the late 1920's and early 1930's, often well-known but most all now long deceased, and some of them not often written about or their likeness presented in photographic plates. Thus, Gunder's articles are reprinted to again bring forth these interesting notes and images. I have also added some notes on the current status of each collection to bring us up to date, now some 70 years later.

Gunder himself was an active amateur lepidopterist in southern California. He was an enthusiastic collector of butterflies. His particular specialty seems to have been the search for odd forms among the North American butterflies, to which his numerous new names for forms and varieties bear witness. A few butterfly varieties that Gunder discovered were also named after him over the years. There has only been a brief note about him in an obituary from 1948 (Martin, 1948). Gunder's large butterfly collection was sold to the American Museum of Natural History, New York, in 1930, and his library was purchased by Cyril F. dos Passos, now presumably incorporated with the other dos Passos books at Wittenberg College, Indiana.

In this reprint of Gunder's article series, the text has been reformatting to fit our page style but has not been altered in any other way from what he wrote. His artistic Art Deco frontispiece plates for each article have been copied from the pages of *Entomological News* and are unchanged except being enlarged to fill one of our larger format pages. Other photographs which Gunder included have mostly been reduced somewhat. The additions at the end of each Gunder article cover current statistics and information about each collection as they are today, most being considerably larger and altered from what they were 70 years ago. Only the Barnes Collection is unchanged in its status as of 1930, whereafter it was sold to the Smithsonian Institution, Washington, DC, upon the death of William Barnes (1860-1930), and is now incorporated into their collection of Lepidoptera; likewise for the Brooklyn Museum insect collection which is also now at the Smithsonian.

The reprint of Gunder's articles will be done in several parts. As noted, the plates are copied from the printed versions published in *Entomological News*. With the kind help of Howard Boyd, of the American Entomological Society, Philadelphia, Julian Donahue, of the Natural History Museum of Los Angeles County, Los Angeles, and Frederick H. Rindge, of the American Museum of Natural History, New York, a search was made but no originals of Gunder's plates could be located. Possibly they are still preserved in Gunder archives somewhere. Fortunately, however, modern scanning technology enables us to reproduce Gunder's plates almost as well from the printed versions as they would be from the original plates.

References to entomologists (now deceased) mentioned by Gunder in his articles can be found in Gilbert (1977).

ACKNOWLEDGMENTS

My thanks to Howard Boyd (American Entomological Society, Philadelphia, Pennsylvania), Julian Donahue (Natural History Museum of Los Angeles County, Los Angeles, California), and Frederick H. Rindge (American Museum of Natural History, New York, New York), for help on questions about Gunder and his articles and photographic records. The American Entomological Society kindly gave permission to reprint Gunder's articles from their journal, *Entomological News*.

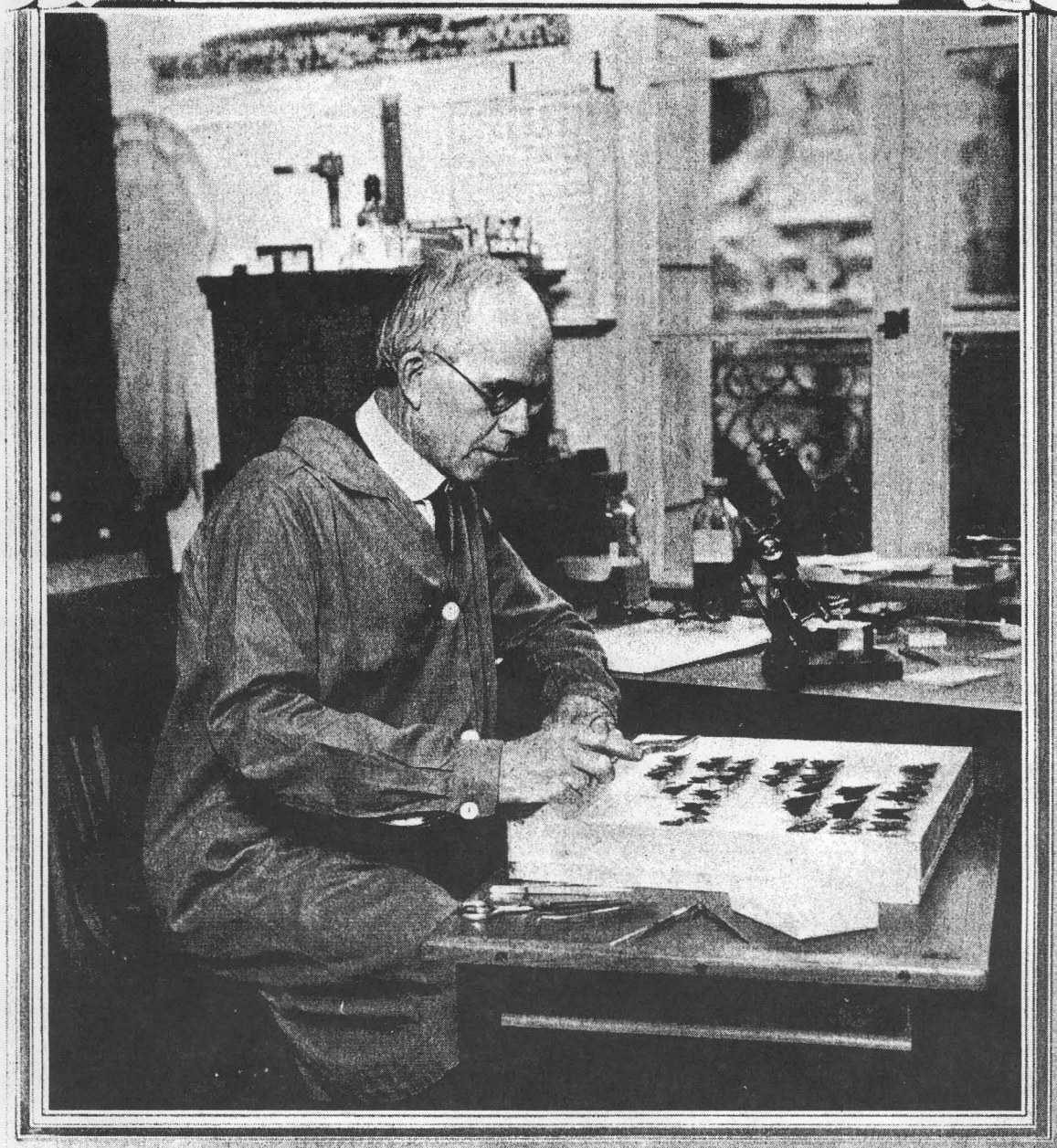
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¹ Contribution No. 922, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv.



NATURAL HISTORY MUSEUM, SAN DIEGO, CALIF.



W. S. WRIGHT

1. San Diego Natural History Museum

Anyone visiting the City of San Diego in southern California is struck by the beauty and magnitude of its famous Balboa Park. Within this park were erected the buildings of the Panama-California Exposition in 1915-1916, and one of these ornate structures is now the permanent home of the Natural History Museum. This institution is a private enterprise and although receiving some city funds, was largely dependent upon public support until 1920, when the Scripps family of San Diego left it a substantial foundation. Since then, and mostly through the efforts of the present director, Mr. Clinton G. Abbott, an ornithologist, the Museum has been enlarged and its scope of public service broadened. Mr. Abbott's wisely pursued policy of "local natural history first" is giving the southwest a really thorough and useful knowledge of its immediate environs.

In 1874, when San Diego was a little town and people came down the coast by means of horse stages or weekly boat, several naturalists who had been meeting at each other's homes, met in the law offices of David Cleveland, a botanist, and founded the original San Diego Natural History Society. Among this group was O. N. Sanford, a coleopterist, who is considered the first curator of entomology for the present institution. As years went by Mr. George Field became the second curator. Mr. Field is still active and though not now connected with the Museum, is known to hundreds of lepidopterists around the country because of his commercial insect dealings dating back to the time when L. E. Ricksecker, the coleopterist, and Frank Stephens, the naturalist, were in their prime.

Mr. W. S. Wright, the present curator of entomology whose picture accompanies this article, needs little introduction. When one thinks of *Geometridae* (moths), one thinks of "W. S." right away! He has been collecting Lepidoptera for about thirty-five years and there are many new names listed to his credit. Most of his papers will be found published in the *Entomological News*, *Jl. N. Y. Ent. Soc.*, *Proc. Calif. Acad. Sci.* and lately in the *Trans. of the local Museum*. Mr. Wright was born in La Salle Co., Illinois, on April 23, 1866, and after attending Doane College, Nebraska, went to Columbia University in New York. He has three sons and two daughters.

The entomological activities of the San Diego Museum really began in 1923 when it acquired by donation the Wright collection of insects. Two rooms in the building are devoted to entomological research and there is a sizeable display of local and exotic lepidoptera on view to the public. Mr. Wright estimates that there are about fifty thousand specimens of butterflies and moths in the mounted collections which are contained in thirty wooden cases of thirteen drawers each. He has represented practically all of the lepidoptera from San Diego County and has specialized for years upon material in long series from this section. The type and paratype specimens are not kept separate at present, but it is proposed to give them that advantage within the year.

Mr. Wright asks me to say that all entomologists will be especially welcomed by him should they come to San Diego and if they are visiting in Southern California, not to pass by his city.

J. D. GUNDER

Originally published: 1929. *Entomological News*, 40:33-34, pl. 2.

THE MUSEUM TODAY

The welcome expressed by W. S. Wright (1866-1933) back in 1929 certainly is as apt today for anyone visiting San Diego. Balboa Park is still a large green oasis in a city that now has grown to be the second largest on the West Coast, with a population of about 1.4 million. In Balboa Park, the San Diego Natural History Museum was housed in an exposition building near the famous San Diego Zoo in 1929. In 1933, the current museum building was constructed, and this has recently been more than doubled with a major expansion on one entire side of the building. Current collections total about 7.5 million specimens, with about 5 million being marine invertebrates. Another strength of the museum is its large natural history library of over 92,000 volumes.

The focus of the Museum is on San Diego and southern California, plus nearby regions of northern Mexico, especially including Baja California. The insect collections amount to about 900,000 curated specimens, housed in about 2,200 insect drawers, with Lepidoptera and Coleoptera comprising the largest parts of the holdings. Besides the research collections, the museum also has extensive exhibits on all plants and animals of the region.

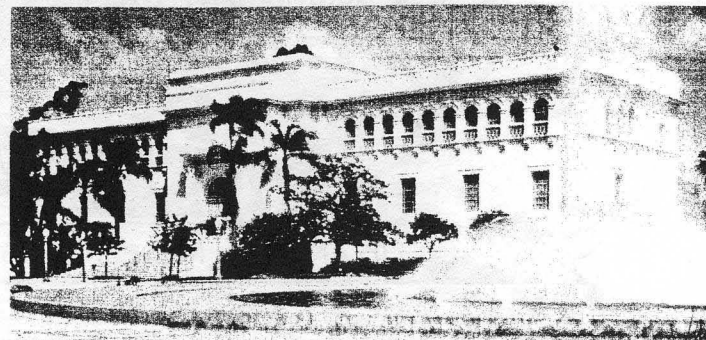


Fig. 1. San Diego Natural History Museum.

I can add some personal notes about this well-known California museum, inasmuch as I lived in the San Diego area, near the towns of El Cajon and Lakeside, during my high school years. Being only 15 miles from the museum, I remember often visiting the collections to check on specimens I had found. Charles Harbison was curator of the entomological collections, and was there until 1969; his primary interest was with Odonata, but he did some research on megathymine skippers and *Atteva* moths. Francis X. Williams (1882-1967), retired from many years of service on insect problems in the Pacific and Hawaii, also lived in San Diego then and usually was to be found at the museum on most weekdays. I still recall the welcome help always offered by Harbison, as well as Williams, to the many questions asked and unknown species brought along during my visits. In 1967, after I transferred to the University of California at Berkeley to study entomology, a subject not offered at the UC campus in San Diego where I started in 1965, my frequent visits to the San Diego Museum had to end.

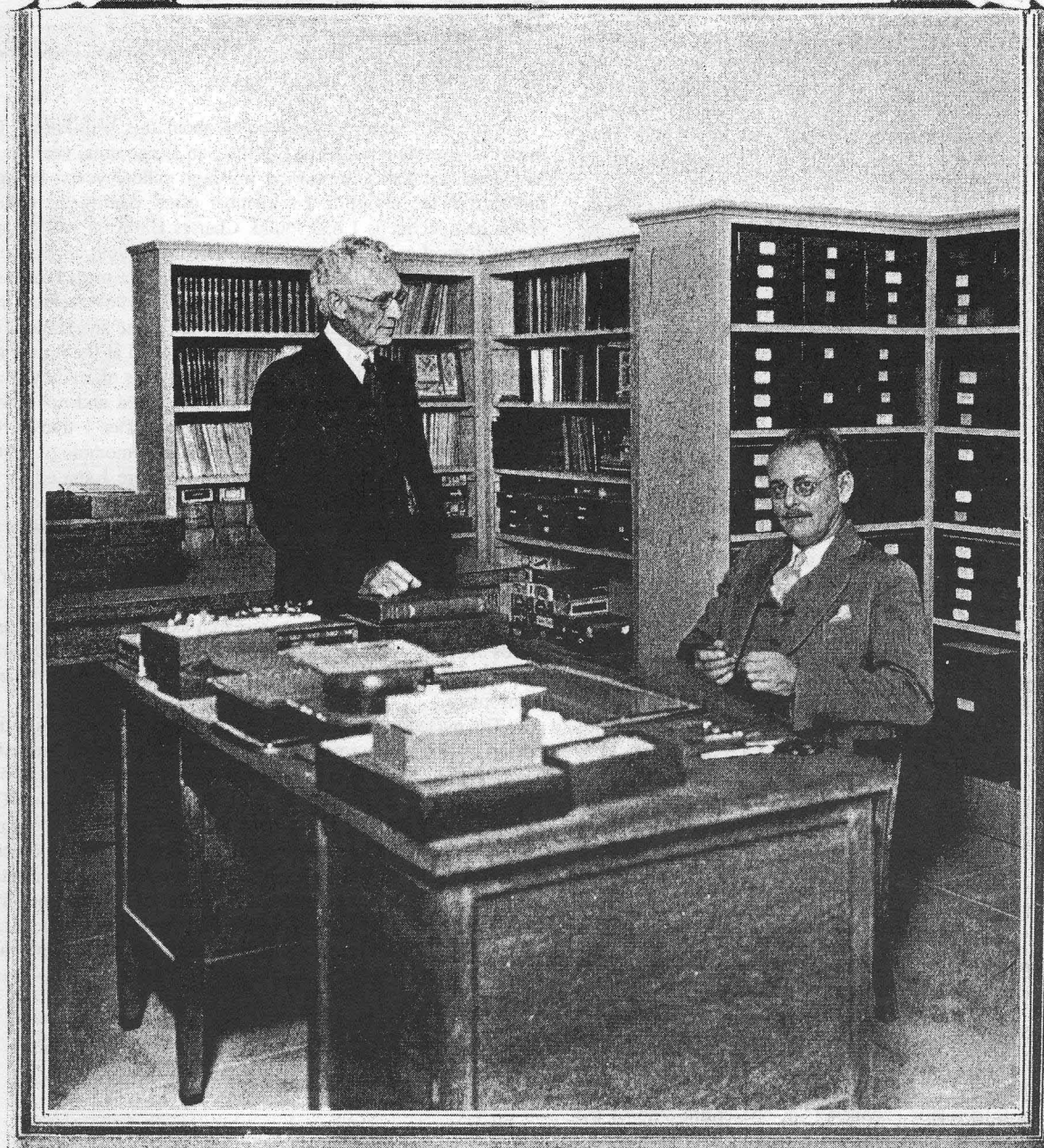
Since the 1960s, the collections have grown extensively through a succession of research associates after Harbison retired. Fred Thorne, a lepidopterist from El Cajon, was a part-time curator during the 1970s. John W. Brown, a specialist of Tortricidae moths and now at the Smithsonian Institution, was a research associate for a few years in the 1990s after finishing his doctoral degree at UC Berkeley. David Faulkner has been on the entomology staff part-time, his main interest being Neuroptera.

The museum has had funding problems over the years and funds for curators were sometimes lacking. From Florida, Arthur Allyn, who founded the Allyn Museum of Entomology (now in Sarasota but soon to be moved to Gainesville as part of the new McGuire Center for Lepidoptera Research), took over the directorship of the museum for awhile in 1978-79 in order to get its financing back in order, but this degraded again after he left. However, in recent years the museum has prospered, gotten more grants, and gotten more help from the City of San Diego (currently helping with a \$20 million endowment campaign), resulting in the building addition already mentioned and many other improvements.

J. B. HEPPNER
Gainesville, Florida



LOS ANGELES MUSEUM, LOS ANGELES, CALIFORNIA.



PROF. L. J. MUCHMORE

DR. J. A. COMSTOCK

2. Natural History Museum of Los Angeles County

One of the most imposing buildings in Exposition Park, Los Angeles, is the Museum of History, Science and Art. This Museum was formally opened on November 6, 1913, under county financial supervision. Within the last eight years the present structure (illustrated) has become inadequate, so about two years ago a major building program was begun of which two units have been constructed and which, when finally completed, will make this Museum one of the largest in the United States. The new buildings will have approximately thirteen times the present ground area and will cost over ten million dollars. The construction is of the most approved type, reinforced concrete throughout, and with adequate facilities for modern display and research.

Although the Museum's activities cover the three fields of art, science and history, its most outstanding collection, from the viewpoint of international interest, is that of the pleistocene remains recovered from the La Brea asphalt beds which are within the city limits. It is estimated that this collection contains more bone material than is found in all the combined museums of the world.

Of interest to entomologists is the collection of insect remains found in the La Brea pits. Of course, the crude asphalt has not preserved any Lepidoptera, but occasionally beetles and other hard shelled insects are found in fair condition.

The Museum as a whole (including also the Otis Art Institute and Hancock Park), is under the direction of Mr. William Bryan, well known as a museum executive and connoisseur of art. Before assuming the directorship of the Los Angeles Museum, Mr. Bryan had filled posts in public service, including a curatorship with the Bishop Museum of Honolulu. He has been ably supported in the phenomenal expansion and development of the Los Angeles Museum by the County Board of Supervisors. The associate directorship of the Museum is held by Dr. John A. Comstock, formerly director of the Southwest Museum (Los Angeles), and all departments of Natural Science are under his personal guidance.

Prof. L. J. Muchmore is in charge of the entomological department and except for the Lepidoptera which are under the supervision of Dr. Comstock, all other insects are in his care. Mr. Muchmore has been engaged for the last few years in bringing the Coleoptera material up to date. The collections of Lepidoptera include those of Daggett, Herr, Albright, Cooledge (Heterocera only), and the recently acquired Comstock collections.

Dr. Comstock is well known for his work on western diurnal Lepidoptera and for his recently published book, "The Butterflies of California", which has taken the place of the older publication, W. G. Wright's "Butterflies of the West Coast". Dr. "J. A." was born Jan. 30, 1883, in Evanston, Illinois, and attended public high school there. He received his M.A. at Occidental College, Los Angeles, and his medical degree through the College of Ost. Phys. & Surg., also in Los Angeles.

Since 1920, he has been editor of the "Bulletin of the So. Calif. Acad. of Sciences". He began collecting about 1895 and with his brother, Hurd Comstock, first attended an entomological meeting in Chicago.

The Entomological Department of the Los Angeles Museum is housed on the third floor of the second new unit and occupies three spacious rooms. Types are at present incorporated in the general collection, but will eventually be segregated in separate steel cabinets. A display collection of insects, chiefly Lepidoptera, is one of the museum features and is used extensively by visiting teachers and classes.

The Lorquin Entom. Society is affiliated with the Museum and holds monthly meetings in the main building. This organization was founded by Fordyce Grinnell and was for a time working in association with the Southwest Museum, but when that institution decided to limit its field to anthropology, the Society transferred its interests to the Los Angeles Museum. Once each year in February this Club sponsors a "Butterfly Show" which is held in the Museum and creates much public interest and press comment. This year the 8th Annual Exhibit will be held.

The Museum buildings are only a short distance from the giant Los Angeles Stadium in which will be centered most of the activities of the

Olympic Games in 1932. At that time it is hoped that many entomologists will take the opportunity of visiting Los Angeles, and to these the Museum extends a most cordial invitation of welcome,

J. D. GUNDER

Originally published: 1929. *Entomological News*, 40:67-69, pl. 3.

THE MUSEUM TODAY

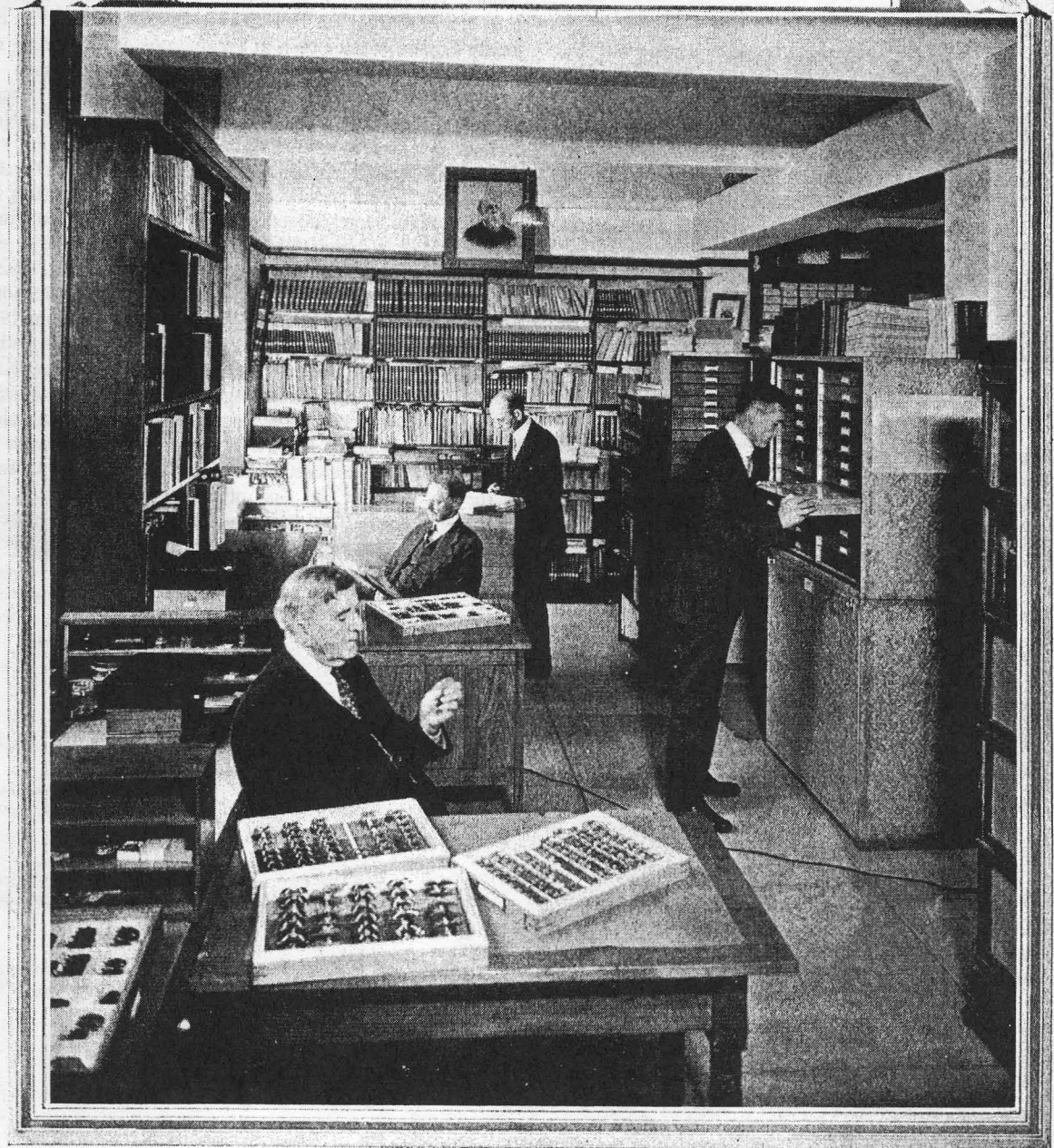
The name of the museum was revised to Los Angeles County Museum of Natural History, having dropped its other interests of art and history from its official name in 1964 when the art section of the museum was split off as a separate museum, the Los Angeles County Museum of Art. More recently, the natural history museum name was again changed slightly to, Natural History Museum of Los Angeles County. The original 1913 building is still used and appears the same from the view from the museum gardens, but overall the museum has greatly expanded since then to become one of the leading museums of the world, particularly for marine invertebrates and fishes.

Today, the collections of the museum comprise 33 million specimens and artifacts, although much of this involves paleontological findings. For insects, holdings amount to about 5.5 million specimens in about 11,000 insect drawers; about a sixth of the total is Lepidoptera, while about 45% of the collection is Hymenoptera. Staffing is somewhat low for such a large collection, with only a single curator for insects (Brian Brown, a dipterist), a collections manager and 3 assistants (an additional curatorial position may be added); however, several emeritus curators and associates are still active with the collection, including Julian Donahue for Lepidoptera. For many years from the 1950s until his retirement, Lloyd Martin was curator and very active with butterflies. Besides collections, a strength of the museum is its large research library of over 120,000 volumes. Although the museum has worldwide holdings among all plants and animals (especially marine fauna), plus anthropological items, a prime focus of the museum is California and western North America. The museums' long-term paleontology research program in the La Brea tar pits and other sites has especially enhanced its collections of fossil and recent historical faunas. The museum holdings of marine invertebrates amount to over 17 million specimens (including fossil invertebrates).

J. B. HEPPNER
Gainesville, Florida



ACADEMY OF SCIENCES, SAN FRANCISCO, CALIF.



E. P. VAN DUZEE
 DR. E. C. VAN DYKE DR. E. H. BURKE
 JAMES E. COTTLE

3. California Academy of Sciences

Very little has been written and really nothing published concerning the early history of the California Academy of Sciences at San Francisco, yet it is the oldest scientific organization of its kind in western America. I am indebted to Mr. James E. Cottle and others for much time spent in ascertaining for me a few of the following historical facts.

It seems that some twenty-two San Francisco men of scientific bent of mind were assembled on April 4, 1853, in the offices of Col. Thomas J. Nevius, at what was then 174 Clay Street, to discuss the founding of an Academy for the development and study of natural phenomena. There is little evidence that any of these gentlemen were collectors or naturalists in the zoological sense of the word, but eight of them were prominent physicians in the city and several were ministers of the gospel. At a second, more formal meeting, which took place on the 16th of May following, a constitution was adopted and a corps of officers elected. Thus we find that Dr. Andrew Randell became the first president of what was then termed the Academy of Natural Sciences. Later, in 1868, the name was changed to simply the Academy of Sciences. From the first little gathering-place on Clay Street, the society moved into all old discarded Baptist church on the southwest corner of California and Dupont Streets. Here their meetings and lectures began to attract genuine public interest. Eventually, James Lick, of Lick Observatory fame, deeded to them a valuable piece of land at 819 Market Street, in the very heart of the downtown district. Again, several years later, they were fortunate in becoming one of the three residuary legatees to his vast estate from which was derived about \$450,000. With most of this money, an Academy building was erected on the Market Street property and moved into during the summer of 1891. From then on the Academy was on a firm financial basis. Its exhibits, library and laboratories occupied a separate rear portion of the building, while the front part was leased to business offices from which a considerable income was generally derived. A noteworthy visitor to the Academy in the early 70's was Louis Agassiz.

On April 18, 1906, the great San Francisco earthquake and fire left the Academy in ruins.¹ It was a tremendous loss. Everything was destroyed and practically nothing saved. The fire did not reach that section of the city until the second day; so, Mr. Loomis, the director, with the aid of Miss Eastwood, the botanist, and Miss Hyde, the librarian, managed to remove by hand a few books, some old records (from which this article is written) and a complete set of publications, together with the botanical types and certain types of Coleoptera, Hymenoptera and Hemiptera. All the Lepidoptera collections were burned, including Dr. Behr's collections and his type specimens. What little material could be carried out was moved into a store on Turk Street and elsewhere. Although temporarily stunned by its losses, the Academy almost immediately resumed activity and in a few months had rented space in the Security Bldg., near Market Street. Fire insurance money began coming in; a donation of \$20,000 was received from Chas. Crocker and with the Lick endowment again bearing interest, the Academy went ahead and laid its plans for a real new home to eventually rise in Golden Gate Park, which is over on the western edge of the city towards the ocean and far away from any future fire hazard. The new Academy building was completed and occupied by 1915. It is partly shown in the accompanying illustration (Plate V). Its construction is of solid concrete and stone, making it practically immune from cataclysm. One good feature is its roomy, well-arranged laboratories which are probably better equipped for the use of the student than any other in the country. Dr. Barton W. Evermann is the present director and is interested mostly in ichthyology. An auditorium, an African Museum Hall and new library quarters are planned for the future.

The Academy's Department of Entomology was founded on January 6, 1862, by the appointment of a definite curator-in-charge and the following gentlemen have held that post to date: (Their chief interest is noted.)

Dr. H. Herman Behr, 1862-1867, Lepidoptera.

Mr. Richard H. Stretch, 1868-1880, Lepidoptera.

Dr. H. Herman Behr, 1881-1904, Lepidoptera.

Dr. Edwin C. Van Dyke, 1904-1916, Coleoptera.

Mr. Edward P. Van Duzee, 1916 to date, Hemiptera.

The entomological department is especially strong in the Coleoptera of western North America and in the Hemiptera of America, north of Mexico. It is estimated that the Lepidoptera collections number about eighty thousand mounted specimens. Almost one-third the moths listed in the 1917 Barnes Check List are catalogued, which makes this collection the largest of its kind in the west. Most of the specimens in all orders are kept in twenty-four drawer metal cabinets of the size and style of the several shown in the illustration. The butterfly collections consist of the well known W. G. Wright material and the collections of F. X. Williams, E. J. Newcomer and Albert Koebele. The Wright types and the particular specimens which went to make up his plates for the "Butterflies of the West Coast" are of special interest. There is also a sizable collection of western diurnals purchased from the late Chas. L. Fox.

Mr. E. P. Van Duzee, the present curator of Entomology, is well known for his work in the Order Hemiptera, but he has always taken a great deal of interest in Lepidoptera, especially Heterocera. "EP" was born in New York City, April 6, 1861, and his first entomological work was on moths under the personal guidance and encouragement of A. R. Grote, at Buffalo, from 1876 to 1882. He published a list of the Lepidoptera of Buffalo, New York, in 1894. From 1885 on, his scientific work with insects has been almost entirely in the Hemiptera on which more than one hundred papers have been published. For twenty-eight years he was connected with the Grosvenor Library at Buffalo. One year was spent at La Jolla, California, with the Scripps Institute for Biological Research. For two years the University of California, at Berkeley, claimed his services and from there he came to the Academy in 1916. All of his collections have been donated to the Academy. Mr. Van Duzee has made the following interesting field trips: Muskoka Lakes, Canada, in 1888; Michigan in 1891; Georgia in 1899; Colorado and Utah in 1900-3; New Jersey in 1902; Jamaica in 1906; Florida in 1908; New Hampshire and Maine in 1909; Ottawa in 1912; Lake Tahoe in 1915; San Jacinto Mountains, California, in 1917; Siskiyou County, California, in 1918; Huntington Lake, California, in 1919; Washington and Vancouver Island in 1920; Gulf of California in 1921; Utah in 1922; Arizona in 1924; Truckee, California, and Nevada in 1927. There are very few entomologists who can claim as active and unbroken a fifty-three year period of service for science as can E. P. Van Duzee.

The accompanying illustration shows Dr. Edwin C. Van Dyke, the well known Coleopterist, as well as Dr. H. E. Burke, a forest insect specialist who happened to be visiting the Academy when this picture was taken. Dr. Van Dyke may well be considered the best authority on beetles in the west.

I am particularly pleased to be able to include in this plate, a picture of Mr. James E. Cottle. He is undoubtedly the oldest living lepidopterist on the coast and personally knew all the bygone collectors like Behr, Letcher, Fuchs, Mueller, Rivers, Harford, Dunn and many others. Several years ago he retired from long, meritorious duty in the San Francisco Police Department and since then has been more than ever active in building up his collections of butterflies and moths. Jim Cottle was born in New York City on July 10, 1861 (same place and year as Van Duzee). When a small boy his folks moved westward to San Francisco and he has lived there ever since. In 1901 he married Magdelina Schulthress. Years ago, when an employe in the Hibernia Bank he became ill and was sent to Anderson Springs to recuperate. While there an acquaintance was made with Beverly Letcher and from then on, according to Cottle, "I became a chaser with the net!" Anyone visiting San Francisco should look up Jim Cottle and see his collection. He can tell you all about the good old collecting grounds and besides it's a pleasure to meet and know Mrs. Cottle.

1. Mr. W. G. Wright in the June, 1906, issue of the *News* shows a picture of the buildings or what was left of them after the destruction.

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In 1901 Chas. Fuchs and others established the California Entomological Club which, a year later, changed its name to the Pacific Coast Entomological Society. This organization meets quarterly and publishes an annual Proceedings. Since July 1924, it has published the *Pan-Pacific Entomologist*, a good quarterly journal and one of which the Society may well be proud. Mr. Van Duzee is the editor.

J. D. GUNDER

Originally published: 1929. *Entomological News*, 40:101-105, pl. 5.

THE MUSEUM TODAY

The California Academy of Sciences remains in Golden Gate Park, within the city of San Francisco. Since 1929 the museum has grown extensively, currently estimated to have about 16 million specimens, including nearly 9 million insects. The museum also has a very complete natural history library of about 200,000 books and journals. The collection is worldwide in scope, with special emphasis on the Pacific Region and South America. Embioptera, Coleoptera and Diptera form large portions of the collection. Currently, a massive expansion and refurbishment program is underway, with \$132 million allocated from the State of California for a completely new facility to replace its existing building. Private matching funds are also being sought to further enhance the collections. Lepidoptera at the Cal Academy have been somewhat of an orphan group more recently, other than during the earliest years, since curators were always hired who specialized in other groups. Yet, Lepidoptera specimens were nonetheless added to over the years, and many types were deposited there as well: Lepidoptera now total about 450,000 specimens. Many expeditions worldwide have added to specimen holdings. The skipper specialist, C. Don MacNeill, was curator for Lepidoptera from 1957-65, and still helps to curate parts of the collection in his area of interest.

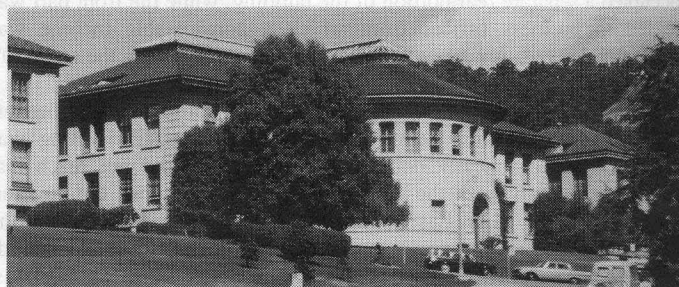


Fig. 2. Essig Museum, in Wellman Hall (center), on the UCB campus.

UC: BERKELEY

Among the many collections Gunder did not visit in his survey of Lepidoptera collections in 1929-30 were the insect collections of the University of California, at campuses in Berkeley, Davis, and Riverside, but in 1929 these collections were very small and with few Lepidoptera. The collections at Berkeley, now called the Essig Museum of Entomology, have grown sizeable only since 1940, and for Lepidoptera only since Jerry A. Powell has been on staff there, since about 1963. The Essig Museum, now holding about 4.5 million specimens, with Lepidoptera (22%) and Coleoptera (29%) forming the largest portions thereof. The Essig Museum's prime focus is the western Nearctic and northern Mexico, plus the Neotropical region, but also has some worldwide holdings. For Lepidoptera, the collection is especially rich in Microlepidoptera, about 45% of the Lepidoptera holdings, and including extensive reared material. The accompanying photograph shows the front of Wellman Hall, which houses the Essig Museum in its rotunda, as it was in 1971 when I was studying entomology at UCB. Prof. Powell has been in charge since 1963. John Chemsak was a researcher and curator on beetles then, especially cerambycid beetles, and remained until his retirement in 1995, but other professors also help curate parts of the collection, as do the taxonomy students of the entomology department. As of 2001, the director of the Essig Museum is Rosemary Gillespie, a specialist on spiders; beetles are curated by Cheryl Barr, since 1994.

J. B. HEPPNER
Gainesville, Florida

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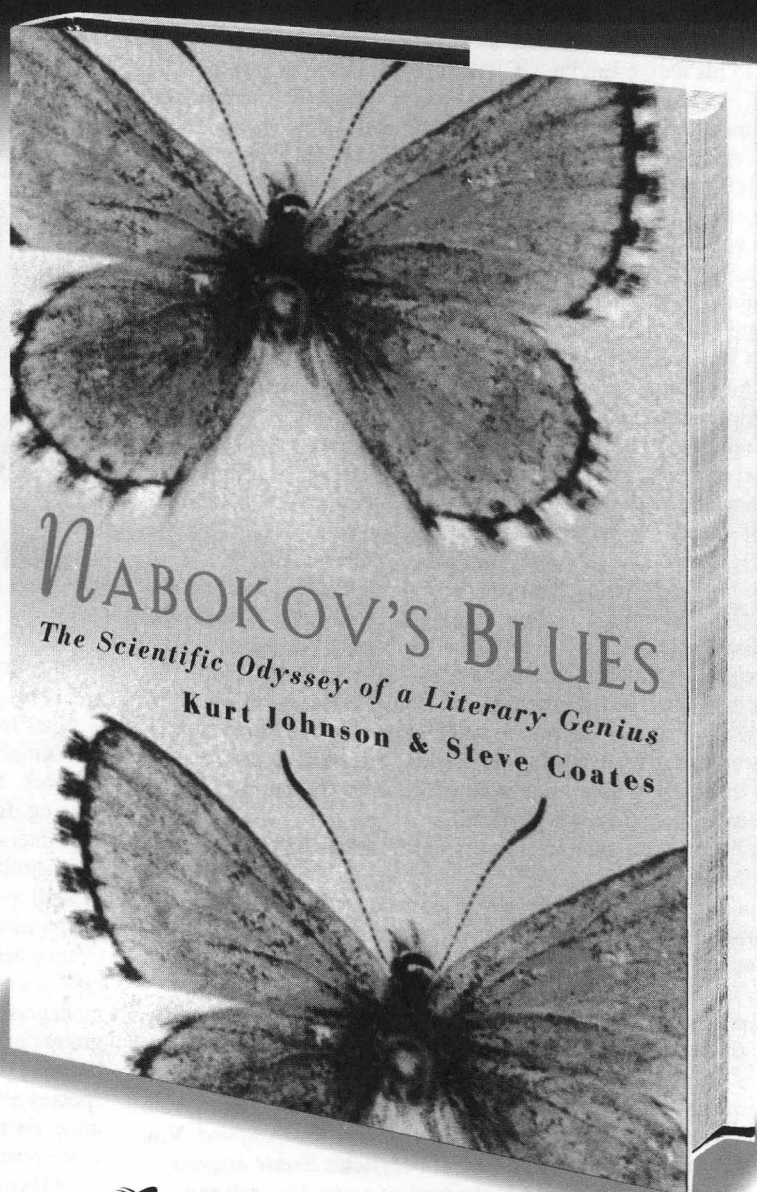
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EXOTIC MICROLEPIDOPTERA

of Edward Meyrick - 1

J. B. Heppner, Editor¹

Florida State Collection of Arthropods
FDACS, DPI, P. O. Box 147100, Gainesville, Florida 32614, USA

Edward Meyrick's self-published journal, *Exotic Microlepidoptera*, is primarily a compendium of the original descriptions of new species and genera of Lepidoptera. I do not know how many copies he had printed of each issue, but one would think probably not over 100 copies each. Original copies are exceedingly rare, however, and the few copies now in museums and libraries around the world are about all that are available of the original edition, inasmuch as most of the remaining stock was destroyed in a London air raid during World War II (G. S. Robinson, pers. comm.).

It is believed that Meyrick (1854-1938) described close to 20,000 species of Lepidoptera during his lifetime, mostly among the small moths, the so-called Microlepidoptera, which he was most interested in. His early studies were mostly on the Lepidoptera of Australia and New Zealand, while he resided there from 1877 to 1886, before returning to his native England. Clarke (1955), in the first volume of his series illustrating many of the Meyrick types deposited in the British Museum (BMNH; now called the Natural History Museum, London), cataloged 14,199 Meyrick names for Microlepidoptera alone (Pyralidae and larger moths were excluded from this catalog), missing only a handful of Meyrick names among the micros. Meyrick's collection of some 100,000 specimens of Microlepidoptera, plus the bulk of his holotypes, went to the BMNH. The next largest accumulation of Meyrick types is in South Africa (Janse, 1968).

Although Meyrick published in a variety of journals from 1875 to 1938 (Clarke notes 420 titles; one paper was published posthumously), he eventually began his own journal to publish his many new descriptions. As Clarke (1969) noted in the preface to the 1969 reprint edition of Meyrick's series, 5 volumes of *Exotic Microlepidoptera* were published from 1912 to 1937, describing 821 new genera and 6,876 new species, with 2,722 pages in total. A number of journals have been checked for the years 1912-20, but no notice or review could be found for *Exotic Microlepidoptera*. Janse (1939) notes that Meyrick paid for the journal himself, and distributed most of the copies without charge to colleagues around the world. His species are from all over the world but mostly from tropical regions of the former British colonies in Asia and Africa. He also described most of the small moths from the Neotropics prior to 1939 as well. As the recognized world expert on the small moths, most new material was sent to him for identification or description. After his death, there is a large void of work on the micros until at least a decade or more after his death.

It has been to the great usefulness of all interested in Microlepidoptera, that E. W. Classey & Co. (now in Faringdon, England), decided in 1969 to reprint Meyrick's journal. However, today even this facsimile reprint edition is rare. Classey did not add to the series in any way, other than to include an index to Vol. 5, which Meyrick had not been able to complete prior to his death in 1938 (the index was compiled for the reprint edition by the late J. F. G. Clarke, formerly of the Smithsonian Institution, Washington, DC). Classey also added a listing of all of Meyrick's publications, from 1875 to 1939, compiled by T. B. Fletcher and A. J. T. Janse (reprinted from its first printing in 1942, in Janse's, *The Moths of South Africa*, Vol. 4). The 1969 facsimile reprint edition of Meyrick's *Exotic Microlepidoptera* did not in any way verify the correct genus for each species, or note if the name was now considered a synonym, and so forth.

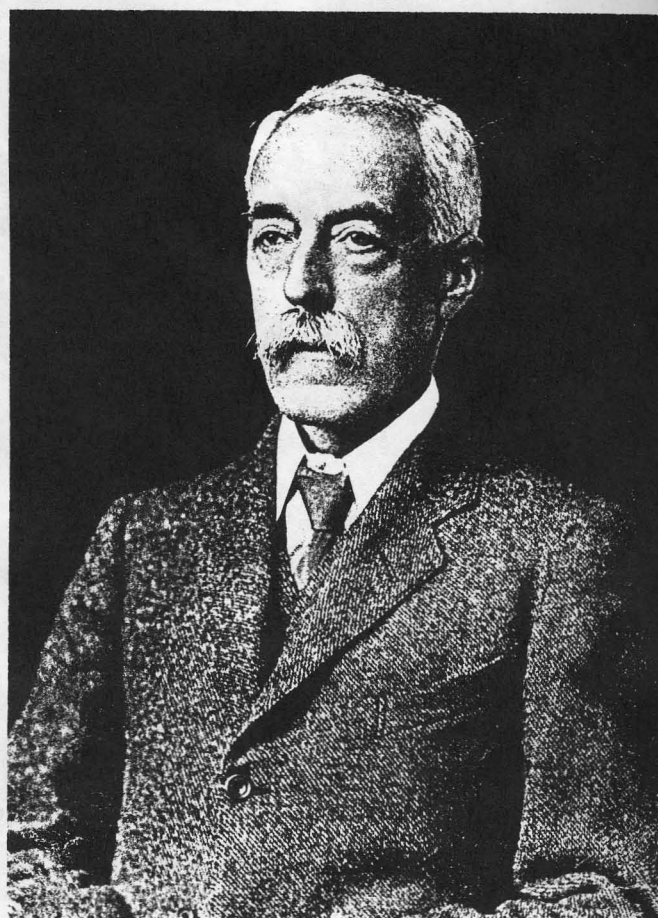


Fig. 1. Edward Meyrick (1854-1938) (after Clarke, 1955).

Clarke (1955-70) illustrated a large number of Meyrick's species for the first time (ca. 5,000 species), but since Meyrick types are scattered among many museums (mostly in Europe), even the figures of types from the BMNH missed many of them. Clarke for the most part emphasized the Asian and New World taxa described by Meyrick, and thus, many of the African and Australian species are missing from his work, and he also did not treat many of the leafminers and other tiny moths. Clarke for the first time dissected the majority of the Meyrick types he studied, illustrated the genitalia, as well as the adult type specimens, and was thus able to correctly assign many of Meyrick's species to modern genera, except in those cases where more study was needed. Clarke's efforts to dissect all the type specimens might not be allowed today — most collection managers would not now allow wholesale dissections of different groups except by a specialist in each group — but Clarke's catalog became the single best source to allow identification of Meyrick species ever published by the BMNH; nothing since then has been done on the remaining Meyrick types in London, or for the even more obscure Walker types.

Meyrick's descriptions invariably were brief and unillustrated, the only exceptions being those rare cases where Meyrick was part of an illustrated publication project, like the *Genera Insectorum* series. Most of Meyrick's descriptions were based on head morphology, wing venation, and wing maculation. Meyrick himself never

¹ Contribution No. 921, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv.

dissected any of his specimens or studied their genitalia, leading him to make numerous errors in generic assignment, and even to some incorrect family assignments. One of the most singular lapses was his concept of the "Glyphipterigidae:" as already documented (Heppner, 1982), Meyrick's generic assignments to this group actually contained 25 different "families" of moths erroneously conglomerated together. Likewise, most Stathmopodini (Oecophoridae) he described as Heliodininae, since he failed to note any significance in the scaled haustellum, which is not scaled in all true Heliodininae as we now define them. Evenso, Meyrick made rather careful examinations of his new species with the small hand lens he used for his studies, usually making correct assessments that a new name was needed, given the time period he lived in. Modern generic limits have also produced the need to reassign most of Meyrick's species names to other genera.

The other prolific describer of the 19th century, Francis Walker (1809-1874), whose assignment was to describe and inventory all the new insects present in the collection of the British Museum at the time, also did a series on Lepidoptera (35 parts, from 1854-66), describing about 23,000 species therein. The Walker names have not been given the treatment of the Meyrick names and are even more confused in many cases than Meyrick's species. Like Meyrick, most of Walker's descriptions are cryptic and unillustrated. A Walker project will have to await some future date. In both cases, the often superficial descriptions enabled them to make prolific numbers of new taxa in the time it nowadays would take to complete accurate and full descriptions of only a few species. Furthermore, both were active at a time of great discovery of tropical biodiversity and, thus, most of what they studied needed a name.

Many have criticized both Meyrick and Walker for the numerous errors they made, but they worked at a time when 1000s of new species were being discovered, as already noted, and much of the biodiversity of moths that we know about is due to their efforts. It is doubtful that so many species would be documented today had they not named them at the time, since other workers would not have filled the void with as much activity. After Meyrick's death in 1938, there was little of significance done with the Microlepidoptera for the next 20 years, although this was partly due to the interruptions of WWII.

In order to make Meyrick's journal series again available for use, and also to allow the names to be more correctly assigned, the present reprinting provides corrections to the names of the species, as far as this is known to date. The last phrase just noted is important, since many of Meyrick's species are still not placed with certainty and remain to be thoroughly studied: there simply are not enough specialists working on Microlepidoptera in the world to have studied all the species involved, even in the last 60 years. A complete illustrated catalog of all Meyrick species is not feasible, but this new listing herein will provide another step to elucidate all the names.

Meyrick issued his journal periodically in parts several times a year from 1912 to 1937, each issue seamlessly continuing from the previous issue until 640 pages were completed for each volume (Vol. 5 is abbreviated at 160 pages, due to Meyrick's death in 1938 at the age of 84). An issue date for each part is noted on the first page of each 16-page section (Meyrick issued his journal in 16-page signature parts, 40 of them to complete a volume); the current reprinting adds these dates also to each species name in the marginal notes. Also added to the species notes are citations for any illustrations now available for each species (figures in Clarke (1955-70) and some other works are cited by volume and page number). An eventual appendix to this reprint edition will provide a hostplant index for those species where Meyrick noted what plant any of his new species were found feeding on.

While new combinations are made where needed to place Meyrick names in the correct genus, it should be noted that a few

common spelling errors were standardized among lepidopterists during the years Meyrick was active, and these have been altered to their correct spelling without the use of a new generic combination for the species names involved, inasmuch as the generic name was merely misspelled (actually, incorrect emendations in use at the time): for example, Meyrick used *Glyphipteryx*, and *Hyponomeuta*, instead of the correct names, *Glyphipterix* and *Yponomeuta*, respectively.

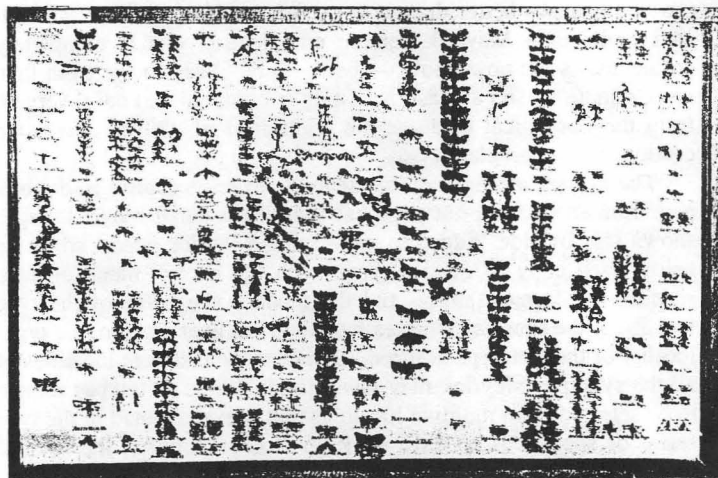


Fig. 2. A typical drawer from Meyrick's collection (after Clarke, 1955).

EXOTIC MICROLEPIDOPTERA.

BY

EDWARD MEYRICK, B.A., F.R.S.

Fig. 3. Title page to the first volume of Meyrick's *Exotic Microlepidoptera*.

Some new combinations herein also are made to have a genus name to place a species in, yet species may still be misplaced (this is denoted with "mispl." added to the line). The recent Australian Lepidoptera catalog (Nielsen *et al.*, 1996), for example, tends to diverge from proper binomial nomenclature, contrary to what is required by the Zoological Code, in assigning some species only to species groups and without an actual generic assignment. Meyrick names in these cases are herein assigned to the nearest available generic name until further study can elucidate the correct genus. This procedure seems better than to leave the species name in a generalized limbo of a Meyrick generic combination that is completely erroneous, as we now know — better to be closer to the truth than more remote — and at least the listing is binomial and not divergent from the Zoological Code as the Nielsen *et al.* (1996) Australian catalog is in some places.

The present arrangement presents a facsimile reprint in double-page format: each reprint page has two of the small Meyrick pages shown side by side. Added to the original Meyrick pages, are notes below each copy of original page with the correct name of each species, the correct family, and the modern site name of the type locality of the species. Where a lectotype has been chosen, the type-locality of the lectotype is listed, instead of the different localities of all the syntypes Meyrick may have listed. Where lectotypes remain to be selected from multiple localities that Meyrick noted in the type series of specimens, a slash-mark (/) is used between the various locales.

This first installment in the new annotated reprint series of Meyrick's *Exotic Microlepidoptera* treats the first 64 pages (actually pages 1-63, plus the preface). Meyrick published the original series over a period of 26 years. Several years will now likely be required, even in 64-page installments, to complete all 5 volumes of Meyrick's series and annotate the species data. Most of the references below pertain to biographical accounts on Meyrick or to those works where some of the Meyrick species are illustrated (adults). As species names are corrected or transferred to other genera in the future, such changes will be noted from time to time in corrective notes.

The Index entries refer to Meyrick page numbers.

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EXOTIC MICROLEPIDOPTERA.

PREFACE.

THE purpose of this volume is to ensure the speedy publication of material which is required for immediate use in other works proceeding at the same time, especially in my contributions to the *Genera Insectorum* and *Lepidopterorum Catalogus*; the delays incidental to publication through other channels would otherwise involve so much arrangement in advance as to seriously hamper the work. It will therefore appear in instalments of equal size but at irregular intervals, as occasion requires. The arrangement of the material must necessarily be to a considerable extent promiscuous, and not in systematic order, but an index will be given at the end of the volume; to insist on classified order would be to destroy its use.

I would therefore describe it as a spasmodic entomological magazine on one subject by a single contributor.

EDWARD MEYRICK.

TORTRICIDÆ.

Catamacta scrutatrix, n. sp.

♀. 17 mm. Head grey. Palpi pale grey. Thorax whitish-ochreous, anterior third grey. Abdomen pale grey. Forewings elongate, costa anteriorly moderately, posteriorly slightly arched, apex pointed, termen slightly sinuate, rather strongly oblique; whitish-ochreous, with a very few scattered black scales; a black dot in disc at $\frac{2}{3}$; cilia whitish-ochreous. Hindwings whitish-grey; cilia whitish.

NATAL, Pinetown, in June (Leigh); one specimen. This is a good species, and the neurulation is clear, but further specimens are needed to justify the normality of the type; the only other South African Tortricid that I have seen with 7 and 8 of forewings stalked was an abnormal example of *Tortrix capensana*.

Catamacta provocata, n. sp.

♀. 23 mm. Head, palpi, and thorax brownish-ochreous. Forewings elongate, moderate, costa anteriorly strongly arched, posteriorly nearly straight, apex round-pointed, somewhat produced, termen sinuate, somewhat oblique, stalk of 7 and 8 short; whitish-ochreous, with interrupted brown striae or strigulae; basal area tinged with brownish; central fascia moderate, rather strongly oblique, brown, posterior margin suffused towards dorsum; costal patch brown, flattened-triangular: cilia whitish-ochreous. Hindwings whitish reticulated with grey; dorsal half suffused with grey; cilia ochreous-whitish, with two faint greyish lines.

ASSAM, Khasis, in April; one specimen.

Capua fabrilis, n. sp.

♀. 20 mm. Head light brownish-ochreous. Palpi brownish-ochreous irrorated with dark fuscous. Thorax brownish-ochreous, patagia brown. Abdomen fuscous. Forewings elongate, moderate, costa anteriorly moderately, posteriorly slightly arched, apex obtuse, termen almost straight, rather oblique; brown; markings rather darker reddish-brown, strigulated with dark leaden-fuscous;

VOL. I.—March 1912.

B

TORTRICIDÆ

Catamacta scrutatrix Meyrick, 1912
South Africa: Natal, Pinetown
Fig.: Clarke (1958), 3:80

Catamacta provocata Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:75

Capua fabrilis Meyrick, 1912
Philippines: Luzon
Fig.: Clarke (1958), 3:67

basal patch moderate, edge obtusely angulated above middle; central fascia only distinct on costal third, thence outer edge traceable to tornus; costal patch flattened-triangular; a suffused spot towards termen below middle, and several small indistinct spots along termen: cilia brown. Hindwings grey spotted with darker; cilia light grey.

PHILIPPINES, Luzon, at 5000 feet; one specimen.

Capua cornigera, n. sp.

♀. 20 mm. Head and thorax ochreous-white. Palpi dark fuscous, terminal joint and apex of second white. Abdomen grey. Forewings elongate, costa gently arched, apex obtuse, termen sinuate, somewhat oblique: ochreous-white, with some scattered grey strigulae partly suffused with pale yellowish, especially posteriorly; two small dark fuscous spots on costa at and near base; an irregular-edged grey streak along dorsum from near base to central fascia; central fascia rather dark leaden-grey, partially edged with blackish and tinged here and there with yellowish, oblique, rather narrow on costal third, slender and somewhat angulated inwards beneath this, dorsal half broad and with a black projection on its upper posterior angle; a small dark fuscous semi-oval spot on middle of costa; costal patch rounded-triangular, dark leaden-grey marked with blackish; some irregular blackish dots on apical part of costa and termen: cilia ochreous-whitish, on costa with blackish bars. Hindwings grey; cilia light grey, with faint darker subbasal shade.

MADRAS, Nilgiris, at 3500 feet, in August (*H. L. Andrewes*).

SPHETERISTA, n. g.

Antennæ in ♂ fasciculate-ciliated. Palpi moderately long, porrected, second joint rough-scaled above and beneath, terminal joint moderate. Thorax with erectile posterior crest. Forewings with 3 from angle, 7 and 8 stalked, 7 to termen. Hindwings without basal pecten; 3 and 4 connate, 5 approximated, 6 and 7 approximated towards base.

Type *variabilis* Wals., from the Hawaiian Islands; placed by Lord Walsingham in *Capua*, in which genus, however, 6 and 7 of hindwings are stalked. Several allied Hawaiian species are also referable here.

ENODITIS, n. g.

Antennæ in ♂ ciliated. Palpi very long, porrected, second joint clothed with dense appressed scales. Forewings with 3 from angle, 7 and 8 stalked, 7 to termen. Hindwings without basal pecten; 3 and 4 remote, 5 approximated to 4, 6 and 7 connate.

Type *præcana* Kenn., from Eastern Siberia.

Adoxophyes parastrophæ, n. sp.

♂. 17-18 mm. Head, palpi, and thorax ferruginous-ochreous. Abdomen whitish. Forewings suboblong, costa anteriorly strongly arched, with broad fold from base to $\frac{2}{5}$, posteriorly straight, apex obtuse, termen straight, vertical; glossy whitish-ochreous, with scattered ferruginous-ochreous strigulae; costa sometimes suffused with ferruginous throughout; half of an irregular-oval ferruginous-brown ring with some black scales resting on dorsum towards $\frac{1}{3}$, forming a small spot on its posterior edge, the ring sometimes filled up with dark fuscous; central fascia deep ferruginous, very oblique, narrow on costal half, on dorsal half divided into slender irregular parallel branches, sometimes little marked except at extremities; a narrow nearly straight deep ferruginous fascia from $\frac{2}{3}$ of costa to termen above tornus, remote from preceding throughout; a small deep ferruginous spot on costa before apex: cilia glossy whitish-ochreous. Hindwings and cilia ochreous-whitish.

ASSAM, Khasis, in April and July; three specimens.

Adoxophyes flagrans, n. sp.

♀. 21 mm. Head, palpi, and thorax light ochreous-orange sprinkled with ferruginous. Abdomen whitish-ochreous. Forewings suboblong, costa anteriorly strongly arched, posteriorly nearly straight, apex obtuse, termen slightly sinuate, little oblique; yellow, closely reticulated with bright ferruginous; markings dark ferruginous-brown mixed with dark purplish-fuscous; a streak from base of costa to $\frac{1}{3}$ of dorsum, thence continued along dorsum to tornus; central fascia oblique, narrow, irregular, almost interrupted below middle; costal patch triangular, from its apex sending a slender fascia, projecting inwards in disc, to termen above tornus, where it runs into dorsal streak: cilia dark fuscous, on upper part of termen with basal half yellow limited by a ferruginous-orange shade. Hindwings and cilia whitish-yellowish.

UPPER BURMA, Maymyo, in May (*H. L. Andrewes*); one specimen. Nearly allied to *templana*, but distinguished by dark fuscous cilia of forewings, and the anterior edge of posterior fascia is rather concave on costal half, whereas in *templana* it is always angularly prominent beneath costa.

Homona socialis, n. sp.

♂ 17-19 mm., ♀ 24 mm. Head, palpi, and thorax brownish or light brownish-ochreous. Abdomen grey. Forewings elongate-oblong, narrower than in *coffearia*, costa in ♂ anteriorly moderately arched, with broad fold from base to $\frac{2}{5}$, posteriorly straight, in ♀ anteriorly strongly arched, posteriorly somewhat sinuate, apex obtuse, termen short, vertical, in ♂ almost straight, in ♀ slightly sinuate, tornus broadly rounded; in ♂ ochreous, brownish, or light fuscous, costa and dorsum suffused with ochreous-brown

2

TORTRICIDÆ

Capua cornigera Meyrick, 1912
India: Tamil Nadu, Nilgiri Hills
Fig.: Clarke (1958), 3:67

Spheterista Meyrick, 1912

Type-sp.: *Capua variabilis* Walsingham, 1907
Hawaii
Fig.: Zimmerman (1978), 9:455, pl. 2

Enoditis Meyrick, 1912

Type-sp.: *Epagoge præcana* Kennel, 1900
Russia: Far East

Adoxophyes parastrophæ Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:24

Adoxophyes flagrans Meyrick, 1912

Myanmar: Maymyo
Fig.: Clarke (1958), 3:20

Homona socialis Meyrick, 1912

India: Meghalaya, Khasi Hills

or ferruginous-brown, in ♀ yellow-ochreous with some irregular ferruginous strigæ; lower half of costal fold in one ♂ mixed with dark fuscous; central fascia in ♂ suffusedly darker, very undefined, interrupted beneath costa, where it forms a small spot sometimes marked with black beneath, broad below this, sometimes marked with blackish on dorsum, in ♀ indicated only by an indefinite dorsal blotch of darker suffusion; in ♂ a triangular darker apical patch, more or less produced along costa and termen: cilia pale ochreous. Hindwings in ♂ grey, in ♀ light yellowish tinged with grey; cilia ochreous-whitish, in ♂ sometimes tinged with grey.

ASSAM, Khasis, in April, July, and September; four specimens. The ♂ differs from *coffearia* by obviously narrower forewings, from *meniana* by absence of orange apical patch of hindwings; the ♀ appears to have forewings narrower posteriorly than in either of these species, hindwings less deep yellow, and distinctly greyish-tinged.

***Cacoecia leucocymba*, n. sp.**

♂. 18 mm. Head and thorax fuscous mixed with reddish-brown and blackish. Palpi dark reddish-fuscous. Antennal ciliations 1. Abdomen grey. Forewings oblong, costa without fold, towards base very abruptly arched and roughened with scales on arch, thence almost straight, apex obtuse, termen scarcely perceptibly sinuate, hardly oblique; fuscous suffusedly mixed and strigulated with dark red-brown, dark fuscous, and blackish; a silvery-white narrow semioval patch extending along costa from $\frac{1}{4}$ to $\frac{1}{2}$, widest before middle, where it reaches $\frac{1}{3}$ across wing. Hindwings reddish-grey, more reddish-tinged posteriorly; cilia whitish-grey, with grey subbasal line.

MADAGASCAR, Antananarivo; one specimen.

***Cacoecia machlopi*, n. sp.**

♀. 20–25 mm. Head and thorax dark purplish-fuscous. Palpi fulvous. Abdomen grey. Forewings suboblong, costa anteriorly strongly curved, roughened with scales on curve, then deeply sinuate, with roughened scales before apex, apex round-pointed, prominent, termen vertical, sinuate on upper half, rounded-prominent beneath; dark purplish-brown; a very narrowly elongate-semioval dark reddish-fuscous mark along sinuation of costa; sometimes a small blackish spot beneath this: cilia purplish-brown, round apex dark reddish-fuscous, on tornus light ochreous. Hindwings grey, apical half orange-yellow; cilia grey, round apex sometimes orange at base, on costa with a thickened patch of dark grey cilia before apex.

ASSAM, Khasis; JAVA, Bandong; from October to December, four specimens. Allied to *epicyrta*, but with all curves of forewings exaggerated.

***Cacoecia salaconis*, n. sp.**

♀. 26 mm. Head whitish-ochreous partially tinged with pale grey and brownish. Palpi pale ochreous sprinkled with brownish. Thorax dark fuscous, anterior margin and posterior extremity whitish-ochreous. Abdomen whitish-ochreous irrorated with fuscous. Forewings suboblong, moderately broad, costa anteriorly strongly arched, somewhat prominent before middle, concave on posterior half, apex round-pointed, rather prominent, termen concave beneath apex, strongly rounded-prominent on lower half, reaching further than apex; light brown, sprinkled especially posteriorly with grey-whitish; basal patch and costal half of space between this and central fascia suffused with dark purplish-fuscous, edge of basal patch running from $\frac{1}{4}$ of costa to $\frac{2}{3}$ of dorsum, obtusely angulated below middle, indicated on upper portion by two or three small dark red-brown marks; central fascia from before middle of costa to dorsum before tornus, on costal half dark red-brown, narrow, irregular, in disc interrupted above and below middle, on dorsal portion somewhat broader, suffused, reddish-brown sprinkled with dark fuscous; an elongate dark red-brown mark along costa from middle to $\frac{1}{4}$; a fuscous striga before termen from apex to tornus: cilia whitish-ochreous, tips brownish on termen, becoming dark fuscous round apex. Hindwings grey, extreme apex tinged with pale brownish; cilia whitish-grey.

PHILIPPINES, Mindoro, Laguna de Naujan, near sea-level, in March (*Mounsey*); one specimen.

MEGALODORIS, n. g.

Head smooth-scaled. Palpi moderately long, porrected, smooth-scaled, terminal joint rather short. Antennæ in ♂ simple or minutely ciliated. Thorax without crest. Forewings with 3 from angle, 7 separate, to apex. Hindwings without basal pecten; 3 and 4 connate or closely approximated at base, 5 approximated, 6 and 7 approximated at base.

Type *stephanitis* Meyr. I refer here also *heliacula* Meyr. and *thiasodes* Meyr.; all these were formerly included in *Cerace*.

***Megalodoris electrina*, n. sp.**

♀. 36–38 mm. Head, antennæ, and palpi blue-blackish, palpi nearly 3. Thorax deep blue or indigo. Abdomen purple-blackish (apex in one specimen with loose pale ochreous woolly hairs). Forewings suboblong, moderately broad, costa anteriorly strongly, posteriorly gently arched, apex obtuse, termen rounded, little oblique; bright deep orange; base very narrowly blackish-blue, very shortly and slenderly produced along costa and dorsum; a deep purple or indigo-blackish terminal fascia, its anterior edge running from beyond $\frac{2}{3}$ of costa to dorsum before tornus, somewhat concave, in one specimen angulated above middle, this fascia in one

TORTRICIDÆ

Cacoecia leucocymba Meyrick, 1912
Madagascar: Antananarivo

Archips micaceana (Walker, 1863)
Cacoecia machlopi Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:40, 43

Archips salaconis (Meyrick, 1912)
Cacoecia salaconis Meyrick, 1912
Philippines: Mindoro: Laguna de Naujan
Fig.: Clarke (1958), 3:47
Diakonoff (1968), 24, f. 502-504

Megalodoris Meyrick, 1912
Type-sp.: *Atteria stephanitis* Meyrick, 1910

Zacorisca electrina (Meyrick, 1912)
Megalodoris electrina Meyrick, 1912
Philippines: Mindanao: Mt. Apo
Fig.: Clarke (1958), 3:263
Diakonoff (1968), 9, f. 483
Meyrick (1913), 149: pl. 3, f. 332

specimen enclosing an oblique-oval orange spot midway between apex and anterior edge: cilia blackish-blue. Hindwings bright deep orange; hairs of 1b blue-blackish; a deep purple or indigo-blackish apical blotch occupying $\frac{1}{6}$ of wing, anterior edge straight: cilia orange, round blotch blackish-blue, on dorsum indigo-blackish.

PHILIPPINES, Mindanao, Mt. Apo, 6500 feet, amongst dense forest, in October (*Mounsey*). Allied to *stephanitis*, but larger, and without the basal streak on costa; in *stephanitis* the dark terminal fascia of forewings extends to middle of costa.

Tortrix tricensa, n. sp.

♂ ♀. 15–18 mm. Head and thorax light ochreous-grey, face sometimes whitish. Palpi grey, internally whitish. Antennæ in ♂ shortly ciliated, with scattered longer cilia. Abdomen pale greyish-ochreous. Forewings oblong, costa anteriorly moderately arched, in ♂ with moderate fold extending from base to $\frac{2}{3}$, posteriorly nearly straight, apex obtuse, termen almost straight, rather oblique; very pale brownish, strigulated with grey and a few blackish scales; three dark grey costal spots marked with blackish, viz. an oblique transverse spot representing upper $\frac{2}{3}$ of central fascia, a semioval spot representing costal patch, and a small spot beyond and sometimes confluent with this; two or three blackish strigulae before termen in middle; cilia whitish-brownish. Hindwings light grey; cilia whitish-grey, with faint darker subbasal line.

ASSAM, Khasis, in April, October, and November; eight specimens.

Tortrix humana, n. sp.

♂. 19 mm. Head, palpi, and thorax brownish-ochreous. Antennal ciliations $\frac{2}{3}$. Abdomen pale greyish, anal tuft whitish-ochreous. Forewings elongate, moderate, costa anteriorly moderately arched, with moderate fold extending from base to $\frac{1}{3}$, posteriorly slightly arched, apex round-pointed, termen somewhat sinuate, rather oblique; glossy whitish-ochreous, with scattered small grey dots containing a few black scales; costa narrowly ferruginous-ochreous, dilated to cover fold, and on a spindle-shaped streak extending from middle to near apex; central fascia ferruginous-ochreous, very undefined and indistinct on costal half, well-defined anteriorly on dorsal half but suffused posteriorly: cilia whitish-ochreous. Hindwings and cilia ochreous-whitish.

SIKKIM, Darjiling, 7000 feet, in August; one specimen.

Tortrix albescens, n. sp.

♂. 18–19 mm. Head and palpi grey sprinkled with whitish points. Thorax pale whitish-yellowish, anteriorly suffused with grey. Abdomen pale whitish-yellowish. Forewings elongate,

costa gently arched, without fold, apex round-pointed, termen faintly sinuate, oblique; pale whitish-yellowish; costal edge suffused with white: cilia yellow-whitish. Hindwings and cilia whitish.

TRANSVAAL, Pretoria district, in January (*Janse*); two specimens.

Tortrix insincera, n. sp.

♂ ♀. 22–23 mm. Head, palpi, and thorax whitish-ochreous. Antennæ in ♂ subdentate, ciliations $1\frac{1}{4}$. Abdomen pale whitish-ochreous. Forewings elongate, moderate, costa anteriorly moderately, posteriorly slightly arched, in ♂ without fold, apex obtuse, termen in ♂ slightly rounded, in ♀ straight, rather oblique; whitish-ochreous; central fascia and costal spot in ♂ pale ochreous, ill-defined, in ♀ wholly absent: cilia whitish-ochreous. Hindwings pale grey, in ♀ slightly darker; cilia ochreous-whitish.

ASIA MINOR, Alma Dag; two specimens.

Tortrix intrepida, n. sp.

♂ 14 mm., ♀ 19 mm. Head, palpi, and thorax pale ochreous more or less irrorated with fuscous. Antennal ciliations in ♂ 2. Abdomen whitish-ochreous sprinkled with grey. Forewings moderately broad, costa anteriorly strongly arched, posteriorly almost straight, apex obtuse, termen faintly sinuate, almost vertical; in ♂ pale yellow-ochreous irregularly sprinkled or tinged with brownish, in ♀ light brownish-ochreous strigulated with darker brown; basal patch brownish, edge sprinkled with dark fuscous, irregular, angulated in middle, followed on dorsum by a suffused spot; central fascia oblique, ochreous-brownish, narrow on upper half, broad on lower, edged with a few dark fuscous scales; costal patch undefined, brownish, edged anteriorly by a brown stria sprinkled with dark fuscous running to termen above tornus; two or three dark fuscous strigulae before upper part of termen; cilia whitish-ochreous suffused with brownish on upper part of termen. Hindwings in ♂ pale whitish-ochreous, in ♀ pale ochreous-yellowish, suffused with grey on dorsal half; cilia ochreous-whitish.

NATAL, Pinetown (*Leigh*), 1 ♂, 1 ♀; Comoro Is., Anjouan and Grand Comoro, in June and July (*Leigh*), 1 ♂, 1 ♀. Much like *capensana*, but antennal ciliations of ♂ longer (in *capensana* 1), and distinguished in both sexes by yellowish colouring of hindwings and grey suffusion of dorsal half.

Tortrix sanidota, n. sp.

♂ ♀. 17–24 mm. Head, palpi, and thorax fuscous. Abdomen grey. Forewings moderately broad, costa anteriorly strongly, posteriorly hardly arched, in ♂ without fold, apex obtuse, termen almost straight, hardly oblique; brown with a faint rosy tinge,

TORTRICIDÆ

Tortrix tricensa Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:256

Tortrix humana Meyrick, 1912

India: Sikkim, Darjeeling

Fig.: Clarke (1958), 3:240

Tortrix albescens Meyrick, 1912

South Africa: Transvaal, Pretoria

Tortrix insincera Meyrick, 1912

Turkey: Alma Dag

Fig.: Clarke (1958), 3:243

Tortrix intrepida Meyrick, 1912

Comoro Is.

Fig.: Clarke (1958), 3:243

Tortrix sanidota Meyrick, 1912

Comoro Is.

Fig.: Clarke (1958), 3:252

strigulated with dark fuscous; markings suffused with grey and edged with dark brown; basal patch with outer edge irregular, angulated in middle, followed by a spot on dorsum; central fascia moderate, rather strongly oblique, somewhat broader on lower half; costal patch triangular, undefined posteriorly, anteriorly edged by a dark brown stria running parallel to central fascia to termen above tornus; in one large ♀ these markings are obsolete, but there is a streak of dark fuscous suffusion along dorsum throughout; in one specimen some irregular white marking accompanying edge of basal patch and central fascia in middle, and before middle of termen; two or three small dark fuscous spots on costa posteriorly: cilia light brown, sprinkled or spotted with dark fuscous, in the large ♀ specimen suffused with dark grey except towards tips. Hindwings grey; cilia grey-whitish, with grey subbasal line.

COMORO Is., Mayotte and Grand Comoro, from May to July (Leigh); nine specimens.

Epichorista chloradelpha, n. sp.

♂. 15–17 mm. Head and palpi grey sprinkled with whitish points. Thorax whitish-ochreous, anterior margin suffused with grey. Abdomen ochreous-whitish. Forewings elongate, costa gently arched, without fold, apex round-pointed, termen almost straight, oblique; whitish-ochreous, tinged with yellow; a very few scattered dark fuscous scales in disc: cilia concolorous. Hindwings whitish-grey; cilia whitish.

TRANSVAAL, Pretoria district and Waterval-onder, from November to January (Janse); three specimens.

Epichorista tortuosa, n. sp.

♀. 18–20 mm. Head, palpi, and thorax yellow-ochreous, palpi 4. Abdomen grey. Forewings elongate, costa gently arched, apex round-pointed, termen slightly sinuate, rather strongly oblique; light ochreous-yellow; costal edge suffused with white from base to $\frac{1}{2}$; a thick ferruginous streak above middle from near base to $\frac{2}{3}$; two or three indistinct spots of ferruginous suffusion above and below this; a thick oblique ferruginous streak from costa before middle to disc at $\frac{3}{4}$, where it meets a similar inwardly oblique streak from costa near apex; a short inwardly oblique ferruginous streak from dorsum before tornus, sometimes connected with angle of costal streaks by a bar of indistinct ferruginous suffusion: cilia pale ochreous-yellow. Hindwings grey; cilia grey-whitish, with grey basal shade.

TRANSVAAL, Pretoria, in October and March (Janse); two specimens.

Epichorista sicca, n. sp.

♂. 14 mm. Head, palpi, and thorax grey-whitish sprinkled with grey. Abdomen light grey. Forewings elongate, costa moderately arched, apex pointed, termen sinuate, rather strongly oblique; whitish-grey sprinkled with grey, with a few scattered black scales: cilia whitish sprinkled with dark grey. Hindwings and cilia whitish.

MADAGASCAR, Antananarivo; one specimen.

Epichorista perversa, n. sp.

♀. 15–17 mm. Head whitish-ochreous, sometimes mixed with fuscous. Palpi 4, whitish-ochreous irrorated with dark fuscous. Thorax brownish-ochreous. Abdomen light grey. Forewings moderate, costa anteriorly strongly arched, posteriorly nearly straight, apex obtuse, termen sinuate, somewhat oblique; pale brownish-ochreous, somewhat strigulated with brown; a brown spot on fold indicating acute angle of basal patch; central fascia rather dark brown, moderate, oblique, broader on lower half, anterior edge straight; costal spot rounded-triangular, dark fuscous, sending a dark brown stria from middle of its posterior side to termen above tornus; a marginal black dot on each side of tornus: cilia whitish-ochreous tinged with grey or brownish, with dark brown median shade, sometimes dark fuscous towards tips. Hindwings ochreous-whitish, dorsum narrowly tinged with grey; cilia whitish.

NATAL, Pinetown and Camperdown, from January to March (Leigh); three specimens. Recognisable from the very similar *Tortrix hedrastis* by the whitish hindwings.

Epichorista ingenua, n. sp.

♀. 14 mm. Head and palpi whitish-ochreous. Thorax pale brownish-ochreous. Abdomen whitish-ochreous. Forewings sub-oblong, costa anteriorly moderately arched, posteriorly nearly straight, apex obtuse, termen slightly sinuate, somewhat oblique; glossy whitish-ochreous; dorsal half of basal area suffused with yellow-ochreous; central fascia yellow-ochreous, rather oblique, dilated towards dorsum, dorsal edge suffused with dark fuscous; costal patch triangular, yellow-ochreous, sending an obsolescent striga to tornus: cilia whitish-ochreous. Hindwings whitish-grey; cilia whitish.

SIKKIM, Kangra Valley, at 4500 feet, in July (Dudgeon); one specimen.

Arotrophora crustata, n. sp.

♂ ♀. 13–14 mm. Head and thorax whitish. Palpi 3, fuscous sprinkled with whitish, internally white. Antennæ in ♂ flatly-

TORTRICIDÆ

Epichorista chloradelpha Meyrick, 1912
South Africa: Transvaal, Pretoria

Epichorista tortuosa Meyrick, 1912
South Africa: Transvaal, Pretoria

Epichorista sicca Meyrick, 1912
Madagascar: Antananarivo
Fig.: Clarke (1958), 3:115

Epichorista perversa Meyrick, 1912
South Africa: Natal, Pinetown
Fig.: Clarke (1958), 3:115

Epichorista ingenua Meyrick, 1912
India: Sikkim, Kangra Valley
Fig.: Clarke (1958), 3:112

Arotrophora crustata Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:112

dentate, ciliations 1. Abdomen grey. Forewings elongate, posteriorly dilated, costa moderately arched, apex round-pointed, termen slightly sinuate, oblique; silvery-white tinged with grey, with scattered grey strigulae and black scales; a dark grey spot with some black scales on dorsum near base; a large triangular dark grey blotch mixed with ferruginous and blackish extending on costa from $\frac{1}{5}$ to beyond middle, its apex nearly or quite reaching dorsum; two black dots on angles of cell near beyond blotch; a spot of grey suffusion on costa at $\frac{2}{3}$, and one above tornus; some grey strigulation towards apex: cilia pale grey. Hindwings grey; cilia light grey.

ASSAM, Khasis, from June to August; two specimens.

Cnephasia incepta, n. sp.

♂. 12 mm. Head and thorax whitish-ochreous, shoulders narrowly dark fuscous. Antennal ciliations 1. Palpi whitish-ochreous irrorated with dark fuscous. Abdomen grey, anal tuft whitish-ochreous. Forewings elongate, costa moderately arched, apex round-pointed, termen slightly sinuate, oblique; 7 to termen; whitish-ochreous, with some scattered fuscous scales and strigulae; base of costa dark fuscous; quadrate fuscous spots, edged laterally with dark fuscous, on costa before middle and halfway between this and apex: cilia whitish-ochreous. Hindwings grey; cilia whitish.

TRANSVAAL, Waterval-ouder, in November (*Janse*); one specimen.

Cnephasia olearis, n. sp.

♂. 12 mm. Head, palpi, and thorax fulvous-ochreous. Antennal ciliations $\frac{1}{2}$. Abdomen grey, anal tuft whitish-ochreous. Forewings moderate, costa moderately arched, apex obtuse, termen faintly sinuate, somewhat oblique; 7 to termen; whitish-ochreous, silvery-iridescent, with irregular transverse lines of grey scales; basal patch mixed with fulvous-ochreous and light grey, outer edge marked by a curved blackish stria suffused with fulvous-ochreous, a similar less marked stria midway between this and base; central fascia rather narrow, oblique, fulvous-ochreous mixed with dark fuscous and on costa with grey, edged anteriorly by a blackish stria, posteriorly edged with blackish towards costa but narrowed and suffused with grey towards dorsum; a stria of scattered blackish scales suffused with ferruginous-ochreous beyond this, obsolete towards costa; a suffused grey patch on costa at $\frac{3}{4}$, from each side of which irregular black striae suffused with ferruginous-ochreous run to lower part of termen, converging downwards; a short blackish striga at apex: cilia whitish-ochreous tinged with fulvous. Hindwings pale grey; cilia grey-whitish, with light grey subbasal shade.

TRANSVAAL, Barberton, in January (*Janse*); one specimen.

Cnephasia corusca, n. sp.

♂. 15 mm. Head and thorax reddish-brown somewhat mixed with pale yellowish. Palpi reddish-brown, base and a bar on second joint pale yellowish. Antennae simple. Abdomen dark fuscous, anal tuft pale ochreous. Forewings elongate-triangular, costa gently arched, apex obtuse, termen rounded, somewhat oblique; light brown with violet-silvery iridescence; markings darker olive-brown edged with blackish and then with pale yellowish; a transverse mark from costa near base; a triangular blotch on dorsum about $\frac{1}{3}$, reaching half across wing; a narrow fascia from $\frac{1}{3}$ of costa to middle of dorsum, somewhat angulated in middle, sending from angle a branch obliquely downwards into next fascia; a very irregular fascia about $\frac{2}{3}$, outer edge acutely angulated above middle but beneath this with a deep reniform excavation edged with yellow-whitish, costal portion forming two parallel arms, dorsal extremity almost obsolete; a narrow subterminal fascia, towards costa trifurcate, lower part of first branch mixed with brassy-yellow; several small subconfluent triangular spots along termen, one in middle touching a projection of subterminal fascia: cilia dark brown barred with pale yellowish. Hindwings dark fuscous; cilia fuscous, with dark fuscous subbasal shade.

FRENCH GUIANA, St. Jean du Maroni, in January; one specimen.

Cnephasia temulenta, n. sp.

♀. 17 mm. Head, palpi, and thorax dark fuscous mixed with deep ferruginous, palpi 4. Abdomen pale grey. Forewings sub-oblong, costa anteriorly rather strongly, posteriorly slightly arched, apex obtuse, termen slightly sinuate, oblique; 7 to termen; deep ferruginous suffusedly mixed with dark purplish-fuscous; angulated edge of basal patch and straight rather oblique anterior edge of central fascia indicated by some blackish scales, but very indefinite: cilia dark grey with blackish subbasal line. Hindwings light grey; cilia grey-whitish, with faint grey subbasal shade.

TRANSVAAL, Waterval-ouder, in November (*Janse*); two specimens. A peculiar species, at first sight strongly resembling a *Peronea*.

Eulia smaragditis, n. sp.

♂. 24 mm. Head and thorax white mixed with grey. Antennal ciliations 1. Abdomen whitish sprinkled with grey. Forewings elongate, moderate, posteriorly dilated, costa gently arched, apex obtuse, termen slightly rounded, little oblique; silvery-white with a faint greenish tinge, strewn with small scattered strigulae and groups of black and emerald-green scales; basal patch grey with scattered black scales, on costa and outer edge irregularly marked with black and emerald-green, outer edge angulated in middle, submedian area suffused with silvery-whitish to near base; a series of small black spots along costa; an emerald-green spot marked

TORTRICIDÆ

Cnephasia incepta Meyrick, 1912
South Africa: Transvaal, Waterval-ouder

Cnephasia olearis Meyrick, 1912
South Africa: Transvaal, Barberton

Eulia corusca (Meyrick, 1912)
Cnephasia corusca Meyrick, 1912
French Guiana: St. Jean du Maroni
Fig.: Clarke (1958), 3:210

Cnephasia temulenta Meyrick, 1912
South Africa: Transvaal, Waterval-ouder

Orthocomotis smaragditis (Meyrick, 1912)
Eulia smaragditis Meyrick, 1912
Argentina: Parana
Fig.: Clarke (1958), 3:160

with black connecting angle of basal patch with central fascia; central fascia moderate, oblique, grey sprinkled with black, on margins irregularly marked with black and emerald-green; an emerald-green spot marked with black in disc connecting this with following fascia; a darker grey rather incurved fascia mixed with green and blackish from $\frac{2}{3}$ of costa to termen above tornus, dilated posteriorly into a blotch on costa: cilia white barred with dark fuscous. Hingwings grey, indistinctly darker-strigulated; cilia grey-whitish, with grey subbasal shade.

ARGENTINA, Parana, in October; one specimen.

PETELIACMA, n. g.

Antennæ in ♂ strongly ciliated. Palpi moderate, ascending, second joint with appressed scales, terminal joint short. Thorax with erectile posterior crest. Forewings with 3 from angle, 8 and 9 out of 7, 7 to termen. Hindwings without basal pecten; 3 and 4 short-stalked, 5 approximated, 6 and 7 stalked.

Probably a development of the following genus.

Peteliacma torrescens, n. sp.

♂. 15 mm. Head and thorax ochreous. Palpi ferruginous-brown. Antennal ciliations $2\frac{1}{2}$. Abdomen pale ochreous. Forewings elongate, slightly dilated posteriorly, costa hardly arched, apex obtuse, termen straight, oblique; reddish-ochreous, tinged with violet; a dark reddish-brown oblique transverse spot from dorsum at $\frac{1}{3}$, reaching half across wing; central fascia yellowish-ferruginous, somewhat oblique, broad on costa, narrowed towards dorsum; a moderate yellowish-ferruginous fascia from $\frac{2}{3}$ of costa to tornus, costal area between this and central fascia suffused with whitish; apical and terminal area beyond it also suffused with whitish, with two or three reddish-brown strigulae on margins towards apex: cilia ochreous. Hindwings ochreous - whitish, thinly scaled; an elongate patch of ochreous suffusion on tornus; several small reddish-fuscous spots towards apex; cilia pale whitish-yellowish.

MADAGASCAR, Antananarivo, in May; one specimen.

BALIOXENA, n. g.

Antennæ in ♂ ciliated. Palpi moderate, subascending, second joint with appressed scales, roughly expanded at apex above, terminal joint very short. Thorax without crest. Forewings with 3 from angle, 7 separate, to termen. Hindwings without basal pecten; 3 and 4 connate, 5 approximated, 6 and 7 stalked.

Balioxena iospila, n. sp.

♂. 18 mm. Head whitish mixed with grey. Palpi reddish-fuscous, expanded scales of second joint whitish. Antennal ciliations $1\frac{1}{2}$. Thorax whitish mixed with grey, with a ferruginous stripe on each side of back. Abdomen light grey, anal tuft whitish. Forewings elongate, moderate, posteriorly slightly dilated, costa gently arched, without fold, apex obtuse-pointed, termen nearly straight, oblique; pale silvery-grey, costal third suffused with white; costal edge ferruginous, somewhat triangularly thickened towards middle and $\frac{2}{3}$; median, submedian, and dorsal longitudinal series of small irregular ferruginous spots; several ferruginous dots along termen: cilia white, beneath tornus tinged with grey. Hindwings grey-whitish; cilia white.

MADAGASCAR, Antananarivo; one specimen.

Schoenotenes spectralis, n. sp.

♀. 16-19 mm. Head, thorax, and abdomen silvery-white. Palpi white, second joint partially suffused with grey. Forewings suboblong, costa moderately arched, more strongly anteriorly, apex obtuse, termen slightly rounded, somewhat oblique; silvery-white; some variable irregular dark fuscous strigulation, sometimes connected by faint oblique fuscous striæ; markings fuscous mixed with black; edge of basal patch indicated by a striga from costa and a transverse mark from dorsum reaching to fold; central fascia indicated by two small marks on middle of costa; a transverse spot on costa at $\frac{2}{3}$, and one before middle of termen; an erect striga from tornus; several tufts of raised scales, especially two beneath middle of disc and a ridge on end of cell: cilia white. Hindwings silvery-white with a very faint greyish tinge; cilia white.

QUEENSLAND, Herberton, at 3500 feet, in January (Dodd); three specimens.

PLANOSTOCHA, n. g.

Palpi moderately long, porrected, second joint with scales somewhat appressed towards apex, terminal joint moderate. Antennæ in ♂ ciliated. Thorax without crest. Forewings in ♂ with costal fold, costa with rough median projection of scales, 3 from before angle, 7 and 8 usually connate, 7 to termen. Hindwings without basal pecten; 3 and 4 stalked, 5 approximated, 6 and 7 stalked.

Type *cumulata* Meyr.

CALLIBRYASTIS, n. g.

Palpi short, ascending, shortly rough-scaled beneath, terminal joint short. Thorax with posterior crest. Forewings with costal

TORTRICIDÆ

Peteliacma Meyrick, 1912

Type-sp.: *Peteliacma torrescens* Meyrick, 1912

Peteliacma torrescens Meyrick, 1912

Madagascar: Antananarivo

Fig.: Clarke (1958), 3:256

Meyrick (1913), 149: pl. 4, f. 48

Balioxena Meyrick, 1912

Type-sp.: *Balioxena iospila* Meyrick, 1912

Balioxena iospila Meyrick, 1912

Madagascar: Antananarivo

Fig.: Clarke, (1958), 3:59

Cornuticlava spectralis (Meyrick, 1912)

Schoenotenes spectralis Meyrick, 1912

Australia: Queensland

Fig.: Meyrick (1913), 149: pl. 3, f. 36

Planostocha Meyrick, 1912

Type-sp.: *Cacoecia cumulata* Meyrick, 1907

Callibryastis Meyrick, 1912

Type-sp.: *Callibryastis pachnota* Meyrick, 1912

scale-projection before middle, 7 and 8 stalked, 7 to apex. Hindwings without basal pecten; 3-5 nearly approximated at base, 6 and 7 stalked.

Callibryastis pachnota, n. sp.

♀. 21 mm. Head and thorax olive-green. Palpi yellow-ochreous. Abdomen grey, apex pale ochreous. Forewings sub-oblong, somewhat dilated posteriorly, costa abruptly arched towards base, roughened with scales from base to $\frac{2}{3}$, where they form a projection, thence almost straight, apex obtuse, termen rounded, somewhat oblique; olive-green, with obscure suffused transverse series of lighter emerald-greenish subconfluent spots, towards termen edged with silvery-bluish-white; costal edge yellow-ochreous from $\frac{2}{3}$ to apex; costal half from base to $\frac{2}{3}$ tinged with pale violet and sprinkled with bluish-white, extending in disc to middle: cilia olive-greenish. Hindwings rather dark grey; cilia grey, towards tips whitish-tinged.

ASSAM, Khasis; one specimen.

Tymbarcha astuta, n. sp.

♂. 14 mm. Head pale fuscous. Palpi whitish-fuscous irrorated with dark fuscous. Thorax pale greyish-ochreous, shoulders with a blackish patch. Abdomen pale fuscous. Forewings elongate, costa gently arched, slightly roughened with scales, apex obtuse, termen nearly straight, rather oblique; whitish-ochreous, suffused with pale grey, with some scattered raised blackish scales; a blackish dot on base of costa, and two before middle; a triangular blackish spot on middle of costa; a small blackish scaletuft in disc at $\frac{1}{4}$; an irregular line of scattered blackish scales from $\frac{1}{4}$ of costa to termen above tornus: cilia whitish-ochreous suffused with light grey. Hindwings with 5 absent; light grey; cilia whitish-grey.

ASSAM, Khasis; one specimen.

Spatalistis orbiger, n. sp.

♂. 13 mm. Head and thorax ochreous-white. Palpi fuscous. Abdomen grey. Forewings elongate-oblong, costa anteriorly moderately arched, posteriorly nearly straight, apex round-pointed, termen faintly sinuate, rather strongly oblique; rather dark fuscous, with oblique ferruginous-brown striae sprinkled with blackish; three round whitish-ochreous blotches becoming whitish on their margins, viz. one occupying basal fourth of dorsum, one resting on costa about $\frac{1}{4}$, and the third and largest resting on dorsum beyond middle and reaching more than half across wing, centred with a transverse tuft of raised scales; several small whitish dots on posterior part of costa and termen: cilia fuscous mixed with darker. Hindwings pale grey, thinly scaled in disc and towards base, suffused with dark grey towards apex and on termen, veins dark grey; cilia whitish-grey.

ASSAM, Khasis, in April; one specimen.

Spatalistis tyrophthora, n. sp.

♂ ♀. 12-13 mm. Head and thorax whitish-ochreous mixed with grey. Palpi ochreous-whitish spotted with dark grey. Abdomen dark grey. Forewings elongate-oblong, costa abruptly bent near base and moderately at $\frac{2}{3}$, apex round-pointed, termen sinuate, little oblique; pale leaden-grey or rather dark grey, with three broad oblique obscure brownish fasciae sprinkled and strigulated with black, costa suffused with whitish-ochreous; in one specimen a large semi-ovate pale brownish-ochreous blotch extending along dorsum from $\frac{1}{4}$ to near tornus, and reaching half across wing posteriorly: cilia whitish-ochreous, with fuscous basal spots at apex, below middle, and on tornus, apical half sometimes pale leaden-metallic. Hindwings dark fuscous; cilia whitish, basal half fuscous.

ASSAM, Khasis, in November; two specimens.

Eboda haruspex, n. sp.

♂ ♀. 14-15 mm. Head, palpi, and thorax brown-reddish mixed with pale grey. Abdomen grey. Forewings elongate, widest in middle, costa gently arched, abruptly at base, in middle slightly bent, apex obtuse, termen slightly rounded, little oblique; 7 to apex; deep brown-reddish or dull crimson, sometimes greyish-tinged, obscurely darker-strigulated; costa dark fuscous spotted with ferruginous-ochreous; in one specimen a transverse median fascia of three irregular partially connected light grey spots centred with ferruginous-brownish and two or three blackish scales: cilia light grey, towards base suffused with brown. Hindwings dark grey; cilia grey, towards tips whitish.

CEYLON, Madulsima, in April and October (Green); two specimens.

Eboda facilis, n. sp.

♂ ♀. 15-17 mm. Head and thorax brown-reddish, sometimes partially suffused with light grey. Palpi whitish sprinkled with dark fuscous. Abdomen grey. Forewings elongate, widest in middle, costa abruptly arched near base, more or less bent in middle, apex obliquely rounded off, indefinite, termen prominently rounded; brown-reddish, sometimes with a few small scattered blackish dots; costa suffused with ferruginous-ochreous and spotted with dark fuscous; generally a more or less indicated narrow irregular rather oblique fascia of light grey broken rings with a few black scales; an oblique series of faint pale rings before apex: cilia pale grey, towards base suffused with brown-reddish. Hindwings grey, darker posteriorly and on veins; cilia light grey.

ASSAM, Khasis, in June, July, and October; nine specimens. Very similar in colouring to *haruspex*, but easily distinguished by different form of apex and termen of forewings.

TORTRICIDAE

Callibryastis pachnota Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:63

Meyrick (1913), 149: pl. 4, f. 46

Tymbarcha astuta Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:259

Spatalistis orbiger Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:259

Spatalistis tyrophthora Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:227

Eboda haruspex Meyrick, 1912

Sri Lanka: Madulsima

Fig.: Clarke (1958), 3:112

Eboda facilis Meyrick, 1912

India: Meghalaya, Khasi Hills

Fig.: Clarke (1958), 3:111

Peronea amethystas, n. sp.

♀. 14 mm. Head whitish-ochreous, collar, yellow-ochreous. Palpi ochreous-whitish speckled with grey, second joint with two dark fuscous spots anteriorly. Thorax ochreous-whitish partially tinged with violet and bluish. Abdomen fuscous. Forewings elongate, costa moderately arched, apex round-pointed, termen slightly sinuate, oblique; deep green, largely suffused with blackish; about six irregular oblique shining indigo-blue fasciae with violet reflections, space between third and fourth suffused with whitish, fourth marked with a purple spot above dorsum; an indigo-blue spot at apex: cilia dark fuscous. Hindwings fuscous, darker posteriorly; cilia fuscous.

ASSAM, Khasis, in January; one specimen.

Peronea erioptila, n. sp.

♀. 14-15 mm. Head, palpi, and thorax fuscous sprinkled with whitish and marked with dark fuscous, palpi long. Abdomen dark grey. Forewings elongate, moderate, costa moderately arched, apex pointed, termen strongly sinuate, rather oblique; purplish-fuscous, with scattered raised white scales and blackish strigulae; costa marked with obscure paler and blackish strigulae; basal patch darker, edge blackish, obtusely angulated in middle, enclosing a small white tuft on fold and some scattered white scales; a spot of blackish scales on tornus edged with whitish laterally; two transverse white striae posteriorly resting on termen above tornus and below middle respectively, not reaching costa: cilia fuscous sprinkled with dark fuscous and whitish. Hindwings rather dark fuscous; cilia fuscous.

CEYLON, Maskeliya, in June (Pole); two specimens. Allied to *rapax* and *halidora*; very like *rapax* in colouring, but readily separated by obviously shorter and broader forewings.

Peronea enitescens, n. sp.

♂ ♀. 14-15 mm. Head ochreous-whitish mixed with fuscous. Palpi fuscous. Thorax ferruginous-brown. Abdomen grey. Forewings elongate, moderate, costa strongly and evenly arched, apex obtuse, termen slightly sinuate, somewhat oblique; ferruginous; basal area with violet reflections; a semioval blotch of ochreous-yellowish suffusion extending on dorsum from $\frac{1}{4}$ to $\frac{3}{4}$; two very oblique fasciae of pale violet iridescence before and beyond middle, posterior running to tornus; two small black tufts below middle of disc, and several other minute scattered black dots; a bluish-lead-metallic curved streak crossing apex: cilia grey mixed with dark fuscous. Hindwings grey; cilia light grey.

ASSAM, Khasis, in September and October; three specimens.

Peronea dryadarcha, n. sp.

♀. 28-30 mm. Head and thorax brown. Palpi very long, light brownish suffusedly irrorated with dark fuscous. Abdomen pale fuscous. Forewings elongate, moderate, costa strongly arched, roughened with scales from $\frac{1}{2}$ to apex, apex obtuse, termen rounded, rather oblique; deep brown or red-brown, suffusedly mixed with pale greyish-ochreous, sometimes with scattered spots of grey suffusion; several spots of dark and pale suffusion along costa; an undefined blotch of dark fuscous suffusion in disc, extended to enclose a pale greyish-ochreous spot on costa at $\frac{3}{5}$: cilia ferruginous-brownish, on tornus tinged with grey. Hindwings with 5 parallel to 4; whitish-ochreous or pale greyish-ochreous; cilia whitish-ochreous.

ASSAM, Khasis, in July; SIKKIM, Darjiling, 7000 feet, in March; two specimens.

Peronea semitexta, n. sp.

♂. 16 mm. Head whitish. Palpi moderate, brownish, irrorated with dark fuscous. Thorax and abdomen grey-whitish. Forewings suboblong, moderate, costa anteriorly moderately arched, with projection of scales before middle, rather arched again towards apex, apex obtuse, termen slightly sinuate, somewhat oblique; grey-whitish, with a few minute scattered raised blackish dots; a narrow fuscous streak spotted with ferruginous along dorsum from $\frac{1}{4}$ to $\frac{3}{4}$, edged above with pale yellowish; an elongate dark red-brown mark on costal antemedian scale-projection, two others equally elongate beyond middle, and two shorter ones posteriorly; apical half of wing beyond a slightly curved line from antemedian projection of costa to beyond middle of dorsum suffusedly mixed with brown and grey, with a fine curved waved whitish line from $\frac{2}{3}$ of costa to tornus, and a subterminal series of minute black dots or strigulae; veins posteriorly white; an interrupted fine black line on upper part of termen: cilia white, with pale greyish anterior and light brownish posterior shades. Hindwings with 5 approximated to 3 at base; grey-whitish, with a few grey strigulae near apex; cilia whitish, with a grey line round apex.

SIKKIM, at 4500 feet, in November (Dudgeon); one specimen.

Peronea placata, n. sp.

♂ ♀. 15-18 mm. Head, palpi, and anterior half of thorax dark bronzy-fuscous, posterior half of thorax pale yellow-ochreous. Abdomen grey. Forewings oblong, costa anteriorly strongly, posteriorly hardly arched, apex obtuse, termen slightly sinuate, rather oblique; pale yellow-ochreous, with a few black specks, dorsum with some minute dark fuscous strigulae; costa dark fuscous

VOL. I.—March 1912.

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TORTRICIDAE

Acleris amethystas (Meyrick, 1912)
Peronea amethystas Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:3

Acleris erioptila (Meyrick, 1912)
Peronea erioptila Meyrick, 1912
Sri Lanka: Maskeliya
Fig.: Clarke (1958), 3:8

Acleris enitescens (Meyrick, 1912)
Peronea enitescens Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:8

Acleris dryadarcha (Meyrick, 1912)
Peronea dryadarcha Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:7

Acleris semitexta (Meyrick, 1912)
Peronea semitexta Meyrick, 1912
India: Sikkim
Fig.: Clarke (1958), 3:15

Acleris placata (Meyrick, 1912)
Peronea placata Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1958), 3:12

towards base; a dark brown elongate-triangular patch extending along costa from $\frac{2}{5}$ to near apex, and reaching half across wing, partially marked with ferruginous and round apex with some minute black raised dots; three or four black dots on upper part of termen: cilia pale yellow-ochreous. Hindwings with 5 approximated to 3 at base; grey; cilia pale grey.

ASSAM, Khasis, from July to October; five specimens.

Peronea napaea, n. sp.

♂. 27 mm. Head and thorax fuscous sprinkled with dark fuscous and grey-whitish. Palpi moderate, whitish, sprinkled with fuscous and dark fuscous. Abdomen grey, anal tuft pale ochreous. Forewings elongate-oblong, slightly dilated posteriorly, costa strongly arched towards base, thence almost straight, rough-scaled throughout except at base, apex round-pointed, termen sinuate, oblique; grey, irrorated with dark grey and whitish, and mixed with brown, especially towards tornal area; several incomplete oblique transverse series of minute black raised dots; a very faintly indicated triangular patch of somewhat darker suffusion extending on costa from $\frac{1}{3}$ to near apex, and reaching half across wing; several short marks of blackish irroration along posterior half of costa: cilia grey irrorated with whitish, base spotted with brown. Hindwings with 5 approximated to 3 at base; light grey; cilia light grey.

BALUCHISTAN, Quetta, 5000 feet; one specimen.

Peronea hapalactis, n. sp.

♀. 15-16 mm. Head and palpi fuscous. Thorax light yellow-ochreous. Abdomen grey, apex whitish-ochreous. Forewings suboblong, costa anteriorly strongly arched, posteriorly nearly straight, apex round-pointed, termen sinuate, oblique; light yellow-ochreous, with a few scattered minute black tufts, veins on posterior half marked with very fine fuscous lines; a faint triangular patch of slight ferruginous-ochreous suffusion extending on costa from about $\frac{2}{5}$ to $\frac{4}{5}$, and reaching half across wing; a broad ferruginous-ochreous terminal fascia, becoming obsolete on costa, deepest towards tornus, before which it includes a transverse suffused spot of dark fuscous irroration: cilia pale ferruginous-ochreous, suffused with grey on termen. Hindwings with 5 approximated to 3 at base; light grey; cilia light grey.

ASSAM, Khasis, in July; two specimens.

Peronea nectaritis, n. sp.

♂. 17 mm. Head, palpi, and thorax ochreous-brown. Abdomen whitish. Forewings elongate, posteriorly slightly dilated, costa anteriorly moderately, posteriorly slightly arched, apex

round-pointed, termen somewhat sinuate, rather oblique; brownish-ochreous tinged with ferruginous-yellow, especially towards dorsum; costa indistinctly strigulated with brown; a minute blackish dot in disc beyond middle: cilia yellow-ochreous. Hindwings with 5 approximated to 3 at base; grey-whitish; cilia whitish.

MADRAS, Nilgiris, at 6000 feet, in May (Andrewes); one specimen.

Peronea petulans, n. sp.

♀. 17-18 mm. Head ochreous-whitish, sometimes with dark fuscous mark on each side of face, sides of crown with some dark fuscous hairs. Palpi ochreous-whitish, second joint sprinkled and spotted with dark fuscous, terminal joint with a median dark fuscous spot. Thorax whitish, mixed or sometimes almost wholly suffused with dark fuscous and ferruginous. Abdomen dark grey. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen sinuate beneath apex, little oblique; ochreous-whitish more or less mixed irregularly with ferruginous and blackish, with numerous raised scales and minute tufts in irregular transverse series; costa spotted and strigulated with blackish; a thick streak of dark grey and black suffusion extending along dorsum throughout, enlarged before tornus into a blotch reaching nearly half across wing; some irregular ferruginous and blackish marking in middle of disc; posterior area more or less wholly suffused with ferruginous, leaden-grey, and blackish, except a round ochreous-whitish blotch above tornus; a leaden-metallic streak preceding an ochreous-whitish terminal streak: cilia ferruginous-ochreous mixed with dark grey. Hindwings with 3 and 4 connate, 5 rather approximated towards base; rather dark fuscous; cilia whitish-ochreous, with grey subbasal line.

ASSAM, Khasis, in October; two specimens.

Cerace loxodes, n. sp.

♀. 52 mm. Head and thorax ochreous-white (partly defaced). Abdomen orange. Forewings elongate, rather narrow, costa strongly arched, apex obtuse, termen straight, rather strongly oblique; dark coppery-purple-fuscous: submedian fold from base to middle and a streak of suffusion from $\frac{1}{3}$ of disc to apical blotch orange-red; very numerous ochreous-white dots and small round spots arranged in longitudinal rows, on costa becoming transverse bars, longer towards base, on red streak posteriorly marked with silvery scales; an orange-red apical blotch, triangularly produced along upper half of termen: cilia whitish, barred with dark fuscous and at apex with reddish. Hindwings orange; a dark purple-fuscous blotch occupying apical $\frac{2}{5}$, anterior edge somewhat broken into spots, especially towards dorsum; cilia orange, on apical blotch dark fuscous, with white spots at and above apex.

TENASSERIM; one specimen.

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TORTRICIDÆ

Acleris napaea (Meyrick, 1912)
Peronea napaea Meyrick, 1912
 Pakistan: Baluchistan, Quetta
 Fig.: Clarke (1958), 3:12

Acleris hapalactis (Meyrick, 1912)
Peronea hapalactis Meyrick, 1912
 India: Meghalaya, Khasi Hills
 Fig.: Clarke (1958), 3:11

Acleris nectaritis (Meyrick, 1912)
Peronea nectaritis Meyrick, 1912
 India: Tamil Nadu, Nilgiri Hills
 Fig.: Clarke (1958), 3:12

Phricanthes petulans (Meyrick, 1912)
Peronea petulans Meyrick, 1912
 India: Meghalaya, Khasi Hills
 Fig.: Clarke (1958), 3:176

Cerace loxodes Meyrick, 1912
 Myanmar: Tenasserim

Eboda obstinata Meyr.

Larva slightly tapering posteriorly, green, with a lateral row of whitish hairs; subdorsal line indistinct, whitish; head yellow-green: in rolled leaves of *Cardiospermum* (*Sapindaceae*) (Fletcher). Besides India and Ceylon, I have obtained this species from South Africa, the Comoro Is., and Mauritius.

PHALONIADÆ.

Phalonia capnospila, n. sp.

♂. 20 mm. Head and thorax ochreous, shoulders irrorated with dark fuscous. Antennal ciliations 2. Abdomen dark grey. Forewings elongate, rather narrow, posteriorly slightly dilated, costa hardly arched, apex obtuse, termen slightly rounded, oblique; 7 to apex; pale ochreous; costa strigulated with dark fuscous; a small basal patch of ferruginous-ochreous suffusion; two moderately broad deep ferruginous transverse fasciæ, their margins marked with irregular series of dark leaden-grey spots, first from before middle of costa to middle of dorsum, angulated in middle, second from $\frac{2}{3}$ of costa to dorsum before tornus, rather curved, connected with first below middle; a series of dark leaden-grey spots along termen: cilia whitish-ochreous. Hindwings dark fuscous; cilia whitish, with dark grey subbasal shade.

ASIA MINOR, Alma Dag; one specimen.

Pharmacis chalcantha, n. sp.

♂ ♀. 17-19 mm. Head and thorax white, shoulders sometimes tinged with ochreous. Palpi long, white, externally tinged with pale ferruginous. Abdomen whitish-ochreous. Forewings elongate, dilated posteriorly, costa gently arched, apex obtuse, termen nearly straight, rather oblique; white, tinged in places with pale yellow; a thick suffused orange streak along costa from base almost to first fascia; a rather broad orange fascia before middle parallel to termen, narrower on costa, marked with two irregular series of small pale violet-bronzy spots; two small orange or pale yellowish spots on costa beyond this; a broad orange terminal fascia, marked with a curved median series of small pale violet-bronzy spots, two or three on anterior edge towards dorsum, one or two before apex and several along termen: cilia whitish, with two orange shades. Hindwings light grey; cilia white, with grey subbasal shade.

ASIA MINOR, Alma Dag; three specimens.

GRACILARIADÆ.

Lithocolletis melanosparta, n. sp.

♀. 7 mm. Head whitish, sides and front of tuft fulvous. Palpi white. Thorax reddish-ochreous, with whitish dorsal stripe. Abdomen grey. Forewings lanceolate; ferruginous-ochreous; dorsal edge whitish throughout; markings formed of black irroration, partially edged with whitish suffusion; two slender fasciæ angulated above middle, first at $\frac{1}{3}$, obsolete on lower half, second about middle; a spot on costa at $\frac{2}{3}$; a slender somewhat sinuate fascia from $\frac{5}{8}$ of costa to $\frac{2}{3}$ of dorsum; an irregular apical patch, preceded by slight dots on costa and tornus: cilia ferruginous-ochreous, towards tornus light grey. Hindwings dark grey; cilia grey.

TRANSVAAL, Barberton, in December (*Janse*); one specimen.

Lithocolletis dorinda, n. sp.

♂. 3 mm. Head and thorax shining bronzy-metallic, hairs of crown blackish. Forewings lanceolate, acute; orange; three pairs of opposite costal and dorsal shining violet-white black-edged spots, and a fourth costal spot before apex: cilia grey, basal third black round apex. Hindwings rather dark grey; cilia grey.

BENGAL, Pusa, in August (*Fletcher*); one specimen. Larva mining leaves of *Desmodium* (*Leguminosae*) (*Fletcher*). A very interesting species, closely related to the Australian *aglaazona* and North American *desmodiella*.

Epicephala chalybacma Meyr.

Larva without prolegs on 10, pale greenish-yellow; head yellow; when full-grown, with a red band on each of segments 2-12, a red spot on 13: feeds inside unexpanded flowers of *Poinciana pulcherrima* (*Leguminosae*), showing no outward sign; when full-grown, it gnaws its way out and pupates in a white cocoon covered with bubbles, usually on the upper surface of a leaf; "the larva first applies a layer of silk to the surface of the leaf, larger than the cocoon and sometimes covering the whole leaf; then it begins to enclose itself by preparing a roof, and when this is sufficiently thick, the larva from the interior cuts through portions of it, works the cut portion about in its mouth and emits it again as a transparent round bubble attached to the end of the strip cut; apparently the bubble is formed in the mouth, and is prepared very quickly; the cuts are then closed with more silk applied from within; in this way nearly the whole of the cocoon may be covered with these stalked bubbles; when the cocoon is finished no cuts are to be seen, and the bubbles appear to rise from the outer

TORTRICIDAE

Eboda obstinata Meyrick, 1908

Sri Lanka: Puttalam

Fig.: Clarke (1958), 3:112

Host: *Cardiospermum* (*Sapindaceae*)

Chlidonia capnospila (Meyrick, 1912)

Phalonia capnospila Meyrick, 1912

Turkey: Alma Dag

Fig.: Clarke (1963), 4:8

Pharmacis chalcantha Meyrick, 1912

Turkey: Alma Dag

Fig.: Clarke (1963), 4:32

GRACILARIIDAE

Phyllonorycter melanosparta (Meyrick, 1912)

Lithocolletis melanosparta Meyrick, 1912

South Africa: Transvaal, Barberton

Fig.: Vári (1961), 208, pl. 22, f. 4

Host: *Rhynchosia caribaea*, *Flemingia grahamiana*, *Vigna* (*Leguminosae*)

Phyllonorycter dorinda (Meyrick, 1912)

Lithocolletis dorinda Meyrick, 1912

India: Bihar, Pusa

Host: *Desmodium* (*Leguminosae*)

Epicephala chalybacma Meyrick, 1908

Sri Lanka: Peridemiya

Host: *Poinciana pulcherrima* (*Leguminosae*)

surface of the cocoon" (Fletcher). This interesting cocoon recalls that of the North American genus *Marmara*, and would seem to indicate near affinity with that genus, as so exceptional a habit is not likely to have arisen independently. The cocoon suggests the appearance of a batch of empty eggshells.

Epicephala invita, n. sp.

♀. 9–10 mm. Head shining white, almost smooth. Palpi with appressed scales, dark fuscous, terminal joint white except towards base. Antennæ dark grey. Thorax shining white, patagia dark fuscous. Abdomen shining grey. Basal joint of middle and posterior tarsi somewhat rough-scaled. Forewings elongate, narrow, short-pointed; purplish-fuscous irrorated with dark fuscous, with obscure indications of darker streaks; an irregular-edged attenuated white streak along dorsum from base to middle of termen, terminal portion very slender; a fine obscure strigula of whitish irroration on costa towards apex; apical area finely irrorated with whitish and blackish; a black violet-edged apical dot: cilia grey, round apex whitish with a dark violet-fuscous basal shade, a blackish median line, and a black apical hook. Hindwings rather dark grey; cilia grey.

TRANSVAAL, Barberton, in December (Janse); two specimens.

Acrocercops hexalocha, n. sp.

♀. 8 mm. Head white. Palpi smooth-scaled, white, apex of second joint blackish. Thorax whitish, shoulders with a spot of dark fuscous irroration. Abdomen greyish, beneath white with dark fuscous rings. Legs white banded with dark fuscous. Forewings very narrowly elongate, long-pointed; brownish mixed with whitish, towards costa sprinkled with blackish; six somewhat oblique white transverse fasciæ, edged with black irroration, first broad, basal, sprinkled with a few dark fuscous scales, second and third moderate, third in middle, fourth narrow, connected with third on dorsum, fifth very slender, more oblique, approximated to sixth, sixth just before apex, very slender, triangularly dilated on costa: cilia whitish, round apex with two blackish lines. Hindwings and cilia grey.

TRANSVAAL, Barberton, in January (Janse); one specimen.

Acrocercops carcharota, n. sp.

♀. 9 mm. Head and thorax white, patagia dark fuscous. Palpi with appressed scales, white, apex of second joint dark fuscous. Abdomen light grey, beneath white. Forewings very narrowly elongate, moderately pointed, acute; dark fuscous; a strong snow-white streak along dorsum and termen to near apex, its posterior half marked off by an indentation and transformed into

three spots connected at base, first two triangular, reaching slightly more than half across wing, third very small; a white dot on costa between the two larger spots; an oblique white striga crossing wing before apex; cilia pale greyish-ochreous, round apex white with a black median line, on costa with a blackish basal line, at apex with a blackish hook. Hindwings grey; cilia pale ochreous-grey.

TRANSVAAL, Pretoria, in January (Janse); one specimen.

Acrocercops monodecta, n. sp.

♀. 10 mm. Head and thorax shining white, patagia bronzy-brown. Palpi with appressed scales, white, upper part of second joint towards apex and base of terminal joint dark fuscous. Antennæ ochreous-whitish. Abdomen pale shining grey. Forewings very narrowly elongate, long-pointed; bronzy-brown; a rather broad shining white streak along dorsum and termen from base to near apex, narrowly interrupted on tornus, terminal portion edged above by a black streak; a few scattered black scales on upper edge of this streak towards middle of wing: cilia pale grey, round apex white, above apex with a black basal streak, a blackish median patch, and tips black. Hindwings and cilia grey.

TRANSVAAL, Barberton, in December (Janse); one specimen.

Acrocercops hormophora, n. sp.

♂. 6 mm. Head dark bronzy-fuscous, face white. Palpi smooth, white, terminal joint dark fuscous towards apex. Antennæ dark fuscous. Thorax dark fuscous, spotted with whitish posteriorly. Abdomen dark grey, beneath white, on sides with oblique dark fuscous bars. Legs white, obliquely banded with dark fuscous. Forewings very narrowly elongate, short-pointed, obtuse; dark fuscous; a transverse white spot on dorsum at $\frac{1}{4}$, reaching half across wing; oblique white wedge-shaped marks on costa and dorsum about middle of wing, costal longer and reaching beyond dorsal; two slender violet-silvery-metallic transverse fasciæ at $\frac{3}{4}$ and towards apex, anterior white on dorsum: cilia grey, round apex white with blackish basal and median lines. Hindwings dark fuscous; cilia grey.

TRANSVAAL, Barberton, in January (Janse); one specimen.

Acrocercops heterodoxa, n. sp.

♂. 9 mm. Head whitish, somewhat mixed with grey. Palpi somewhat loosely scaled, white, terminal joint with two suffused dark fuscous rings. Thorax whitish, shoulders tinged with ochreous. Abdomen ochreous-whitish. Middle and posterior tibiae and tarsi white. Forewings elongate-lanceolate, acute; pale ferruginous, tinged with whitish-ochreous anteriorly, with a few scattered blackish specks; a suffused white costal streak from base to beyond

GRACILLARIIDÆ

Paraclectis invita (Meyrick, 1912)

Epicephala invita Meyrick, 1912

South Africa: Transvaal

Fig.: Vári (1961), 71, pl. 13, f. 5

Spulerina hexalocha (Meyrick, 1912)

Acrocercops hexalocha Meyrick, 1912

South Africa: Transvaal, Barberton

Fig.: Vári (1961), 185, pl. 21, f. 6

Host: *Sclerocarya caffra* (Anacardiaceae)

Dialectica carcharota (Meyrick, 1912)

Acrocercops carcharota Meyrick, 1912

South Africa: Transvaal

Fig.: Vári (1961), 140, pl. 14, f. 4

Host: *Lithospermum* (Boraginaceae)

Cryptolectica monodecta (Meyrick, 1912)

Acrocercops monodecta Meyrick, 1912

South Africa: Transvaal, Barberton

Fig.: Vári (1961), 178, pl. 16, f. 3

Polydema hormophora (Meyrick, 1912)

Acrocercops hormophora Meyrick, 1912

South Africa: Transvaal, Barberton

Fig.: Vári (1961), 116, pl. 11, f. 5

Acrocercops heterodoxa Meyrick, 1912

South Africa: Transvaal, Donkerhoek

Fig.: Clarke (1958), 3:252

Vári (1961), 161, pl. 16, f. 6