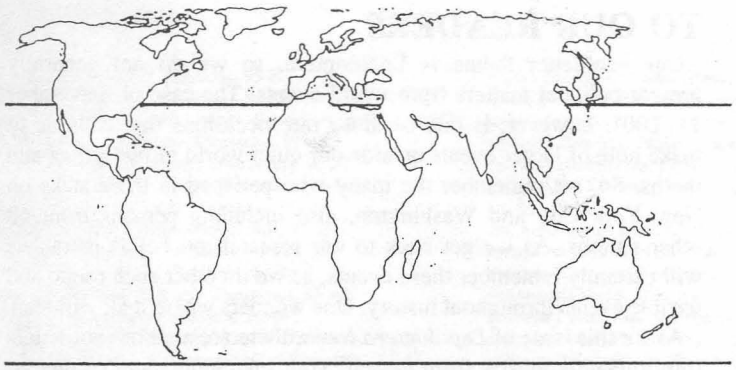
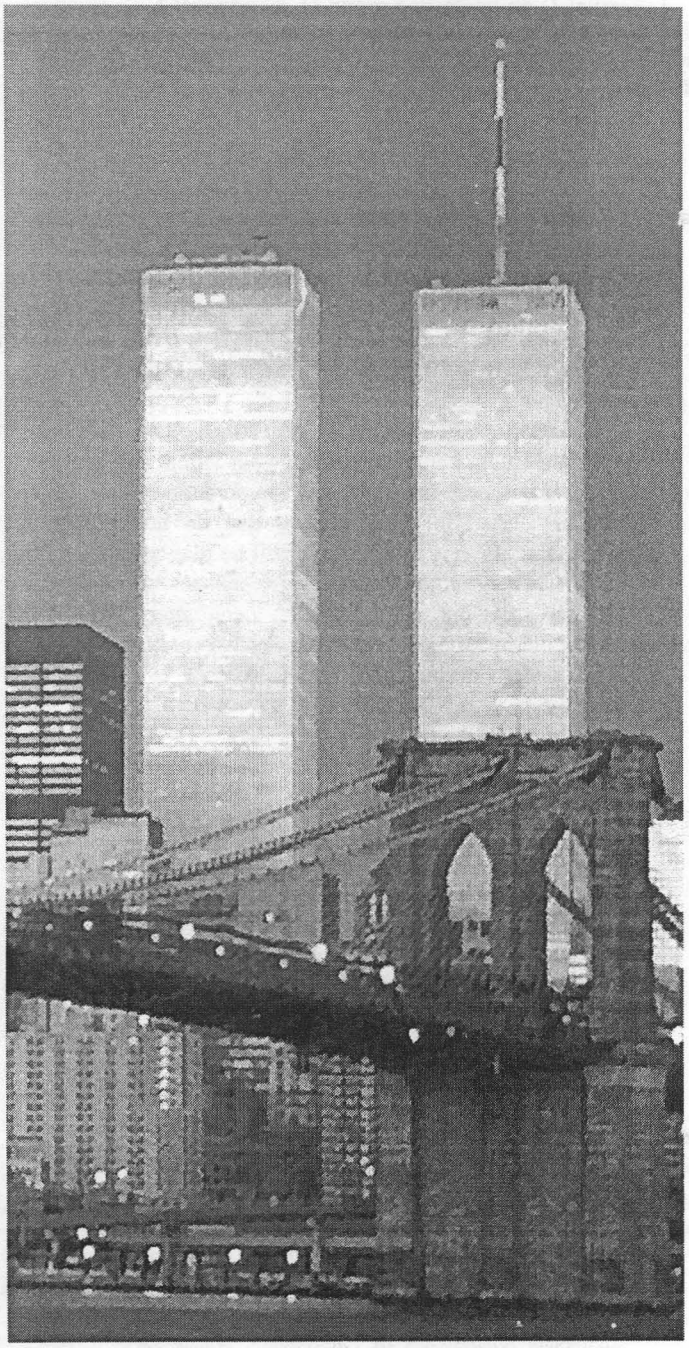


LEPIDOPTERA NEWS

September 2001 **No. 3**



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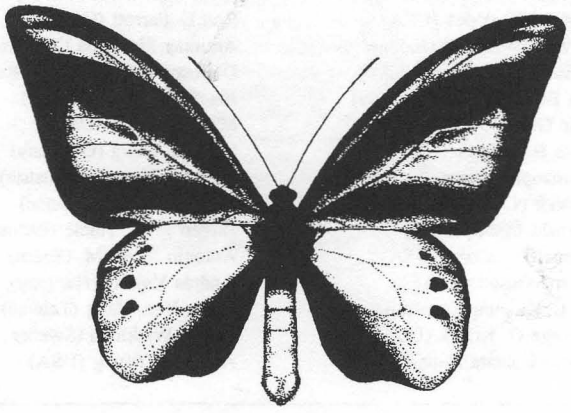

LEPIDOPTERA NEWS

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Published by the
Association for Tropical Lepidoptera, Inc.
P. O. Box 141210
Gainesville, FL 32614-1210, USA
Tel: (352) 392-5894 FAX: (352) 392-0479 www.troplep.org
Frequency: Quarterly (March, June, September, December)
e-mail: jbhatl@aol.com ISSN: 1062-6581
The Association for Tropical Lepidoptera, Inc., is a non-profit corporation for the study and conservation of tropical and subtropical Lepidoptera of the world. Contributions are tax-deductible. Advertising is accepted.

JOURNALS: separates (1990-95 only), $1 first page, 25¢ each added page (specify author and citation). Past journal issues: $22.50 each (1990-98) (1994 *HL* double issue: $45). *Lepid. News*: $10 per year. **CONTENTS** for the journals are issued every two years.

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).

LETTERS

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 butterfliers (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 tenents. 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 exhonorated 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 demogoguery 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 Servce (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 disappearence 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 woodsy 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 suppossedly endangered butterfly which is now more widespread than previoiusly 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 butterfliers 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 butterfliers 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 recured 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. Butterfliers 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 butterfliers 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

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 extirminated 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 lepist in the cause of helping put another fellow lepist "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 simple 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 eumaeines 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. Its 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 Polyommatini (Lycaenidae), the work I have published with Bàlint 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 lumper) 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 thoughful 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 mispelling 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 Hesperiidae 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 recources 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 nonexistant 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 stduies 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.

J. B. HEPPNER
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, Editor[1]
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 reformated 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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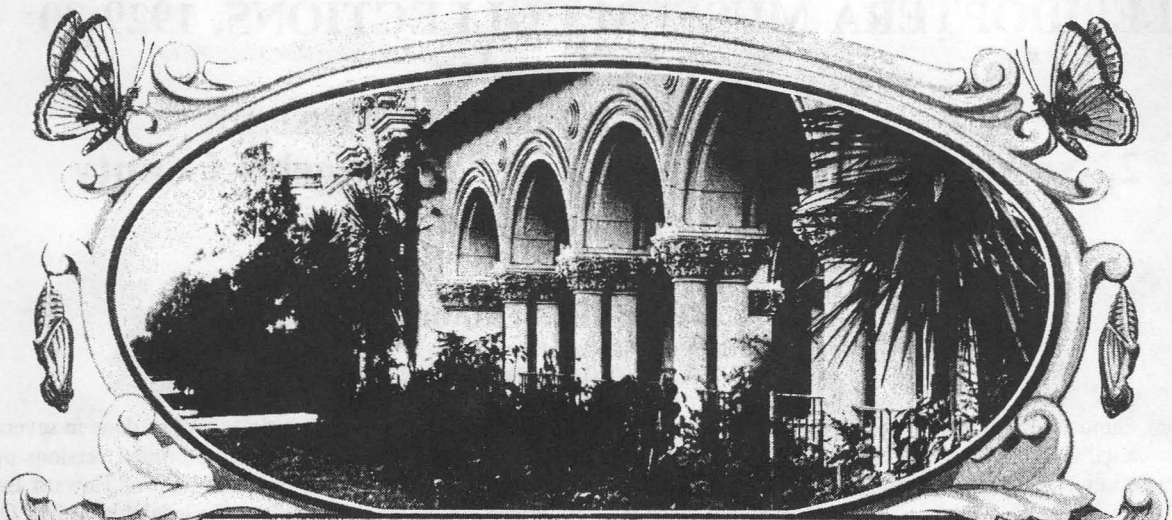
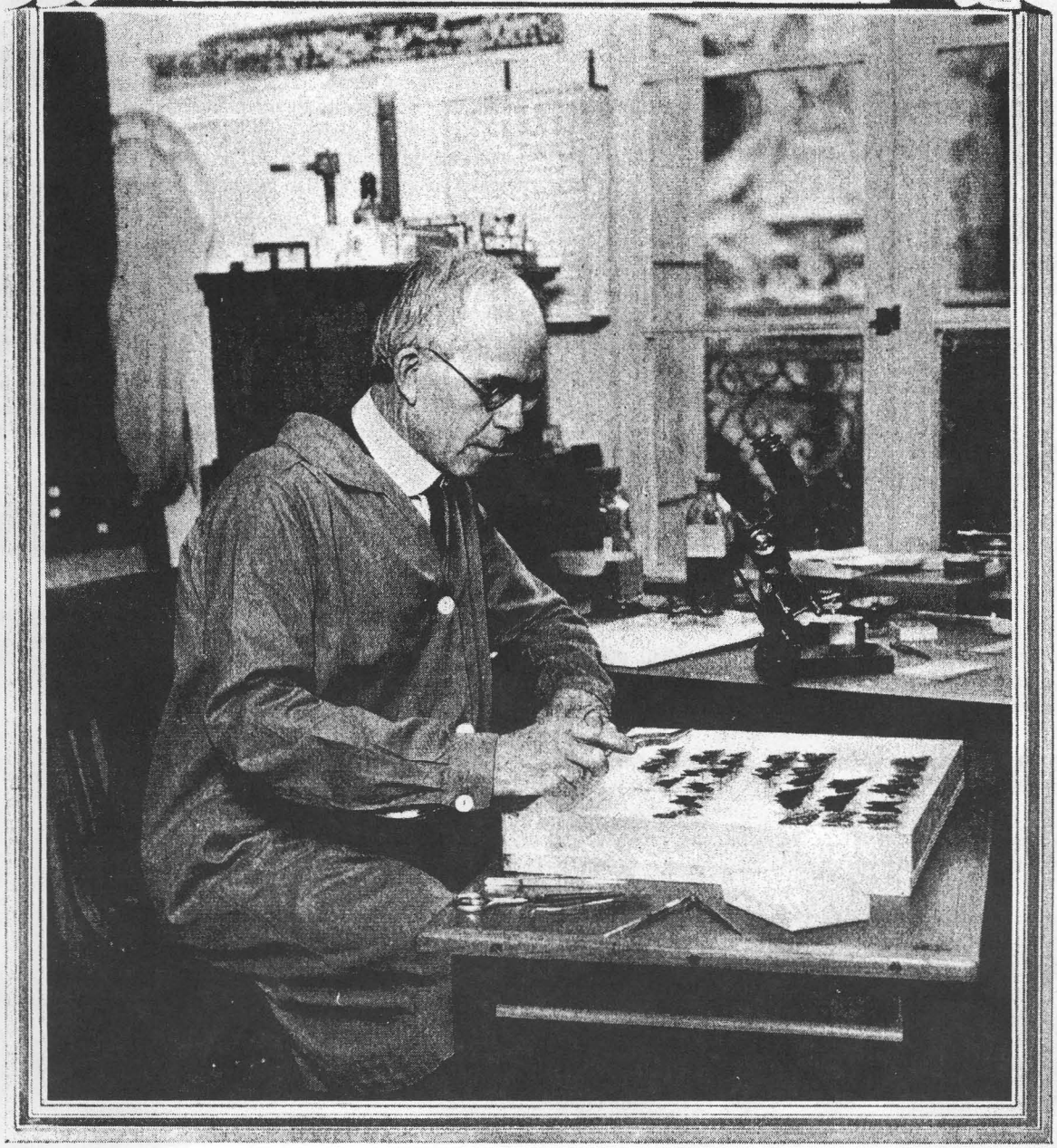
[1] Contribution No. 922, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv.



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.

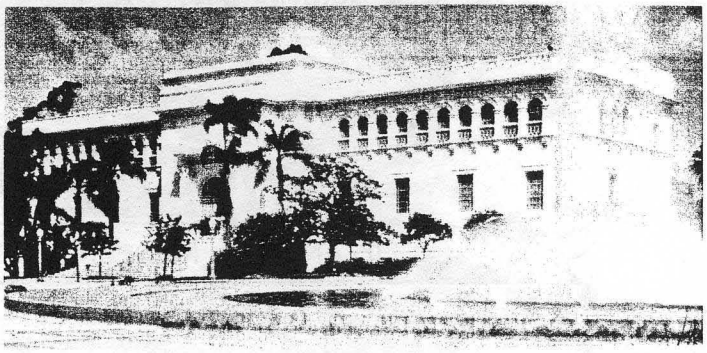


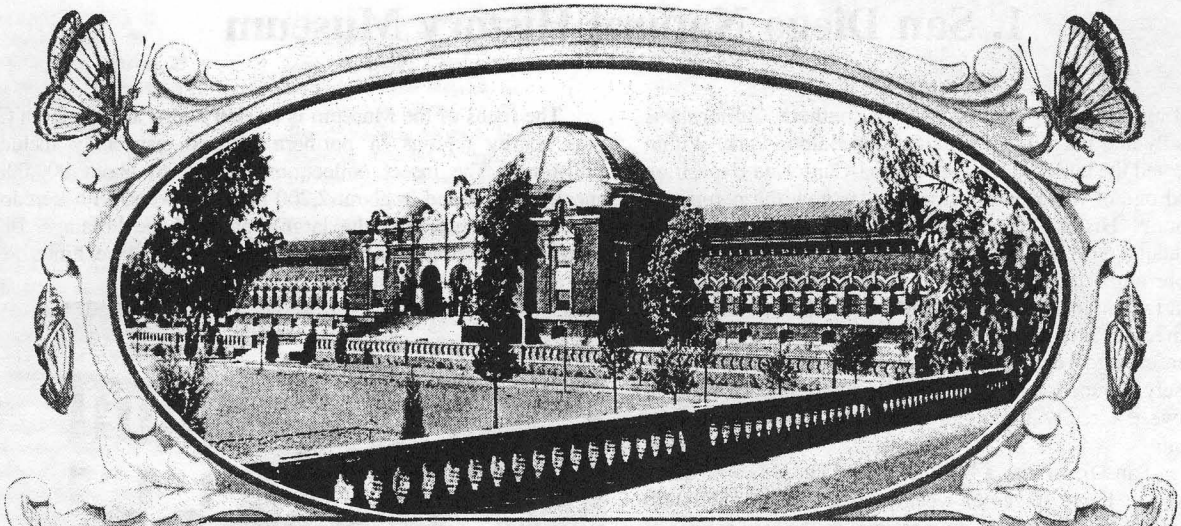
Fig. 1. San Diego Natural History Museum.

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.

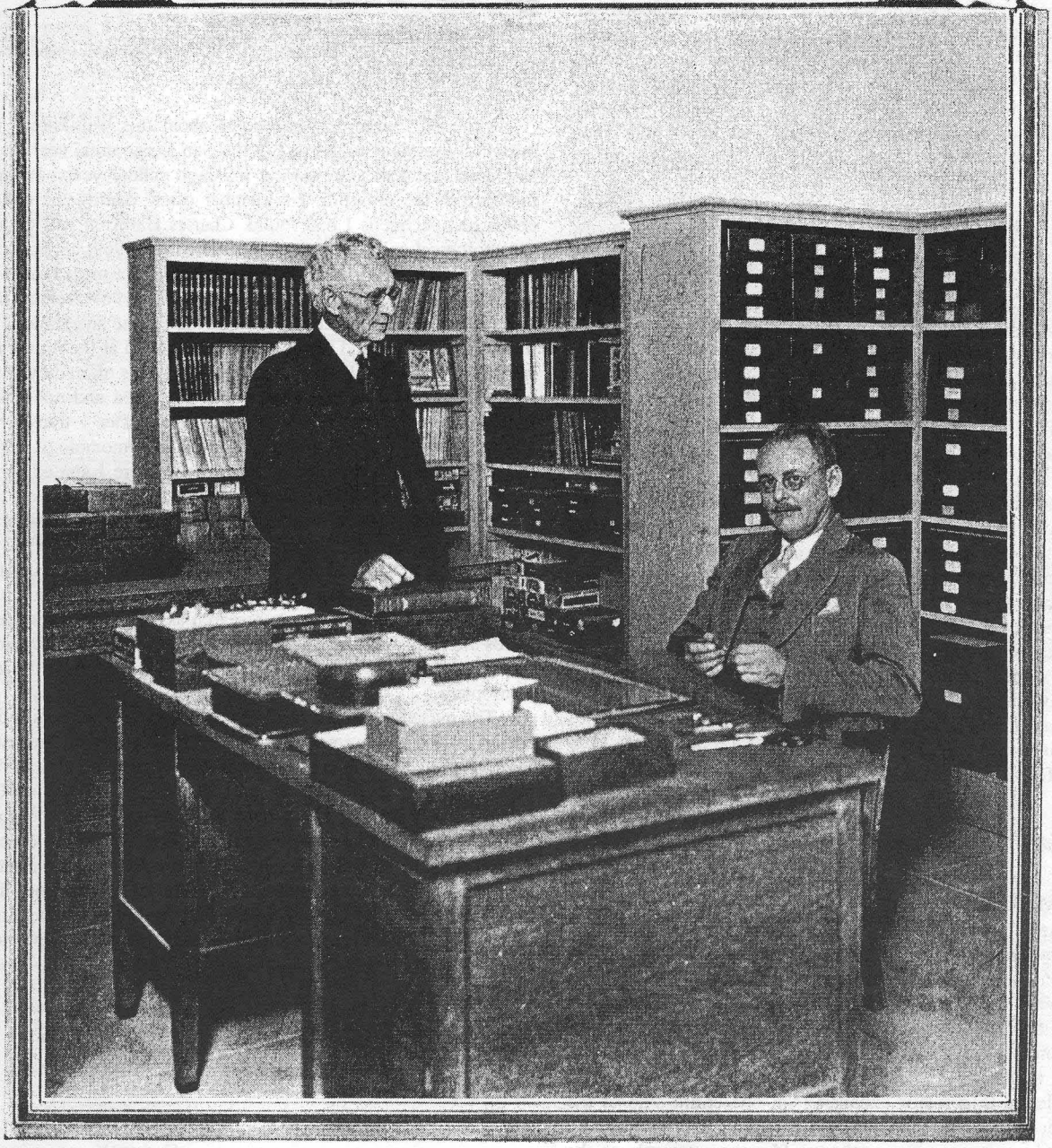
Since the 1960s, the collections have grown extensively through a succession of research associates after Harbison retired. Fred Thorne, a lepidopterist from El Cajon, was a part-time curator during the 1970s. John W. Brown, a specialist of Tortricidae moths and now at the Smithsonian Institution, was 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 connoiseur 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

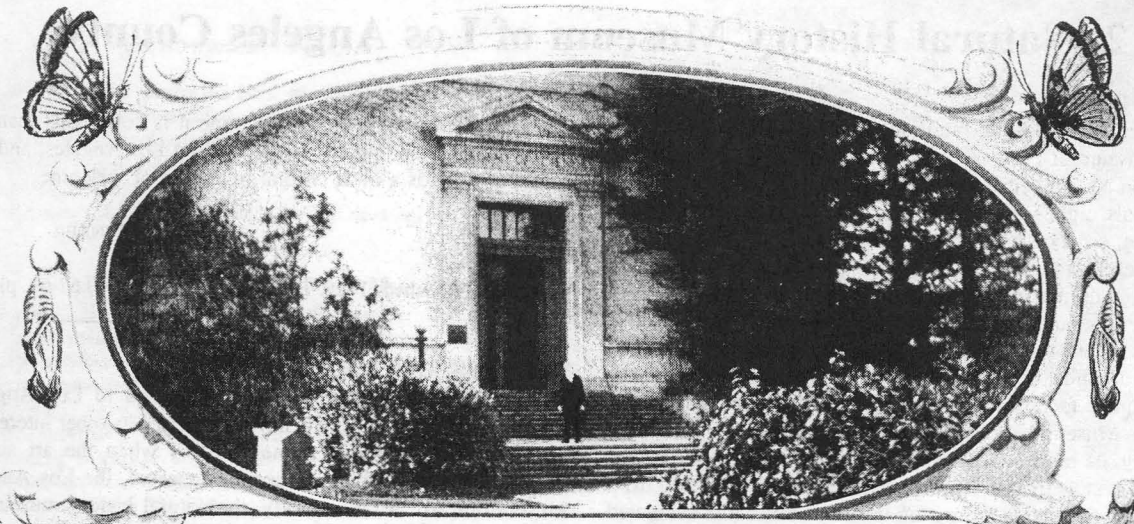
Originally published: 1929. *Entomological News*, 40:67-69, pl. 3.

THE MUSEUM TODAY

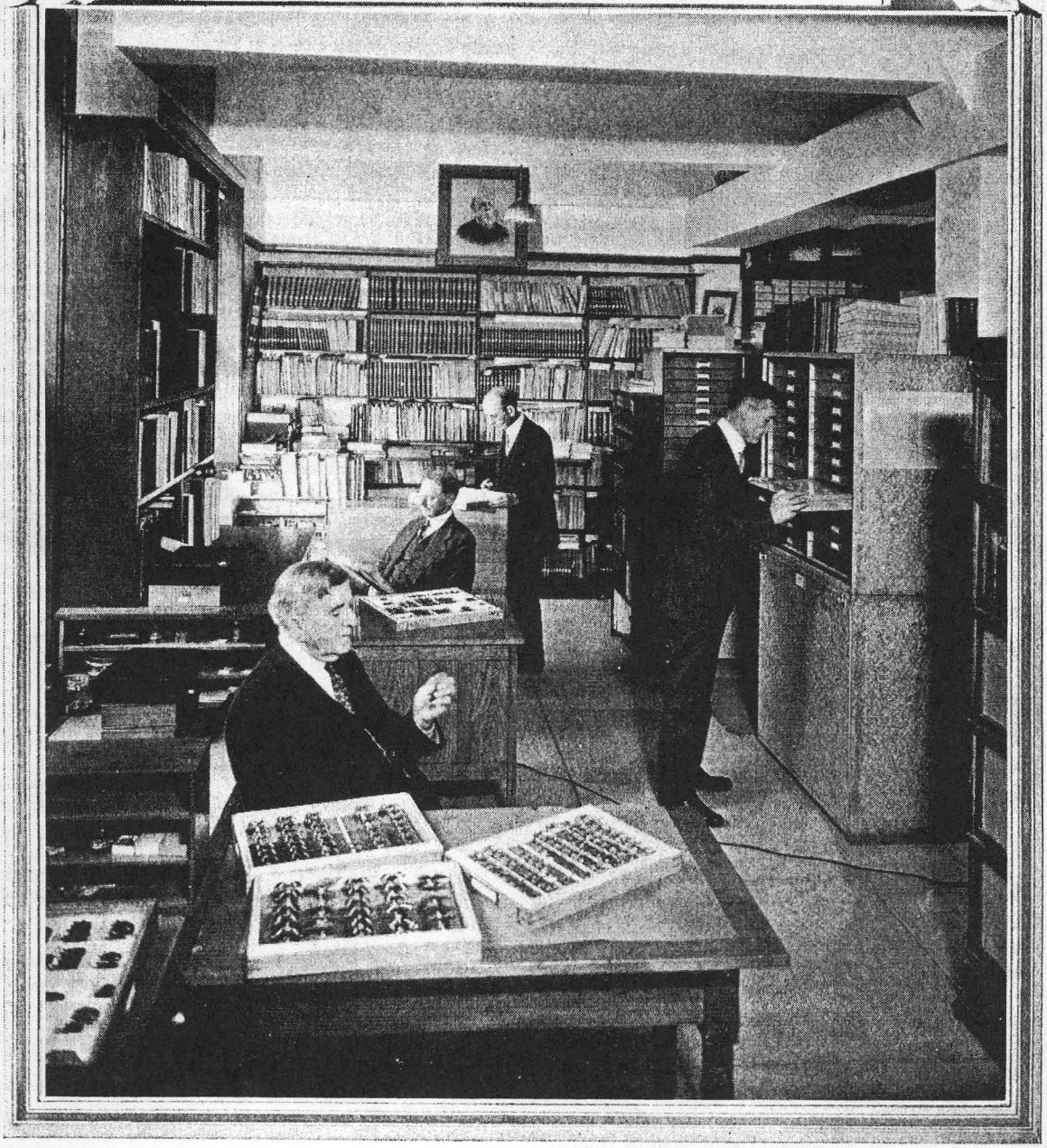
The name of the museum was revised to Los Angeles County Museum of Natural History, having dropped its other interests of art and history from its official name in 1964 when the art section of the museum was split off as a separate museum, the Los Angeles County Museum of Art. More recently, the natural 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 oil 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 geimine 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 down-town 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 tip 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 be 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 tinder 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 Letchcr 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.

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.

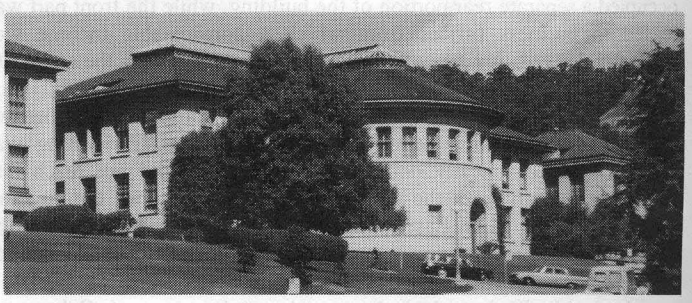


Fig. 2. Essig Museum, in Wellman Hall (center), on the UCB campus.

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

EXOTIC MICROLEPIDOPTERA of Edward Meyrick - 1

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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.

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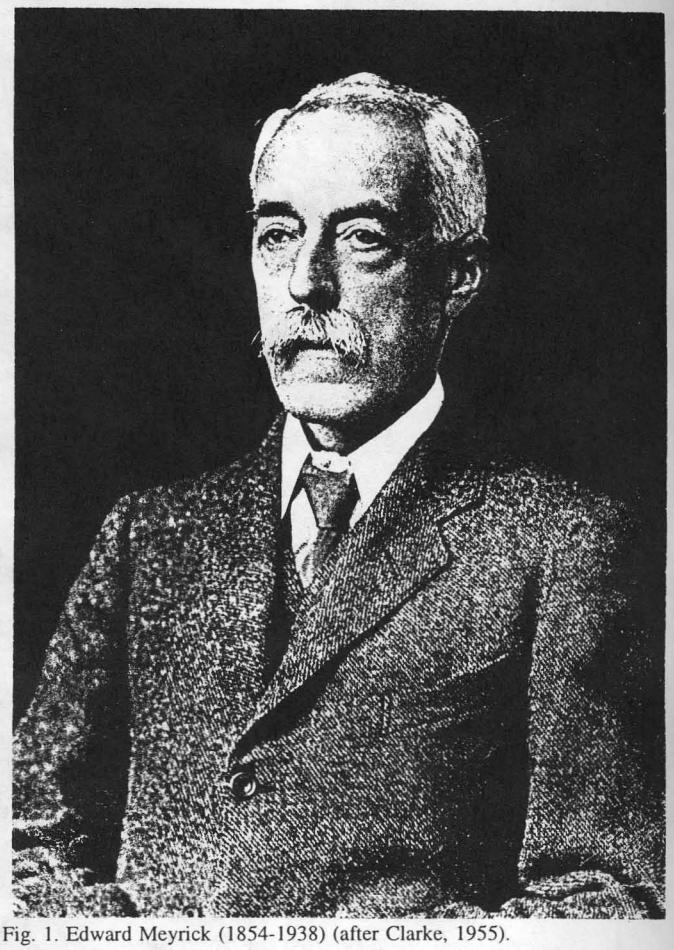


Fig. 1. Edward Meyrick (1854-1938) (after Clarke, 1955).

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

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 Heliodinidae, since he failed to note any significance in the scaled haustellum, which is not scaled in all true Heliodinidae 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.

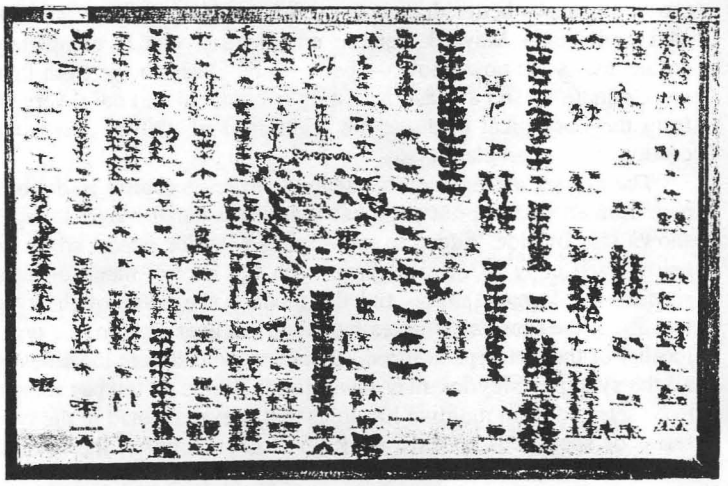
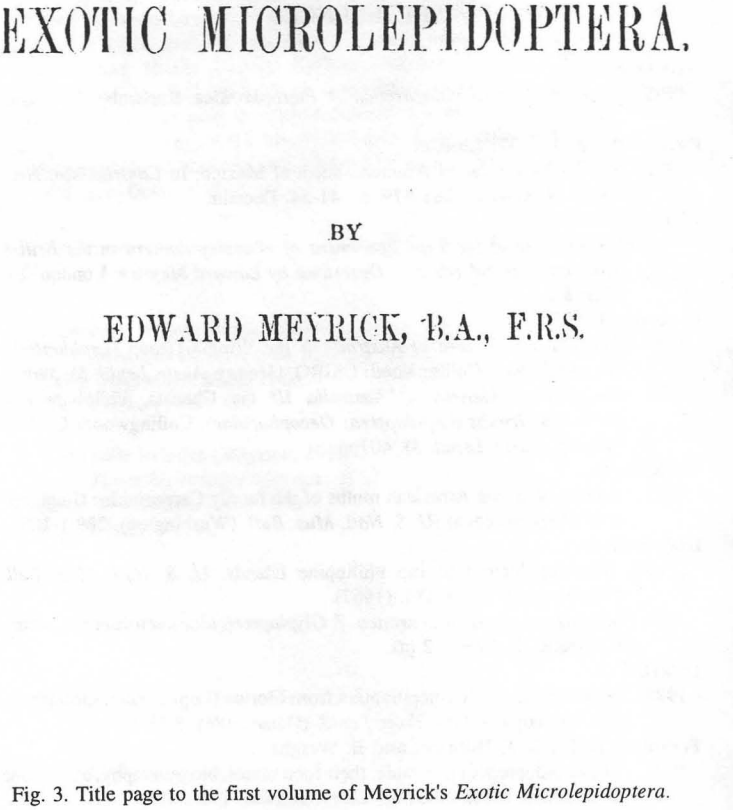


Fig. 2. A typical drawer from Meyrick's collection (after Clarke, 1955).



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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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 detroy its use.

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

EDWARD MEYRICK.

EXOTIC MICROLEPIDOPTERA.

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 $\frac{2}{5}$: cilia whitish-ochreous. Hindwings whitish-grey; cilia whitish.

NATAL, Pinetown, in June (*Leigh*); one specimen. This is a good species, and the neuration 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 striæ or strigulæ; 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;

TORTRICIDAE

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 strigulæ 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 parastropha, 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 strigulæ; 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

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TORTRICIDAE

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 praecana* Kennel, 1900
Russia: Far East

Adoxophyes parastropha 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 *menciana* 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 $\frac{4}{5}$, 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 machlopis, 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 $\frac{1}{5}$ of costa to $\frac{2}{5}$ 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 $\frac{4}{5}$; 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 *heliaula* 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

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TORTRICIDAE

Cacoecia leucocymba Meyrick, 1912
Madagascar: Antananarivo

Archips micaceana (Walker, 1863)
Cacoecia machlopis 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 1 *b* 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 $\frac{2}{5}$, 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 $\frac{2}{5}$ of central fascia, a semioval spot representing costal patch, and a small spot beyond and sometimes confluent with this; two or three blackish strigulæ 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 Dagh; 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 strigulæ 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,

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TORTRICIDAE

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 Dagh
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 $\frac{1}{5}$; a thick ferruginous streak above middle from near base to $\frac{2}{5}$; 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 suboblong, 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-

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TORTRICIDAE

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 strigulæ 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 strigulæ; 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-onder, 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 striæ 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. Antennæ 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 suboblong, 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-onder, 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 strigulæ 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

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TORTRICIDAE

Cnephasia incepta Meyrick, 1912
South Africa: Transvaal, Wateval-onder

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-onder

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 $\frac{3}{4}$ 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 strigulæ 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 $\frac{3}{4}$; 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 $\frac{3}{4}$, 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

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TORTRICIDAE

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 $\frac{2}{5}$, 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 $\frac{2}{5}$ to apex; costal half from base to $\frac{2}{5}$ 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 $\frac{1}{3}$; an irregular line of scattered blackish scales from $\frac{4}{5}$ 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 orbigera, 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 striæ 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 $\frac{1}{3}$, 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 fasciæ 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 orbigera 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: Maghalaya, 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 fasciæ 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 strigulæ; costa marked with obscure paler and blackish strigulæ; 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 striæ 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 fasciæ 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-leaden-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 $\frac{1}{5}$ 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 strigulæ; 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 strigulæ 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 strigulæ; costa dark fuscous

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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, Khásis, 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.

TORTRICIDAE

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* (*Sapindaceæ*) (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 $\frac{3}{4}$ 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 Dagh; 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 Dagh; 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 $\frac{5}{6}$ of costa to $\frac{3}{4}$ 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* (*Leguminosæ*) (Fletcher). A very interesting species, closely related to the Australian *aglaozona* 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* (*Leguminosæ*), 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

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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 Dagh
Fig.: Clarke (1963), 4:8

Pharmacis chalcantha Meyrick, 1912
Turkey: Alma Dagh
Fig.: Clarke (1963), 4:32

GRACILLARIIDAE

Phyllonorycter melanosparta (Meyrick, 1912)
Lithocolletis melanosparta Meyrick, 1912
South Africa: Transvaal, Barberton
Fig.: Vári (1961), 208, pl. 22, f. 4
Host: *Rhynchosia caribaea, Flemingia grahmiana, 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 tibiæ 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

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GRACILLARIIDAE

Pareclectis 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, Donkerkoek
Fig.: Clarke (1958), 3:252
Vári (1961), 161, pl. 16, f. 6

middle; a black dot in disc at $\frac{3}{4}$; an undefined apical spot of blackish irroration: cilia pale ochreous. Hindwings whitish; cilia pale whitish-ochreous.

TRANSVAAL, Donkerkoek, in October (*Janse*); one specimen. The facies of this species is exceptional in the genus, but the structure conforms; *punctulata* Wals., which I have not yet obtained, is clearly nearly allied, and must also belong here and not in *Gracilaria*.

Acrocercops carbunculata, n. sp.

♂. 8–11 mm. Head, palpi, and thorax dark fuscous, finely sprinkled with whitish, palpi with appressed scales. Abdomen grey. Forewings very narrowly elongate, moderately pointed; dark fuscous finely irrorated with whitish, forming more or less obscure strigulæ towards costa on posterior half; a thick streak of blackish suffusion beneath costa from about $\frac{1}{4}$ to $\frac{1}{2}$; a rhomboidal blackish spot on costa beyond middle; three semioval blackish dorsal spots, sometimes distinctly margined with whitish, first at $\frac{1}{4}$ of wing, second largest, in middle of wing, third on tornus: cilia grey, round apex tinged with whitish, with two dark fuscous lines and two blackish apical hooks, on middle of termen with two dots of blackish suffusion. Hindwings rather dark grey; cilia grey.

TRANSVAAL, Pretoria, Barberton, in December, January, and May (*Janse*); three specimens.

Acrocercops gravissima, n. sp.

♀. 11 mm. Head white, centre of crown with a dark fuscous mark. Palpi white, second joint dark fuscous except apical portion, with very long rough projecting tuft beneath, terminal joint with three rings and extreme apex dark fuscous. Thorax white, margins suffused with dark fuscous. Abdomen dark fuscous, apex whitish. Forewings very narrowly elongate, parallel-sided, short-pointed, rather obtuse; dark purplish-fuscous, sprinkled and on costa obscurely strigulated with blackish; an irregular pointed white streak along dorsum from base to tornus, strigulated with dark fuscous; a very oblique white striga from above tornus, reaching half across wing; a white mark along lower part of termen, and another above this, separated by some black scales; two oblique blackish rhomboidal spots on costa above these, reaching half across wing, separated by a pair of short whitish costal strigulæ, and followed by another pair, of which the second is continued as an oblique somewhat curved silvery-metallic line to termen above middle; a white dot on costa near apex: cilia grey, round apex whitish with a black basal shade and apparently median and apical lines. Hindwings dark fuscous; cilia grey.

TRANSVAAL, Three Sisters, in March (*Janse*); one specimen.

Acrocercops hyphantica, n. sp.

♀. 7–8 mm. Head ochreous-whitish, sometimes slightly sprinkled with fuscous. Palpi dark fuscous, second joint with very long projecting tuft beneath, apex white, terminal joint white, with black median ring. Antennæ ochreous-whitish spotted with dark fuscous. Thorax ochreous-whitish mixed with brownish, shoulders with a dark fuscous spot. Abdomen whitish. Forewings narrowly elongate-lanceolate, apex round-pointed; brown; basal area irregularly marked with white and blackish; a slender irregular white streak running along dorsum from near base to near tornus; a pair of irregular curved white lines, each edged anteriorly with black, crossing wing at $\frac{1}{3}$; a straight white line running from middle of costa to termen above tornus, edged anteriorly on upper half by a thick black streak; a fine white oblique partially black-edged line from dorsum beyond middle running into middle of this line, followed by a parallel whitish-ochreous line; a small blackish spot on tornus; four very oblique black strigæ from posterior half of costa, reaching half across wing; a somewhat curved white line crossing wing before apex; a whitish dot in apex edged beneath with black: cilia whitish-grey, round apex white with two blackish hooks. Hindwings rather dark grey; cilia light grey.

BENGAL, Pusa, in August (*Fletcher*); two specimens. Larva flattened, slightly tapering posteriorly, yellowish-green, head whitish-yellow; mining leaves of *Cæsalpinia bonducella* (*Leguminosæ*); pupa in a cocoon outside the mine (*Fletcher*).

Parectopa bathracma, n. sp.

♂ ♀. 8–9 mm. Head white, centre of crown light brownish. Palpi loosely scaled anteriorly, white, second joint grey except apex. Thorax brownish-ochreous with two white stripes. Abdomen grey. Forewings very narrowly elongate, moderately pointed; golden-bronzy-ochreous, sometimes irrorated with fuscous; markings shining white, edged with dark fuscous; four wedge-shaped streaks from costa reaching half across wing, first three outwardly oblique, first at $\frac{1}{3}$, produced along costa towards base, fourth inwardly oblique; four wedgeshaped streaks from dorsum reaching half across wing, first from base, extremely oblique, second from middle of dorsum, second and third outwardly oblique, fourth tornal, very small, inwardly oblique; an elongate black apical dot, sometimes edged with white beneath: cilia grey, at apex with a white patch containing a blackish hook. Hindwings and cilia grey.

TRANSVAAL, Pretoria, Barberton, in December and April (*Janse*); six specimens. The white streaks may be straight or irregular, and vary considerably; in two specimens the basal streak is extended to become confluent with apex of second dorsal. The species is very like *onychota*, but may be immediately distinguished by the first dorsal streak rising from base.

GRACILLARIIDAE

Conopobathra carbunculata (Meyrick, 1912)
Acrocercops carbunculata Meyrick, 1912
South Africa: Transvaal, Pretoria
Fig.: Vári (1961), 97, pl. 10, f. 8

Conopbathra gravissima (Meyrick, 1912)
Acrocercops gravissima Meyrick, 1912
South Africa: Transvaal
Fig.: Vári (1961), 96, pl. 16, f. 1

Acrocercops hyphantica Meyrick, 1912
India: Bihar, Pusa
Host: *Caesalpinia bonducella* (Leguminosae)

Aristaea bathracma (Meyrick, 1912)
Parectopa bathracma Meyrick, 1912
South Africa: Transvaal, Pretoria
Fig.: Vári (1961), 59, pl. 4, f. 6

Cyphosticha cærulea, n. sp.

♂. 7 mm. Head and thorax shining whitish-fuscous, with violet-blue reflections, face whitish. Palpi whitish, terminal joint with dark fuscous supramedian band. Abdomen bluish-fuscous. Legs white, anterior and middle tibiæ and femora violet-blackish. Forewings very narrow, long-pointed; light grey with strong shining violet-blue reflections, irrorated with blackish; four whitish costal spots, first at $\frac{1}{4}$, last towards apex: cilia pale grey, sprinkled with blackish towards base, at apex with two blackish lines. Hindwings grey; cilia pale grey.

BENGAL, Pusa, from April to July (*Fletcher*); three specimens. Larva somewhat flattened, slightly tapering posteriorly, greenish, laterally pale yellow, with subdorsal reddish dot on each segment, head flat; when full grown, becomes wholly blood-red: mining a whitish elongate blotch in leaves of *Crotalaria juncea* (*Leguminosæ*) or a brownish blotch in leaves of *Vigna sinensis* (*Leguminosæ*) (Fletcher).

Gracilaria citricula, n. sp.

♂. 7 mm. Head ochreous-whitish, sides and front of crown dark fuscous. Palpi loosely scaled, second joint dark fuscous, terminal joint whitish with two dark fuscous rings. Thorax fuscous, suffused anteriorly with dark fuscous. Abdomen grey, apex ochreous-whitish. Forewings very narrowly elongate, moderately pointed; purplish-fuscous irrorated with dark fuscous; three narrow rather irregular whitish-yellowish fasciæ edged with black scales, first at $\frac{1}{5}$, somewhat oblique, entire, second in middle, rather oblique, not quite reaching costa, third at $\frac{4}{5}$, transverse, not reaching dorsum: cilia purplish-fuscous, with rows of black points. Hindwings and cilia grey.

TRANSVAAL, Barberton, in January (*Janse*); one specimen. Closely allied to the Indian *acidula* (erroneously described by me as an *Acrocercops*, but I have since received a dozen specimens from Mr. Fletcher, and find it to be a true *Gracilaria*), but differing by first fascia being entire, second rather oblique and not reaching costa. The two following species are also allied, but less closely.

Gracilaria ligata, n. sp.

♂. 8 mm. Head whitish. Palpi loosely scaled, dark fuscous, terminal joint whitish with three blackish bands. Thorax fuscous sprinkled with blackish and whitish. Abdomen grey. Middle tibiæ blackish, tarsi white. Forewings very narrowly elongate, moderately pointed; purplish-fuscous irrorated with dark fuscous, with some pale scales; fine rather irregular somewhat oblique white fasciæ at $\frac{1}{5}$ and middle, their margins sprinkled with black irroration; a small ochreous spot in disc at $\frac{2}{3}$; a fine transverse whitish mark at $\frac{4}{5}$, pale ochreous on costa, not reaching dorsum, ged with some black scales; an indistinct pale ochreous transverse mark before apex: cilia purplish-fuscous with rows of black points, and a strong black median line round apex. Hindwings and cilia grey.

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

Gracilaria filifera, n. sp.

♂. 7 mm. Head whitish, crown more or less mixed with dark fuscous. Palpi loosely scaled, whitish, obscurely ringed with grey. Thorax fuscous mixed with whitish, shoulders dark fuscous. Abdomen grey. Middle tibiæ black, tarsi white with fuscous rings. Forewings very narrowly elongate, moderately pointed; brownish-ochreous, irregularly and suffusedly irrorated with dark fuscous and blackish; five fine irregular white fasciæ edged with some black scales, first at $\frac{1}{5}$, transverse, not extending below fold, second rather oblique, third median, slightly curved, transverse, fourth beyond $\frac{3}{4}$, somewhat dilated on costa, not reaching dorsum, fifth præapical; indistinct whitish dots on costa at $\frac{2}{3}$ and tornus; the brownish-ochreous ground colour forms a transverse bar in disc before fourth fascia: cilia grey, round apex whitish, with rows of black points. Hindwings and cilia grey.

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

Gracilaria seriata, n. sp.

♂. 16 mm. Head and thorax light brownish somewhat mixed with whitish. Palpi loosely scaled, light grey sprinkled with dark fuscous, apex whitish. Abdomen light grey. Anterior and middle tibiæ blackish mixed with pale scales, tarsi white. Forewings very narrow, moderately pointed, acute; light brownish; costal third suffused with whitish from base to $\frac{3}{4}$; whole wing, except dorsal area beneath submedian fold, strewn with scattered blackish scales arranged especially in groups along veins; cilia whitish-brownish, round apex sprinkled with blackish. Hindwings and cilia light grey.

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

ADELIDÆ.

ULOMETRA, n. g.

Head rough-haired; ocelli present; tongue developed. Antennæ 3, in ♂ with rather long fine ciliations (3) diminishing from base to $\frac{2}{3}$, basal joint short, stout. Labial palpi rather short, porrected, slender, pointed. Maxillary palpi moderately long, folded, porrected. Posterior tibiæ with thin fine long hairs above. Forewings with 2 from angle, 7 to apex, 9 absent, 11 from before middle. Hind-

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GRACILLARIIDAE

Cyphosticha caerulea Meyrick, 1912
India: Bihar, Pusa
Host: *Crotalaria juncea, Vigna sinensis* (Leguminosae)

Ectropina citricula (Meyrick, 1912)
Gracilaria [sic] *citricula* Meyrick, 1912
South Africa: Transvaal, Barberton
Fig.: Vári (1961), 39, pl. 5, f. 3

Ectropina ligata (Meyrick, 1912)
Gracilaria [sic] *ligata* Meyrick, 1912
South Africa: Transvaal, Barberton
Fig.: Vári (1961), 39, pl. 5, f.

Aspilapteryx filifera (Meyrick, 1912)
Gracilaria [sic] *filifera* Meyrick, 1912
South Africa: Transvaal, Pretoria
Fig.: Vári (1961), 31, pl. 3, f. 6

Aspilapteryx seriata (Meyrick, 1912)
Gracilaria [sic] *seriata* Meyrick, 1912
South Africa: Transvaal, Barberton
Fig.: Vári (1961), 31, pl. 3, f. 5

ADELIDAE

Ulometra Meyrick, 1912
Type-sp.: *Ulometra indigna* Meyrick, 1912

wings 1, elongate-ovate, cilia $\frac{2}{3}$; 2-7 all separate, 5 and 6 approximated towards base.

Ulometra indigna, n. sp.

♂. 14–15 mm. Head light ochreous-yellowish, face grey. Palpi grey. Antennæ whitish, becoming grey on basal third. Thorax whitish, anteriorly suffused with grey. Abdomen whitish-grey. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely rounded; light violet-grey, obscurely strigulated throughout with dark grey; an indistinct cloudy dark fuscous dot on end of cell; a series of small indistinct whitish spots round posterior part of costa and termen: cilia grey. Hindwings light brassy-grey, obscurely darker-strigulated; cilia whitish-grey.

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

Ceromitia nerina, n. sp.

♂ ♀. 14-16 mm. Head whitish. Antennæ whitish, in ♂ ciliated ($1\frac{1}{2}$) on basal half, in ♀ ringed with grey on basal half. Labial palpi long, whitish, second joint clothed with very long rough hairs, in ♀ mixed with dark fuscous, maxillary moderate, considerably shorter than labial. Thorax whitish mixed and spotted with dark fuscous. Abdomen grey. Forewings elongate, costa moderately arched, apex obtuse, termen obliquely rounded; light purple, irregularly mixed with grey and blackish; series of fine transverse strigæ of white irroration along costa and dorsum, a few scattered white scales in disc, and some strigulation towards termen: cilia white mixed with grey. Hindwings bronzy-grey; cilia pale grey.

TRANSVAAL, Three Sisters, in March (*Janse*); two specimens.

Ceromitia phæocoma, n. sp.

♂. 18–21 mm. Head brown, back of crown whitish. Antennæ whitish, ciliated on basal third (2). Labial palpi short, whitish, loosely haired; maxillary fuscous, slightly longer than labial. Thorax whitish sometimes tinged with brown, shoulders and posterior extremity brown. Abdomen pale grey. Forewings elongate, rather narrow, somewhat dilated posteriorly, costa moderately arched, apex obtuse, termen very obliquely rounded; light fuscous, much mixed or suffused with whitish, with small scattered dark fuscous dots or strigulæ; more conspicuous dark fuscous dots on dorsum at $\frac{1}{3}$ and $\frac{2}{3}$ and on costa beyond middle: cilia pale fuscous somewhat mixed with whitish. Hindwings rather dark grey, with slight brassy tinge; cilia whitish-grey, with darker subbasal shade.

TRANSVAAL, Barberton, in December and January (*Janse*); six specimens.

Ceromitia ochrotricha, n. sp.

♀. 17–18 mm. Head yellow-ochreous, back of crown whitish. Palpi whitish, labial very short, second joint loosely scaled, maxillary longer than labial. Antennæ white ringed with fuscous. Thorax white. Abdomen whitish. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely rounded; 8 and 9 stalked; white, with some irregularly scattered black scales and small dots; two black dots beneath costa at $\frac{1}{6}$ and $\frac{1}{3}$; costal edge blackish at base: cilia ochreous-white. Hindwings pale violet-grey, with brassy reflections; cilia white or grey-whitish.

TRANSVAAL, Barberton, Waterval-onder, Three Sisters, in November, January, and March (*Janse*); three specimens.

Ceromitia mellicoma, n. sp.

♂. 15–16 mm. Head dull light ochreous-yellowish. Labial palpi extremely short, maxillary short, curved, ascending. Antennæ whitish, more or less infuscated towards base. Thorax yellow-whitish, shoulders grey. Abdomen grey, anal tuft and long claspers ochreous-whitish. Forewings elongate, rather narrow, slightly dilated posteriorly, costa moderately arched, apex obtuse, termen very obliquely rounded; pale whitish-ochreous suffusedly irrorated with fuscous; a very undefined basal patch and three rather broad irregular transverse fasciæ of fuscous suffusion or dark fuscous irroration, all variable and very obscure; costa posteriorly and termen irregularly strigulated with dark fuscous: cilia ochreous-grey-whitish somewhat mixed with fuscous towards base. Hindwings with 5 and 6 approximated or stalked; rather dark grey, faintly purplish-tinged; cilia light grey, mixed with whitish towards tips.

TRANSVAAL, Waterval-onder, Moorddrift, in October and November (*Janse, Swierstra*); four specimens.

Ceromitia transtrifera, n. sp.

♂. 20–21 mm. Head white or ochreous-whitish, face fuscous. Antennæ white, ciliations $\frac{1}{2}$. Palpi extremely short, dark fuscous. Thorax white tinged with brownish, shoulders and a central spot dark fuscous. Abdomen grey. Forewings elongate, rather narrow, posteriorly somewhat dilated, costa gently arched, apex obtuse, termen very obliquely rounded; white, strewn with small scattered dark fuscous dots and strigulæ tending to unite into transverse strigæ; markings dark fuscous; a thick pointed streak along basal fourth of costa; a moderate fascia from before middle of costa to $\frac{1}{3}$ of dorsum, slightly narrowed towards costa; a triangular spot on dorsum at $\frac{2}{3}$; a moderately broad rather incurved fascia from $\frac{2}{3}$ of costa to tornus, narrowed towards tornus; a transverse spot on costa just before apex, sometimes extended to reach preceding fascia below

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ADELIDAE

Ulometra indigna Meyrick, 1912
South Africa: Transvaal, Barberton

Ceromitia nerina Meyrick, 1912
South Africa: Transvaal, Three Sisters

Ceromitia phaeocoma Meyrick, 1912
South Africa: Transvaal, Barberton

Agisana ochrotricha (Meyrick, 1912)
Ceromitia ochrotricha Meyrick, 1912
South Africa: Transvaal, Barberton

Agisana mellicoma (Meyrick, 1912)
Ceromitia mellicoma Meyrick, 1912
South Africa: Transvaal, Waterval-onder

Ceromitia transtrifera Meyrick, 1912
South Africa: Transvaal/Natal

middle: cilia whitish or pale fuscous, indistinctly barred with dark fuscous on basal half, above apex with a dark fuscous patch. Hindwings grey; cilia whitish-grey, with grey subbasal shade.

TRANSVAAL, Barberton, Three Sisters, from December to February (*Janse*); NATAL, Pinetown (*Leigh*); four specimens.

Nemotois gymnota, n. sp.

♂. 13 mm. Head fulvous on crown, with a few black hairs, face shining purple-grey, eyes much enlarged, nearly approximated. Antennæ white, smooth, basal joint dark purple-grey. Palpi very short, fulvous, loosely haired. Thorax metallic bronze. Abdomen dark grey. Forewings elongate, posteriorly dilated, costa moderately arched, apex obtuse, termen very obliquely rounded; bright deep purple, with some scattered coppery-golden scales, more numerous on dorsal area; a short black streak beneath costa at base; some irregularly scattered black scales in disc: cilia shining coppery-bronze. Hindwings and cilia deep bronze.

MADAGASCAR, Antananarivo; one specimen.

EUCOSMIDÆ.

Ancylis tumida, n. sp.

♂ ♀. 13-15 mm. Head and thorax brownish, face whitish. Palpi fuscous, terminal joint and hairs of second white. Abdomen grey. Forewings elongate, rather narrow, costa moderately arched, in ♂ without fold, apex round-pointed, strongly prominent, termen strongly concave below apex, rounded beneath; 7 and 8 very shortly stalked; reddish-ochreous-brown; costa dark fuscous, with pairs of oblique whitish strigulæ; a dark brown flattened-triangular patch extending along costa from before middle to near apical prominence, crossed by very oblique leaden-grey strigæ; a white (♂) or ochreous-whitish (♀) line along submedian fold throughout, dorsal area beneath suffused with dark brown or dark fuscous; two streaks of dark fuscous suffusion running from beyond cell to near apical prominence, beyond these an oblique pale leaden-metallic mark; tornal area streaked with dark fuscous suffusion; apical prominence irrorated anteriorly with blackish, edged beneath and anteriorly above by white marks; a fine black marginal line round apex and upper part of termen: cilia brownish. Hindwings with 3 and 4 coincident, tornus in ♂ rectangular, almost acute; rather dark grey, in ♂ except on margins hyaline closely strewn with blackish points; cilia grey.

CEYLON, Kandy, in September (*Green*), ♂ type; MADRAS, N. Coorg, 3500 feet, in August (*Newcome*); two specimens.

Ancylis aromatias, n. sp.

♂. 13 mm. Head and thorax ochreous-brownish, face whitish. Palpi rosy-brownish, hairs of second joint whitish. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, without fold, apex round-pointed, strongly prominent, termen strongly concave below apex, rounded-prominent beneath; ochreous-brownish, with violet reflections; costal edge with oblique whitish strigulæ, irrorated with dark fuscous between these; dorsal area beneath fold and dorsal half of wing posteriorly ferruginous; two indistinct dark reddish-fuscous streaks between cell and apical prominence, beyond these an oblique pale silvery-metallic mark; apical prominence edged beneath and anteriorly above by slender white marks; a fine black marginal line round apex and upper part of termen: cilia brownish-ochreous. Hindwings with 3 and 4 coincident, tornus obtusely angulated; grey with a faint violet tinge; cilia whitish-grey, with grey subbasal shade.

MADRAS, N. Coorg, 3500 feet, in November and February (*Newcome*); two specimens.

Ancylis hylæa, n. sp.

♂ ♀. 13–14 mm. Head whitish-ochreous, face whitish. Palpi white, second joint externally greyish-ochreous except towards apex. Thorax pale ochreous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, in ♂ without fold, apex round-pointed, strongly prominent, termen deeply excavated below apex, rounded-prominent beneath; whitish-ochreous or pale brownish-ochreous; costa with oblique whitish strigulæ, irrorated with black between these; a narrow dark brownish patch or streak extending along costa beneath these from before middle to near apical prominence, crossed by oblique leaden-grey strigæ; a broad median streak of ochreous-whitish suffusion from base to middle, sometimes posteriorly edged with dark fuscous beneath; dorsal half of wing more or less suffused with brownish or sprinkled with dark fuscous; two parallel lines of black irroration running from end of cell to near apical prominence, above and beneath these are sometimes whitish streaks, and beyond them a pale leaden-metallic oblique mark; some blackish dots along dorsum; apical prominence brownish, sprinkled anteriorly with black, edged beneath and anteriorly above by white marks; a fine black marginal line round apex and upper part of termen: cilia whitish, above apex with a brownish patch, on upper part of termen tinged with greyish on outer half. Hindwings with 3 and 4 coincident, tornus in ♂ rectangular; grey; cilia light grey.

ASSAM, Khasis, in October and November; five specimens. This and the two preceding species are closely allied, but at present appear distinct.

ADELIDAE

Nemophora gymnota (Meyrick, 1912)
Nemotois gymnota Meyrick, 1912
Madagascar: Antananarivo

TORTRICIDAE

Ancylis tumida Meyrick, 1912
Sri Lanka: Kandy
Fig.: Clarke (1958), 3:295

Ancylis aromatias Meyrick, 1912
India: Karnataka, Coorg
Fig.: Clarke (1958), 3:288

Ancylis hylaea Meyrick, 1912
India: Maghalaya, Khasi Hills
Fig.: Clarke (1958), 3:292

Ancylis glycyphaga, n. sp.

♀. 15–18 mm. Head and thorax brownish-ochreous, patagia mixed with dark fuscous. Palpi brownish, second joint with broad tuft beneath, somewhat mixed with dark fuscous. Abdomen fuscous. Forewings elongate, rather narrow, costa gently arched, apex round-pointed, strongly prominent, termen deeply concave below apex, rounded beneath; greyish-ochreous sprinkled with whitish points, towards anterior half of costa suffused with whitish; costa with whitish strigulæ separated by dark fuscous or blackish irroration; a broad very undefined median streak of brownish-ochreous suffusion sometimes mixed with dark fuscous running from base to apex, posteriorly sometimes streaked with blackish; posterior half of costa suffused with dull rosy, with four very oblique grey strigæ; apical prominence dark fuscous, on anterior half edged above and beneath with white; tornal area tinged with grey: cilia ochreous sprinkled with whitish, at apex mixed with blackish, above and beneath this with whitish bars. Hindwings with 3 and 4 stalked; grey; cilia grey-whitish, with grey subbasal shade.

Bengal, Pusa; Assam, Khasis; in January, four specimens. Larva subcylindrical, yellow, head flattened; feeds on the sugary excretion of *Phromnia marginella* (*Homoptera*); pupa in a white cocoon (*Fletcher*).

Ancylis lutescens, n. sp.

♂ ♀. 14–15 mm. Head and thorax light brown. Palpi light brownish, second joint with two grey bars and tuft mostly grey, terminal joint grey. Abdomen fuscous. Forewings elongate, rather narrow, costa gently arched, in ♂ with costal fold extending from base to middle, apex round-pointed, strongly prominent, termen deeply concave below apex, rounded beneath; brown, basal area with indistinct longitudinal lines of dark fuscous irroration; usually more or less dark fuscous or blackish irroration extending over anterior half of costal area, especially on costal fold of ♂, and in a patch connected with this occupying central portion of disc; posterior half of costa suffused with reddish-brown, with three obscure grey oblique converging strigæ rising from pairs of whitish strigulæ; an obscure streak of dark grey suffusion running from end of cell towards apex, sometimes edged by a pale line beneath, and some fulvous suffusion below this; a dark fuscous spot occupying apical prominence, edged beneath and on costa anteriorly by white strigulæ; a fine black line round concavity of termen: cilia brownish or light ochreous sprinkled with whitish, at apex dark brown mixed with blackish, above and beneath this with whitish bars. Hindwings with 3 and 4 stalked; grey; cilia light grey, with darker subbasal shade.

Bengal, Pusa, in March, April, July, and October (*Fletcher*); five specimens. This is the only species of the genus known to me as possessing a costal fold in ♂. Larva cylindrical, tapering posteriorly, greenish, towards extremities yellowish, with short scattered whitish hairs; head rosy-yellowish; 2nd segment with shining yellow semicircular lobes at anterior angles, not meeting dorsally: in rolled leaves of *Zizyphus jujuba* (*Rhamnaceæ*); pupa in cocoon in same position (*Fletcher*).

Ancylis sculpta, n. sp.

♂. 12 mm. Head pale brownish-ochreous, face whitish. Palpi ochreous-whitish, second joint light brownish-ochreous externally, with long ochreous-whitish tuft. Thorax brownish-ochreous. Abdomen whitish-ochreous. Forewings elongate, costa moderately arched, apex pointed, prominent, termen concave, rather oblique; light ochreous-brown; a broad whitish streak runs along costa from base to $\frac{2}{5}$, strigulated on costal edge with dark fuscous, thence crossing wing to $\frac{2}{3}$ of dorsum, enclosed dorsal patch suffused with deeper ochreous-brown posteriorly; from dorsal extremity of this streak an irregular whitish streak runs obliquely to near termen in middle, thence angulated and curving round tornus nearly to its origin, thus forming a triangular tornal blotch enclosing a curved streak of ground-colour; two dark fuscous longitudinal lines in disc above this; fours pairs of white strigulæ on posterior half of costa, whence arise oblique bluish-leaden strigæ converging to a white dot on termen above middle: cilia pale grey, with a white bar on supramedian dot, tornal area suffused with whitish. Hindwings with 3 and 4 stalked; pale grey; cilia pale grey, tips whitish.

Korea, Port Hamilton, in April (*Fletcher*); one specimen.

Spilonota rhothia Meyr.

Larva cylindrical, slightly tapering posteriorly, bright orange; head flattened, yellow; spots yellow-whitish, with very fine white hairs; segments constricted transversely in middle: in rolled terminal portions of leaves of *Eugenia jambolana* (*Myrtaceæ*) (Fletcher). The bred specimens received are ♀, and the species has hitherto been reared only from the allied *Psidium guava*; there is therefore a possibility of an allied species, but they are probably identical.

Eucosma stereoma, n. sp.

♂ ♀. 10–11 mm. Head and thorax fuscous mixed with dark fuscous and whitish, face whitish, in ♂ sprinkled with black. Palpi whitish-grey. Antennæ in ♂ simple. Abdomen grey, in ♂ suffused with whitish on basal half. Forewings elongate, costa gently arched towards base, posteriorly nearly straight, apex obtuse, termen somewhat sinuate-indented beneath apex, nearly vertical; dark grey irrorated with ochreous-whitish; basal third of costa with a patch of flocculent white scales accompanied by two small black tufts and covered by reflexed scales from costa but

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TORTRICIDAE

Ancylis glycyphaga Meyrick, 1912
India: Bihar, Pusa
Fig.: Clarke (1958), 3:290
Host: assoc. with *Phromnia marginella* (Homoptera)

Ancylis lutescens Meyrick, 1912
India: Bihar, Pusa
Fig.: Clarke (1958), 3:293
Host: *Zizyphus jujuba* (Rhamnaceae)

Ancylis comptana (Frölich, 1828)
Ancylis sculpta Meyrick, 1912
Korea: "Port Hamilton"
Fig.: Clarke (1958), 3:295

Strepsicrates rhothia (Meyrick, 1910)
Spilonota rhothia Meyrick, 1910
Trans. Ent. Soc. London, 1910:368
Sri Lanka: Maskeliya
Fig.: Clarke (1958), 3:596
Host: *Eugenia jambolana, Psidium guajava* (Myrtaceae)

Eucosma stereoma Meyrick, 1912
India: Bihar, Pusa
Host: *Acacia* sp. (Leguminosae)

without membranous fold; several pairs of indistinct whitish strigulæ on costa posteriorly; a narrow irregular suffused purplish-leaden fascia beyond middle, two subconfluent angulated striæ from $\frac{2}{3}$ of costa to tornus, and a striga from $\frac{3}{4}$ of costa to termen beneath apex, space between these suffused with dark fuscous on costal half; a silvery-whitish mark along median portion of termen, preceded by two or three black dots: cilia grey irrorated with ochreous-whitish and dark fuscous. Hindwings with 3 and 4 stalked; grey, paler and thinly scaled towards base, especially in ♂, veins and terminal area suffused with dark grey; cilia whitish-grey, with grey subbasal shade.

Bengal, Pusa, in August (*Fletcher*); two specimens. Larva cylindrical, greyish-yellow; head flattened, yellow; plate of second segment large, yellow; spots with longish white hairs: in rolled terminal leaves of *Acacia* sp. (*Leguminosæ*); pupa in a white cocoon (*Fletcher*).

Eucosma directa, n. sp.

♂. 12 mm. Head and thorax brownish-ochreous. Abdomen grey, anal tuft pale whitish-ochreous. Forewings elongate, costa gently arched, slightly bent in middle, without fold, apex round-pointed, termen sinuate, rather oblique; brownish-ochreous mixed with fuscous, basal half suffused with fuscous; costa obliquely strigulated throughout with white and dark fuscous; an oblique white streak from before middle of costa to beyond middle of dorsum, sharply defined anteriorly, suffused posteriorly; a white strigula from middle of costa very obliquely elongated, and giving rise to a leaden-metallic line which is sharply angulated near termen beneath apex, and terminating in ocellus; ocellus represented by an undefined leaden-grey patch, anteriorly with an acute-triangular projection edged with white: cilia white, round apex and on upper half of termen leaden-grey, with two white bars at apex. Hindwings and cilia grey.

Asia Minor, Taurus Mts.; one specimen. Probably allied to *aspidiscana*.

Polychrosis glebifera, n. sp.

♂ ♀. 13–14 mm. Head ochreous, crown with a blackish bar. Thorax grey mixed with black, patagia mostly ochreous. Abdomen dark fuscous, anal tuft of ♂ whitish-ochreous. Forewings elongate, posteriorly dilated, costa gently arched, apex obtuse, termen rather obliquely rounded; dark grey, with scattered black strigulæ; edge of basal patch formed by a curved black fascia mixed with ferruginous-ochreous in disc; a rather curved ferruginous-ochreous fascia from middle of costa to beyond middle of dorsum, mixed with black on upper half, with strong prominence on posterior edge in middle, space between this and basal patch whitish-ochreous on dorsal half; four ferruginous-ochreous spots mixed with black on posterior part of costa, alternating with pairs of whitish strigulæ; area beneath these and beyond central fascia wholly whitish-ochreous, enclosing a triangular ferruginous-ochreous tornal spot mixed with blackish, and a suboval ferruginous-ochreous blotch occupying most of the remaining area, somewhat mixed posteriorly with blackish: cilia whitish-ochreous, mixed with ferruginous-ochreous, and on upper half of termen with blackish. Hindwings dark fuscous; cilia white, with dark fuscous basal line.

Asia Minor, Alma Dagh; two specimens. Near *bicinctana*, from which it differs by rounded edge of basal patch, pale ochreous space beyond it covering dorsal half only (in *bicinctana* it forms a fascia reaching costa), and wholly dark fuscous hindwings.

GLYPHIPTERYGIDÆ.

Mictopsichia picturata, n. sp.

♂. 14 mm. Head dark fuscous, forehead and collar mixed with fulvous-ochreous. Palpi ochreous-whitish, second and terminal joints each with basal and subapical blackish rings. Thorax dark fuscous, patagia mixed with fulvous-ochreous, with a bluish-metallic line on their inner edge. Abdomen dark fuscous, anal tuft ferruginous. Posterior legs dark fuscous, base and apex of first two tarsal joints white. Forewings elongate, posteriorly dilated, costa gently arched, apex obtuse, termen hardly sinuate, little oblique; grey; basal area partly suffused with ferruginous, and spotted with blue-metallic and blackish; a blue-metallic slender streak from dorsum at $\frac{1}{4}$, reaching fold, and a curved similar streak from beneath costa at $\frac{1}{3}$, also reaching fold; a dark fuscous patch strewn with whitish hair-scales extending along dorsum from $\frac{1}{3}$ to tornus, and reaching half across wing; an oblique blue-metallic more or less interrupted striga from beneath costa before middle, reaching half across wing; an oblique undefined streak of ferruginous suffusion spotted with blackish from middle of costa to posterior edge of dorsal patch; a blue-metallic slightly curved streak from $\frac{2}{3}$ of costa to tornus; a blue-metallic streak from costa towards apex to below middle of termen, preceded by a thicker streak of ferruginous suffusion edged anteriorly with blackish and attenuated downwards; a few blue-metallic scales at apex: cilia grey, with dark fuscous basal line, and apical and broad median patches of dark fuscous suffusion. Hindwings dark fuscous, median third transversely striated with ochreous-whitish; a black patch occupying terminal third, irregularly marked with orange-ochreous strigulæ and containing a subterminal series of five small round bright leaden-metallic spots,

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TORTRICIDAE

Eucosma directa Meyrick, 1912
Turkey: Taurus Mts.

Lobesia glebifera (Meyrick, 1912)
Polychrosis glebifera Meyrick, 1912
Turkey: Alma Dagh
Fig.: Clarke (1958), 3:471

Nexosa picturata (Meyrick, 1912)
Mictopsichia picturata Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:184

and a terminal series of linear bluish-silvery-metallic marks; cilia whitish, with dark fuscous subbasal line, towards apex and termen suffused with dark grey.

Assam, Khasi Hills, in October; one specimen.

Mictopsichia hexaphala, n. sp.

♀. 14 mm. Head, thorax, and abdomen dark fuscous, beneath white. Palpi dark grey, becoming whitish towards base. Forewings elongate-triangular (broader posteriorly than in *picturata*), costa gently arched, apex obtuse, termen sinuate-bowed, somewhat oblique; dark fuscous; basal area with some slight scattered markings of bluish-leaden-metallic scales, and a few ferruginous scales on costa; a curved bluish-metallic streak from beneath $\frac{3}{5}$ of costa to tornus; a wedge-shaped bluish-metallic streak, edged posteriorly with ferruginous, from costa at $\frac{4}{5}$, reaching half across wing, whitish on costa, space between this and preceding streak pale yellowish in disc; a bluish-metallic streak from costa just before apex to middle of termen, preceded and followed by a few ferruginous scales. Hindwings white, irregularly strigulated with dark fuscous; a small dark fuscous basal patch; apical third black somewhat mixed with fuscous, with a few ferruginous scales, and containing an irregular series of six small round bright leaden-metallic spots, termen also sprinkled with bright leaden-metallic scales.

Ceylon, Maskeliya, in May (*de Mowbray*); one specimen, in imperfect condition, but certainly distinct from the preceding.

Hilarographa leucopyrga, n. sp.

♂. 9 mm. Head, palpi, and thorax bronzy-fuscous. Abdomen fuscous. Forewings somewhat elongate-triangular, costa towards apex moderately arched, apex obtuse, termen slightly rounded, faintly sinuate beneath apex, somewhat oblique; 7 and 8 approximated at base, 7 to apex; fulvous-orange; anterior half of costa suffused with yellow-whitish; six violet-grey streaks from costa, edged with dark fuscous, first from a white mark on base of costa through disc to above middle, second from $\frac{1}{3}$ of costa, very oblique, third and fourth less oblique, these three not reaching half across wing, fifth running from $\frac{4}{5}$ of costa to tornus, sixth to termen below middle; space between these streaks and dorsum crossed by nine irregular somewhat oblique dark fuscous lines, and an ochreous-white fasciaform antemedian blotch, which is somewhat narrowed upwards and terminated by apex of first costal streak; four small round blackish spots before termen: cilia violet-grey, with dark fuscous basal line. Hindwings rather dark fuscous; cilia whitish-grey, with dark fuscous basal line.

Japan, Nagasaki, in April (*T. B. Fletcher*); one specimen.

Hilarographa bellica, n. sp.

♂. 14 mm. Head and palpi pale ochreous. Antennæ dark fuscous. Thorax dull fulvous with three dark fuscous stripes. Abdomen dark fuscous. Forewings somewhat elongate-triangular, costa gently arched, apex rounded-obtuse, termen bowed, sinuate above middle, somewhat oblique; 7 and 8 separate; deep orange, extreme costal edge whitish; dorsal $\frac{2}{3}$ crossed by a network of irregular anastomosing dark purplish-fuscous oblique streaks; costal third crossed on anterior half by five dark purple-fuscous oblique streaks, last two confluent downwards; a thicker and longer oblique dark purple-fuscous streak from costa at $\frac{3}{5}$, including a short blue-metallic mark from a white costal dot; a triangular deep reddish-fulvous apical patch reaching this streak on costa, dark fuscous on costal edge, marked with a blue-metallic oblique streak running from a white dot on costa at $\frac{3}{4}$ to beneath apex, and two white wedge-shaped marks from costa before apex; two blackish dots before termen below middle. Hindwings orange; dorsal third fuscous; a præterminal dark fuscous streak on upper $\frac{2}{3}$, lower portion broken into three spots; cilia fuscous, with blackish subbasal shade.

Dutch Guiana, Paramaribo, in December; one specimen.

Tortyra sybaritis, n. sp.

♂. 18 mm. Head metallic green-blue. Palpi whitish-bronze, terminal joint blackish. Antennæ black, with narrow white band at $\frac{2}{3}$, apex whitish. Thorax dark bronzy-fuscous, with three metallic-green stripes. Abdomen dark fuscous. Forewings rather elongate-triangular, costa gently arched, apex rounded-obtuse, termen rounded, rather oblique; dark bronzy-fuscous; a metallic-green basal patch, enclosing an elongate patch of ground-colour above middle from base to near posterior edge; a straight transverse metallic-green streak near beyond this; a median transverse blackish streak parallel to this, edged on both sides with prismatic-purple, wing beyond this wholly coppery-purple-metallic, mixed with dark fuscous towards costa and termen: cilia grey, towards base coppery, with black basal line. Hindwings dark fuscous, tornus not prominent; a suffused light ochreous-fuscous discal streak from base to beyond middle; dorsum rather narrowly subhyaline; cilia pale grey, with dark fuscous basal line.

Queensland, Kuranda, near Cairns (*Dodd*); one specimen.

Tortyra tabularia, n. sp.

♂ ♀. 16–17 mm. Head coppery-metallic. Palpi light greyish-ochreous, terminal joint dark fuscous. Antennæ dark fuscous, with white band about $\frac{2}{3}$, in ♂ hardly at all thickened, in ♀ thickened with dark purple-fuscous scales. Thorax dark bronzy-fuscous, with three coppery-metallic streaks. Abdomen dark fuscous. Forewings rather elongate-triangular, costa gently

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TORTRICIDAE

Nexosa hexaphala (Meyrick, 1912)
Mictopsichia hexaphala Meyrick, 1912
Sri Lanka: Maskeliya
Fig.: Clarke (1969), 6:183

Thaumatographa leucopyrga (Meyrick, 1912)
Hilarographa leucopyrga Meyrick, 1912
Japan: Nagasaki
Fig.: Diakonoff (1986), 59, pl. 1, f. 7
Hosts: *Elaeocarpus* (Elaeocarpaceae)

Hilarographa bellica Meyrick, 1912
Surinam: Paramaribo
Fig.: Clarke (1969), 6:88

CHOREUTIDAE

Saptha libanota (Meyrick, 1910)
Tortyra sybaritis Meyrick, 1912
Australia: Queensland: Kuranda

Saptha tabularia (Meyrick, 1912)
Tortyra tabularia Meyrick, 1912
Loyalty Is.: Lifu

arched, apex rounded-obtuse, termen slightly rounded, somewhat oblique; dark bronzy-fuscous; a purplish-coppery-metallic subcostal streak from base to beyond $\frac{1}{4}$, and broader nearly confluent similar median and subdorsal streaks; a straight transverse purplish-coppery streak near beyond these; a straight black median transverse streak parallel to this, edged with purple anteriorly; wing beyond this wholly densely irrorated with purple-coppery-golden scales with green reflections, tending to be arranged in longitudinal lines: cilia purplish-grey, with blackish basal line. Hindwings dark fuscous, tornus not prominent; a pale greyish-ochreous discal streak from base to $\frac{2}{3}$, dilated posteriorly; cilia whitish, with dark fuscous basal line.

LOYALTY ISLANDS, Lifu; two specimens.

Tortyra hyalozona, n. sp.

♂. 12 mm. Head, thorax, and abdomen dark grey, crown suffused with metallic-blue. Palpi dark grey, suffused with metallic-blue towards base. Antennæ dark purple-fuscous (broken). Forewings rather elongate-triangular, costa gently arched, apex obtuse, termen sinuate-bowed, somewhat oblique; dark fuscous closely irrorated with whitish; a small bluish-silvery-metallic spot on base of costa, edged externally with blackish; a narrow slightly curved bluish-silvery-metallic antemedian fascia, somewhat widened towards costa, strongly edged on both sides with blackish; a broad terminal fascia of purplish-coppery-metallic suffusion, broadest towards tornus: cilia purplish-coppery. Hindwings dark fuscous; cilia whitish-grey, basal third grey.

COLOMBIA, Popayan; one specimen.

Jonaca nephelospila, n. sp.

♂. 18–23 mm. Head and palpi light brownish. Antennæ simple. Thorax dark fuscous mixed with brownish. Abdomen dark fuscous. Forewings elongate, rather narrow, posteriorly rather dilated, costa slightly arched, apex rounded-obtuse, termen somewhat rounded, nearly vertical; dark fuscous mixed with light brownish; apical and terminal margins tinged with reddish: cilia light brown tinged with reddish, with blackish basal line, and dark fuscous tornal patch. Hindwings blackish; an obscure spot of whitish suffusion in disc before middle, and one on costa beyond middle: cilia ochreous-whitish tinged with reddish round apex, with blackish basal line.

VENEZUELA, Carupano, in December; DUTCH GUIANA, Berg-en-Daal, in April; two specimens.

Imma tetrascia, n. sp.

♂. 19–20 mm. Head, palpi, and thorax pale ochreous-yellowish, terminal joint of palpi half second. Abdomen whitish-ochreous tinged with fuscous. Forewings elongate, posteriorly dilated, costa slightly arched, apex obtuse, termen rounded, little oblique; 7 and 8 stalked, 8 to apex; pale ochreous-yellowish; four rather irregular transverse fuscous lines or shades, first very near base, second at $\frac{1}{3}$, broken and interrupted in middle, upper portion oblique, third beyond middle, somewhat oblique, fourth from $\frac{4}{5}$ of costa to tornus, rather curved, sometimes very faint except towards costa; a slender dark fuscous streak round apex and upper portion of termen: cilia pale yellowish, on tornus tinged with pale fuscous. Hindwings rather dark fuscous; cilia ochreous-whitish tinged with grey.

QUEENSLAND, Cooktown, Geraldton (*Meek*); three specimens.

Imma vaticina, n. sp.

♂ ♀. 20–22 mm. Head, palpi, and thorax fuscous, terminal joint of palpi short. Antennal ciliations of ♂ 1. Abdomen dark fuscous. Anterior femora in ♂ beneath with dense rough flocculent whitish-ochreous scales, tibiæ very short, tufted with whitish hairs beneath; posterior tibiæ in ♂ short, densely tufted beneath with long grey and whitish hairs. Forewings elongate, posteriorly dilated, costa slightly arched, apex obtuse, termen rounded, rather oblique, less so in ♀; 7 and 8 stalked, 8 to apex; violet-fuscous; a transverse dark fuscous mark on end of cell, in ♂ connected with dorsum by a direct obscure darker shade, followed by somewhat paler suffusion: cilia fuscous. Hindwings hyaline, veins dark fuscous; a broad fuscous band along costa; a dark fuscous terminal band, broadest at apex, with an abrupt projection inwards beneath vein 2, below this abruptly narrow, then with a long wedge-shaped projection on vein 1 *b*; dorsum slenderly suffused with fuscous; cilia pale greyish, with dark fuscous subbasal line.

QUEENSLAND, Herberton, 3500 feet, in December (*Dodd*); three specimens. Allied to *penthinoides* Pag., which is stated to have whitish cilia in forewings.

Imma ancistrota, n. sp.

♂. 18 mm. Head ochreous-whitish, crown with a bar of dark purplish-fuscous scales. Palpi grey-whitish, with a lateral line of blackish scales, basal joint rather long, second laterally compressed, bent back, terminal metamorphosed into a very fine linear acute recurved black hook. Antennal ciliations $1\frac{1}{2}$. Abdomen dark grey, apex ochreous-whitish. Forewings rather elongate-triangular, costa slightly arched, apex obtuse, termen rounded, rather oblique; 7 and 8 stalked, 8 to apex; dark lilac-fuscous, markings ochreous-yellow; a spot at base; a moderate somewhat oblique fascia near beyond this, confluent with it in middle; an irregular transverse streak before middle, dilated on costa, broken inwards on fold, lower portion sinuate outwards; a dot in disc beyond middle; a

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CHOREUTIDAE

Tortyra hyalozona Meyrick, 1912
Colombia: Popayan
Fig.: Clarke (1969), 6:212

BRACHODIDAE

Sagalassa nephelospila (Meyrick, 1912)
Jonaca nephelospila Meyrick, 1912
Surinam: Berg-en-Daal
Fig.: Clarke (1969), 6:199

IMMIDAE

Imma tetrascia Meyrick, 1912
Australia: Queensland, Cooktown
Fig.: Clarke (1969), 6:156

Imma vaticina Meyrick, 1912
Australia: Queensland, Herberton
Fig.: Clarke (1969), 6:164

Moca ancistrota (Meyrick, 1912)
Imma ancistrota Meyrick, 1912
[Indonesia, Irian Jaya], New Guinea: Mafor Id.
Fig.: Clarke (1969), 6:103

narrow irregular fascia beyond this, interrupted in middle, not reaching dorsum; a subtriangular spot on costa towards apex; a fine line on submedian fold posteriorly; an ochreous-whitish line running from just before lower extremity of costal spot to tornus, twice dentate outwards, lower dentation confluent with an ochreous-yellow spot on termen above tornus; a fine ochreous-whitish terminal line. Hindwings prismatic-hyaline, veins dark fuscous; a dark fuscous band round costa and upper half of termen, broadest at apex, continued narrowly and irregularly round lower part of termen and tornus.

NEW GUINEA, Mefor Island, in June; one specimen. The structure of apical joint of palpus is wholly unique, so far as I know, but probably not found in ♀. Probably allied to *diaphana* Pag., and somewhat resembles the rough figure given, but cannot possibly be reconciled with the description.

Imma paratma, n. sp.

♂. 17–18 mm. Head fuscous, face white. Palpi white, second and terminal joints each with a dark fuscous external streak, second joint relatively short, terminal joint as long as second, stout. Antennæ dark fuscous, ciliations minute. Thorax fuscous mixed with darker. Abdomen dark fuscous with a white anteapical blotch. Forewings elongate, moderate, posteriorly dilated, costa slightly arched posteriorly, apex rounded-obtuse, termen rounded, somewhat oblique; 7 and 8 separate, 8 to costa; dark fuscous, irregularly finely sprinkled with ochreous-whitish, discal area anteriorly lighter and more brownish: cilia fuscous, with darker basal shade. Hindwings dark fuscous, anteriorly rather thinly scaled; undefined patches of fuscous-whitish suffusion extending over upper and lower margins of cell, veins in these dark fuscous; cilia fuscous, with dark fuscous basal line.

BRITISH GUIANA, R. Demerara; two specimens.

Imma phthorosema, n. sp.

♂. 20 mm. Head fuscous. Palpi dark fuscous, extreme apex of second and terminal joints ochreous-white, second joint rather short, terminal more than half second. Antennæ dark fuscous, ciliations $\frac{1}{2}$. Thorax and abdomen dark fuscous. Forewings moderate, posteriorly dilated, costa slightly arched, apex obtuse, termen rounded, somewhat oblique; dark fuscous; some brownish-ochreous strigulation towards costa at $\frac{1}{4}$; two obscure blackish dots transversely placed in disc on end of cell; posterior $\frac{2}{5}$ of wing irregularly and suffusedly strigulated with light brownish-ochreous; an interrupted blackish terminal line: cilia fuscous mixed with darker, base obscurely dotted with whitish-ochreous. Hindwings rather dark grey; cilia pale greyish, with dark grey subbasal line, tips ochreous-whitish.

COLOMBIA, San Antonio, 5800 feet, in November; one specimen.

LASIODICTIS, n. g.

Head with appressed scales, sidetufts loosely spreading; ocelli absent; tongue developed. Antennæ $\frac{2}{3}$, in ♂ clothed with long fine cilia, basal joint moderate, without pecten. Labial palpi moderate, curved, ascending, second joint with appressed scales, terminal joint shorter, slender, pointed. Maxillary palpi obsolete. Posterior tibiæ roughly haired above. Forewings with 2 and 3 stalked from angle, 7 to termen, 11 from middle. Hindwings over 1, ovate, cilia $\frac{1}{4}$; 3 and 4 connate, 5 parallel, 6 and 7 short-stalked, 8 connected with cell in middle.

Lasiodictis melistoma, n. sp.

♂ ♀. 16–18 mm. Head yellow-ochreous, face in ♂ tinged with fuscous. Palpi ochreous-yellow. Antennæ grey. Thorax and abdomen dark fuscous. Forewings moderate, posteriorly slightly dilated, costa gently arched, apex obtuse, termen straight, rather oblique; dark fuscous, with faint purplish tinge: cilia fuscous. Hindwings blackish-fuscous; cilia fuscous, with dark fuscous subbasal line.

ASSAM, Khasi Hills, in May, June, and September; seven specimens.

Heliostibes callispora, n. sp.

♂. 17 mm. Head deep metallic-green, with purple reflections, collar ferruginous-orange. Palpi ferruginous-orange, terminal joint rather more than half second, blackish anteriorly. Antennæ dark fuscous, ciliations $\frac{1}{3}$. Thorax shining deep greenish-purple-bronze. Abdomen dark fuscous. Forewings elongate, posteriorly dilated, costa slightly arched, faintly sinuate in middle, apex obtuse, termen straight, little oblique, rounded beneath; dark indigo-fuscous, closely strewn with pale greenish-yellowish hair-scales: cilia fuscous, basal third dark fuscous mixed with deep ferruginous. Hindwings blackish; cilia fuscous, with blackish basal shade.

NEW ZEALAND, Wellington, in January (*Hudson*); one specimen.

HIERODORIS, n. g.

Head smooth; ocelli present; tongue developed. Antennæ $\frac{1}{5}$, in ♂ minutely ciliated, basal joint elongate, without pecten. Labial palpi moderately long, curved, ascending, with appressed scales, terminal joint $\frac{2}{3}$ of second, pointed. Maxillary palpi obsolete. Posterior tibiæ with scales somewhat rough above. Forewings with 1*b* furcate, 2 from towards angle, 7 absent, 11 from middle. Hindwings over 1, ovate, cilia $\frac{1}{3}$; 3 and 4 connate, 5–7 somewhat approximated towards base.

IMMIDAE

Moca paratma (Meyrick, 1912)
Imma paratma Meyrick, 1912
Guyana: Rio Demerara
Fig.: Clarke (1969), 6:144

Moca phthorosema (Meyrick, 1912)
Imma phthorosema Meyrick, 1912
Colombia: San Antonio
Fig.: Clarke (1969), 6:147

OECOPHORIDAE

Lasiodictis Meyrick, 1912
Type-sp.: *Lasiodictis melistoma* Meyrick, 1912

Lasiodictis melistoma Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1955), 2:438
Meyrick (1914), 164: pl. 2, f. 23

Heliostibes callispora Meyrick, 1912
New Zealand: Wellington
Fig.: Hudson (1928), 306, pl.33, f. 24

Hierodoris Meyrick, 1912
Type-sp.: *Hierodoris iophanes* Meyrick, 1912

Hierodoris iophanes, n. sp.

♂. 13 mm. Head deep bluish-bronze. Palpi bronzy-fuscous. Thorax deep bronze suffused with purple. Antennæ and abdomen dark fuscous. Forewings elongate, posteriorly slightly dilated, costa slightly arched, faintly sinuate in middle, apex obtuse, termen rounded, somewhat oblique; dark bronzy-fuscous; a shining purple fascia from base of costa almost to dorsum at $\frac{1}{4}$, followed by a spot of blackish suffusion beneath costa, beyond which is a short metallic-blue oblique strigula; a narrow shining purple fascia from a silvery-whitish dot beneath costa before middle to a pale ochreous spot on middle of dorsum; a pale blue-metallic linear mark on end of cell; triangular shining purple spots above and below middle beyond this, their anterior angles tending to meet in disc; an undefined shining purple spot before middle of termen: cilia deep purplish-bronze. Hindwings blackish; cilia fuscous, with blackish basal shade.

New Zealand, Wellington, in January (*Hudson*); one specimen.

Simaethis xanthogramma, n. sp.

♂ ♀. 11–13 mm. Head whitish-ochreous more or less mixed with blackish. Palpi whitish-ochreous, second and terminal joints with basal and subapical blackish rings. Antennæ black dotted with white. Thorax blackish. Abdomen dark fuscous mixed with fulvous-orange. Posterior tibiæ whitish-yellowish banded with blackish, tarsi black, base and apex of first two joints, and third joint wholly white. Forewings triangular, costa moderately arched, apex rounded-obtuse, termen rounded, somewhat oblique; blackish-fuscous; a whitish-ochreous antemedian fascia, anterior edge almost straight, sharply defined, posterior yellower, irregular; second line thick, orange, on costal edge white, very shortly angulate-looped outwards on median third, enclosing an orange transverse discal spot within the loop; a suffused triangular orange costal spot close beyond this; an undefined terminal fascia of orange suffusion: cilia grey, with black basal line. Hindwings dark fuscous; a wedge-shaped orange streak in disc from base to $\frac{2}{3}$; in ♀ an orange fascia along lower $\frac{2}{3}$ of termen, in ♂ almost or quite obsolete; cilia grey-whitish with blackish basal line, greyer towards apex and tornus.

Philippines, Mindoro, Rio Baco, in October and February (*Mounsey*); New Guinea, Kei Is., in January; four specimens.

Simaethis anthorma, n. sp.

♀. 13 mm. Head blackish, a frontal patch and a spot on each side of face ochreous-whitish. Palpi ochreous-whitish, second and terminal joints with black basal and subapical rings. Antennæ white ringed with black. Thorax blackish, anterior third ochreous-whitish. Abdomen light orange-ochreous suffusedly ringed with dark fuscous. Posterior tibiæ pale yellowish banded with blackish, tarsi black, base and apex of first two joints, and third joint except apex white. Forewings triangular, costa moderately arched, apex obtuse, termen rounded, somewhat oblique; blackish; a whitish-ochreous curved transverse line very near base; first line thick, pale ochreous, white on costa, almost straight; second line thick, pale ochreous, white on costa, straight except that it is interrupted and shortly broken inwards on fold, above middle with a slight enlargement containing an undefined transverse mark of ground-colour; a yellow-ochreous transverse spot on costa near beyond this; a transverse yellow-ochreous spot from costa just before apex, reaching half across wing; an undefined fascia of yellow-ochreous suffusion along termen, narrow or partially obsolete towards apex: cilia grey, with blackish basal line. Hindwings orange; a dark fuscous costal band; some dark fuscous suffusion on submedian fold and dorsal area towards base; a blackish line from costal band at $\frac{2}{3}$ to tornus, and another along termen; cilia grey-whitish, with dark fuscous basal line.

Philippines, Mindoro, Laguna de Naujan, in March (*Mounsey*); one specimen.

Simaethis trogalia, n. sp.

♂ ♀. 14–16 mm. Head dark fuscous, irrorated with whitish. Palpi white, second and terminal joints with basal and subapical dark fuscous rings. Antennæ white ringed with black. Thorax dark fuscous irrorated with whitish except posteriorly. Abdomen dark fuscous mixed with fulvous. Posterior tibiæ ochreous-brownish banded with dark fuscous, tarsi dark fuscous, basal half of first joint ochreous, third joint and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; brown; basal area more or less whitish-sprinkled, with a small blackish spot on costa near base; a straight blackish transverse shade at $\frac{1}{3}$, followed by a pale violet shade forming a white dot on costa; an irregularly curved pale violet postmedian line, white on costa, rounded-angulated above middle and somewhat dentate below it, preceded by a fascia of blackish suffusion, and followed by a fine blackish line, beyond which is an obscure band of pale violet irroration: cilia brown with darker basal line, and apical, median, and tornal undefined patches of dark fuscous suffusion. Hindwings dull fulvous; an irregular dark fuscous band along costa; dorsal half irregularly suffused with dark fuscous from base to beyond middle; a dark fuscous subterminal streak from tornus to apex, where it forms an apical patch; cilia fuscous, with darker basal line.

Assam, Khasi Hills, in December and January; fifteen specimens.

Simaethis eumetra, n. sp.

♂ ♀. 13–14 mm. Head and thorax dark fuscous irrorated with greyish-ochreous. Palpi ochreous-whitish, second and terminal joints with basal and subapical dark fuscous rings. Antennæ

OECOPHORIDAE

Hierodoris iophanes Meyrick, 1912
New Zealand: Wellington
Fig.: Hudson (1928), 305, pl.33, f. 3

CHOREUTIDAE

Choreutis xanthogramma (Meyrick, 1912)
Simaethis xanthogramma Meyrick, 1912
Philippines: Mindoro, Rio Baco
Fig.: Clarke (1969), 6:21
Diakonoff (1986), 174, pl. 7, f. 60

Choreutis anthorma (Meyrick, 1912)
Simaethis anthorma Meyrick, 1912
Philippines: Mindoro, Laguna de Naujan
Fig.: Clarke (1969), 6:3
Diakonoff, (1968), 205, f. 683

Choreutis trogalia (Meyrick, 1912)
Simaethis trogalia Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:20

Choreutis eumetra (Meyrick, 1912)
Simaethis eumetra Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:8

white ringed with black. Abdomen fuscous mixed with dull orange and sprinkled with blackish. Posterior tibiæ whitish-ochreous banded with dark fuscous, tarsi blackish, first joint with a whitish-ochreous subbasal band, third joint and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; dark fuscous; markings formed by yellow-ochreous or ochreous-whitish suffusion; two indistinct subconfluent transverse shades near base; two thick rather irregular shades enclosing first line, connected in disc by a bar with following pair; two shades enclosing second line, first narrower, second thick, abruptly angulated above middle and somewhat sinuate below it; a thick terminal shade, partially obsolescent on upper half: cilia pale ochreous, with dark fuscous apical, median, and tornal patches. Hindwings dark fuscous; an orange median streak from base to $\frac{2}{3}$, its apex forming a projection upwards; an orange streak along lower $\frac{3}{5}$ of termen; cilia pale orange, with a dark fuscous basal line, at apex and tornus suffused with grey.

Assam, Khasi Hills, in March; two specimens.

Simaethis antichlora, n. sp.

♀. 15 mm. Head dark fuscous suffusedly irrorated with pale greyish-ochreous. Palpi ochreous-whitish, second and terminal joints with basal and subapical dark fuscous rings. Antennæ white ringed with black. Thorax dark fuscous, transversely banded with pale greyish-ochreous irroration. Abdomen dark fuscous mixed with orange. Posterior tibiæ orange banded with dark fuscous, tarsi blackish, first joint with subbasal ochreous-whitish band, third joint and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; two thick transverse shades near base, first whitish, second whitish-ochreous; first line nearly straight, enclosed by thick anterior shade of whitish irroration and narrower posterior whitish-ochreous shade; second line gently curved, enclosed by narrow anterior shade of whitish irroration, and somewhat thicker whitish-ochreous posterior shade; an irregular spot of whitish irroration in disc between these lines; some undefined groups of whitish-ochreous scales towards termen above middle and tornus: cilia greyish, with blackish subbasal line, and apical, median, and tornal patches of dark fuscous suffusion. Hindwings dark fuscous; an orange-fulvous median streak from base to $\frac{3}{4}$, extremity enlarged upwards into a blotch; an undefined blotch of orange-fulvous suffusion towards dorsum beyond middle; an orange-fulvous streak along lower $\frac{3}{5}$ of termen; cilia grey, with blackish subbasal line edged externally with grey-whitish.

Assam, Khasi Hills, in March; one specimen. Allied to *eumetra*, but immediately distinguished by the gently curved second line of fore wings.

Simaethis strepsidesma, n. sp.

♀. 12–13 mm. Head and thorax fulvous-brown, slightly whitish-sprinkled. Palpi ochreous irrorated with dark grey, basal joint and tips of four whorls of scales whitish. Antennæ white ringed with black. Abdomen ferruginous sprinkled with dark fuscous. Posterior tibiæ dark fuscous mixed with ferruginous and sprinkled with white, tarsi dark fuscous, first joint with subbasal whitish band, third joint and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; ferruginous-brown, more or less mixed with blackish, especially in disc below middle, and slightly sprinkled with whitish specks; first line represented by a somewhat sinuate thick posteriorly undefined shade of whitish irroration; second line formed of whitish irroration, slender, irregularly dentate on lower $\frac{2}{5}$, angulated outwards at $\frac{1}{3}$ from costa and broken inwards at $\frac{2}{3}$, followed on upper $\frac{2}{5}$ by a shade of whitish irroration: cilia reddish-fuscous, with apical, median, and tornal patches of dark fuscous suffusion. Hindwings dark fuscous; an irregular patch of fulvous suffusion in middle of disc; a fulvous streak along lower $\frac{3}{5}$ of termen; cilia reddish-ochreous, with dark fuscous basal line, tips whitish.

Assam, Khasi Hills, in September and November; three specimens.

Simaethis cothurnata, n. sp.

♂ ♀. 14 mm. Head and thorax light ochreous, with some ferruginous suffusion behind shoulders. Palpi ochreous-whitish, second and terminal joints with basal and subapical ferruginous-ochreous rings. Antennæ white ringed with black. Abdomen ochreous mixed with dark fuscous. Posterior tibiæ ochreous-whitish banded with ochreous-brown, tarsi roughly tufted with scales above, blackish, first joint suffused with ochreous-brown except towards apex, second ochreous-white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; light ochreous; a small ferruginous-brown spot on base of costa; a larger ferruginous-brown spot on costa at $\frac{1}{4}$, marked with blackish on costal edge, and giving rise to a faint undefined fascia of ferruginous suffusion crossing wing; a blackish mark on middle of costa, and blackish dots before and beyond this; some broad undefined ferruginous suffusion on dorsal half beyond middle; an undefined spot of blackish suffusion on costa at $\frac{3}{4}$; a dark fuscous or reddish-fuscous quadrate spot on termen above middle, and a suffused similar patch on tornus: cilia dark reddish-fuscous, with small pale ochreous patches below apex and below middle of termen. Hindwings blackish-fuscous; an undefined narrow median streak of whitish suffusion from base to $\frac{2}{3}$, where it sometimes forms an irregular spot; an irregular partially interrupted whitish streak along lower $\frac{2}{3}$ of termen: cilia ochreous-whitish, more or

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CHOREUTIDAE

Choreutis antichlora (Meyrick, 1912)
Simaethis antichlora Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:3

Choreutis strepsidesma (Meyrick, 1912)
Simaethis strepsidesma Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:19

Choreutis cothurnata (Meyrick, 1912)
Simaethis cothurnata Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:7

less suffused with ochreous on lower third of termen, with ochreous basal line becoming dark fuscous round apex.

Assam, Khasi Hills, in November; two specimens.

Simaethis achyrodes, n. sp.

♂ ♀. 13–16 mm. Head dark fuscous irrorated with whitish. Palpi with eight whorls of blackish white-tipped scales, basal joint white. Antennæ white ringed with black. Thorax ferruginous-brown or fuscous, sprinkled with whitish. Abdomen dark fuscous. Posterior tibiæ blackish irrorated with white, tarsi blackish, third joint and base and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; ferruginous-brown; markings formed by irroration of white scales with dark fuscous bases; two slight very undefined shades towards base; first line nearly straight, narrow; second line double, both portions slender, obtusely angulated above middle, twice or thrice dentate on lower portion, angulation including a discal transverse linear mark, all tending to be partially interrupted and resembling an irregular network; usually some slight irregular admixture of black scales before and beyond second line, especially towards tornus: cilia fuscous, with somewhat darker apical, median, and tornal patches, and dark ferruginous-fuscous basal line, tips whitish, on costa dark fuscous with a snow-white mark before apex. Hindwings dark fuscous; cilia reddish-brown, with dark fuscous basal line, tips grey-whitish.

Assam, Khasi Hills; Bombay, Kanara (*Maxwell*); S. India, Coorg, 3500 feet (*Newcome*), Nilgiris, 3500 feet (*Andrewes*); Ceylon, Kandy, Maskeliya (*Green, Pole, Mackwood*); from May to December, sixteen specimens.

Simaethis ialeura, n. sp.

♂. 12–13 mm. Head and thorax dark fuscous irrorated with whitish. Palpi with eight whorls of blackish white-tipped scales, basal joint white. Antennæ white ringed with black. Abdomen dark fuscous mixed with fulvous. Posterior tibiæ blackish irrorated with white, tarsi blackish, third joint and base and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, rather oblique; basal $\frac{2}{5}$ olive-brown, remainder deep ferruginous suffusedly mixed with black except along costa and termen; markings formed of violet-white irroration; a moderate basal patch; first line represented by a hardly curved shade; second line slender, acutely angulated above middle, and with a deep indentation towards dorsum, angulation including an undefined spot, this line followed by a thick shade: cilia grey, towards tips whitish, with blackish basal line, and apical, median, and tornal dark grey patches, on costa dark grey with a white mark towards apex. Hindwings dark fuscous; a more or less developed orange-ochreous triangular patch in disc extending from base to $\frac{3}{4}$; an undefined spot of orange-ochreous suffusion on tornus, and a slender streak along median portion of termen; cilia fuscous, with dark fuscous basal line, tips whitish.

S. India, Nilgiris, 3500 feet, in August (*Andrewes*); Ceylon, Maskeliya, in May (*Pole*); two specimens.

Simaethis psilachyra, n. sp.

♀. 10 mm. Head and thorax dark fuscous, slightly whitish-sprinkled, patagia fulvous. Palpi with eight whorls of blackish white-tipped scales, basal joint white. Antennæ white ringed with black. Abdomen dark fuscous. Posterior tarsi blackish, third joint and basal and apical portions of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; dark fuscous suffused with orange-fulvous; two slight striæ of whitish irroration towards base; first line represented by a nearly straight stria of violet-white irroration, preceded by a few black scales, forming a white dot on costa; second line black, irregular, rather curved outwards above middle and inwards below middle, followed by a few whitish specks and on costa by a snow-white dot; a black irregular line from $\frac{3}{4}$ of costa to tornus: cilia grey mixed with white above and below middle of termen, with blackish subbasal line, on costa with a snow-white mark towards apex. Hind wings dark fuscous; cilia grey, with dark fuscous subbasal line.

Ceylon, Maskeliya, in May (*de Mowbray*); one specimen. Not in good condition, but a distinct species.

Simaethis holachyrma, n. sp.

♂. 14 mm Head and thorax dark fuscous irrorated with whitish. Palpi ochreous sprinkled with dark fuscous, basal joint and median and apical rings of second and terminal joints whitish. Abdomen dark fuscous. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, oblique, sinuate-indented at $\frac{3}{4}$; dark fuscous, irrorated throughout with whitish; costal extremities of first and second lines indicated by white dots, first preceded, second preceded and followed by small blackish spots; an irregular blackish patch on costa towards apex: cilia fuscous, with blackish basal line, in sinuation indented with whitish. Hindwings dark fuscous; a cloudy orange-ochreous spot in disc beyond middle, and a streak of suffusion along lower $\frac{3}{5}$ of termen; cilia fuscous, with dark fuscous basal line, tips whitish.

Assam, Khasi Hills, in November; one specimen. Characterised by the peculiar sinuation of termen, and general pale irroration.

Simaethis lethaea, n. sp.

♂ ♀. 11–14 mm. Head and thorax dark fuscous slightly sprinkled with whitish. Palpi dark fuscous, basal joint whitish, second and terminal joints each with median and apical white

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CHOREUTIDAE

Choreutis achyrodes (Meyrick, 1912)
Simaethis achyrodes Meyrick, 1912
India: Tamil Nadu, Nilgiri Hills
Fig.: Clarke (1969), 6:2
Diakonoff (1986), 189, pl. 8, f. 70

Choreutis ialeura (Meyrick, 1912)
Simaethis ialeura Meyrick, 1912
India: Tamil Nadu, Nilgiri Hills
Fig.: Clarke (1969), 6:10
Diakonoff (1986), 187, pl. 8, f. 69

Choreutis psilachyra (Meyrick, 1912)
Simaethis psilachyra Meyrick, 1912
Sri Lanka: Maskeliya
Fig.: Clarke (1958), 6:17

Choreutis holachyrma (Meyrick, 1912)
Simaethis holachyrma Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:10

Choreutis lethaea (Meyrick, 1912)
Simaethis lethaea Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:10

rings. Antennæ white ringed with black. Abdomen dark fuscous, somewhat tinged with fulvous. Posterior tibiæ dark fuscous sprinkled with whitish, tarsi blackish, first two joints with subbasal and apical white rings, third joint white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, somewhat oblique; dark fuscous, more or less mixed with fulvous, with an irregular narrow fulvous terminal fascia; markings formed of whitish irroration; a slight shade near base; first line rather thick, slightly curved; second line slender, irregularly curved outwards above middle, curve enclosing a transverse linear mark, lower half irregular, with a strong subtriangular indentation at $\frac{3}{4}$, this line followed throughout by a thick irregular shade: cilia dark grey, mixed with ochreous-whitish above and below middle, with black basal line. Hindwings dark fuscous; a few fulvous scales on middle of termen; cilia ochreous-whitish, towards apex and tornus grey, with dark fuscous basal line.

Assam, Khasi Hills, in October and November; nine specimens.

Simaethis fulminea, n. sp.

♀. 11 mm. Head and thorax yellow-ochreous sprinkled with white. Palpi yellow-ochreous sprinkled with grey, basal joint and apex of whorls of scales white. Antennæ white ringed with black. Abdomen dark fuscous. Posterior tibiæ dark fuscous sprinkled with white, tarsi blackish, base and apex of first joint white, second and third joints white. Forewings triangular, costa moderately arched, apex obtuse, termen rounded, somewhat oblique; deep ferruginous-brown, suffused with blackish except towards costa and termen; two violet-blue-metallic transverse shades towards base, and a third representing first line, margined posteriorly by a whitish-ochreous projecting spot in middle and smaller ones above and below this; an undefined violet-blue-metallic spot in disc at $\frac{2}{3}$; second line double, violet-blue-metallic, curved-angulated above middle and rather approximated to termen on median third, irregularly dentate towards termen. Hindwings dark fuscous; a short whitish mark along tornus; a few red-brown scales on middle of termen: cilia whitish, with dark reddish-brown basal line, towards apex and tornus grey.

Ceylon, Trincomali, in December (*Fletcher*); one specimen.

Simaethis dichlora, n. sp.

♂. 9 mm. Head and thorax dark fuscous mixed with ochreous-whitish. Palpi ochreous-white, second and terminal joints with basal and supramedian dark fuscous rings. Antennæ white ringed with black. Posterior tibiæ ochreous-white banded with blackish (tarsi broken). Forewings triangular, costa moderately arched, apex obtuse, termen bowed, rather oblique; dark fuscous, median and terminal areas irregularly and suffusedly mixed with pale ochreous; a white transverse stria near base; an irregular white shade nearly preceding first line; first line slender, irregular, white; a transverse white discal mark beyond middle; second line slender, white, obtusely angulated above middle, below this irregular, dentate at $\frac{3}{4}$, nearly followed by a similar slightly thicker pale ochreous line: cilia white, with blackish basal line, and dark grey apical, median, and tornal patches. Hindwings dark fuscous; cilia white, with blackish basal line, at apex and tornus tinged with grey.

China, Hainan I.; one specimen.

Simaethis diplogramma, n. sp.

♂ ♀. 12 mm. Head, thorax, and abdomen dark fuscous irrorated with pale ochreous. Palpi ochreous-whitish, second and terminal joints with dark fuscous basal and supramedian rings. Antennæ white ringed with black. Posterior tibiæ white banded with black, tarsi black, subbasal ring of first and apex of first two joints white, third joint white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, rather oblique; dark fuscous; a yellowish transverse line near base, followed by some scattered yellowish scales; first line slender, rather irregular, white, nearly followed by a more irregular yellowish one; a transverse linear white discal mark beyond middle, preceded by a patch of yellowish suffusion; second line slender, white, obtusely angulated above middle, below this irregular, dentate at $\frac{3}{4}$, nearly followed by a somewhat thicker less irregular ochreous-yellowish line; some irregular ochreous-yellow irroration or scattered scales towards termen: cilia dark grey, with whitish patches above and below middle of termen, and blackish basal line. Hindwings dark fuscous; an orange transverse patch in disc beyond middle, connected with base by a slender streak of suffusion; a short suffused orange subterminal mark from tornus, reaching $\frac{1}{3}$ across wing; cilia whitish, with blackish basal line, at apex and tornus tinged with grey.

Assam, Khasi Hills, in June, September, and October; three specimens.

Simaethis itriodes, n. sp.

♂. 13 mm. Head, thorax, and abdomen dark fuscous irrorated with pale greyish-ochreous. Palpi ochreous-whitish, second and terminal joints with black basal and supramedian rings. Antennæ white ringed with black. Posterior tibiæ white banded with black, tarsi black, subbasal ring of first and apex of first three joints white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, rather oblique; blackish, irrorated throughout with light greyish-ochreous; lines formed of similar irroration, first rather thick, hardly defined, second slender, right-angled above middle, followed by a somewhat thicker similar line; a transverse linear pale greyish-ochreous discal mark beyond middle: cilia blackish-grey, with blackish basal line, with a whitish patch below middle of termen and tips whitish on a patch above middle.

CHOREUTIDAE

Choreutis sexfasciella (Sauber, 1902)
Simaethis fulminea Meyrick, 1912
Sri Lanka: Trincomali
Fig.: Clarke (1969), 6:9
Diakonoff, (1968), 206, fig. 689
Diakonoff (1986), 179, pl. 7, f. 63

Choreutis dichlora (Meyrick, 1912)
Simaethis dichlora Meyrick, 1912
China: Hainan Id.
Fig.: Clarke (1969), 6:6

Choreutis diplogramma (Meyrick, 1912)
Simaethis diplogramma Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:6

Choreutis itriodes (Meyrick, 1912)
Simaethis itriodes Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969),

Hindwings dark fuscous; a triangular orange patch in disc beyond middle, connected with base by a suffused streak; a short orange subterminal streak from tornus, hardly reaching $\frac{1}{3}$ across wing; cilia pale yellowish, with dark fuscous basal line, at apex and tornus grey.

Assam, Khasi Hills, in November; one specimen.

Simaethis pilaria, n. sp.

♂. 11 mm. Head and thorax dark fuscous mixed with whitish-ochreous. Palpi ochreous-whitish, second and terminal joints with basal and supramedian pale ochreous rings sprinkled with dark fuscous. Antennæ white ringed with black. Abdomen dark fuscous, segmental margins mixed with whitish-ochreous. Posterior tibiæ ochreous-white banded with dark fuscous, tarsi blackish, third joint and base and apex of first two white. Forewings triangular, costa moderately arched, apex obtuse, termen bowed, rather oblique; purple-blackish; a whitish transverse line near base; some whitish irroration in disc before first line; first line rather thick, whitish, nearly straight; a white transverse linear discal mark beyond middle; second line slender, white, curved-angulated above middle, beneath this irregular, sharply dentate at $\frac{3}{4}$, nearly followed throughout by a slightly thicker light ochreous-yellowish line; some ochreous-yellowish irroration towards termen: cilia white, with dark fuscous basal line, and fuscous apical, median, and tornal patches. Hindwings dark fuscous; a roundish whitish-ochreous spot in disc below middle; a whitish-ochreous subterminal streak from tornus reaching $\frac{1}{3}$ across wing; cilia whitish, with dark fuscous basal line, towards apex and tornus suffused with light grey.

Assam, Khasi Hills, in June; one specimen.

Simaethis halimora, n. sp.

♂ ♀. 11–12 mm. Head, thorax, and abdomen dark fuscous sprinkled with white points. Palpi white, second and terminal joints each with dark fuscous basal and supramedian bands. Antennæ white ringed with black. Posterior tibiæ dark fuscous sprinkled with white, tarsi dark fuscous, basal band of first joint and apex of first three white. Forewings elongate-triangular, costa gently arched, apex obtuse, termen bowed, oblique; blackish-fuscous; very undefined subbasal, antemedian, and subterminal fasciæ of white irroration, latter two forming white dots on costa; second line fine, of white irroration, forming a white dot on costa, angulated outwards in disc and twice sinuate inwards between this and dorsum, angularly projecting outwards between sinuations: cilia dark fuscous, above apex with tips white, above and below middle of termen with patches of white intermixture. Hindwings dark fuscous; a cloudy curved white line from tornus, reaching half across wing; cilia grey-whitish, towards apex and tornus grey, with dark fuscous basal shade.

Assam, Khasi Hills, from July to September; twenty specimens.

Brenthia luminifera, n. sp.

♂ ♀. 9–10 mm. Head, thorax, and abdomen dark bronzy-fuscous. Palpi with basal joint dark fuscous, second and terminal joints white with basal and subapical dark fuscous rings. Antennæ dark fuscous dotted with whitish. Posterior tibiæ white banded with dark fuscous, tarsi white, with an apical band of first joint, apex of third, and two apical joints wholly dark fuscous. Forewings elongate-triangular, costa slightly arched, apex rounded, termen rounded, little oblique; dark fuscous; a suffused white transverse streak from dorsum at $\frac{1}{4}$, reaching more than half across wing; a transverse-oval white spot on disc beyond middle; a small round white spot towards termen in middle; an almost marginal series of irregular brilliant violet-brassy-metallic dots round apex and termen: cilia fuscous with two darker shades, at apex with a white spot on tips. Hindwings dark fuscous; an undefined spot of whitish suffusion in disc before middle; a white transverse streak in disc towards termen, traversing about $\frac{1}{3}$ of wing; a slender violet-brassy-metallic streak round apex; cilia fuscous, with two darker shades, on middle of termen with an oblique patch of whitish suffusion.

Assam, Khasi Hills, in October and November; fifteen specimens. Nearly allied to *albimaculana*, but that species has the white markings more largely developed, different violet-metallic markings in hindwings, and the terminal joint of palpi with blackish anterior edge and without subapical ring.

Brenthia strophalora, n. sp.

♀. 10 mm. Head grey. Palpi white, second and terminal joints with dark fuscous basal and supramedian rings. Antennæ dark fuscous dotted with white. Thorax dark fuscous somewhat mixed with grey. Abdomen dark fuscous, segmental margins mixed with whitish. Posterior tibiæ white banded with dark fuscous, tarsi white, apex of first three joints, and last two wholly blackish. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen bowed, somewhat oblique; dark fuscous; a short oblique whitish mark from base of costa; a broad somewhat curved antemedian transverse fascia of whitish suffusion and irroration; an indistinct slight transverse-oval ring of whitish irroration in disc beyond middle, surrounded by some scattered whitish scales, and followed by a patch of whitish irroration extending to costa and terminal fascia; a white costal mark at $\frac{3}{4}$; a black marginal fascia round apex and termen, cut by pale yellowish lines into eight spots, each centred with a brilliant violet-blue-metallic dot: cilia fuscous, with two darker shades, and whitish marks at base

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CHOREUTIDAE

Choreutis dichlora (Meyrick, 1912)
Simaethis pilaria Meyrick, 1912, syn.
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:6

Prochoreutis halimora (Meyrick, 1912)
Simaethis halimora Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:9

Brenthia luminifera Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:34

Brenthia strophalora Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:38

above tornus, and on tips beneath apex. Hindwings fuscous clouded with darker; a whitish antemedian ring in disc; a rather broad light orange-ochreous terminal fascia, not reaching tornus, and becoming very narrow round apex, preceded on this narrow portion by a pale blue-metallic mark edged with some black scales posteriorly, whence a white grey-edged subterminal streak runs through middle of broader portion; cilia grey-whitish, with white antemedian and dark grey subbasal shades, outer portion suffused with dark grey on lower part of termen and a spot beneath apex.

ASSAM, Khasi Hills, in October; one specimen.

Brenthia virginalis, n. sp.

♂. 12 mm. (Head broken.) Forewings rather elongate-triangular, costa slightly arched, apex rounded, termen almost straight, little oblique; dark fuscous, irregularly irrorated with whitish; a transverse-oval whitish ring in disc beyond middle; a black terminal fascia divided into three blotches by slender whitish-fuscous bars, uppermost smallest, other two nearly equal, lowest with three and each of the others with two brilliant violet-metallic terminal dots: cilia grey, with dark fuscous subbasal shade. Hindwings dark fuscous; an oblique-oval whitish ring in disc before middle; a curved inwardly oblique violet-metallic streak from costa towards apex; an undefined lighter subterminal line, becoming white for a short distance towards middle; a violet-metallic streak along upper half of termen, and a shorter one below middle; cilia grey, with dark fuscous basal line, with oblique blackish patches at apex, middle of termen, and tornus, and oblique whitish patches between these.

NATAL, Pinetown, in February (*Leigh*); one specimen.

Brenthia ardens, n. sp.

♀. 10–11 mm. Head, thorax, and abdomen dark fuscous. Palpi white, second and terminal joints each with dark fuscous basal and supramedian rings. Antennæ dark fuscous dotted with white. Posterior tibiæ whitish banded with dark fuscous, tarsi white, apex of three first joints and last two wholly dark fuscous. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen rounded, somewhat oblique; dark fuscous; irregularly sprinkled with whitish, sometimes forming undefined transverse shades and a discal ring; a marginal black fascia running round apex and termen, cut by fine pale ochreous lines into seven or eight spots, each containing a violet-blue-metallic dot: cilia fuscous with two darker shades. Hindwings dark fuscous; a white subterminal streak on discal third; a short violet-blue-metallic mark on apical margin, and a dot on costa above it; cilia greyish with two dark fuscous shades, with more or less whitish-suffused patches above and below middle of termen, and above apex.

ASSAM, Khasi Hills, in October; four specimens.

Brenthia cyanaula, n. sp.

♂ ♀. 11 mm. Head, thorax, and abdomen dark fuscous, margins of patagia with very fine white lines. Palpi white, second and terminal joints with dark fuscous basal and supramedian bands. Posterior tibiæ dark fuscous ringed with white, tarsi white, first three joints with dark fuscous apical rings, two apical joints dark fuscous. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen rounded, somewhat oblique; dark bronzy-fuscous, irregularly irrorated with white; white dots on costa before middle and at ¾; a brown marginal fascia round apex and termen, including eight suboval black spots, each containing a violet-blue-metallic dot: cilia fuscous, with two darker shades. Hindwings dark fuscous; a small round whitish spot in middle of disc; a bright purple-blue-metallic submarginal line before termen throughout; cilia dark fuscous, with patches of whitish suffusion at apex and above and below middle of termen.

BENGAL, Calcutta, Pusa (*Lefroy*); S. INDIA, Coorg, 3500 feet (*Newcome*); in July, August, November, and February, five specimens.

Brenthia carola, n. sp.

♂ ♀. 11–12 mm. Head, thorax, and abdomen dark bronzy-fuscous. Palpi white, second and terminal joints each with basal and supramedian dark fuscous bands. Antennæ dark fuscous dotted with white. Posterior tibiæ dark fuscous ringed with white, tarsi white, first three joints with apex dark fuscous, two apical joints wholly dark fuscous. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen rounded, somewhat oblique; dark purplish-fuscous more or less irrorated with whitish; a terminal fascia, of which upper half is brown including a blackish apical blotch marked with a violet-blue-metallic dot on upper anterior angle and another on lower margin, lower half blackish, marked with a violet-metallic dot on upper edge and another below its middle: cilia fuscous, with a dark fuscous basal line, towards middle of termen obscurely barred with whitish. Hindwings dark fuscous; an oblique white wedge-shaped mark in disc at ¾, above and beneath which are brilliant blue marks; a brilliant blue almost marginal line on upper half of termen; cilia dark fuscous, beneath middle of termen with an oblique whitish patch.

ASSAM, Khasi Hills, in October and November; sixteen specimens.

Brenthia paranympha, n. sp.

♂ ♀. 7–8 mm. Head bronzy. Palpi white, second and terminal joints with basal and supramedian dark fuscous rings. Antennæ dark fuscous dotted with white. Thorax and abdomen dark fuscous. Posterior tibiæ white banded with dark fuscous, tarsi

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CHOREUTIDAE

Brenthia virginalis Meyrick, 1912
South Africa: Natal, Pinetown

Brenthia ardens Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:25
Diakonoff (1986), 76, pl. 2, f. 12

Litobrenthia cyanaula (Meyrick, 1912)
Brenthia cyanaula Meyrick, 1912
India: Tamil Nadu, Coorg, Dibidi
Fig.: Clarke (1969), 6:29

Litobrenthia carola (Meyrick, 1912)
Brenthia carola Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:25
Diakonoff (1986), 83, pl. 2, f. 16

Brenthia paranympha Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:37

white, first three joints with dark fuscous apical rings, last two wholly dark fuscous. Forewings elongate-triangular, costa gently arched, apex rounded-obtuse, termen slightly rounded, somewhat oblique; dark fuscous, irregularly and variably irrorated with whitish or pale brownish, sometimes indicating obscure transverse shades and discal ring; three irregular blackish terminal spots partially suffused and surrounded with irregular fulvous markings, first forming a streak round apex marked with two round white dots, second on middle of termen, marked posteriorly with a small violet-golden-metallic spot, third above tornus, including a golden-metallic dot: cilia ochreous-fuscous, with obscure whitish median line preceded by a darker fuscous line. Hindwings dark fuscous; an oblique grey-whitish ring in disc; a curved inwardly-oblique violet-metallic streak from costa at $\frac{3}{4}$; a violet-metallic subterminal line on lower $\frac{2}{3}$ of wing, its extremities whitish; a violet-metallic streak round apex; cilia dark fuscous, with oblique patches of whitish suffusion at apex and above and below middle.

Assam, Khasi Hills, from December to March; twelve specimens.

Choreutis moniligera, n. sp.

♂. 10–12 mm. Head and thorax dark fuscous sprinkled with whitish. Palpi with tuft of second joint formed of two whorls of long projecting dark fuscous white-tipped scales, terminal joint dark fuscous sprinkled with white. Antennæ white ringed with black. Abdomen rather dark fuscous. Forewings rather elongate-triangular, costa moderately arched, apex rounded-obtuse, termen rounded, somewhat oblique; dark fuscous, markings formed of whitish irroration; two transverse shades towards base; first line very irregularly and strongly radiate-dentate throughout; a transverse linear mark in disc beyond middle; second line slender, forming a white dot on costa, in disc forming a quadrate loop outwards, its outer side sinuate; a very irregular subterminal shade near beyond this; terminal edge irrorated with whitish: cilia fuscous, round apex and upper half of termen with basal fourth marked with small sharp black and white chequers. Hindwings rather dark fuscous; two indistinct whitish more or less widely interrupted lines towards termen on dorsal $\frac{2}{3}$; cilia whitish-fuscous, with dark fuscous subbasal and postmedian lines.

Assam, Khasi Hills, in November; three specimens. Distinguished from all species of the genus by the peculiar markings at base of cilia of forewings.

Choreutis hestiarcha, n. sp.

♂ ♀. 10–12 mm. Head and thorax ochreous-bronzy. Palpi mixed with white and dark fuscous, second joint with a band of ochreous suffusion, tuft long and rough. Antennæ white ringed with black, cilia in ♂ 2. Abdomen dark fuscous. Forewings elongate-triangular, costa gently arched, apex obtuse, termen rounded, rather oblique; dark fuscous, posterior third and sometimes base more or less suffused with fulvous; an irregular indistinct pale brassy-blue-metallic transverse line towards base; first and second lines pale brassy-blue-metallic, irregular, interrupted, forming white dots on costa, first rather curved, followed by a broad irregular fascia of white irroration except towards costa, second angulated in disc; an oblique brassy-blue-metallic mark from costa at $\frac{4}{5}$; a streak of violet-silvery-metallic irroration along termen: cilia white with dark fuscous basal and postmedian shades. Hindwings dark fuscous; cilia as in forewings.

Assam, Khasi Hills, from July to October; six specimens.

Choreutis philonyma, n. sp.

♂. 12 mm. Head, thorax, and abdomen dark bronzy-fuscous. Palpi black sprinkled with white, second joint with long rough tuft. Antennæ white ringed with black, ciliations 4. Forewings elongate, posteriorly somewhat dilated, costa slightly arched, apex obtuse, termen slightly rounded, oblique; dark bronzy-fuscous, posterior third suffused with fulvous; basal area with some scattered pale blue-metallic scales; a white dot on costa at $\frac{2}{5}$, beneath which is an elongate patch of pale blue-metallic suffusion, and between this and dorsum an irregular fascia of white irroration; two minute white dots transversely placed in disc at $\frac{2}{3}$; second line pale blue-metallic, forming a white dot on costa, angulated above middle and dentate outwards at $\frac{3}{4}$; a series of several pale blue-metallic dots before termen on upper half; some scattered whitish scales along termen: cilia white, with dark fuscous basal and postmedian shades. Hindwings dark fuscous; a short white linear mark on tornal margin; cilia as in forewings.

Ceylon, Hakgala, in February (*Green*); one specimen.

Choreutis argyrota, n. sp.

♂ ♀. 10–11 mm. Head and thorax dark fuscous, more or less sprinkled with white. Palpi with whorls of dark fuscous white-tipped scales, tuft of second joint short. Antennæ white ringed with black. Abdomen dark fuscous, segmental margins silvery. Forewings elongate-triangular, costa gently arched, apex obtuse, termen rounded, rather oblique; dark bronzy-fuscous more or less suffusedly mixed with blackish; a silvery-metallic transverse line towards base; first line silvery-metallic, interrupted in middle, forming a white dot on costa; an irregular undefined median fascia of silvery-white irroration; second line violet-silvery-metallic, forming a white dot on costa, obtusely angulated in middle, interrupted near dorsum; an oblique violet-silvery-metallic mark from a white dot on costa at $\frac{4}{5}$; an irregular more or less interrupted or incomplete violet-silvery-metallic line before termen:

CHOREUTIDAE

Brenthia moniligera (Meyrick, 1912)
Choreutis moniligera Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:46

Prochoreutis hestiarcha (Meyrick, 1912)
Choreutis hestiarcha Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:45
Diakonoff (1986), 140, pl. 6, f. 48

Prochoreutis sehestediana (Fabricius, 1777)
Choreutis philonyma Meyrick, 1912
Sri Lanka: Hakgala
Fig.: Clarke (1969), 6:49
Diakonoff (1986), 110, pl. 4, f. 29
Hosts: *Scutellaria* (Labiatae)

Prochoreutis argyrota (Meyrick, 1912)
Choreutis argyrota Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:44
Meyrick (1914), 164: pl. 1, f. 7

cilia white, with dark fuscous basal and postmedian lines, and apical, median, and tornal patches. Hindwings dark fuscous; cilia white, with dark fuscous basal and postmedian lines, and apical patch.

Assam, Khasi Hills, from July to November; ten specimens.

Choreutis antiptila, n. sp.

♂. 13 mm. Head and thorax rather dark fuscous, sprinkled with whitish. Palpi dark fuscous mixed with whitish, tuft of second joint moderate, terminal joint with median scale-projection posteriorly. Antennæ dark fuscous spotted with white. Abdomen dark fuscous. Forewings elongate-triangular, costa moderately arched, apex obtuse, termen rounded, rather oblique; dark fuscous; three curved shades of violet-whitish irroration on basal area; first line represented by a lighter fuscous shade irrorated with whitish, sinuate, forming a white dot on costa; second line formed of violet-white irroration, very undefined, thick, obtusely angulated above middle and broken inwards towards dorsum, forming a white dot on costa; a thick shade of violet-whitish irroration from a white dot on costa at $\frac{4}{5}$ to tornus; some irregular violet-whitish irroration along termen: cilia shining greyish, with dark fuscous subbasal line, beneath apex and above tornus whitish-tinged. Hindwings dark fuscous; a streak of whitish irroration from disc at $\frac{3}{4}$ to tornus; a small patch of whitish irroration on middle of termen; cilia whitish-fuscous, with dark fuscous subbasal line.

China, Hainan I.; one specimen.

Glyphipteryx cultrata, n. sp.

♀. 10 mm. Head and thorax greyish-bronze. Palpi on second and terminal joints with four whorls of dark fuscous white-tipped scales. Forewings elongate, costa gently arched, apex obtuse, termen somewhat sinuate, oblique; rather deep greyish-ochreous-bronze; six white streaks from costa between $\frac{1}{3}$ and apex, edged with dark fuscous and terminated beneath with prismatic-silvery-metallic, first oblique, others gradually less so, first three reaching half across wing, others shorter; a broad ochreous-white oblique lunulate streak from middle of dorsum, reaching nearly to apex of second costal streak; a short violet-golden-metallic black-edged wedge-shaped streak from dorsum before tornus, and a dot beyond its apex; three violet-golden-metallic black-edged dots in a curved series before termen, lowest surmounted by a suffused blackish mark; a round black spot occupying apex: cilia whitish, basal half bronzy, limited with dark fuscous and indented with white beneath apex, above apex with a dark fuscous hook. Hindwings rather dark fuscous; cilia grey.

Assam, Khasi Hills, in April; one specimen.

Glyphipteryx stilata, n. sp.

♂. 7 mm. Head and thorax shining light bronzy-grey. Palpi with four whorls of grey white-tipped scales. Forewings elongate, rather narrow, costa gently arched, apex obtuse-pointed, termen somewhat sinuate, very oblique; shining greyish-bronze, suffused with pale dull orange-ochreous on posterior half; a strongly curved oblique white streak from middle of dorsum, reaching half across wing to disc at $\frac{2}{3}$, upper portion very slender, towards dorsum broadly dilated and suffused posteriorly, edged with dark fuscous anteriorly; five white anteriorly black-edged streaks from costa, first beyond middle, first two oblique, reaching half across wing, others very short, wedge-shaped; short silvery-whitish partially dark-edged marks from before and beyond tornus; a small black apical spot: cilia greyish, beneath apex whitish with two slender grey bars. Hindwings dark grey; cilia grey.

Ceylon, Maskeliya, in February (*Pole*); one specimen.

Glyphipteryx aerifera, n. sp.

♀. 11 mm. Head and thorax shining bronze. Palpi on basal and second joints with three whorls of black white-tipped scales, terminal joint white with black anterior and interior streaks. Abdomen grey. Forewings elongate, costa gently arched, apex tolerably pointed, termen somewhat rounded, rather strongly oblique; bright shining bronze; markings pale golden-metallic; five slender streaks from costa, first from middle, short, oblique, indistinct, others edged with a few blackish scales, second and third rather oblique, reaching half across wing, fourth and fifth short, transverse; a transverse mark from tornus, not reaching half across wing, lying between second and third costal streaks and not meeting either; small spots on termen above and below middle: cilia bronzy, on outer half grey, with pale golden-metallic basal spots on terminal markings. Hindwings rather dark grey; cilia grey, towards tips paler.

New Zealand, Mt. Ruapehu, 4500 feet, in January (*Hudson*); one specimen.

Glyphipteryx molybdora, n. sp.

♀. 18 mm. Head, palpi, thorax, and abdomen dark bronzy-fuscous; palpi very short. Forewings elongate, rather narrow, posteriorly somewhat dilated, costa slightly arched, apex rounded, termen oblique, faintly sinuate; dark bronzy-fuscous, on posterior $\frac{2}{3}$ irrorated with light yellowish; markings shining bluish-leaden-grey; narrow transverse fasciæ at $\frac{1}{4}$ and middle; a patch of blackish suffusion in disc beyond middle; a narrow sinuate fascia from $\frac{2}{3}$ of costa towards tornus, not reaching it; three small spots on costa posteriorly, second largest and transverse; a roundish spot on termen beneath apex; an elongate mark along lower half

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CHOREUTIDAE

Choreutis antiptila Meyrick, 1912
China: Hainan Id.
Fig.: Clarke (1969), 6:41
Diakonoff (1986), 212, pl. 10, f. 83

GLYPHIPTERIGIDAE

Glyphipterix cultrata Meyrick, 1912
Glyphipteryx [sic] *cultrata* Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:65

Glyphipterix stilata Meyrick, 1912
Glyphipteryx [sic] *stilata* Meyrick, 1912
Sri Lanka: Maskeliya
Fig.: Clarke (1969), 6:82

Glyphipterix aerifera Meyrick, 1912
Glyphipteryx [sic] *aerifera* Meyrick, 1912
New Zealand: Mt. Ruapehu
Fig.:

Carmentina molybdora (Meyrick, 1912)
Glyphipteryx [sic] *molybdora* Meyrick, 1912
Sri Lanka: Pundaloya
Fig.: Clarke (1969), 6:70

of termen: cilia bronzy-greyish, with indistinct dark fuscous shade (imperfect). Hindwings dark fuscous; cilia greyish.

CEYLON, Pundaloya, in November (*Green*); one specimen, not in good condition.

Glyphipteryx tripedila, n. sp.

♂. 12 mm. Palpi short. Forewings elongate, rather dilated posteriorly, costa posteriorly moderately arched, apex obtuse, termen slightly sinuate, oblique; dark fuscous irregularly mixed with fulvous; a curved median transverse series of about six violet-leaden-metallic dots edged with dark fuscous suffusion; two angulated posterior series of similar dots, second consisting of a subconfluent series from $\frac{4}{5}$ of costa to termen beneath apex, and two dots near termen below middle; apical area beyond this fulvous, enclosing a small black apical spot: cilia shining grey. Hindwings dark fuscous; cilia fuscous.

ASSAM, Khasi Hills, in April; one specimen.

Epicroesa calliteucha, n. sp.

♀. 8–9 mm. Head and thorax shining dark purple-fuscous. Palpi grey. Antennæ dark grey, extreme apex whitish. Abdomen dark fuscous. Forewings elongate, costa slightly arched, apex obtuse, termen obliquely rounded; shining golden-ochreous; a shining deep purple basal patch edged with blackish, occupying nearly $\frac{1}{3}$ of wing; a narrow straight shining greyish-purple fascia slightly before middle, edged with black anteriorly, and posteriorly followed by a rather broad dark fuscous band; a curved transverse prismatic-golden-metallic black-edged streak from $\frac{2}{3}$ of costa to tornus, followed by a blackish patch on lower part of termen; two transverse violet-golden-metallic black-edged marks from costa towards apex, second almost apical: cilia bronzy, on upper part of termen whitish with a black basal line. Hindwings with 5 absent; dark fuscous; cilia rather dark fuscous.

NEW GUINEA, Tenimber Is., in July; two specimens.

Heliodines perichalca, n. sp.

♂. 11–12 mm. Head and thorax shining bronzy-grey-metallic. Palpi grey-whitish. Antennæ dark grey. Abdomen orange, towards base and apex shining dark grey. Forewings elongate, very narrow, costa slightly sinuate, apex pointed, termen extremely obliquely rounded; bright deep orange; markings shining metallic violet-bronzy-grey; a slender basal fascia, dilated and centred with black on costa; a narrow sinuate transverse fascia at $\frac{1}{4}$, partially edged with some black scales; a spot on middle of costa, partially edged with black laterally; a streak from near beyond this along costa, and another from middle of dorsum along dorsum and termen, both running to apex and meeting there: cilia fuscous. Hindwings dark grey; cilia fuscous.

NEW MEXICO, Las Vegas, in July; two specimens.

ACTINOSCELIS, n. g.

Head smooth, forehead forming a raised fillet, face retreating; ocelli absent; tongue very short. Antennæ $\frac{2}{3}$, in ♂ with long fine ciliations, basal joint elongate, flatly dilated with scales. Labial palpi very short, drooping, slender, pointed. Maxillary palpi absent. Posterior tibiæ smooth, with radiating whorls of extremely long fine bristles at origin of spurs, apex of long inner spurs terminating in whorls of bristles, apex of tarsal joints also with similar radiating whorls. Hindwings $\frac{1}{2}$, linear, cilia 6. Neuration not properly determinable, but may be assumed to resemble *Corsocasis* in type, perhaps with some reduction.

Actinoscelis irina, n. sp.

♂. 7 mm. Head and thorax shining violet-bronze, face bright silvery-metallic. Palpi silvery-white. Antennæ dark fuscous. Abdomen dark grey, base and under surface silvery-white. Forewings very narrowly elongate, costa somewhat sinuate, apex long-pointed, acute; violet-fuscous; a moderate longitudinal grey-whitish streak in disc beyond middle, and a similar one along dorsum beneath it: cilia violet-fuscous. Hindwings dark fuscous; cilia shining violet, on costa deep indigo.

BOMBAY, Kanara, in December (*Maxwell*): one specimen.

CORSOCASIS, n. g.

Head smooth; ocelli present; tongue short. Antennæ $\frac{1}{2}$, in ♂ shortly ciliated, basal joint moderate, without pecten. Labial palpi moderate, curved, ascending, second joint loosely scaled beneath, terminal joint as long as second, transversely compressed, pointed. Maxillary palpi rudimentary. Posterior tibiæ with scattered bristles above, and whorls of bristly projecting scales at origin of spurs. Forewings with 2 from towards angle, 7 to termen, 9 and 10 from near 8, 11 from middle. Hindwings $\frac{3}{4}$, very elongate-ovate, cilia 2; 3 and 4 connate, 5 parallel, 6 and 7 somewhat approximated towards base.

Corsocasis coronias, n. sp.

♂ ♀. 8–12 mm. Head, palpi, antennæ, thorax, and abdomen dark purplish-bronzy-grey, second joint of palpi whitish. Forewings elongate, narrow, posteriorly somewhat dilated, costa sinuate, apex obtuse-pointed, termen very obliquely rounded; dark purplish-bronzy-fuscous: cilia fuscous. Hindwings dark fuscous; cilia fuscous.

GLYPHIPTERIGIDAE

Glyphipterix tripedila Meyrick, 1912
Glyphipteryx [sic] *tripedila* Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Clarke (1969), 6:85

HELIODINIDAE

Epicroesa calliteucha Meyrick, 1912
Indonesia: Tanimbar Is.

Heliodines perichalca Meyrick, 1912
USA: New Mexico, Las Vegas
Fig.: Meyrick, (1914), 165: pl. 2, f. 21

Actinoscelis Meyrick, 1912
Type-sp.: *Actinoscelis irina* Meyrick, 1912

Actinoscelis irina Meyrick, 1912
India: Bombay, Kanara

Corsocasis Meyrick, 1912
Type-sp.: *Corsocasis coronias* Meyrick, 1912

Corsocasis coronias Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Meyrick, (1914), 165: pl. 2, f. 30

ASSAM, Khasi Hills, from September to November; S. INDIA. Coorg, 3500 feet, in May (*Newcome*); CEYLON, Maskeliya, in March (*Pole*); fourteen specimens.

THRASYDOXA, n. g.

Head with appressed scales; ocelli present; tongue absent. Antennæ $\frac{4}{5}$, scaled, in ♂ simple, basal joint moderate. Labial palpi moderate, slightly curved, porrected, loosely scaled beneath, terminal joint much shorter than second, pointed. Maxillary palpi obsolete. Posterior tibiæ clothed with rough hairs above. Forewings with 2 from towards angle, 6 absent, 7 to termen, 11 from beyond middle. Hindwings $\frac{2}{3}$, elongate, round-pointed, cilia $1\frac{1}{2}$; 3 and 4 remote, 5 and 6 rather approximated towards base, 7 nearly parallel.

Thrasydoxa tyrocopa, n. sp.

♂. 17 mm. Head, palpi, antennæ, thorax, and abdomen dark fuscous. Fore wings elongate, narrow, posteriorly rather dilated, costa slightly sinuate, posteriorly arched, apex obtuse, termen very obliquely rounded; dark bronzy-fuscous; a semi-oval whitish-ochreous blotch extending along dorsum from near base to beyond middle, and reaching half across wing: cilia dark fuscous. Hindwings dark fuscous; a suffused whitish-ochreous streak along termen from near base to near middle of wing; cilia rather dark fuscous.

COLOMBIA, San Antonio, 5800 feet, in November; one specimen.

AMPHICLADA, n. g.

Head smooth; ocelli absent; tongue absent. Antennæ $\frac{5}{6}$, basal joint elongate. Labial palpi moderate, almost straight, porrected, with appressed scales, terminal joint shorter than second, pointed. Maxillary palpi rudimentary. Forewings with 1 *b* furcate towards base, 1 *b* and 1 *c* anastomosing towards apex, 2 from towards angle, 4 absent, 7 to apex, 11 from $\frac{4}{5}$ of cell. Hindwings $\frac{3}{4}$, elongate-ovate, cilia $\frac{4}{5}$; 3 and 4 connate, transverse vein absent between 4 and 5, 5 and 6 approximated towards base, 7 parallel.

Amphiclada fervescens, n. sp.

♀. 14 mm. Head, thorax, abdomen, forewings, and hindwings wholly ferruginous. Palpi and antennæ greyish-ochreous.

GRENADA, St. George's, in November; one specimen. In one forewing of this example the apex of vein 1 *c* is by an abnormality furcate, so that its combination with 1 *b* appears to terminate in three branches.

Thriambeutis coryphæa, n. sp.

♀. 22 mm. Head rather dark fuscous, collar reddish-orange. Palpi orange. Antennæ dark purplish-fuscous (tip broken). Thorax reddish-orange. Abdomen blackish, two basal segments reddish-orange. Forewings elongate, very narrow, costa slightly sinuate, apex obtuse, termen very obliquely rounded; reddish-orange; a blackish line running round apical third of costa and continued round termen to middle of dorsum: cilia blackish. Hindwings blackish-fuscous; basal $\frac{2}{5}$ reddish-orange; cilia dark fuscous, with blackish basal line, on dorsum reddish-orange.

PHILIPPINES, Mindoro, Baco R., in February (*Mounsey*); one specimen.

TRICHOTHYRSA, n. g.

Head smooth; ocelli present; tongue short. Antennæ nearly 1, in ♂ biciliated with long fascicles, basal joint moderate, without pecten. Labial palpi short, slender, slightly curved, porrected, second joint loosely scaled beneath, terminal joint as long as second, pointed. Maxillary palpi rudimentary. Posterior tibiæ smooth, with whorls of projecting bristly scales at origin of spurs, and at apex of first tarsal joint. Forewings with 2 from towards angle, 7 to termen, 9 and 10 from near 8, 11 from middle. Hindwings under 1, very elongate-trapezoidal, apex obtuse, termen rounded, cilia 1; 3 and 4 connate, 5 parallel, 6 and 7 somewhat approximated towards base.

Type *T. flammivola*.

Trichothyrsa coridarcha, n. sp.

♀. 16–17 mm. Head dark purplish-bronzy; collar, thorax, and abdomen reddish-orange. Palpi orange. Antennæ dark fuscous, apical half whitish. Forewings elongate, narrow, posteriorly slightly dilated, costa sinuate, apex obtuse, termen very obliquely rounded; reddish-orange; a suffused black line round termen and posterior portion of costa and dorsum: cilia blackish-grey. Hindwings reddish-orange; a suffused black streak running along posterior $\frac{3}{5}$ of costa and round termen to before middle of wing, with projections along veins 5 and 6; cilia dark grey, round tornus and dorsum reddish-orange.

ASSAM, Khasi Hills, in September and October; six specimens.

Trichothyrsa flammivola, n. sp.

♂. 16 mm. Head, thorax, and abdomen deep reddish-orange. Palpi orange, terminal joint mixed with blackish. Antennæ dark purple-fuscous, ciliations long. Forewings elongate, very narrow, posteriorly hardly dilated, costa sinuate, apex obtuse, termen very obliquely rounded; deep reddish-orange; a very slender suffused

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HELIODINIDAE

Thrasydoxa Meyrick, 1912
Type-sp.: *Thrasydoxa tyrocopa* Meyrick, 1912

Thrasydoxa tyrocopa Meyrick, 1912
Colombia: San Antonio
Fig.: Meyrick (1914), 165: pl. 2, f. 24

Amphiclada Meyrick, 1912
Type-sp.: *Amphiclada fervescens* Meyrick, 1912

Amphiclada fervescens Meyrick, 1912
Grenada: St. George's

Thriambeutis coryphaea Meyrick, 1912
Philippines: Mindoro, Rio Baco
Fig.: Meyrick (1914), 165: pl. 2, f. 27
Diakonoff (1968), 213, f. 691

Trichothyrsa Meyrick, 1912
Type-sp.: *Trichothyrsa flammivola* Meyrick, 1912

Trichothyrsa coridarcha Meyrick, 1912
India: Meghalaya, Khasi Hills
Fig.: Meyrick (1914), 165: pl. 2, f. 28

Trichothyrsa flammivola Meyrick, 1912
India: Karnataka, Coorg

blackish streak along posterior half of dorsum and termen: cilia dark grey. Hindwings reddish-orange; posterior half purple-blackish, sending projections inwards along costa and dorsum; cilia dark grey, on upper half of termen suffused with whitish, on dorsum reddish-orange.

S. INDIA, Coorg, 3500 feet, in December (*Newcome*); one specimen.

Trichothyrsa taedifera, n. sp.

♀. 20 mm. Head and thorax reddish-orange. Palpi ochreous, terminal joint mixed with dark fuscous. Antennæ dark fuscous, towards tips whitish. Abdomen dark fuscous. Forewings elongate, very narrow, posteriorly somewhat dilated, costa sinuate, apex obtuse, termen very obliquely rounded; deep reddish-orange; costal area anteriorly irrorated with blackish, on posterior half of costa becoming a rather broad irregular blackish streak continued round termen to tornus, and forming an elongate prætornal patch on dorsum, projecting inwards in disc to middle: cilia dark grey. Hindwings reddish-orange; posterior half purple-blackish, sending projections inwards along costa and dorsum; cilia dark grey.

CEYLON, Pundaloya, in November (*Green*); one specimen.

Trichothyrsa pyrrhocoma, n. sp.

♂. 15 mm. Head reddish-ochreous. Palpi pale ochreous, terminal joint mixed with dark fuscous. Antennæ dark purple-fuscous, towards apex whitish, ciliations very long. Thorax and abdomen dark fuscous. Forewings elongate, narrow, slightly dilated posteriorly, costa somewhat sinuate, apex obtuse, termen very obliquely rounded; dark purple-fuscous: cilia grey, tips whitish. Hindwings dark fuscous; cilia as in forewings.

CEYLON, Pundaloya (*Green*); two specimens.

Trichothyrsa grypodes, n. sp.

♂ ♀. 14–16 mm. Head ochreous, sometimes partially infuscated. Palpi whitish-ochreous; maxillary palpi somewhat more developed than in the other species. Antennæ grey, becoming pale greyish-ochreous towards base, ciliations in ♂ very long. Thorax purplish-fuscous. Abdomen ochreous. Forewings elongate, narrow, posteriorly slightly dilated, costa sinuate, apex obtuse, termen sinuate, oblique; dark purplish-fuscous, usually more or less irrorated with pale ochreous, especially round discal spot; a dark fuscous spot in disc at $\frac{2}{3}$: cilia rather dark fuscous, on median third of termen ochreous-whitish except towards base. Hindwings dark fuscous; cilia fuscous, darker towards base, on median area of termen whitish-tinged except towards base.

S. INDIA, Palni Hills, 6000 feet (*Campbell*); five specimens.

ELECTROGRAPHA, n. g.

Head smooth; ocelli present; tongue short. Antennæ $\frac{1}{2}$, in ♂ shortly ciliated, basal joint moderate, without pecten. Labial palpi moderate, curved, ascending, transversely compressed, with whorls of scales, terminal joint shorter than second, pointed. Maxillary palpi rudimentary. Posterior tibiæ smooth, spurs roughened with scales above. Forewings with 1 *b* simple, 2 from $\frac{3}{4}$, 3 from angle, 4 and 5 widely remote, 7 to apex, 7 and 8 closely approximated at base, 11 from before middle. Hindwings $\frac{4}{5}$, trapezoidal-ovate, cilia $\frac{3}{4}$; 3 and 4 connate, 5–7 considerably approximated towards base.

A development of *Glyphipteryx*.

Electrographa thiolychna, n. sp.

♂. 13 mm. Head and thorax dark indigo-fuscous. Palpi with whorls of blackish white-tipped scales, apex streaked with black and white. Abdomen dark fuscous. Forewings elongate, somewhat dilated posteriorly, costa gently arched, apex rounded, termen obliquely rounded; glossy dark indigo-fuscous; a hardly sinuate transverse whitish line beyond $\frac{1}{3}$, thickened and more conspicuous on dorsal half; a pale greenish-blue-metallic somewhat oblique striga from costa at $\frac{3}{5}$, not reaching half across wing; a pale greenish-blue metallic dot on costa at $\frac{3}{4}$, and a curved striga from just beyond this to termen beneath apex: cilia dark fuscous, round apex with pale basal and median lines. Hindwings and cilia dark fuscous.

BURMA, Momeit; one specimen.

EUCOSMIDÆ.

Argyroploce archimedias, n. sp.

♂ ♀. 13–15 mm. Head, palpi, and thorax light brown, thoracic crest dark red-brown. Abdomen grey, anal tuft of ♂ pale greyish-ochreous. Posterior tibiæ ochreous-whitish. Forewings elongate-triangular, costa gently arched, apex obtuse, termen rounded, little oblique; rosy-ochreous strigulated with grey; costa shortly strigulated with dark fuscous, extreme edge whitish; markings deep red-brown, partially finely edged with white; a triangular blotch on dorsum about $\frac{1}{3}$, reaching more than half across wing; central fascia moderately broad, oblique, suffused anteriorly, well-defined and rather irregular posteriorly, becoming obsolete towards dorsum and only traceable on posterior edge; a rounded blotch resting on middle of termen, deepest and white-edged only on upper half: cilia brown, whitish-sprinkled, with crimson-brown basal shade on upper part of termen. Hindwings with tornus in ♂ somewhat prominent, dark grey; cilia grey, towards tips whitish, with dark grey subbasal shade.

CHINA, Hongkong; three specimens.

HELIODINIDAE

Trichothyrsa taedifera Meyrick, 1912
Sri Lanka: Pundaloya

Trichothyrsa pyrrhocoma Meyrick, 1912
Sri Lanka: Pundaloya

Trichothyrsa grypodes Meyrick, 1912
India: Tamil Nadu, Palni Hills

GLYPHIPTERIGIDAE

Electrographa Meyrick, 1912
Type-sp.: *Electrographa thiolychna* Meyrick, 1912

Electrographa thiolychna Meyrick, 1912
Myanmar: Momeit
Fig.: Clarke (1969), 6:53

TORTRICIDAE

Olethreutes purpurissatana (Kennel, 1901)
Argyroploce archimedias Meyrick, 1912
China: Hong Kong

INDEX TO *EXOTIC MICROLEPIDOPTERA*, Part 1

LOCALITIES

HOSTS

ATLAS OF NORTH AMERICAN LEPIDOPTERA
Checklist: Part 1. Papilionidae

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There have been several catalogs for North American Lepidoptera, the most recent being that of Hodges *et al.* (1983). Most all such catalogs have used the Mexican border with the United States as the southern boundary, even though true Nearctic biota continues into the central plateau of Mexico: too little was known of the northern Mexican fauna to adequately add it to northern catalogs. The political boundary, thus, has been a convenient stopping point. Today, the northern Mexican fauna still remains relatively poorly surveyed. The present catalog likewise involves only the area north of Mexico, but does include stray species that will be found in the border regions from time to time. Inasmuch as parts of this new catalog to Nearctic Lepidoptera are still being finished, it should be of useful to users to have parts of it available in turn until all can be combined into one publication. Thus, the present part on Papilionidae is the first installment for the butterfly volume.

The catalog section herein includes a basic index so species names can be found more easily. Unlike previous catalogs that were numbered consecutively, either starting with butterflies, or more recently with the most primitive moths, or even unnumbered as is the format preferred by some, the present catalog will have each family numbered separately as standard format for the series. Although some have criticized this numbering system, I believe their criticisms stem mainly from the lack of interest in new techniques: when using species numbers prefixed with the family number in a general index, one can then easily determine what family each belongs to merely by scanning the number for each name (this is facilitated once some of the main family numbers are remembered, like 95 for Papilionidae, etc.). We now have fairly well stabilized families in Lepidoptera (although it is still possible some new families may turn up in more remote tropical faunas), so using family numbers enhances the index: of course, in a single section where only one family is treated, as is the case here, this becomes superfluous, but once the species names are combined with those from other families in the general index, the purpose becomes obvious.

The present catalog presents our most current knowledge for the species involved. Undoubtedly many specialists will have personal preferences nonetheless, as to where certain species go or to what genera they may belong: considerable study yet remains to be done before all specilists can agree on a genuine consensus of these questions. However, I believe we are closer to such a consensus than perhaps 20 or 30 years ago. Even so, specialists also have varying opinions on what a species is and what parameters genera should have, what theory of classification one should use (phylogenetic, cladistic, even theological!, etc.), whether to arrange species alphabetically or phylogenetically to nearest relatives, and so forth: thus, these conflicts also make it difficult to have full consensus on a catalog. Hopefully, the present catalog is closer to the truth, at least as far as the species are concerned.

In my view, genera should not be split too much or else one loses the value of generic names. For example, in birds it has come to be that almost every species is in a different genus: one can do this in all groups, but the question becomes whether this is useful in understanding the evolution of the group when classified in this way. Since my specialty is with moths, I have taken the parameters of what most taxonomists for moths think of as a genus and applied this throughout the order and, consequently, not all generic splitting currently fashionable among the butterflies is followed herein. I purposely use the word "fashionable" not in a derogatory manner, but to induce the knowledge to the reader that generic splitting and lumping, when extreme, are actually like changes in social fashions. Currently, there is considerable splitting going on that was not the case perhaps 35 years ago: not that we want to revert to classifications of 1965, just that the understanding of what a reasonable generic limit is should be adhered to for all Lepidoptera, not broadly for moths and narrowly for butterflies. For example, one can take the case of some of the "genera" adopted among the swallowtails as a case in point: some specialists use generic names that I view as "subgenera" of subgenera. The groupings in such cases among other families would be shown as well by the use of species-groups (or subgenera), rather than formal generic names, but some specialists do not like using species-group names (or subgenera), so they just subjectively elevate these groups to genera.

Classification opinions, thus, still are with us, even if the species are more clearly defined than in the past. Thus, one can understand the difficulties in having a consensus about any larger group like Papilionidae. The same is true with subspecies, where one specialist names every local population as a different subspecies and another specialist names subspecies only over very large regions and where they are truly isolated geographically (which actually is the standard definition of a subspecies: merging subspecies, or "subspecies" within the range of another subspecies, is a kind of misnomer and does not involve subspecies but only geographic forms). Herein, subspecies are retained where they are clearly in different areas, although sometimes this can involve many names when a species is distributed in a region as complex topographically as California, for example. Subspecies need not actually be named in any case and their naming should be mainly to facilitate talking about each population, although obviously these populations also differ slightly genetically and over time may diverge, eventually even becoming separate species if they lose contact with each other. In the catalog, I have tried to maintain consistancy throughout. For those wishing to use every available name that could be considered a subspecies by some, various population names are listed which in past catalogs have been listed as full subspecies (more notes on this below). These questions of subspecies mainly involve butterflies, since among the moths few specialists have named subspecies even for widespread species.

After this series of part publication of the Nearctic catalog is completed, the full catalog will be combined into one book, together with a complete index and bibliography to the pertinent literature. Since studies continue daily among numerous researchers, the final version may well be altered here and there as new data (even new species) are added.

The current classification for butterflies (Papilionoidea) is shown on the following page in overview down to tribal level for the world fauna (a number of groups listed are not Nearctic). Some authorities still split away the skippers as a separate superfamily, Hesperioidea, but I find the differences between the two groups to be more accurately demonstrated by the use of the "series" category below the superfamily level, thus Hesperiiformes and Papilioniformes. The family numbers from the entire Lepidoptera classification are noted, going from 94 to 100 for butterflies.

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PAPILIONOIDEA

Series Hesperiiformes

94. HESPERIIDAE - Skipper Butterflies
- Coeliadinae
- Pyrrhopyginae
- Pyrginae
  - Eudamini
  - Pyrgnini
- Trapezitinae
- Heteropterinae
- Megathyminae
  - Aegialini
  - Agathymini
  - Megathymini
- Hesperiinae

Series Papilioniformes

95. PAPILIONIDAE - Swallowtail Butterflies
- Baroniinae
- Parnassiinae
  - Parnassiini
  - Zerynthiini
- Papilioninae
  - Troidini
  - Graphiini
  - Leptocircini
  - Teinopalpini
  - Papilionini

96. PIERIDAE - Yellow-White Butterflies
- Pseudopontiinae
- Dismorphiinae
  - Leptideini
  - Dismorphiini
- Pierinae
  - Pierini
  - Anthocharini
- Coliadinae
  - Colotini
  - Coliadini
  - Gonepterygini

97. LYCAENIDAE - Gossamer-Winged Butterflies
- Lipteninae
  - Pentilini
  - Liptenini
- Poritiinae
- Liphyrinae
- Miletinae
  - Spalgini
  - Lachnocnemini
  - Miletini
  - Curetinae
- Lycaeninae
- Theclinae
  - Eumaeini
  - Luciini
  - Theclini
  - Zesiini
  - Amblypodiini
  - Aphnaeini
  - Iolaini
  - Horagini
- Polyommatinae
  - Lycaenesthini
  - Candalidini
  - Zizeerini
  - Lampidini
  - Everini
  - Lycaenopsini
  - Scolitantiidini
  - Polyommatini

98. RIODINIDAE - Metalmark Butterflies
- Styginae
- Hamearinae
- Euselasiinae
- Corrachiinae
- Riodininae
  - Mesosemiini
  - Eurybiini
  - Riodinini
  - Symmachiini
  - Charitini
  - Helicopini
  - Emesini
  - Lemoniadini
  - Nymphidiini
  - Stalachtini

99. LIBYTHEIDAE - Snout Butterflies

100. NYMPHALIDAE - Brush-Footed Butterflies
- Group Nymphalinina
  - Tellervinae
  - Danainae
    - Danaini
    - Lycoreini
    - Euploeini
  - Ithomiinae
    - Napaeogenini
    - Godyridini
    - Oleriini
    - Ithomiini
    - Mechanitini
    - Dircennini
    - Meliaeini
    - Tithoreini
    - Methonini
  - Acraeinae
    - Acraeini
    - Pardopsini
  - Heliconiinae
    - Heliconiini
    - Argynnini
  - Nymphalinae
    - Nymphalini
    - Melitaeini
    - Neptini
    - Pseudoergolini
    - Euthaliini
    - Catagrammini
    - Limenitidini
    - Biblidini
    - Aegeroniini
    - Coloburini
    - Marpesiini
- Group Satyrinina
  - Calinaginae
  - Apaturinae
    - Apaturini
    - Charaxini
    - Anaeini
    - Zaretini
    - Preponini
    - Prothoini
  - Amathusiinae
  - Morphinae
  - Brassolinae
  - Satyrinae
    - Lethini
    - Satyrini
    - Melanitini
    - Elymniini
    - Mycalesini
    - Ypthimini

EXPLANATIONS OF THE CATALOG

The following notes summarize the format and systematic arrangement of the catalog:

1) Genera are divided into subgenera where it appears subgenera can be used, rather than dividing each group into different genera;

2) All synonyms are listed, including misspellings and infraspecific names (the infraspecific names are technically invalid and need not be listed, but since they are in the literature their listing is needed so users will know what these names refer to);

3) Type localities are abbreviated to standardized codes (see below);

4) Previous catalog numbers in wide usage are noted to the right for each species entry: MONA numbers (Hodges *et al.*, 1983);

5) Subspecies are denoted by a prefix letter (as a, b, etc.) and are listed geographically, as much as possible, from a north to south and east to west arrangement (subspecies not recognized herein are listed in the same geographic fashion, as population names, but not in boldface);

6) Citations to original descriptions, as well as other details and notes, can be found in Miller and Brown (1981).

Species are numbered within each family: this numbering scheme differs from what is familiar for North American catalogs but has advantages in indexing (in Europe, most catalogs list species without any numbering). The index to species, thus, indicates both the family number and the species number: e.g., "**clodius** Ménétriés, Parnassius, 95-2" indicates that the species *P. clodius* is number 2 in family 95, of genus *Parnassius* (Ménétriés is the author of the species name, in parentheses if the name has been recombined with another genus from what the original author placed it in). This numbering method has the salient feature of providing information to the user of the index, once various family numbers are remembered, like 95 being for Papilionidae.

Symbols and abbreviations used in the catalog are noted below. To conserve space, many phrases or place names are abbreviated, as for example, using 2-letter codons for states of the United States when noting type-localities (Canada and Mexico also now use 2-letter codons for their states, but as these are relatively unfamiliar to most residents of the United States, I retain the longer state abbeviations as used in the past for Canadian and Mexican states). Since many of the subspecies are within the ecological range of their type-locality, full ranges are not given. Users can consult recent works on the distribution of North American butterflies (see Opler, 1995; Stanford and Opler, 1993) to verify the full ranges of all species and subspecies.

Classification

The most current taxonomic classifications have been studied to provide the arrangement for this catalog. All major recent works on North America butterflies have been consulted and are listed in the bibliography. The higher classification follows that of recent arrangements, summarized by Heppner (1992, 1995, 1996a,b, 1998a,b): some alternate views are discussed in Kristensen *et al.* (1999). Genera are arranged in a phylogenetic order, from presumed primitive to more advanced groups. Thus, some of the arrangements will be different from what many are familiar with. For example, the Megathyminae are among the more primitive of skippers and should not be at the advanced end of Hesperiidae where they have usually been found in older catalogs. Users will find many other species and genera in new places.

The catalog lists genera without a proliferation of subgenera. Some recent authors have continually split larger genera until one approaches the situation as in birds, where there is nearly one genus for every species. Some newer "genera" among butterflies have even been split off from what previously were considered only subgenera. Such continual splitting of genera is not useful for validating relationships among various species and reduces the cohesive value of the generic level.

Subspecies

The treatment of subspecies herein conforms to a more practical and worldwide approach where named subspecies should only be used for populations clearly demarcated geographically. It is a misnomer to call overlapping populations of differing phenotypes to be distinct "subspecies": these clearly are only forms of various kinds (altitudinal, ecological, hostplant dependent, etc.) and not genetically isolated populations that should be called subspecies.

In North America, the use of subspecies is often questionable for species along the eastern seaboard, where often a number of subspecies have been named over the years (or former aberrational or form names raised to subspecies level) that essentially merge together from north to south (populations in southern Florida being an exception in some cases). Something similar is often found in western species where there are altitudinal forms that have been named, although differences between populations in the cold rainforests of Washington and the deserts of southern California are usually clearly divergent. A related problem involves the proliferation of subspecies names for any phenetically differing population, even when only from various remote mountains or offshore islands: one can get to the point of having names for every major mountain range and then having dozens (perhaps even 100s) of "subspecies" for some of the western species. Clearly, the definition and practical usage of the subspecies category is often warped beyond usefulness and many of these names should be used in reference to populations and not subspecies. One can think of examples among the Parnassiinae, particularly in Europe, where nearly every mountain and valley supports a slightly different phenotype, most of which have been given names: for example, *Parnassius apollo* has perhaps 300 named forms, varieties and subspecies names applied to what is a single highly variable species (some of this naming was instigated in Europe for the commercial purposes of selling new "forms" to collectors who attempted to have complete collections of all varieties).

In the present catalog, the subspecies category is designated with a prefix letter (a, b, c, etc.) and listed generally from north to south, east to west. For those who wish to use every available name for subspecies (names for so-called subspecies generally used in some of the more recent literature), the names are indented below the subspecies level and are not in italics. Thus, the indented names below subspecies level are considered only population names herein (in Roman typeface; names in italics are synonyms). The subspecies that are listed as valid generally only involve those that are clearly geographical isolates, generally over larger regions. In a few cases there are population names listed within each subspecies as further subdivisions for those wanting to use such names. The following is a typical example for a complicated catalog entry with all categories of listed names (all names would have author and date noted):

VANESSA Fabricius, 1807 - genus name, with author and date
Cynthia Fabricius, 1807 - generic synonym

35 **alba** (author, date) (*Nymphalis*) MONA # VA
- species name, with author, date, and original generic combination; MONA catalog number to the right, plus original type locality by state (Virginia in this example), and current Atlas catalog number to the left (as listed under family 100, Nymphalidae, in this example)

a) **alba** - subspecies name (eastern and northern subspecies)
appalachiana - population name (Eastern populations); unrecognized subspecies name listed herein as a population name

b) **albertiana** - subspecies name (Rockies subspecies)
coloradensis - population name (southern Rockies populations)
ruidosalis - synonym, misspelling, or infraspecific name

c) **arizonensis** - subspecies name (western desert subspecies)

36 ***beta** - an extralimital species (asterisk in front) Surinam

a) **nearctica** - North American subspecies

Although the subspecies category is used sparingly, in a few cases names are revived as needed. For example, some southern Florida populations are given names where previously the Cuban or West Indian subspecies names were used in older catalogs: this conforms to the pattern used for other species like that of the Schaus swallowtail, which has a named Florida subspecies while the nominate populations are nearby in Cuba and may not be very much different than what is found in Florida yet are relatively isolated.

Genetics differ for each population, but subspecies names are mainly geographical handles to discern geographically isolated populations of a species. Some of these isolates may in time become sibling species or even full species, thus presenting us with a varied quilt of populations in various degrees of progression from populations to full species: this is what presents such a continual problem in naming various geographical isolates as they evolve over time.

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ABBREVIATIONS

ab.	aberration
auct.	of authors (= misdetermination)
aut. f.	autumn form
emend.	emendation (incorrect emendation)
f.	form
gynand.	gynandromorph
hyb.	hybrid
incorr. spell.	incorrect original spelling (often the use of diacritic marks)
ICZN	International Commission on Zoological Nomenclature (and *International Code of Zoological Nomenclature*)
misid.	misidentified
mispl.	misplaced (generic assignment uncertain or incorrect)
missp.	misspelling
n. comb.	new combination (transfer to another genus)
n. syn.	new synonymy (identical to an older name for the same species, thus becoming a junior name by date priority)
nom. dub.	nomen dubium (= identity uncertain)
nom. nud.	nomen nudum (= undescribed name; an invalid name according to the ICZN due to an insufficient description or lack of a description)
nom. oblit.	nomen oblitum (= forgotten name; unavailable if unused in more than 99 years)
preocc.	preoccupied name (name already published by someone else within the same genus)
redesc.	redescribed name (a second original description)
repl. name	replacement name (for a preoccupied name)
rev. stat.	revised status
[sic]	original misspelling (= lapsus calami)
spr. f.	spring form
sum. f.	summer form
suppr.	suppressed (in a rejected work according to ICZN)
teste	"verified" by expert study
unassoc.	unassociated female or male
unavail.	unavailable name (by ICZN article)
uncert. stat.	status uncertain
var.	variety
wint. f.	winter form
*	prefix for extralimital taxa (usually for species for which there are local subspecies)
"	"and" (used to separate two or more localities where a lectotype has not been chosen to restrict the type locality)

CANADA

Alberta	Alb	Northwest Terr.	NWT
British Columbia	BC	Nova Scotia	NS
Labrador	Lab	Nunavut	Nun
Manitoba	Man	Prince Edward Is.	PEI
Ontario	Ont	Quebec	Que
New Brunswick	NB	Saskatchewan	Sask
Newfoundland	Nfld	Yukon	Yuk

UNITED STATES

Alabama	AL	Kentucky	KY	North Dakota	ND
Alaska	AK	Louisiana	LA	Ohio	OH
Arizona	AZ	Maine	ME	Oklahoma	OK
Arkansas	AR	Maryland	MD	Oregon	OR
California	CA	Massachusetts	MA	Pennsylvania	PA
Colorado	CO	Michigan	MI	Rhode Island	RI
Connecticut	CT	Minnesota	MN	South Carolina	SC
Delaware	DE	Mississippi	MS	South Dakota	SD
District of Columbia	DC	Missouri	MO	Tennessee	TN
Florida	FL	Montana	MT	Texas	TX
Georgia	GA	Nebraska	NE	Utah	UT
Hawaii	HI	Nevada	NV	Vermont	VT
Idaho	ID	New Hampshire	NH	Virginia	VA
Illinois	IL	New Jersey	NJ	Washington	WA
Indiana	IN	New Mexico	NM	West Virginia	WV
Iowa	IA	New York	NY	Wisconsin	WI
Kansas	KS	North Carolina	NC	Wyoming	WY

MEXICO

Aguascalientes	Agu	Guerrero	Gue	San Luis Potosi	SLP
Baja California Norte	BCN	Hidalgo	Hid	Sinaloa	Sin
Baja California Sur	BCS	Jalisco	Jal	Sonora	Son
Campeche	Cam	México	Mex	Tabasco	Tab
Chiapas	Chia	Michoacán	Mic	Tamaulipas	Tam
Chihuahua	Chih	Morelos	Mor	Tlaxcala	Tla
Coahuila	Coa	Nayarit	Nay	Veracruz	Ver
Colima	Col	Nuevo León	NL	Yucatán	Yuc
Distrito Federal	DF	Oaxaca	Oax	Zacatecas	Zac
Durango	Dur	Querétaro	Que		
Guanajuato	Gua	Quintana Roo	QR		

95. PAPILIONIDAE

PARNASSIINAE

Tribe PARNASSIINI

PARNASSIUS Latreille, 1804
Doritis Fabricius, 1807
Parnassis Hübner, [1819], missp.
Therius Billberg, 1820
Tadumia Moore, [1902]
Kailasius Moore, [1902]
Koramius Moore, [1902]
Lingamius Bryk, 1935
Eukoramius Bryk, 1935

1 *__eversmanni__ Ménétriés, [1851] 4153 [Russia]
Eversmann's Parnassian
– infraspecific names listed in Palearctic catalog
versmanni Bryk & Eisner, 1937, missp.
a) **thor** H. Edwards, 1881 AK
ab. *kohlsaati* Gunder, 1932 AK
ab. *ochreoocellatus* Bryk & Eisner, 1932, nom. nud.
quincunx.– Bryk & Eisner, 1934 (not Bryk, 1914)
f. *desubmarginatus* Bryk, 1934, nom. nud. AK
meridionalis Eisner, 1978, preocc. (Pagenstecher, 1909) Can. (BC)
pinkensis Gauthier, 1984, repl. name

2 **clodius** Ménétriés, 1855 4154 CA
Clodius Parnassian
a) **incredibilis** Bryk, 1932 AK
b) **claudianus** Stichel, 1907 Can. (BC)
baldus Ehrmann, 1918 WA
kallias Ehrmann, 1918, repl. name WA
f. *excelsior* Eisner, 1957 WA
pseudogallatinus Bryk, 1913 Can. (BC)
hel Eisner, 1956 WA
f. *grundi* Eisner, 1956 WA
shepardi Eisner, 1966 WA
c) **altaurus** Dyar, 1903 ID
f. *flavoocellatus* Bryk, 1935, nom. nud.
d) **gallatinus** Stichel, 1907 MT
immaculatus Skinner, 1911 WY
e) **menetriesii** H. Edwards, 1877 UT
f. *medionigroocellatus* Bryk & Eisner, 1932, nom. nud.
f. *nigroanalis* Bryk & Eisner, 1932, nom. nud.
f. *nigroocellata* Bryk & Eisner, 1932, nom. nud.
f. *ocelloconjunta* Bryk & Eisner, 1932, nom. nud.
f. *albocentratus* Bryk & Eisner, 1932, nom. nud.
f) **baldur** W. H. Edwards, 1877 CA
ab. *lorquini* Oberthür, 1891 CA
f. *lusca* Stichel, 1907 CA
ab. *binigrimaculellus* Gunder, 1926 CA
f. *primoettertiopictaetornatus* Bryk & Eisner, 1932, nom. nud.
medionigroocellatus.– Bryk, 1935 (not Bryk & Eisner, 1932)
sol Bryk & Eisner, 1932 [CA]
g) **clodius** Ménétriés, 1855 CA
ab. *castus* Bryk, 1913 ?
ab. *sulfureus* Gunder, 1932 CA
f. *extinctoanalis* Bryk & Eisner, 1932, nom. nud.
strohbeeni Sternitzky, 1945 CA
f. *dodgei* Gunder, 1932 CA

3 *__phoebus__ (Fabricius, 1793) (*Papilio*) 4155 [Russia]
Phoebus Parnassian
– infraspecific names listed in Palearctic catalog
a) **apricatus** Stichel, 1906 AK
golovinus Holland, 1930 AK
elias Bryk, 1934 AK
alaskensis Eisner, 1956 AK
alaskaensis Eisner, 1957, emend.

4 **smintheus** Doubleday, [1847] 4155e Can. [AB]
Smintheus Parnassian
a) **yukonensis** Eisner, 1969 AK
b) **smintheus** Doubleday, [1847] Can. [AB]
rocky Grum-Grshmailo, 1890 "Rocky Mts."
alt. f. *nanus* Neumoegen, 1890 Can. (BC)/MT
f. *minor* Verity, [1907], preocc.(Staudinger, 1881) Can. (BC)
ab. *nigerrimus* Verity, 1907, preocc.(Verity, 1907) Can. (BC)
f. *minusculus* Bryk, 1912, nom. nud.
f. *quincunx* Bryk, 1914, nom. nud.
f. *verityi* Ehrmann, 1918, repl. name
f. *ernestinae* Bryk & Eisner, 1935 Can. (BC)
manitobaensis Bryk & Eisner, 1935 Can. (MB)
magnus W. G. Wright, 1905 Can. (BC)
c) **olympiannus** Burdick, 1941 WA
olympianus dos Passos, 1964, missp.
f. *excelsior* Eisner, 1969 WA
guppyi Wyatt, [1971] Can. (BC)
d) **xanthus** Ehrmann, 1918 ID
idahoensis Bryk & Eisner, 1931 ID
montanulus Bryk & Eisner, 1935 MT
maximus Bryk & Eisner, 1937 MT
e) **sayii** W. H. Edwards, 1863 CO
f. *hermodur* H. Edwards, 1881 CO
ab. *mendicus* Stichel, 1907 Can. (MT/BC)/CO
ab. *pseudocorybas* Verity, 1907 CO
ab. *mariae* Bryk, 1912 ?
quincunx.– Bryk, 1915 (not Bryk, 1914)
polus Ehrmann, 1917 CO
montanus Ehrmann, 1918 CO
utahensis Rothschild, 1918 UT
f. *fermatus* Bryk, 1921, nom. nud.
f. *melanophorus* Bryk, 1921, nom. nud.
sordellus Fruhstorfer, 1923 "N.Am."
aristion Fruhstorfer, 1923 CO
catullius Fruhstorfer, 1923 CO
pholus Barnes & Benjamin, 1926, missp.
dakotaensis Bryk & Eisner, 1935 SD
hollandi Bryk & Eisner, 1935 UT
rotgeri Bang-Haas, 1938 CO
f. *reducta* Bang-Haas, 1938 CO
f. *discocircumcincta* Eisner, 1955 CO
hermador F. M. Brown, Eff & Rotger, 1956, missp.
rubiana Wyatt, 1961 NV
rubina L. D. Miller & F. M. Brown, 1981, missp.
pseudorotgeri Eisner, 1966 CO
f) **sternitzkyi** McDunnough, 1936 CA

5 **behrii** W. H. Edwards, 1870 CA
Behr's Parnassian
niger W. G. Wright, 1905 CA
astriotes Fruhstorfer, 1923 CA

PAPILIONINAE

Tribe TROIDINI

BATTUS Scopoli, 1777
Laertias Hübner, [1819]
Ithobalus Hübner, [1819]
Laertiades Doubleday, 1846, missp.

6 **philenor** (Linnaeus, 1771) (*Papilio*) 4157 "Amer."
Pipevine Swallowtail
a) **philenor** (Linnaeus, 1771) (*Papilio*) "Amer."
astinous (Drury, 1773) (*Papilio*) NY/MD/VA
ab. *obsoleta* (Ehrmann, 1900) (*Papilio*) "Penn."
ab. *wasmuthi* (Weeks, 1901) (*Papilio*) NY
serpentariae (Fabricius, 1938) (*Papilio*), repl. name
b) **hirsuta** (Skinner, 1908) (*Papilio*) CA

ab. *inghami* (Gunder, 1927) (*Papilio*) CA
acauda.– auct. (not Oberthür, 1880)
nezahualcotyl.– auct. (not Strecker, 1885)
corbis.– auct. (not Godman & Salvin, 1889)
orsua.– auct. (not Godman & Salvin, 1889)

7 **polydamas** (Linnaeus, 1758) (*Papilio*) 4158 Surinam
Polydamas Swallowtail
a) **lucayas** (Rothschild & Jordan, 1906) (*Papilio*) Bahamas
b) **polydamas** (Linnaeus, 1758) (*Papilio*) Surinam
polydamus (McDunnough, 1938) (*Papilio*), missp.
anguicidas (Fabricius, 1938) (*Papilio*), repl. name

Tribe GRAPHIINI

EURYTIDES Hübner, [1821]
Subgenus **PROTOGRAPHIUM** Munroe, 1951

8 **marcellus** (Cramer, 1777) (*Papilio*) 4184 ?
Zebra Swallowtail
ajax (Linnaeus, 1758) (*Papilio*), suppr. (Op. 286) "Amer."
telamonides (C. Felder & R. Felder, [1864]) (*Papilio*) "U.S."
f. *walshii* (W. H. Edwards, 1872) (*Papilio*) ?
ab. *abbotii* (W. H. Edwards, 1872) (*Papilio*) ?
f. *floridensis* (Holland, 1898) (*Papilio*) FL
f. *lecontei* (Rothschild & Jordan, 1906) (*Papilio*) TN
ab. *tockhorni* (Schulz, 1908) (*Papilio*) "N. Am."
cubensis (Boullet & LeCerf, 1912) (*Papilio*), nom.nud. Cuba
ab. *broweri* (Gunder, 1927) (*Papilio*) MO
ab. *carolinianus* (Holland, 1931) (*Papilio*) "Carolina"
ab. *pricei* (Field, 1936) (*Iphiclides*) KS
ab. *nigrosuffusa* (Field, 1936) (*Iphiclides*) KS
annonae (Fabricius, 1938) (*Papilio*), repl. name

Tribe PAPILIONINI

PAPILIO Linnaeus, 1758
Subgenus **HERACLIDES** Hübner, [1819]
Calaides Hübner, [1819]
Priamides Hübner, [1819]
Troilides Hübner, [1825]
Thoas Swainson, [1833]

9 ***anchisiades** Esper, 1788 4183 Surinam
Anchisiades Swallowtail; Ruby-spotted Swallowtail
anchises.– Stoll, 1780 (not Linnaeus, 1758)
hipponous (Hübner, [1819]) (*Priamides*), repl. name
archelaus Godart, [1819] "Guiana"
theramenes C. Felder & R. Felder, 1861 Venezuela
isidorus.– Bates, 1861 (not Doubleday, 1846)
pompeius.– W. F. Kirby, 1871 (not Fabricius, 1781)
matusiki K. Johnson & Rozycki, 1986 Venezuela
a) **idaeus** Fabricius, 1793 "Madras" [Mexico?]
f. *pandion* Bates, 1861, nom. nud.
var. *pandion* C. Felder & R. Felder, 1865 "Mexico"
pandonius Staudinger, 1894, repl. name Mex.

10 ***aristodemus** Esper, 1794 4171 Cuba
Schaus Swallowtail
chresphontinus Martyn, 1797 Cuba
cresphontinus Martyn, 1797, missp.?
daphnis G. R. Gray, 1852, preocc. "West Indies"
a) **ponceanus** Schaus, 1911 FL
driophilus Clench, 1979 Bahamas

11 ***andraemon** Hübner, [1823] 4172 Cuba
Bahamian Swallowtail
hernandezi Torre, 1936 Cuba
a) **bonhotei** E. M. Sharpe, 1900 Bahamas

12 **ornythion** Boisduval, 1836 4174 Mex. (Yuc)
Ornythion Swallowtail

13 ***astyalus** Godart, [1819] 4173 "Brazil"
Astyalus Swallowtail; Broad-banded Swallowtail
lycophron Hübner, [1823] ?
mentor Dalman, 1823 "Brazil"
pirithous Boisduval, 1836 ?
oebalus Boisduval, 1836 ?
drepanon G. R. Gray, 1856, nom. nud.
drepanon Fruhstorfer, 1907 Brazil
ab. *delunensis* Niepelt, 1916 Brazil
f. *paulina* R. Krüger, 1934, preocc. (Cramer, 1777) Brazil
f. *thersitoides* Rousseau-Decelle, 1943 Argentina
f. *suffusa* Rousseau-Decelle, 1943 Paraguay
a) **pallas** G. R. Gray, 1853 Mex. [Oax]
oebalus.– G. R. Gray, 1853 (not Boisduval, 1836)
hozaus Ehrmann, 1921 Costa Rica

14 ***androgeus** Cramer, 1775 4175 Surinam
Androgeus Swallowtail
orestes Meerburgh, [1777] ?
polycaon Cramer, 1779 Surinam
piranthus Cramer, 1779 Surinam
acanthus Gmelin, 1790, missp.
amosis Stoll, 1787 ?
androgeos W. F. Kirby, 1871, missp.
bagous Fruhstorfer, 1907 Brazil
f. *mira* Fassl, 1922 Brazil
f. *feyeri* Niepelt, 1924 Ecuador
f. *fassli* Knop, 1925 Brazil
f. *decellei* R. Krüger, 1934 Brazil
hibisci Fabricius, 1938, repl. name
altheae Fabricius, 1938, preocc. (Borkhausen, 1780)
a) **epidaurus** Godman & Salvin, 1890 ?
var. *polycaon* G. R. Gray, 1853 ?
f. *ochracea* Beutelspacher, 1976 Mexico (Chia)

15 ***thoas** Linnaeus, 1771 4169 Surinam
Thoas Swallowtail
archimedes Fabricius, 1938 ?
a) **autocles** Rothschild & Jordan, 1906 Mex. (Gue)
f. *nigro-caudata* Vázquez, 1949 Mex. (Chia/Ver)
f. *nigrimarginata* Beutelspacher, 1976 Mex. (Ver)
f. *ochracea* Beutelspacher, 1976 Mex. (Chia)
b) **oveido** Gundlach, 1866 Cuba
epithoas Oberthür, 1897 "Mexico" [Cuba]

16 **cresphontes** Cramer, 1777 4170 NY/SC/Jamaica
Giant Swallowtail; Orange Dog
oxilus Hübner, [1819], repl. name
chresphontes Dury, 1878, missp.
ab. *lurida* Schultz, 1908 "N. Am."
ab. *luxuriosa* Reiff, 1911 MI
ab. *intacta* Strand, 1918 ?
ab. *maxwelli* Franck, 1919 ?
ab. *forsythae* Gunder, 1933 FL
f. *melanurus* Hoffmann, 1940 Mexico (Gue)
pennsylvanicus F. Chermock & R. Chermock, 1945 PA
f. *luxuriosus* Forbes, 1960, nom. nud.
Subgenus **PAPILIO** Linnaeus, 1758
Amaryssus Dalman, 1816
Aeronauta Berge, 1842
Achivus W. F. Kirby, 1896

17 ***machaon** Linnaeus, 1758 4166 ? [?Sweden]
Old World Swallowtail
– infraspecific names listed in Palearctic catalog
a) **aliaska** Scudder, 1869 AK
joannisi Verity, 1907 AK
petersii A. H. Clark, 1932 AK
kwakwapoochesi Seyer, 1977, nom. nud.
prestoni Seyer, 1977, nom. nud.
frechini Seyer, 1977, nom. nud.
b) **hudsonianus** A. H. Clark, 1932 Can. (Man)
avinoffi F. Chermock & R. Chermock, 1937 Can. (Man)
dodi McDunnough, 1939 Can. (Alb)
pikei Sperling, 1987 Can. (Alb)
c) **oregonius** W. H. Edwards, 1876 OR

18 **bairdii** W. H. Edwards, 1869 4164 AZ
Baird's Swallowtail
utahensis Strecker, 1878 UT
f. *hollandii* W. H. Edwards, 1892 CO
f. *brucei* W. H. Edwards, 1895 CO
f. *hollandi* L. Miller & F. Brown, 1981, missp.

f. *ampliata* Scott, 1981 CO
f. *comstocki* Scott, 1981, preocc. (Chermock & Chermock, 1937)

19 **brevicauda** Saunders, 1869 4163 Can. (Nfld)
Maritime Swallowtail; Short-tailed Swallowtail
anticostiensis Strecker, 1873 Can. (Que)
gaspeensis McDunnough, 1934 Can. (Que)
bretonensis McDunnough, 1939 Can. (NS)

20 **joanae** J. R. Heitzman, [1974] 4160 MO
Ozark Swallowtail; Joan's Swallowtail

21 ***polyxenes** Fabricius, 1775 4159 "Amer." [Cuba]
Black Swallowtail; Parsleyworm
a) **asterius** Stoll, 1782 NY/"Carolina"/VA
ampliata Ménétriés, 1857 "Amer. sept." [?Mexico]
ab. *calverleyi* Grote, 1864 NY
asterioides Reakirt, [1866] "Mexico"
f. *viridis* Cockerell, 1889 ?
f.♀ *alunata* Skinner & Aaron, 1889 ? [?PA]
ab. *mediocauda* Eimer, 1895, emend.
ab. *semialba* Ehrmann, 1900 PA
curvifascia Skinner, 1902 NM
ab. *ehrmanni* Ehrmann, 1925 PA
ab.♀ *streckeri* Holland, 1927 ?
ab. *gertrudis* Kruck, 1931 Mex. (Oax)
ab. *forsythae* Wood, 1937, preocc. (Gunder, 1933) FL
kahli F. Chermock & R. Chermock, 1937 Can. (Man)
ajax.– McDunnough, 1938 (not Linnaeus, 1758)
gracehus Fabricius, 1938 PA
f. *pseudoamericus* F. M. Brown, 1942 IL
f. *subamplicata* Dufrane, 1946 PA
stabilis.– dos Passos, 1964 (not Rothschild & Jordan, 1906)
comstocki.– Scott, 1981 (not Chermock & Chermock, 1937)
b) **coloro** W. G. Wright, 1905 CA
ab. *rudkini* J. A. Comstock, 1935 CA
f. *clarki* F. Chermock & R. Chermock, 1937 CA
f. *comstocki* F. Chermock & R. Chermock, 1937 CA
chloro L. D. Miller & F. M. Brown, 1981, missp.

22 **zelicaon** Lucas, 1852 4167 CA
Anise Swallowtail; Zelicaon Swallowtail
a) **nitra** W. H. Edwards, 1883 MT
ab. *mcdunnoughi* Gunder, 1928 Can. (Alb)
f. *gothica* Remington, 1968 CO
f. *ampliatanitra* Scott, 1981 CO
b) **zelicaon** Lucas, 1852 CA
zolicaon Boisduval, 1852, missp.
californica Ménétriés, 1863 [CA]
ab. *impunctata* Fischer, 1908 ?
ab. *formosus* Fischer, 1908 ?
ab. *melanotaenia* Fischer, 1908 ?
comstocki.– Scott, 1981 (not Chermock & Chermock, 1937)

23 **indra** Reakirt, 1866 4168 CO
Indra Swallowtail
a) **indra** Reakirt, 1866 CO
minori Cross, 1937 CO
b) **nevadensis** T. Emmel & J. Emmel, 1971 NV
calcicola J. Emmel & Griffin, 1998 NV
c) **shastensis** J. Emmel & T. Emmel, 1998 CA
d) **kaibabensis** Bauer, 1955 AZ
e) **phyllisae** J. Emmel, 1982 CA
f) **fordi** J. Comstock & Martin, 1955 CA
martini J. Emmel & T. Emmel, 1966 CA
panamintensis J. Emmel, 1982 CA
pygmaeus J. Emmel, T. Emmel & Griffin, 1998 CA
g) **pergamus** H. Edwards, 1875 CA

Subgenus **PTEROURUS** Scopoli, 1777
Jasoniades Hübner, [1819]
Euphoeades Hübner, [1819]
Aernauta Berge, 1842
Pyrrhosticta Butler, 1872

24 **pilumnus** Boisduval, 1836 4180 "Mexico"
Three-tailed Swallowtail

25 **palamedes** Drury, 1773 4182 NY
Woodlands Swallowtail; Palamedes Swallowtail
chalcas Fabricius, 1775 "Amer."
flavomaculatus Goeze, 1779 ?
calchas Esper, 1800, emend.
leontis Rothschild & Jordan, 1906 Mex. (NL)

26 **troilus** Linnaeus, 1758 4181 "India" [USA]
Spicebush Swallowtail
ab. *radiatus* Strecker, 1900 DC
anethi Fabricius, 1938, repl. name SC
ab. *flava* Dufrane, 1946, preocc. (Müller, 1776) PA
ab. *obliterata* Dufrane, 1946 "U.S."
ab. *berioi* Dufrane, 1946 PA
ab. *addenda* Dufrane, 1946 PA
texanus Ehrmann, 1900 TX [?FL]
ilioneus J. E. Smith, 1797, preocc. (Cramer, 1775) GA
fakahatcheensis Gatrelle, 2000, **n. syn.** FL

27 **glaucus** Linnaeus, 1758 4176 "Amer. sept."
Tiger Swallowtail
antilochus Linnaeus, 1758 "Amer. sept."
turnus Linnaeus, 1771 "Amer."
alcidamas Cramer, 1775 "Jamaica" [NY]
ab. *fletcheri* Kemp, 1900 NJ
ab. *delunaris* Schultz, 1908 PA
ab. *perfulva* Schultz, 1908 "N. Am."
ab. *imperfecta* Reiff, 1911 USA [NY]
ab. *wheeleri* Reiff, 1911 USA [NY]
ab. *paupercula* Reiff, 1911 USA [NY]
ab. *niger* F. Hering, 1912, preocc. ?
f. *dietzi* Gunder, 1927 NY
f. *gerhardi* Gunder, 1927 IN
lauri Fabricius, 1938, repl. name "Amer."
ehrmanni McDunnough, 1938, preocc. (Ehrmann, 1925) ?
maynardi Gauthier, 1984, repl. name FL
australis Maynard, 1891, preocc. FL

28 **canadensis** Rothschild & Jordan, 1906 4176a Can. (Nfld)
Canadian Swallowtail
a) **arcticus** Skinner, 1906 AK/Can. (NWT)
borealis Boullet & LeCerf, 1912, preocc. ?
b) **canadensis** Rothschild & Jordan, 1906 Can. (Nfld)
ab. *fletcheri* Kemp, 1900 NJ
ab. *deficiens* Dufrane, 1946 "U.S."

29 **rutulus** Lucas, 1852 4177 CA
Western Tiger Swallowtail
a) **rutulus** Lucas, 1852 CA
rutulus Boisduval, 1852 (not Lucas, 1852) CA
var. *ammoni* Behrens, 1887 NV
ab. *hospitonina* Boullet & LeCerf, 1912 Can. (BC)
f. *fannyae* Gunder, 1927 OR
b) **arizonensis** W. H. Edwards, 1883 AZ

30 **eurymedon** Lucas, 1852 4179 CA
Pale Swallowtail
antinous Donovan, 1805, nom. oblit.[1] "Australia" [CA?]
eurymedon Boisduval, 1852, preocc. (Lucas, 1852) CA
albanus C. Felder & R. Felder, 1864, nom. nud. CA
albanus C. Felder & R. Felder, 1865 CA
lewisii W. F. Kirby, 1884, nom. nud. CA
ab. *subnigrata* Schultz, 1908 "N. Am."
ab. *cocklei* Gunder, 1925 Can. (BC)
f. *columbiana* Gunder, 1927 Can. (BC)
eurymeilon (de la Maza, 1987) (*Pterourus*), missp.

31 **multicaudatus** W. F. Kirby, 1884, repl. name 4178 "Mexico"
Two-tailed Swallowtail
daunus Boisduval, 1836, preocc. (Cramer, 1777) "Mexico"
a) **pusillus** Austin & J. Emmel, 1998 NV
b) **multicaudatus** W. F. Kirby, 1884, repl. name "Mexico"
ab. *ragani* Barnes, 1928 AZ

1. *Papilio antinous* Donovan, 1805: the ICZN (1999) clearly states that names not used in over 99 years are to be suppressed as *nomina oblita* (unknown names), rather than given priority over well-known names already in long use. Any use of this old name "*antinous*" is incorrect and against the Code (see Upton, 1985).

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STRAYS

Although listed in some books, the following species are known only from single or few records, being rare strays and not part of Nearctic fauna north of Mexico (two from Florida may be erroneous records). Primary areas of collection records are noted to the right.

Battus devilliers (Godart) - West Indian	FL
Eurytides celadon (Lucas) - Cuban	FL
Eurytides philolaus (Boisduval) - Mexican	TX
Papilio demoleus Linnaeus - Asian (temporary introd.)	CA
Papilio (Heraclides) "pharnaces" (Doubleday) - Mex.	TX
Papilio (Pterourus) "victorinus" (Doubleday) - Mex.	TX
Parides alopius (Godman & Salvin) - Mexican	AZ
Parides eurimedes (Stoll) - Mexican	TX

BOOK NEWS

A GUIDE TO THE MICROLEPIDOPTERA OF EUROPE
by Umberto Parenti
2000. Museo Regionale di Scienze Naturali, Torino. 426pp (156 pl.) (17 x 24cm) cloth. Lira 150000 (ca. $72.00). ISBN 88-86041-36-5.
This first guidebook (*Guide I*) from the Regional Museum of Natural History, in Turin, Italy, offers a superb synoptic sampling of the micro-moths of western Europe, including Pyralidae. The first 24 plates are black & white, mostly with photos taken from nature showing larval damage to hostplants. The remainder are color plates presenting enlarged photographs of museum specimens (984 species are treated); there are 4 painted plates for the smallest species (Nepticulidae and Heliozelidae). For a wider audience, the text is entirely in English but only comprises salient notes (name, size, distribution, hostplants) for each species opposite its illustration. There is a good introductory section on microlepidopteran morphology and biology, plus specialized notes on collection and study techniques for these small moths. No genitalia are illustrated or described, but the species involved may for the most part be correctly identified using this guidebook to verify their wing pattern.

ILLUSTRATED CATALOGUE OF MOTHS IN KOREA (I): Sphingidae, Bombycoidea, Notodontidae
INSECTS OF KOREA, Series 4
edited by K.-T. Park
1999. Center for Insect Systematics, Kangwon National Univ., Chuncheon, South Korea. 358pp, 23 pl. (19 x 26cm) paper. K35000 (ca. $55). ISBN 89-88154-06-1.
Part 4 of the *Insects of Korea* series presents the first part on Korean macro-moths. The first book in the series was on butterflies and in Korean; the subsequent parts have been in English. The color plates are of museum specimens, all with excellent color. Text and figures cover 195 species, and include range maps for Korea.

DAGVLINDERS IN LIMBURG: Verspreiding en ecologie 1990-1999
by R. W. Akkermans, R. A. J. Pahlplatz, and K. Veling
2001. Stichting Natuurpublicaties Limburg, Maastricht. 381pp (17 x 24cm) cloth. Dfl. 73.50 (ca. $48). ISBN 90-74508-18-3.
The butterflies of the Limburg region of the Netherlands are treated in this new book, based on a faunal survey from 1990-99. Each species has several color photographs of adults and immature stages, plus a distribution map for this region of Holland. Text is in Dutch. There is an excellent introduction to Limburg habitats and butterfly conservation. 72 species that have resident populations in Limburg are treated; a few of the incidental or migratory species are also mentioned.

GNORIMOSCHEMINE MOTHS OF COASTAL DUNE AND SCRUB HABITATS IN CALIFORNIA (Lepidoptera: Gelechiidae)
by Jerry A. Powell and Dalibor Povolný
2001. Assoc. Tropical Lepid., Gainesville (*Holarctic Lepid.*, 8 (Suppl. 1). 53pp (1 pl) (22 x 28cm) paper. $18.50 ($10 ATL members). ISSN 1070-4140.
The Gnorimoschemini tribe are small gelechiid moths that include some of the most important pest species. The present revision treats the native mostly non-pest species found in California coastal habitats, including 35 species, with 17 new species named, plus new records for 3 Palearctic species now recorded in California. All species are illustrated, including 1 color plate as a frontispiece, plus genitalia figures, and a selection of the main habitats investigated in California.

DAGVLINDERS IN FRYSLÂN: het Vluchtige Vastgelegd
by G. Bergsma, F. Nijland, S. Sinnema, K. Veling, and P. Zeinstra
2000. Friese Pers, Leeuwarden. 176pp (19 x 26cm) cloth. Dfl. 54.50 (ca. $28). ISBN 90-330-1118-2.
This new book treats the butterflies of the Frisian region of the Netherlands. Text is in Dutch. There are detailed maps for each of the 46 species of skippers and true butterflies that are resident to the region. A few species that sometimes are found are also mentioned. The exceptional color illustrations of butterflies found in Friesland, sometimes with figures of larvae as well, makes the book well worth having. The book is the outcome of a project to inventory the Frisian butterfly fauna during the years 1990-99. The introduction has a historical section on previous researchers in this part of Holland, plus chapters on butterfly biology and conservation.

INSECTORUM MINIMORUM ANIMALIUM THEATRVM: the Butterflies and Moths
edited by George Thomson
2000. Lochmaben, Scotland. 66pp (21 x 29cm) cloth. £70 (ca. $115). No ISBN.
This book is a facsimile reprint of Thomas Moufet's chapter on mostly British Lepidoptera, originally published in 1634 in his *Animalium Theatrum*. Thompson adds extensive notes for each species treated, plus has a new English translation of the original Latin text that accompanies the wood-cut plates. Moufet's book was the first major illustrated book on insects and was one of the main reference on insects in the 17th century. Moufet completed the manuscript already in 1589 with the help of others, but it was published until after his death. The original work is exceedingly rare and virtually unobtainable, and even the more recent facsimile reprints are hard to find, so Thompson's reprint of the Lepidoptera chapter makes this interesting work again available.

TAIWAN'S INSECTS – BUTTERFLY & MOTH SECTION Illustrated Nature of Taiwan, 34
by Yung-Jen Chang
1999. Vacation Publ., Taipei. 239pp (11 x 19cm) paper. NT$ 320 (ca. $9.50) ISBN 957-623-194-9.
This field guide presents the commoner moths and butterflies of Taiwan. Illustrations are full-color taken from nature. The first half of the book treats the butterflies and the remaining pages present some of the macro-moths of the island. There are a few pages of introductory information on moths and butterflies. Text is Chinese; Latin names for species.

FIELD GUIDE TO BUTTERFLIES OF ILLINOIS
by John K. Bouseman and James G. Sternburg
2001. Illinois Nat. Hist. Survey, Champaign. 264pp (14 x 21cm). $19.95 cloth (INHS Manual 9). ISBN 1-882932-05-6.
A full-color field guide to butterflies of Illinois. Illustrations are of both museum specimens and adults in nature, with color distribution maps and some photographs of larvae and typical Illinois habitats. The introduction to butterflies provides basic notes for the neophyte. The guidebook details 98 species recorded for Illinois. With Illinois being centrally located in the USA, the book provides a welcome addition to the growing number of state field guides for butterflies.

MEETINGS

2001	Oct 17-19	**Natura 2000: Pan-European Management of Butterflies**, Laufen/Salzbach, Germany
2002	Apr 6-8	**Association for Tropical Lepidoptera**, Gainesville, Florida, USA
	Jun 1-6	**Societas Europaea Lepidopterologica**, Korsør, Denmark

PASSINGS

Robert J. Warren, January 16, in McAlester, Oklahoma. Charter member of ATL.
Ebbe S. Nielsen, March 2001, in Santa Barbara, California. Curator of Lepidoptera and Director of Insect Collections at CSIRO, Canberra, Australia.
David F. Hardwick, July 25, near Ontario. Canada. Retired researcher of noctuid moths (esp. heliothines); former director of Biosystematic Research Institute, Agriculture Canada, Ottawa, Ontario.
John Holoyda, September 12, in Chicago, Illinois. Specialist of Sesiidae and other diurnal moths.

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