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The larval systematics of leaf-rollers (Tortricidae and Carposinidae).

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In order to go more deeply into the question as to whether it is possible to improve imaginal systematics by investigations of larval morphology and to create a possibility for determination of larvae, a series of papers on larval systematics was undertaken at the Erlanger Zoological Institute.

This goal has been pursued since 1951 in investigations of the larval morphology of Microlepidoptera. In this paper the results of investigation of Tortricidae and Carposonidae are brought together. The latter were separated from the leaf-rollers as a separate family by Meyrick in 1927. In the same way the families of Hyponomeutidae, Orthoteliidae, Acrolepiidae, Tineidae and of the aculeate Tineidae the Incurvariidae, Adelidae, and Monopidae, were revised by my colleague Werner.

This paper makes it possible to determine to species caterpillars of leaf-rollers which show up as pests on all our cultivated plants and are therefore of economic importance. I was able to investigate 356 of the 1000 spp. which Kennel (1908) reported for the Palearctic Region. According to Eckstein (1933) about 400 spp. occur in Germany. Since I revised 329 of these, also; not all the caterpillars of the 400 spp. are known, and part of them occur only in definite regions or rarely, nearly all of the spp. occurring in Germany were included.

Moreover I hope to have given a good indication of imaginal systematics by way of comparison of larval and imaginal systematics for which I drew on especially the most recent systematic papers. This paper is based on Meyrick's (1927) system and on that of Obraztsov (i.lit.). The latter kindly made it possible by way of correspondence for me to take his system into account.

Revision of the adults was in the foreground in the years before 1900, while the caterpillars were treated more as appendages, so far as their biology was concerned. Therefore it is not surprising that the caterpillars were described only according to color and not morphologically. About 1900 they began to take more trouble to discover the caterpillars belonging to the adults. Disque, Sorhagen, [etc.] especially distinguished themselves in this. Through their cooperation and by the exchange of caterpillars it was possible for Disque to get together the greatest collection of microlepidoptera caterpillars in Germany. This collection is now found in the Bavarian State Collection in Munich and is at my disposal, in addition to my own material.

Morphological investigations of lepidopterous caterpillars were treated with much interest only more recently; previously there were only sporadic attempts. Ratzeburg was the first to turn his attention to the uniform setation of butterfly caterpillars, but his work again fell into oblivion. Dyar first (1894) and Chapman (1894) built upon it and created the first nomenclature for the supply of setae. With that the chaetotaxy was examined for uniformity in appearance on the different segments. The homodynamy of the setae was then unequivocally demonstrated by the papers of Forbes (1910), Fracker (1915), Heinrich (1916), Schierbeck (1917), Gerasimov (1935), and Hinton (1946). Unfortunately these authors made use of different nomenclatures, but Gerasimov set them over against each other and thereby made it possible to compare all the papers. As did my colleague Werner, I also used Gerasimov's nomenclature since it had proved to be very suitable and originated by way of comparison of caterpillars of the most varied families.

Fracker (1915) first created a Key to the families. He finally tried to key some the families to the genera, among them the Tortricidae. On looking through his work

it had to be established that only about 50 spp. had been investigated most of which occur only in America. Determination of the subfamilies and genera of leaf-roller caterpillars occurring in Germany was not yet possible by means of this paper. He also made use already of the chaetotaxy and showed that a larval systematics could be based on it. Since that time no further work has been done on a larval system for Tortricidae.

[3 paragraphs of thanks].

A. METHOD OF WORK.
I. Procurement of material.

Special collection methods cannot be used. Also in the case of leaf-roller caterpillars beating does not always show the desired results. It can only be used for those caterpillars which make light leaf-cocoons. Since a great many spp. occur on the inside of plant parts, we are forced to search for the food plants. Therefore it is of the utmost importance, before collecting, to become oriented concerning the timely appearance of the caterpillars their food plants as well as the changes caused to the plants by feeding. Moreover one is then is a position to carry them in at a time which is most favorable for short-term additional rearing. The caterpillars living on leaves and shoots are to be collected chiefly in May and June, also in the fall when there are two generations, and those living on the inside of plant parts can be collected in the spring after hibernation.

The caterpillars found are brought in with parts of the food plants and if possible provided with the usual data right at the place where found.

Some of the caterpillars, if possible in different instars, will be preserved for the investigations. They are previously boiled up in water for a short time whereby they can be better extended [or rolled] and keep their coloring better. 70 percent alcohol is used as preverving agent. It is necessary to keep the coloring in writing before- and, since they become somewhat faded. This applies less to the strongly chitinized parts of the body than to the body itself.

In addition to the material that I got for myself, I also had at my disposal the great Disque collection ~~at my disposal~~ which is found in the Bavarian State Collection at Munich, to draw upon for the investigations. The investigations were made with a binocular with a 60-fold magnification. In order to recognize certain peculiarities the microscope also had to be used of course. When examining alcohol material the caterpillars were kept in a small dish under alcohol, on the one hand to prevent shriveling on the other hand to avoid mirror effects. [or reflections]

After I had recognized the systematically important characters by revision of my alcohol material, I examined the caterpillars of Disque's collection found in the Bavarian State Collection at Munich. This consists of blown-up dry preparations which are found in perfect condition despite the confusion of the war.

The great value of this collection consists in the fact that each caterpillar is provided with the customary locality data and for the most part several caterpillars are at hand for each species. Moreover this collection is also very valuable in biological respects since plant parts with typical frass phenomena are included on the basis of which the biology of many spp. could be completed. It seems to me to be especially favorable that I was able to investigate just this collection since these caterpillars largely came from their discoverers and the first descriptions and files of information were made from them.

II. Rearing caterpillars and butterflies.

Since it was not possible hitherto to determine the caterpillars exactly, rearing was an unconditional necessity in order to discover the species of butterfly present.

Before one undertakes rearing of caterpillars it is necessary to ascertain whether it is really a matter of caterpillars of one species. When making this re-examination we can in no case rely on coloring alone, but must compare morphological characters, otherwise different butterflies can come from one rearing. In rearing it is always necessary to create natural conditions. In order to be in a position to do so, one will try to ascertain the species from the host plant and use the rearing method corresponding to their way of life.

Rearing caterpillars of the summer generation, living between leaves that have been spun together, is the simplest. They are placed in rearing glasses, with food-plant leaves covered with the lids belonging to them, and set in a cool place.

It is better to disregard tying up with cheese-cloth, as is always recommended, since the food plants fade too quickly in the dry summer air. In order to prevent formation of mold, the glasses must frequently be aired. Daily cleaning of the glasses and renewal of the food is of the greatest importance. In doing so care must be taken to see that caterpillars preparing to pupate are not disturbed.

Rearing caterpillars living on the inside of plants is more difficult; when it involves keeping root-stocks or stems fresh, the plants are set in moist sand, shoots of larger plants are kept in fresh water.

Rearing hibernating caterpillars is especially difficult; as natural as possible conditions must be offered to them even during the pupation that follows. According to way of life, then, either sand, peat, or bark is placed in the glasses and they are tied up with cheese-cloth. In order to expose the caterpillars to the cold shock necessary for development, they must be set out in the open in a place protected from rain. When the outside temperature is too low, the glasses are temporarily brought into a cool room. With that care must be taken to see that the difference in temperature is not too great. During this time optimal moisture in the glasses must be provided for.

The butterflies that emerge are killed with ethyl acetate and spread as usual.

III. Examination of the caterpillars.

The caterpillars to be investigated are entered in systematic sequence in tables and then examined for about 50 characters. Besides morphological characters, changes in the number of setae and the position of the setae are of the greatest significance; a larval system for Lepidoptera would be impossible without this.

Since the spp. were cited in systematic sequence, when comparing the material I could soon recognize which were to be evaluated as generic or as specific characters and also which species required transposition. Then I frequently had to establish the fact that Obraztsov had already undertaken to do this on the basis of his imaginal-systematic investigations. In many genera the specific differences are only trifling which is not to be wondered at since we have to do with a more primitive stage in caterpillars and differentiation has not advanced so far in them as in the adults. This means nothing other than a broadened interpretation of the Müller-Häckel Law. Therefore it is to be demanded that the caterpillars of one genus show no great differences.

Details on evaluation of the different characters will be given in the morphological part.

As for constancy of the characters, I must establish the fact that the same characters do fluctuate always in certain genera. From that rises the impression that kindred relations to the nearest genera are implied by these fluctuations. Therefore I was always careful to make the determination certain by means of a 2nd or 3rd character. In such cases the fact that the supply of setae of one half of the body deviates from the other must be kept in mind. In order to ascertain which is the normal case it is necessary to look at several caterpillars and this also was done in my investigations.

So far as possible, I also compared caterpillars of the different instars. With that I was able to observe that the generic characters can be recognized already in the early instars, while the determination of species is still difficult in them. In general, the characters for differentiation were selected according to the last instars; these can be obtained, in case of necessity, by way of short-term rearing. But there would be no point in setting up separate keys to determine the individual instars since the differentiation of characters keeps step with development and with that all kinds of transitions show up.

B. GENERAL PART.

I. Biology.

The differently formed eggs of leaf-rollers are attached separately, in groups, or in irregular distribution directly to the food plant with a secretion.. In the case of caterpillars living inside plant parts they are sunk either with an extensible ovipositor in cracks or between bud scales, or the egg-larva first eats its way into the plant. Oviposition takes place in late fall, then the eggs overwinter, and the larvae first hatch in the spring when they can get at their food - leaves, buds, or shoots. The way of life of the caterpillars varies greatly. Many are extremely monophagous, others polyphagous. Not seldom whole genera are specialized to certain plants or plant families, like the earlier genus Evetria on conifers, for instance.

The caterpillars mostly live separately in the last instars, in the earlier instars, on the other hand, they are often gregarious. Thus for example in Tortrix viridana 5 to 7 caterpillars will be met with in one web; only later are they in a position to make separate leaf rolls for themselves.

The name of this family can be traced back to the way of life of the caterpillars which live in leaf rolls. With that they draw spun threads from the tip of the leaf or from the leaf margin, to the middle of the leaf. These [threads] contract on hardening and the leaf is somewhat drawn in. This is repeated often enough so that a complete leaf roll comes into being. The caterpillars live in this roll, gnawing the surface of the leaf and also transforming in it. But it would be wrong to assume that all leaf-roller caterpillars make such leaf rolls. A large part of the caterpillars living on leaves spin 2 or more leaves together, often quite irregularly. Frequently they aare also folded along the main vein and spun together.

While Tortricinae predominantly live on leaves in this way, the Phaloniinae and for the most part the Olethreutinae occur on the inside of plant parts. The adaptation is so many-sided that these leaf-roller larvae are to be met with everywhere. Thus one can find the caterpillars in fruits, fruiting spurs, stems, roots, flowers, buds, and even in the bast and in the resin flow from trees. With that mostly changes are produced on the plants whereby infestation is made known.

The length of life of caterpillars differs greatly and depends entirely upon the number of generations. During this time there are 4 to 5 molts and 4 instars are differentiated according to that.

For the most part leafrollers have 2 generations. Since caterpillars of the fall generations mostly overwinter, the length of their life is longer than that of the summer generation. On the whole caterpillars overwinter more frequently than is assumed. This applies especially to spp. which live inside plant parts.

Frequently the way of life of caterpillars in the separate generations is also different, for instance in Eupoecilia ambiguella. Development seldom extends over 2 years. One example of this is Petrova resinella.

As soon as the caterpillars are mature, they stop their feeding activity and go to a pupation place. In most leafroller larvae transformation takes place at the place of feeding, in a tube spun between leaves that are spun together. Others let themselves down on a thread and pupate in the ground, under moss, or in cracks in the bark. The caterpillars living inside of plants gnaw their way up to the surface before pupating, filling the opening with bore dust or spin themselves up again. There are even cases in which a thin superficial membrane is left undamaged. These preparations make it possible for the pupa to get out of its pupal cradle more easily with the help of transversely set rows of spines on the abdominal segments.

Many caterpillars which go into the ground to pupate, still overwinter as a caterpillar in a solid cocoon which protects it from the outside. Such cocoons are also called prepupae and sometimes represent a protection for overwintering. Then the true pupation takes place in them in the next spring at the earliest. The pupal rest can vary in length. In the case of caterpillars of the summer generation it hardly lasts longer than 14 days, on the other hand it lasts months in the case of the fall generation.

On eclosion the pupal envelope is burst on the sutures of the antennal- and wing-pads and the *butterfly works itself out. The *butterflies of the different spp. emerge at different times, many in the spring, others in late fall, of which some spp. (26) even overwinter as *butterflies. [*moths, strictly speaking]

The leafrollers are mostly dusk-fliers, but when disturbed they will fly even in the day-time. Separate spp. let themselves fall to the ground when shaken. In the day-time the *butterflies mostly sit quietly with wings folded roof-like, on the side of the food plants protected from the wind. From the fluttering flight as well as from the typical wing position when sitting, the leafrollers can be readily named in the field.

II. Economic Importance of the Leaf-roller.

The family of the tortricids is not only the largest of the Microlepidoptera, it also has the largest proportion of pests. This is certainly to be traced back to the fact that the way of life varies greatly and a large part of the spp. is very polyphagous. There are only a few plants which are not infested by the caterpillars of the leafroller. Therefore the injurious spp. are of great importance not only for agriculture and forestry but also for horticulture and vine-growing.

Although we consider only the spp. occurring on our cultivated plants as pests, there are still many more. To be sure only 6 spp. can be named in the case of the vine of which however the 3 species of grape leaf rollers make large scale control measures necessary in many years. As forest pests, Escherish (1931) named 65 spp. The number of spp. injurious to agriculture and horticulture is hard to overlook. Here belong those which live on the foliage and in the bast of fruit trees, or in shoots, buds, flowers, fruits, stems, tubers, and roots. Since the caterpillar represents the

true stage of growth and the body makes only a poor use of the food by reason of coarse mastication, food consumption is very great. This is especially noticeable when complete defoliation is caused by mass appearances, as for instance by Tortrix viridana in many years. The causes of such mass outbreaks are many times not easy to recognize and in most cases can be traced back to weather conditions favorable for development. Butalso man has created the prerequisite conditions for mass reproduction by establishment of single crops.

The damages are not always so striking as in case of complete defoliation. Known examples are the apple and plum leafrollers to which great amounts of windfalls can be attributed every year.

Even in forestry there are cases in which the damage is very great, although infestation is not so readily recognized. Thus the caterpillars of Rhyacionia buoliana destroy the primary bud and thereby inhibit growth of the Scotch pine. The shoots of the lateral buds then take over the function of the leader. From this comes a greatly curved trunk which can no longer be used as commercial timber, but only for burning.

The extent of the damage is best measured by the expenditures for control.

Nature also comes to the help of man in control. Caterpillar diseases also appear with mass outbreaks. Bacterial, mocrosporidial, and polyhedral diseases can be named as such.

Parasites which frequently have special hosts, also have a great share in destruction of the caterpillars. Ichneumonids, chalcids, braconids, tachinids, and others come into question. Ants, bugs, beetles, and beetle larvae, spiders, and other arthropods are additional enemies of caterpillars. Control by birds is also very useful; they set back not only caterpillars but also moths.

III. Morphology.

The body of the caterpillar is essentially more uniformly segmented than that of the moth since the abdominal segments differ but little from the thoracic segments. While the head capsule is strongly chitinized, the body segments are soft-skinned and only locally chitinized, as for instance the cervical, anal, and prespiracular plates, pinacula, thoracic legs, and often the abdominal legs on the sides. Mostly the caterpillar body is also granulated by way of microscopically small spinules.

The 3 thoracic segments follow the head, each with a 3-jointed pair of legs. The abdominal segments, which differ but little from these, are attached to them. Of these 9 are uniformly developed while the last, called the anal segment, is differently formed. It is assumed that it consists of 2 segments fused together. Only the 3rd, 4th, 5th, and 6th abdominal segments bear parapodia and the anal segment bears a caudal disk.

1. Head (fig. 1, 2, 3).

It differs essentially from the head of the adult by the chewing mouthparts and the possession of 6 ocelli. It represents a round, flatly arcuate chitin capsule which is divided up into different sections by several sutures.

The epicranial suture is drawn from the vertex at the posterior margin of the head forward. The anterior half of the head is divided by the connecting frontolateral suture. The head is segmented into the two hemispheres and the frontal triangle by these two sutures. 6 ocelli are arranged in a horse-shoe shape on the sides of the hemispheres, in which connection the 6th ocellus has been shifted in front of the 5th. The varying arrangement is of systematic importance (fig. 3). The frontal triangle is further segmented

by additional sutures into the clypeus and the adfrontalia. The anteclypeus in leafrollers is fused with the clypeus. The latter is separated from the adfrontalia by the frontal and the frontoclypeal sutures. The suture of contact of the two adfrontalia is called the coronal suture. In Tortricinae this is mostly twice as long as in the Phaloniinae and the greater part of the Olethreutinae and is therefore a systematically important character. Since the adfrontalia in tortricids for the most part reach up to the vertex the epicranial suture is not so frequently developed.

The labro-clypeal membrane, which assures the necessary mobility of the labrum for the masticating process, is found between the clypeus and the labrum extended in front of it.

Labrum (fig. 4).

This is a reniform, somewhat arcuate plate the middle incision of which can be/depth on varying. Since the form varies greatly from species to species, this character can best be used for determination of species. Longitudinal rows of small prickles are found on the under side of the labrum; they form the epipharynx. 6 setal hairs are found on the upperside in the tortricids.

Mandibles (fig. 5 and 6).

The powerful mandibles are situated under the labrum. They are strongly dentate and provided with chewing ridges on the inner side. The different degree of wear and tear on them makes it seem advisable not to use the development and number of the teeth as a systematic character. There are 2 sensory hairs on the outer side.

Maxillae (fig. 7, 8, and 9).

The middle or lower jaw consists of the small cardo and a large stipes. These are fused with the submentum and mentum into a uniform cibarial-organ plate which sits up on the other mouth parts. Dorsally the stipes is bordered by the maxillary palparium, a chitinized base [or socle, socket, etc.]. The palparium bears the 3-segmented maxillary palp. The lobarium, a globular arcuation arises betweeen the 1st and 2nd segments of the palp; on it are situated the lobus externus and lobus internus as well as several sensory hairs and sensory pegs [or cones]. The varying length of the 1st and 2nd palpal segments (fig. 8 and 9) is systematically important.

Labium (fig. 10).

The labium consists of the large submentum with the small mentum situated distad from it. The latter forms the base for the labial appendages, namely the palparia with the palps and the spindle-bearer with the spindle.

The spindle bearer, as a round chitinized socle, is situated on the mentum. The spindle, a slender tube, into which the excretory ducts of the spinning glands empty, stands on it.

The labial palpari are situated on both sides of the spindle bearer on the mentum as crescent-shaped chitinized rings. They bear the labial palps which consist of a cylindrical basal segment on which 2 hairs sit.

Corresponding to the epipharynx of the labrum, the hypopharynx, consisting of longitudinal rows of irregularly formed prickles, is found on the inner side of the labium.

Antennae (fig. 11).

The short 3-segmented antennae are inserted before the ocelli. The cylindrical 2nd segment follows the basal segment. The former bears a short hair on the side and dorsally a special long tactile hair, beside that a short pointed tubercle and a sensory cone. The 3rd antennal segment is much smaller than the 2nd.

2. Torso [i.e., thorax-¼-abdomen].

Thoracic region.

The mostly soft-skinned thoracic region is joined to the chitinized head; it consists of 3 segments. Each of these three - pro-, meso-, and metathorax, has one pair of thoracic legs (fig. 12). These consist of coxa, and 3 moveable chitinized segments plus a terminal claw (fig. 13). While one spiracle is found on each side of the prothorax, which is mostly larger than those on the abdominal segments, they are lacking on the meso- and metathorax. The form of the spiracles and the differences in size are systematically important characters.

Furthermore the prothorax is dorsally provided with a chitinized cervical shield and laterally with a prespiracular shield. The coloring or marking of the cervical shield is of the greatest importance in descriptions of species.

More or less strongly chitinized tubercles are present on the meso- and metathorax which are arranged the same on these two segments, but basically differ from those of the abdominal segments. Since they are always provided with setae, the nomenclature of the setae is always applied to them. Therefore in description of chaetotaxy, the systematic importance [or meaning] of their arrangement is also reported.

Abdominal region.

The thoracic region joins the 9 homonomous abdominal segments and the specially formed anal segment. The latter is evolutionarily reduced to 2 segments. Abdominal segments 1 to 8 have a spiracle on either side. Since the last segments lack them, those on the 8th abdominal segment are mostly enlarged.

Abdominal segments 3 to 6 and the anal segment are provided with parapodia, while the others are without legs. These are unsegmented protrusions of the body for which reason they are called pseudopodia. They are developed as *caudal disks on the anal segment, these differ from the other abdominal legs by the elongate form. [*The German is "Nachschieber" which = proleg, caudal disk, postpedes]. The parapodia are wider on the base than at the distal end whereby they differ from those of caterpillars of other families (fig. 14, 15). If they are chitinized then it is only on the outer side. In that the tortricids differ from a large part of the gelechiids.

The parapodia are mostly provided with closed circles of hooklets which are sometimes uniserial, sometimes biserial (fig. 139, 189). These differences as well as the number of hooklets are systematically very important.

The circles of hooklets on the caudal disks are open behind.

The arrangement of pinacula on abdominal segments 1 to 8 is rather constant but it strongly differs on the 9th where they are situated more in one row and often fused together. This is very important for systematics and will be still more exactly set forth in the description of chaetotaxy.

The anal segment is very different from the other abdominal segments. Dorsally the anal segment is covered with the chitinized anal shield. This is mostly of a different

color than the body, often even provided with a special marking and it therefore serves as a species character.

The spines of an anal comb often project at the posterior margin of the anal shield. Their number varies from 3 to 8. The spines are always straight while they are curved in the gelechiids (figs. 16, 17). Unfortunately I could not systematically evaluate this character since I could not always investigate the blown-up dry preparations of the State collection with respect to it. It was therefore described only for the spp. in whose caterpillar it could be discovered.

IV. Chaetotaxy.

The systematic importance of caterpillar chaetotaxy was proved from the investigations of Dyar (1894), Forbes (1910), Fracker (1915), Hinton (1946), and Gerasimov (1935). Without it no larval system for butterflies would be possible. The same authors also demonstrated the homodynamy of setation which is a basic prerequisite for systematic use.

In the caterpillars of Lepidoptera we had to differentiate 3 kinds of setae:

(a) Primary setae.

These are the ones that show up already in the 1st instar in the lower and higher families and are always bound up to a definite place corresponding to the plan of structure.

(b) Subprimary setae.

These show up only in one of the later instars but are also bound to a definite place. The microsetae which occasionally appear at the anterior margin of the segments were also reckoned to these.

(c) Secondary setae.

They are added in later instars in irregular number and arrangement to the primary setation. They predominantly appear only in caterpillars of Macrolepidoptera and a few groups of Microlepidoptera, as for example the Pterophoridae and some Gelechiidae. They do not occur in the Tortricidae. Laspeyresia fissana forms a single exception.

Only the regularly appearing primary and subprimary setae are of systematic importance. The variations in number and position makes it possible to separate not only families but also genera and spp.

In order to be able to make use of chaetotaxy for systematics, a setal nomenclature proved to be necessary. Unfortunately different nomenclatures were introduced by the authors named. Gerasimov (1935) placed these over against each other and thus made comparison possible.

This paper retains Gerasimov's nomenclature, since this has proved to be very suitable and has arisen by comparative investigations of different families.

Nomenclature of the setae according to Gerasimov (1952).

[Latin names on bottom of page 15 of the text].

For the list of abbreviations used, see page 21[of the text, 12 of the translation].

Setation of the head.

Homologization of the setae of the head and the body segments has not succeeded hitherto and will certainly not be possible. Therefore a special nomenclature has been introduced for it. In most frequent cases the head is provided with 17 pairs of longer and 5 pairs of shorter setae. For purposes of synopsis the setae have been divided up into the following 10 groups (fig. 18 and 19):

(aa) Long setae [see page 17 for names].
(bb) Short setae [" " " " "]

Setation of the head is so constant in tortricids that it has only slight importance in systematics. They will therefore not be presented in detail.

Body setation.

The setae reported for the body appear on all the segments, but in different arrangement. Therefore 4 types are differentiated:

1. Prothoracic type (fig. 20)
2. Mesothoracic type (fig. 21)
3. Abdominal type (fig. 22)
4. Anal type (fig. 23).

1. Prothoracic type (fig. 20).

Described from the dorsal to the ventral Mediana. All data on number of setae refer to one half of the body. The meanings of the abbreviations used can be seen from the list of abbreviations.

On the cervical shield are found 6 setae and of them setae I, II, and III are at the posterior margin, X, IX, and IIIa at the anterior margin. Their different situation to each other is of systematic importance. Below the cervical shield and before the spiracle is the prespiracular shield. This can be situated horizontally or diagonally, in tortricids it bears 3, in carposinids 2, setae. The longest middel one is designated IV, the one before it V, and the one behind it VI. In the Phaloniinae and the greater part of Olethreutinae IV is in the middle, ventrally from V and VI; on the other hand in the Tortricinae IV is considerably closer to V than to VI and in a line with them. Under the prespiracular shield are found setae VIIa and VIIb on a pinaculum. Ventrally from this comes the thoracic leg. Before this are the small setae VIIc and VIId which frequently fail to appear. Between the coxae and mostly somewhat caudad are found the setae VIII which sometimes stand on a pinaculum. The thoracic legs always show the same setation. On the coxa there are 5 setae, on the following segment, 2 on the middle segment 6, and on the last segment 4 setae.

2. Mesothoracic type (fig. 21).

The arrangement of the setae is the same on the mesothorax and metathorax./ Next to the dorsal mediana lies a pinaculum with setae I and II, under that a second one with setae IIIa and III. Sometimes the microscopically small seta X can be recognized before the 1st pinaculum and quite at the anterior margin of the segment and below this, mostly on a pinaculum, the two setae IX.

Seta VI stands on a pinaculum farther ventrad and caudad. Before this and somewhat lower down are found, mostly on a common pinaculum, the setae IV and V.

The large seta VIIa is found on a distinct pinaculum above the coxa. Only in the monotypical genus Tortricodes tortricella (fig. 60) are 2 large setae, namely VIIa

and VII b, found on this pinaculum. The setae VIIb, VIIc, and VIId are, if present at all, situated before the coxae. Seta VIII stands ventrad from the coxa or sometimes on it.

3. Abdominal type (fig. 22).

If we start out from the dorsal mediana, then seta I follows as the first seta. Seta II lies somewhat lower and farther caudad. Sometimes the microseta X can be recognized very close to the anterior boundary of the segment.

The larger seta III and the very small seta IIIa are found above the spiracle. Sometimes IIIa accompanies III on the pinaculum. The latter is sometimes shifted forward on abdominal segments 1 to 7, sometimes somewhat caudad. III is situated dorsocranially, cranially, or ventrocranially from the spiracle on the 8th abdominal segment, which is very important to systematics.

Setae IV and V are found below the spiracle on a common pinaculum. They may be vertically, diagonally, or horizontally placed. The smaller seta, which is situated higher for the most part, is V, the longer one, situated lower down for the most part, is IV. They are of nearly equal length in Tortricinae and in some other genera, as Ancylis, Polychrosis, etc., for example. Seta IVa - within the tortricids - shows up only in the genera Rhyacionia and Clavigesta.

Seta VI lies ventrad from setae IV and V. The group VII consists of 1 to 4 setae which may be very differently arranged. They stand either on a pinaculum or at the base of the parapodia.

In the Tortricids, except for Petrova resinella, group VII on the parapodia consists of 3 setae. In the species named, as in the Carposinidae, it counts 4 setae. On the other segments, the number of setae in group VII changes from segment to segment so that many genera can be separated off thereby. In general a decrease in number of setae from the 7th to the 9th segments can be discovered. Seta VIII is situated next to the ventral mediana. It is important to systematics whether the space between these setae on the 9th abdominal segment is greater or smaller than on the 8th.

These data do not hold good for the 9th abdominal segment for, with a special development, it already goes over to the anal segment from which, however, it is still very distinctly separated (fig. 23).

Here setae II are always closer together than setae I, mostly they stand on a common pinaculum. While setae I and III - except for a few cases of convergence - stand on separate pinacula in the Trotricinae, these are found on a common pinaculum in the Phaloniinae and most of the Olethreutinae. In this case setae III, I, and II are mostly arranged in one line. Ventrad from III follow setae IV, V, VI. These stand on a common pinaculum, or each on a pinaculum of its own. In the Phaloniinae VI is lacking, apart from rare exceptions. Seta V is the longest of these.

Group VII consists of one or 2 setae. Ventrad from this follows setae VIII. The distance between setae VIII may be greater or smaller than on the 8th abdominal segment.

4. Anal type. (fig. 24)

Dorsally the anal segment is covered by the anal shield. This, except for Laspeyresia fissana, always has 8 setae. The seta I is found nearest the mediana, II is somewhat farther away and farther caudad, and III and IIIa are on the margin. The caudal disk is found below the anal shield. On the sides it has a chitin plate with

3 setae and a sensory pit in the middle. The setae are arranged in a triangle standing on the apex; the anterior one is IV, behind it VI, under it V.

On the dorsal aspect of the caudal disk are found 2 setae which are arranged vertically. The upper one is called seta paraprocta (sppr), the lower one VIIa. On the ventral aspect of the caudal disk are found 4, more rarely, 3 setae. These are setae VIIb, VIIc, VIId, and VIII.

V. Coloring.

Such striking colors as those in caterpillars of Macrolepidoptera do not show up in the tortricids. The caterpillars living between spun-up leaves are predominantly green, more rarely brown, and exceptionally gray-black. Occasionally a lighter longitudinal striping appears as for example in the genus Ancylis. On the other hand, caterpillars living in the inside of plant parts are mostly whitish or yellowish, but sometimes they are even orange colored as Laspeyresia dorsana and orobana, or carmine red like Epiblema farfarae. For example it very frequently happens in the genus Laspeyresia that the caterpillars are yellowish-white in the first instars and entirely or at least dorsally red in the last. The strongly chitinized places on the body are mostly colored differently than the body. The head, the cervical shield, the thoracic legs, the pinacula, and the anal shield may be yellow, brown, or black. Sometimes the pinacula are lighter than the body. Often markings typical of the species appear on the cervical shield or the anal shield.

The way the color comes about has already produced many-sided interest. Data are still divergent. According to Meyer (1930) neither chlorophyll nor its degeneration products are taken up by the intestine. The green coloring in the haemolymph is not chlorophyll but rather the oxidation substance of a protein body which is oxidized by a ferment contained in the haemolymph.* We can conclude from this that the color is not passively conditioned by the feeding but rather it is conditioned by the caterpillar itself. The total coloring of the caterpillar is produced by the coloring of the haemolymph as well as by pigments in the skin. Since the color is more intense in free-living caterpillars than in those living on the inside of plant parts, it is to be assumed that it represents a protection against light.

For the Key, I used so far as necessary only the colors of the strongly chitinized parts of the body, from which even alcohol material can be determined.

C. SPECIAL PART.

List of abbreviations used.

Abdseg.	= abdominal segment
Praestig.	= prespiracular shield
Thb.	= thoracic leg
Bfss.	= abdominal legs, parapodia
Nsch.	= caudal disk [or proleg]
N	= cervical shield
A	= anal shield
Proth.	= prothorax
Mesoth.	= mesothorax
Metath.	= metathorax.

The number put in parentheses behind the individual names indicates the number under which this species is cited in Rebel's catalog (1901). Then under these numbers are to be found all other synonyms there.

*insert: Besides this, carotine shows up even in artificially carotine-free feeding.

I. Key to families of Microlepidoptera larvae.

Hitherto there have existed only 2 keys to microlepidopterous larvae erected on scientific bases. The first by Fracker (1915) was revised by Gerasimov (1935). The ame author again improved it in 1952.

This key is cited hereafter with the corrections and completions made on the basis of our morphological observations. The families of the Macrolepidoptera are not considered therein.

It should be mentioned that the large family of Gelechiidae, especially, demands fundamental larval-morphological determination since it proved that some groups always collide again with the families investigated by us. It is to be concluded from the extremely great differentiation of larvae of the individual subfamilies that the classification of the adults cannot be considered as definitely assured.

1 (2) Antennae longer than the head; thelatter strongly retracted into the prothorax. Pseudopodia (8 pairs) segmented, somewhat similar to the thoracic legs, they are found on the 1st to the 8th abdominal segments. Very small caterpillars (5 mm) living on moss and lichens — Micropterygidae

2 (1) Antennae considerably shorter than the head.

3 (16) Caterpillar foot-less or the legs are very weakly developed; thoracic legs unsegmented, tubercle-like; pseudopodia without hooklets.

4 (5) Fronto-lateral suture situated before the antennae or not perceptible at all.

5 (4) Fronto-lateral suture situated behind the antennae. Head strongly flattened down. Small caterpillars (8-10 mm), mining in Betula leaves, rarely in leaves of Corylus, Carpinus, and Quercus. Excrement coherent in the middle like a thread — Eriocraniidae

6 (13) Front more or less right angled or trapezoid, very rarely round; frontal bridge nearly always developed.

7 (8) Fromt more or less right angled, seldom round. The undeveloped unsegmented, stump-like thoracic legs and pseudopodia (the former only meso and metathoracic) almost always present. Very small caterpillars (up to 5 mm), living in mines mainly in leaves — Nepticulidae Stigmellinae

8 (7) Front in the form of a reverse trapezoid.

9 (12) Frontal bridge present.

10 (11) The antenna has some processes (2-3) on the end or on the 2nd segment. The immature larva is apodous and makes epidermal mines. Later, usually from the 3rd instar on, the caterpillar acquires the normal, i.e., subcylindrical (not flattened) form, with thoracic legs and parapodia, triangular front, and — if it lives in mines — the latter are not epidermal. Very small caterpillars — Gracilariidae Lithocolletinae

11 (10) Antennae without processes, apart from the sensory cones usually found on them. Caterpillars apodous throughout life. The lateral part of the labrum strongly developed and bent caudad. Anal segment terminally furcate. The small caterpillars (6 mm) mine in epidermal galleries of Salicaceae leaves. Pupation at the end of the mine under folded leaf margins — Phyllocnistidae

12 (9) Frontal bridge lacking; hypostoma shifted forward and greatly reduced. Caterpillar long and cylindrical, mining in stems of Calta palustris etc. — Nepticulidae Oposteginae

13 (6) Front triangular, frontal bridge lacking or hardly visible.
14 (15) Head weakly flattened, the number of ocelli less than 6. Hypostoma in the form of an equilateral triangle. Frontal bridge completely absent. The very small caterpillars (up to 6 mm) mine the leaves of Vitis, Cornus (Antispila), and Betula (Heliozela). Pupation in a sac cut out from a leaf — Heliozelidae
15 (14) Head not flattened, 6 ocelli. The small caterpillars in seeds (Apodia, Sitotroga) or in mines of the leaves of grasses (Didactylota) — Gelechiidae
16 (3) Caterpillars with legs, often only with parapodia, in the latter case they are greatly reduced but always supplied with hooklets. (In some cases the hooklets are present only on the anal segment).
17 (20) Caterpillars only with parapodia, of which only the hooklets are developed. The latter are not always present on all segments, often they are present only on the anal segment.
18 (19) Head only a little flattened. Front triangular. The small caterpillars (5 to 6 mm) mine the petioles and leaves of Betula, Alnus, and Quercus. Pupation takes place in an oval sac cut out of a leaf at the end of the mine (Heliozelo [sic!]) — Heliozelidae
19 (18) Head strongly flattened; frontal bridge more or less developed. Front with nearly parallel sides in the middle field. The small caterpillars (up to 7 mm) mine the leaves of Quercus, Prunus, and Rosa — Tischeriidae
20 (17) Caterpillars also with thoracic legs, or with only these.
21 (26) Caterpillars only with thoracic legs. (On the abdominal segments no hooklets).
22 (23) The caterpillars carry bags — Coleophoridae, Eupistidae
23 (22) The caterpillars do not carry bags.
24 (25) Caterpillars worm-like often covered with spines (scoliform outgrowths), the primary setae not perceptible. Head strongly retracted into the prothorax. The rather motionless larvae live free, above all on leafy trees — Heterogeneidae, Limacodidae, Cochlidiidae
25 (24) Caterpillars subcylindrical. Not not retracted into the prothorax. Only primary setae present — Gelechiidae in part
26 (21) Caterpillars with thoracic legs and parapodia, the latter without hooklets in rare cases.
27(116) Caterpillars bare, covered only with primary setae. Group IV on the abdominal segments consists only of a single seta. Group VII on (or above) the parapodia consisting of not more than 4 setae. Sometimes there are a few (usually 2) subprimary setae on the dorso-lateral region of the segment.
28 (29) Parapodia lacking on the 6th abdominal segment (except Caloptilia = Gracilaria simplonella F.). Parapodia only on the 3rd, 4th, 5th, and 10th abdominal segments. The caterpillars make mines throughout life, or they later leave the mine and live in a leaf roll. — Gracilariidae, Lithocolletinae
29 (28) Parapodia present on the 6th abdominal segment.
30 (33) The abdominal spiracles are found on dark pinaculi.
31 (32) The pinaculi on which the abdominal spiracles are found, are extended in a cranio-dorsal direction. Parapodia with only a few or no hooklets. Caterpillars in the stalks of grasses. — Ochsenheimeriidae

32 (31) Pinaculi not extended in a cranio-dorsal direction. Hooklets on the parapodia arranged in a circle — Acrolepiidae

33 (30) Spiracles not found on pinaculi.

34(115) Hooklets of the parapodia differently arranged, but never in medial rows. (If the hooklets are arranged in rows, the latter always make a transverse band in relation to the longitudinal axis of the body, not "mediorows").

35(108) All 3 prespiracular setae present on the prothorax, they usually sit on the prespiracular shield.

36 (43) Prespiracular shield coalescent with the cervical shield. Prespiracular setae, often the spiracle also, situated at the margin of the cervical shield. The latter only rarely not developed, then setae I and II on mesothorax and metathorax have an arrangement similar to that on the abdominal segments.

37 (42) Group VII on meso and metathorax above the thoracic legs consists of only one seta.

38 (39) Hooklets of the parapodia arranged in uniserial circles — Tineidae, Dysmasia Tinea fuscipunctella

39 (38) Hooklets of parapodia in multiserial (at least biserial) circles or transverse bands.

40 (41) Hooklets arranged in multiserial or biserial circles. The large caterpillars live on or in roots of different plants — Hepialidae

41 (40) Hooklets arranged in multiserial transverse bands. They become smaller toward the periphery of the planta. The small caterpillars live on the ground in flat oval sacs of bits of leaves or needles. The young caterpillars mine the leaves of trees or live in seeds of plants — Adelidae

42 (37) Group VII on meso and metathorax above the thoracic legs consists of 2 setae. Coxae of thoracic legs grown together or touching each other. Hooklets of parapodia arranged in a lateral penellipse. The caterpillars are bag-bearers — Psychidae

43 (36) Prespiracular shield separated from the cervical shield or not at all distinct. No prespiracular setae on the cervical shield.

44 (45) Large chitinized dorsal shields on meso and metathorax. Hooklets of parapodia arranged in uniserial circles — Tineidae, Lypusinae

45 (44) No dorsal shields on meso and metathorax.

46 (55) Hooklets of parapodia arranged in uniserial transverse bands, of which frequently only one remains. More rarely the hooklets are absent altogether.

47 (48) Only one transverse band of hooklets developed on each parapodium. The cervical shield bears 6, often even 7, setae. 6 setae on the anal shield. Caterpillars on the ground in rounded sacs which were cut out of the leaves — Incurvariidae

48 (47) Parapodia each with 2 transverse bands of hooklets. The anal shield bears 8 setae.

49 (50) Setae IV and V on the abdominal segments always removed from each other. The small caterpillars (up to 10 mm) first live in mines, then free on the leaves where they cause "windows" — Buccolatrigidae

50 (49) Setae IV and V on the abdominal segments approaching.

51 (52) Hooklets of the caudal disk divided into 2 groups. The anal segments bears — on each side — more than 9 setae, exclusively of those of the anal shield — Gelechiidae in part

52 (51) The hooklets of the caudal disk represent an uninterrupted row.

53 (54) Spiracles elliptical or round, not very small. On the 8th abdominal segment they are higher than on the remaining segments. Caterpillars in branches and stems — Sessidae, Aegeriidae

54 (53) Spiracles round, very small, all situated at the same level. The small bag-bearing caterpillars mine chiefly leaves — Coleophoridae, Eupistidae

55 (46) Hooklets of the parapodia (at least some) — the caudal disk does not come into consideration — arranged in a circle or a penellipse.

56 (57) The small caterpillars (6-10 mm) make mines only in grasses. Transformation in a pupa suspensa attached to the food plant only by a few threads — Elaschistidae

57 (56) The caterpillars do not make mines in grasses.

58 (73) Setae IV and V on the abdominal segments — at least the 3rd — removed from one another or V is lacking (in very small caterpillars).

59 (70) Hooklets arranged in a uniserial circle.

60 (61) Parapodia long, nearly as long as the thoracic legs — Plutellinae

61 (60) Parapodia short, considerably shorter than the thoracic legs.

62 (65) On the prothorax the prespiracular group is about exactly as far from the spiracle as the individual setae of this group are from each other.

63 (64) Front triangular. The small mining caterpillars make tortuous mines chiefly on leaves of trees and shrubs. After leaving the mine a loose web is laid down (a "hammock") in which the pupa hangs suspended — Lyonetiidae

64 (63) Front trapezoid. Frontal bridge short, considerably shorter than the base of the front. The small caterpillars chiefly mine the leaves of Papilionaceae, more rarely (Leucoptera scitella) fruit trees. Pupation similar to that of Leonetiidae. — Cemiostomidae Leucopterygidae

65 (62) The prespiracular group of setae on the prothorax is about twice as far from the spiracle as the setae of this group are from each other.

66 (69) Seta IIIa absent on the abdominal segments.

67 (68) 3 setae on the adfrontalia. The small larvae mine [herbaceous] plants — Acrolepiidae

68 (67) 2 setae on the adfrontalia. The small larvae make mines in trees and shrubs — Argyresthiinae

69 (66) Seta IIIa present on the abdominal segments. The small larvae live in sac-like cases on fungi and dead substances, in rotten wood, and also on cereals as well as on wool, hides, textiles, etc. — Tineidae

70 (59) Hooklets of the parapodia in a penellipse, a multiserial circle, of a pseudocircle.

71 (72) Hooklets arranged in multiserial circles, often the whole leg [or foot] is beset with hooklets. Way of life of the caterpillar of different kinds, often in a broad web — Hyponomeutinae

72 (71) Hooklets arranged in a penellipse or a pseudocircle. Parapodia longer than wide — Plutellinae

73 (58) Setae IV and V on the abdominal segments approaching, often on a common pinaculum.

74 (75) More than 4 setae (Group VII) over or on the parapodia. Caterpillars small, in a loose web on different plants — Scythrididae

75 (74) Not more than 4 setae over or on the parapodia.

76 (89) Setae II of the 9th abdominal segment closer together than setae I of the 8th abdominal segment, often on a common pinaculum. (On the 9th abdominal segment all setae are frequently arranged in a vertical line; in this case II is the uppermost and I lies under it).

77 (80) Parapodia scolops-like, almost as long as the thoracic legs.
78 (79) Chitinized collar around the parapodia — Gelechiidae in part
79 (78) Chitinized collar around the parapodia lacking — Glyphipterygidae
80 (77) Parapodia short, substantially shorter than the thoracic legs.
81 (82) Last pair of thoracic legs swollen like a club — Chimacacchinae
82 (81) Last pair of thoracic legs normally developed.
83 (84) Head wedge-shaped, caterpillars very large, they live in trunks and branches — Zeuzeridae
84 (83) Head normally developed round or oval.
85 (88) Parapodia without the collar - at most pigmented on the sides - or without the chitinized central plantar spot. If these characters are lacking then the ventral side of the caudal disk is set with 3 to 4 setae or there are 8 "Borten" [?misprint for "Borsten" = setae] on the anal shield (exception, Laspeyresia fissana) — Tortricidae
86 (87) There is a chitin flap over the apical claw of the thoracic legs — Gelechiidae. Carcina quercana
~~87 (86) No chitin flap over the terminal claw of the thoracic leg~~
87 (86) No chitin flap over the terminal claw of the thoracic leg — Tortricidae
88 (85) Parapodia with collar or a strongly developed central plantar spot. If this character is not found then the ventral aspect of the caudal disk has more than 4 setae or there are more than 8 setae on the anal shield — Gelechiidae
89 (76) Setae II of the 9th abdominal segment at least just as far from each other as the setae I on the 8th abdominal segment.
90 (91) Epicranial seta L-1 almost always farther from A-3 than the latter is from A-2. The small larvae with varied habits are reminiscent of Tortricidae — Gelechiidae, Oecophoridae
91 (90) Epicranial seta L-1 closer to seta A-3 than this is to A-2, or the distances are the same.
92 (93) The distance between the metathoracic coxae is twice as great as their width — Cosmopterygidae in part
93 (92) The distance between the metathoracic coxae is smaller.
94 (95) Setae I and II on the abdominal segments approaching [each other].
95 (94) Setae I and II on the abdominal segments removed from each other. — Heliodinidae
96 (99) Front reaching only halfway to the Sinus verticalis.
97 (98) Setae IV and V of the 9th abdominal segment have separate places of insertion — Zeuzeridae
98 (97) Setae IV and V of the 9th abdominal segment on a common pinaculum — Stenomidae
99 (96) Front reaching 2/3 of the way to the Sinus verticalis.
100 (101) Prothoracic coxae contiguous — Gelechiidae, Blastobasiinae
101 (100) Prothoracic coxae removed from each other.
102 (103) Hooklets of the parapodia usually arranged biserially. Anal segment with more than 9 setae — on each side — excluding the anal shield — Oecophorinae
103 (102) Hooklets of the parapodia uniserial. Anal segment with not more than 9 setae exclusively of the anal shield.
104 (107) Seta I on the prothorax lower down than X.
105 (106) Setae II of the abdominal segments considerably lower than seta I about equidistant from I and III, or even closer to III — Scythrididae, Epermeniinae

106 (105) Setae II of the abdominal segments considerably farther from III than from I. The little caterpillars live in buds and stems and in spun-up leaves of leafy and needle-trees — Argyresthiinae

107 (104) Seta I on the prothorax higher than X. Seta IV of the abdominal segments below the spiracle, shifted only a little caudad. The little caterpillars mine the leaves of ferns — Teichobiinae

108 (35) Only 2 prespiracular setae present on the prothorax (IV, V).

109 (112) Hooklets of the parapodia uniserial.

110 (111) Setae IV and V of the abdominal segments far removed from each other. Seta IV is found distinctly behind the spiracle — Tineidae, Scardia

111 (110) Setae IV and V of the abdominal segments approaching, usually on a common pinaculum. Caterpillars in stems, flowers, and fruits of plants. They often make galls — Carposinidae, Orneodidae

112 (109) Hooklets of the parapodia bi- or tri-serial. If uniserial (very rarely (Chrysauginae)), group VII on the thoracic segments consists of 2 setae.

113 (114) Group VII over the thoracic legs on the meso and metathorax consists of a single seta, if of 2 — very rare — then the hooklets of the parapodia are uniserial — Pyralidae

114 (113) Group VII on both last thoracic segments consists of 2 setae. The little caterpillars live in leaves that have been rolled up together and in the stems of plants — Thyrididae

115 (34) Hooklets of the parapodia arranged in a "mediorow". — Macrolepidoptera part

116 (27) Caterpillars pubescent — often with hairy tubercles, spines, and other outgrowths — or at least tuberculum IV on the abdominal segments consists of 2 setae, or group VII on the abdominal segments counts more than 4 setae — Macrolepidoptera part

The families of the Macrolepidoptera are separated from those of the Microlepidoptera by the two last characters named.

II. Systematics of Tortricidae and Carposinidae.

According to Rebel (1901), Kennel (1908), and Spuler (1910) the genus Carposina of which only 3 spp. occur in the palearctic region, belongs to the Tortricidae. Meyrick (1927) and Obraztsov (i.lit.) raised it to a family of its own. For reasons therein I am joining these authors. The two families are separated as follows:

1 (2) Prespiracular shield with 3 setae, Group VII on the parapodia consists of 3 setae. [Exceptionally in Petrova resinella of 4 setae) — Tortricidae

2 (1) Prespiracular shield with 2 setae, Group VII on the parapodia consists of 4 setae — Carposinidae

The Family Tortricidae.

Diagnosis: Caterpillars with 3 pairs of 3-segmented thoracic legs, 4 pairs of parapodia, and with a caudal disk. The parapodia are wider on the base than on the distal end (fig. 14), often chitinized on the sides, but not provided with a distinctly developed collar (fig. 15). There are 6 setae on the cervical shield, 3 on the prespiracular shield. Of Group VII, 2 setae are found above the thoracic legs on the prothorax, 1 seta on meso and metathorax. Tortricodes tortricella, in which 2 setae are present also on meso and metathorax, is an exception. Setae IV and V are found on the abdominal segments on a common pinaculum. On the 9th abdominal segment, the distance

between setae II is less than that between setae I on the 8th abdominal segment. On the 9th abdominal segment setae II are mostly found on a common pinaculum. The anal shield bears 8 setae, as an exception Laspeyresia fissana has more. On the ventral side of the caudal disk are found not more than 3 to 4 setae, laterally 3, caudally mostly 2. An anal comb does not always stand above the anus; but when one is present then it consists of very straight spines, while in the Gelechiidae they are mostly curved (fig. 16 and 17).

This large family of which about 1000 spp. occur in the palearctic region, is divided into 3 subfamilies, the Tortricinae, Olethreutinae (=Epibleminae), and Phaloniinae, in all older systems.

More recently when workers have been inclined to erect subfamilies or family series they have raised the Phaloniinae to an independent family. Meyrick (1927) named it Phaloniadae, Obraztsov (1950), Agapetidae. Meanwhile Obraztsov informed me that it should be named Phaloniidae again. On the basis of my own investigations, I have come to the conclusion that I will again cite it as a subfamily. The bases for this are set forth in detail in the discussion of the subfamily.

Nothing has been changed in the delimitation of the subfamilies. This causes great difficulties in larval systematics since there are no subfamily characters. The divisions must therefore be done according to tribes, as is to be seen from the key. This splitting up of the subfamilies into tribes was begun by Obraztsov in 1946 and soon after that he published his results reached in the meantime. He made it possible, by way of correspondence, for me to include these in the considerations. I also came upon small deviations from this classification by way of my larval-morphological investigations. Details can be gathered from the Chapter on comparison of larval and adult systematics.

Tribes of the Tortricidae.

1 (18) On the 9th abdominal segment setae I and III stand on separate well-developed pinaculi, or the coronal suture is approximately twice as long as the adfrontalia (fig. 67), and setae V and IV on abdominal segments 1 to 8 are of nearly the same length (fig. 204).

2 (9) Seta-group VII on the 7th abdominal segment consists of 2 setae, at the same time the setae VIII on the 9th abdominal segment are farther apart than on the 8th abdominal segment, or seta VI on the 9th abdominal segment stands on a separate pinaculum.

3 (4) Group VII on the 1st and 2nd abdominal segments consists of 2 setae — Genus Ptycholoma (Archipsini)

4 (3) Group VII consists of 3 setae on the 1st and 2nd abdominal segments or at least on the 2nd abdominal segment.

5 (6) Seta group VII consists of 2 setae on meso and metathorax (fig. 60) — Genus Tortricodes (Cnephasiini)

6 (5) Seta group VII consists of 1 seta on meso and metathorax.

7 (8) Seta VI lacking on the 9th abdominal segment — Cnephasiini in part

8 (7) Seta VI present on the 9th abdominal segment — Tortricini

9 (2) Group 7 consists of 3 setae on the 7th abdominal segment, if of 2, then setae VIII on the 9th abdominal segment are not farther apart than on the 8th.

10(11) Setae IIIa and III on the mesothorax stand vertically or IIIa dorso-caudally from III and the coronal suture is always longer than the adfrontalia in maximum cases, is wide. Group VII on the 7th abdominal segment always consists of 3 setae — Cnephasiini the rest

11(10) Setae IIIa and III stand diagonally on the mesothorax, and with that IIIa is always dorsocraniad from III, or the coronal suture

is not longer than the adfrontalia in maximum cases is wide, or Group VII on the 7th abdominal segment consists of 2 setae.

12 (13) Circle of hooklets completely uniserial, or setae I and III on the 9th abdominal segment are found on a common pinaculum

Olethreutini in part

13 (12) Circle of hooklets biserial, often laterally or cranially uniserial, I and III on the 9th abdominal segment, on separate pinaculi.

14 (15) The coronal suture is not longer than the adfrontalia on the level of the apex of clypeus is wide, or the caterpillars are ventrally yellowgreen, dorsally graygreen, and have 2 light longitudinal stripes as well as prominent [or projecting] light pinaculi. Cervical shield with black spots. The spiracle of the 2nd abdominal segment not essentially larger than the place of attachment of seta III and the spiracle of the 8th abdominal segment is not larger than that on the prothorax

Genus Ancylis (Olethreutini)

15 (14) Coronal suture practically twice as long as the adfrontalia at the level of the apex of clypeus is wide. If the coloring corresponds to the above description the spiracle of the 2nd abdominal segment is larger than the place of insertion of setae III and the spiracle of the 8th abdominal segment is still larger than that of the prothorax.

16 (17) Group VII on the 7th abdominal segment always of 3 setae, the 2nd segment of the maxillary palp twice as long as the last (fig. 9)

Archipsini

17 (16) Group VII on the 7th abdominal segment of 2 or 3 setae, if of 3 then the 2nd segment of the maxillary palp is not twice as long as the last (fig. 8)

Olethreutini the rest

18 (1) On the 9th abdominal segment setae I and III are found on a common pinaculum; if this is only weakly developed then they are close beside each other or the coronal suture is not longer than the adfrontalia is wide and seta V on abdominal segments 1 to 8 is hardly half as long as IV.

19 (20) Seta group VII on the 7th, 8th, and 9th abdominal segments [consisting of] 1 seta. On the prothorax the spiracle is found above the prespiracular shield, dorsal from the 6th seta O-2 stands perpendicularly under the 1st ocellus, not ventro-caudad

Genus Pseudargyrotoza (Archipsini)

20 (19) The caterpillars are not simultaneously equipped with all these characters.

21 (22) Circle of hooks uniserial, VI is lacking on the 9th abdominal segment. The distance between setae VIII on the 9th abdominal segment is greater, mostly twice as great, than on the 8th abdominal segment. IV on the prespiracular shield equidistant from V and VI.

Phaloniinae in part

22 (21) Caterpillars not simultaneously equipped with all the characters cited in couplet 21.

23 (24) Seta Frl-1 stands closer to Frl-2 than to F-1

Phaloniinae the rest

24 (23) Seta Frl-1 equally far removed from Frl-2 and F-1, or closer to F-1.

25 (26) Seta group VII on the 7th and 8th abdominal segments consists of 2setae, on the 9th abdominal segment, of 1 seta. On abdominal segments 1 to 7 inclusive, IV and V are vertically situated, or seta VI is absent on the 9th abdominal segment. If setae IV and V

stand vertically only on the 1st abdominal segment, then on the 8th abdominal segment, III is ventrocraniad or dorsocraniad from the spiracle [NB-The German seemed misprinted here]. Eucosmini in part

26 (25) Caterpillars not simultaneously equipped with all the characters cited under couplet 25.

27 (28) Group VII on the 9th abdominal segment consists of only 1 seta Laspeyresiini

28 (27) Group VII on the 9th abdominal segment consists of 2 setae.

29 (30) Group VII on the 1st, 2nd, 7th, 8th and 9th abdominal segments consists of 2setae and on the mesothorax IIIa is dorsocraniad from III Subg.Dichroramphodes (Laspeyresiini)

30 (29) On the1st, 2nd, 7th, 8th, and 9th abdominal segments, group VII does not simultaneously consist of 2 setae. If of 2 setae, then IIIa on the mesothorax is found dorsocaudad from III Eucosmini, the rest

Subfamily Tortricinae.

Diagnosis: The coronal suture is considerably longer than the adfrontalia is wide, setae IV and V of approximately the same length on the abdominal segments. The setae I and II are, on the 9th abdominal segment, mostly found on separate pinaculi, the circles of hooklets of the parapodia biserial (Psuedargyrotoza conwagana, Cnephasia longana are exceptions).

Obraztsov (1942) differentiated 3 tribes, the Archipsini, Cnephasiini, and Tortricini which I can separate from the larval morphology. Their differences will be evident from the foregoing key as well as from the diagnoses.

Tribe Archipsini.

Diagnosis: On all abdominal segments, setae IV and V are diagonally situated. On the 9th abdominal segment I and III are on separate pinaculi. Group VII on the 7th abdominal segment consists of 3 setae, if of 2, then it also consists of 2 setae on the 1st and 2nd abdominal segment (Ptycholoma lecheana). On the mesothorax IIIa is dorsocraniad from III, the 2nd segment of the maxillary palp is mostly twice as long as the last (fig. 9).

The tribe erected by Obraztsov (1942) is larvo-morphologically a homogeneous group except for 2 exceptions. It is very distinctly different from the Tortricini in that group VII on the 7th abdominal segment consists of 3 instead of 2 setae (except for Ptycholoma lecheana). It is separated from Cnephasiini by the fact that on the mesothorax IIIa is situated dorso-craniad from III. In many characters it is close to some Olethreutini of the 2nd subfamily.

Pseudargyrotoza conwagana is a 2nd exception. This Obraztsov also recognized from the adults for he placed this monotypical genus at the end of this tribe. The close relations to the Phaloniinae, as is shown from the larval morphology, could not be detected by Obraztsov. According to his view, it could only be a convergence.

Obraztsov undertook to make a strong classification [or dividing up] within the Archipsini and this proved justifiable from the larval morphology for the greater part.

Genera of Archipsini:

1 (42) Circles of hooklets of parapodia completely or at least at the posterior margin biserial, group VII of 2 or 3 setae on the 7th abdominal segment.

(3) Group VII of 2 setae on the 1st, 2nd, and 7th abdominal segments Ptycholoma

3 (2) Group VII on the 1st, 2nd, and 7th abdominal segments consists of 3 setae.

4 (15) 2nd ocellus equidistant from the 3rd and the 1st, the spiracle on the 2nd abdominal segment larger than the place of attachment of seta III. On the mesothorax VIII is distinctly set off from the coxa.

5 (6) Seta III on the 8th abdominal segment dorsocraniad from the spiracle, the terminal claw of the thoracic legs elongated and slightly curved only on the end (fig. 40) Ptycholomoides

6 (5) Seta III on the 8th abdominal segment craniad or ventrocraniad from the spiracle, never higher.

7 (8) Spiracle of the 8th abdominal segment distinctly larger than that of the prothorax, the cervical shield on both sides between setae II and III marked with a black spot (fig. 38) Syndemis

8 (7) The spiracle of the 8th abdominal segment not larger than that of the prothorax, on the cervical shield between setae II and III the typical black spots are not developed.

9 (10) Spiracle of the 1st and 11th segments elliptical, circles of hooklets of the parapodia of about 45 hooklets Parasyndemis

10 (9) Spiracles of 1st and 11th segments round, if elliptical then the circle of hooks on the parapodia consists of 60-70 hooklets.

11 (14) Caterpillars with a dark head marking, or the fronto-lateral sutures are distinctly indented toward seta Frl-1 (fig. 28).

12 (13) Setae VIII on the 8th and 9th abdominal segments equidistant from each other Choristoneura

13 (12) Setae VIII on the 9th abdominal segment farther apart than on the 8th Cacoecimorpha

14 (11) Caterpillars without dark head marking (apart from eye and genal spots). The fronto-lateral sutures not emarginate toward the Frl-1 setae Archips

15 (4) The 2nd ocellus is found closer to the 3rd than to the 1st, or the spiracles on the 2nd to the 7th abdominal segments inclusively are not larger than the place of attachment of seta III, or VIII on the mesothorax stands on the margin of the coxa. The 4 characters cited do not all show up at the same time.

16 (21) Circles of hooklets of the parapodia biserial only on the posterior margin, anteriorly uniserial.

17 (18) Spiracles of abdominal segments 2 to 7 inclusive are essentially larger than the insertion places of the seta III standing above them, 2nd ocellus closer to the 3rd than to the 1st Adoxophyes

18 (17) Spiracles of abdominal segments 2 to 7 inclusive not larger than the insertion places of the seta III standing above them, the 2nd ocellus is equally far removed from the 1st and 3rd.

19 (20) Seta I on the 9th abdominal segment is equally far from seta II and seta III Batodes

20 (19) On the 9th abdominal segment seta I has approached so close to seta III that the pinaculi touch or are partly fused together Capua

21 (16) Circles of hooks of parapodia completely biserial or they are uniserial only on the side.

22 (27) 2nd ocellus equally far removed from the 3rd and the 1st. The spiracle on the 2nd abdominal segment is not larger than the insertion place of seta III, and on the mesothorax VIII is very close to the margin of the coxa.

23 (26) Seta VIII on the mesothorax on the coxa.

24 (25) Caterpillar body only weakly granulate, the setae of group VII on the 8th abdominal segment are transverse to the ventral Mediana, head yellow Paramesia

25 (24) Caterpillar body strongly granulate, that is/with brown, distinctly supplied recognizable spinules, the setae of group VII on the 8th abdominal segment parallel to the ventral mediana Paraclepsis

26 (23) Seta VIII on the mesothorax stands very close indeed to the coxa but not on it Philedone

27 (22) Caterpillars not supplied with these general characters.

28 (29) On the 9th abdominal segment, setae IV, V, and VI stand at a right angle on a correspondingly formed pinaculum, the 2nd ocellus is equally far removed from the 1st and 3rd Hastula

29 (28) Setae IV, V, and VI on the 9th abdominal segment do not stand in a right angle to each other, or the 2nd ocellus is closer to the 3rd than to the 1st.

30 (33) On the 9th abdominal segment setae VIII are farther apart than on the 8th and on the mesothorax VIII is distinctly set off from the coxa.

31 (32) Spiracle of the 2nd abdominal segment not larger than the insertion place of the seta III standing above it, cervical shield uniformly brown Lozotaenioides

32 (31) Spiracle of the 2nd abdominal segment larger than the insertion place of the seta III standing above it. Cervical shield with dark spots (fig. 51 and 50) Lozotaenia

33 (30) On the 9th abdominal segment setae VIII are not farther apart than on the 8th, or on the mesothorax VIII is very close to the coxa.

34 (39) Spiracle of 2nd abdominal segment larger than the insertion place of the seta III standing above it. Seta group VII on the 9th abdominal segment of 2 setae, and on the 8th abdominal segment the setae II are not closer together than setae I.

35 (38) On the mesothorax VIII stands right on the margin of the coxa or the 1st, 2nd, and 5th ocelli are so feebly pigmented that they seem to be white in contrast to the other ocelli.

36 (37) Circles of hooks of parapodia biserial on all sides, the ocelli uniformly developed. Spiracle of the 8th abdominal segment as large as pinaculum III. Sparganothis

37 (36) Circles of hooks on parapodia laterally uniserial, or the 1st, 2nd, and 5th ocelli are more feebly developed, or the spiracle on the 8th abdominal segment is smaller than pinaculum III Pandemis

38 (35) On the mesothorax VIII is distinctly set off from the coxa, the ocelli are all uniformly developed Aphelia

39 (34) Spiracle of the 2nd abdominal segment not larger than the insertion place of the seta III standing above it, if larger than the distance between setae II on the 8th abdominal segment is smaller than that of setae I, or group VII on the 9th abdominal segment consists of only one seta.

40 (41) Only the 3rd, 4th, and 6th ocelli are strongly pigmented and therefore look black while the rest are so weakly pigmented that they seem to be white. On the mesothorax seta VIII is distinctly set off from the coxa Argyrotaenia

41 (40) The ocelli are all uniformly pigmented and therefore uniformly colored, or on the mesothorax VIII stands very close beside the coxa Clepsis

42 (1) Hooklets of parapodia uniserial, group VII on the 7th abdominal segment of 1 seta Pseudargyrotoza

The genus Pandemis Hubner 1825.

Diagnosis: Group VII of the 1st, 2nd, and 7th abdominal segments consisting of 3 setae, that of the 8th and 9th abdominal segments, of 2 setae. The spiracles of the 2nd to the 7th abdominal segments inclusive are larger than the insertion place of seta III, or the biserial circles of hooks are laterally uniserial. 2nd Ocellus closer to the 3rd than to the 1st. On the prespiracular shield IV is twice as far removed from VI as from V and stands almost on a line with the two of them. Seta III is found on the 8th abdominal segment somewhat ventro-craniad from the spiracle. On the cervical shield III is farther from IIIa than from IX, II stands exactly ventrad from I. On the 9th abdominal segment setae IV, V, and VI stand on one pinaculum.

The polyphagous larvae live in leaf rolls or also in leaf webs where pupation also takes place. Two generations.

According to a letter communication, Obraztsov included the earlier Tortrix dumetana in this genus. Although the caterpillar of this species differs somewhat more strongly from the others this [generic] transfer can be agreed to since there is great agreement in other respects.

Spp. of Pandemis

1	(6)	On the mesothorax VIII stands right on the margin or on the coxa.	
2	(3)	Cervical shield uniformly brownish or greenish	heparana
3	(2)	Cervical shield likewise green, but marked with black (fig. 25 and 26).	
4	(5)	Between the rows of setae I, II, III, and IIIa, IX, and X on the cervical shield there are several black spots (fig. 25)	corylana
5	(4)	On the cervical shield only the posterior margin is black edged	ribeana
6	(1)	On the mesothorax VIII is distinctly set off from the coxa	dumetana

P.corylana (Fabricius 1794) (1538)

Head yellowish green with dark eye and genal spots. Body green and strongly granulate, dorsally darker. Cervical shield yellowish green with dark spots (fig. 25), anal shield uniformly yellowgreen. Parapodia laterally not chitinized, the biserial circles of hooks laterally uniserial, 40-50 hooklets. Anal comb with as many as 9 spines. On the prothorax and on the 8th abdominal segment the spiracles are larger than on the other segments, and are round.

May, June, between spun-up leaves on Corylus, Quercus, Fagus, Betula, Rhamnus, Rubus and weedy plants. 2 generations that are not separated in time. Pupation in webs on the leaves. Locality: Rathsberg, 6/14/51, Fagus, Corylus, Quercus; very abundant.

P.ribeana (Hübner 1822)(1540)

Head yellowgreen with dark eye and genal spots (in young instars nearly black). Body brownish green, granulated, with large light pinaculi. Cervical shield yellowgreen, black edged (fig. 26). Anal shield, thoracic legs brownish green. Parapodia laterally not chitinized, circles of hooks biserial. 40-50 hooklets, anal comb with 6 to 8 spines. On the prothorax and 8th abdominal segment the spiracles are larger than on the remaining segments, and they are elliptical.

May, June, and July in one or several spun-up leaves on Quercus, Acer, Betula, Tilia, Sorbus, Ribes, Berberis, Prunus, Crataegus, Rosa, Rhamnus, Fraxinus. 2 generations. Pupation June and July between spun-up leaves.

Locality where found: Burgberg June 16, 1951: Acer.

Pandemis heparana (Schiffermiller 1776)(1547)

Caterpillar light green, dorsally with a gray tinge, head, cervical shield brownish green, the latter marked with dark. Head with eye and genal spots. Large light pinaculi, parapodia laterally not chitinized. The biserial circles of hooks laterally uniserial and consisting of 40-50 hooklets. Anal comb with a varying number of spines. The spiracles of the prothorax and 8th abdominal segment larger than those of the other segments and they are round (fig. 27).

May, June, and July in leaf rolls on Fagus, Quercus, Sorbus, Betula, Salix, Tilia, Ulmus, Fraxinus, according to Eckstein (1933) also on Lysimachia, Humulus, and Anchusa. 2 generations. (Fig. 9).

Locality: Marloffstein June 14, 1951 in leaf rolls on Quercus.

Pandemis dumetana (Treitschke 1835)(1600)

Caterpillar green, dorsally sometimes somewhat darker green, head, cervical shield, anal shield, pinaculi, and thoracic legs green. Head with black eye and genal spots and antennae. Anal comb with 6-8 spines, on the 9th abdominal segment setae VIII are not farther apart than on the 8th abdominal segment and on the mesothorax VIII is distinctly set off from the coxa. Spiracle of the 2nd abdominal segment larger than the insertion place of the seta III standing above it. On the 8th abdominal segment, III is ventrocraniad from the spiracle. The 1st, 2nd, and 5th ocelli are weakly pigmented so that they seem to be white in contrast to the others.

May, June in leaf rolls or spun-up flowers on Lonicera periclimenum, [etc.].

Locality: Erlangen on May 22, 1954, on Quercus.

The genus Argyrotaenia Stephens 1852.

Diagnosis: The 3rd, 4th, and 6th ocelli more strongly pigmented than the others, the 2nd is closer to the 3rd than the 1st. The small seta IIIa stands on the abdominal segment at the margin of pinaculum III. The latter on the 8th abdominal segment is ventrocraniad from the spiracle. The distance between setae VIII on the 8th and 9th abdominal segments of the same size.

A. politana (Haworth 1811)(1553)
Syn. pulchellana (Haworth 1811) according to Obraztsov.

Body green, pinaculi light, head brownish, cervical shield yellowish. Group VII of the 1st, 2nd, and 7th abdominal segments consisting of 3 setae, on the 8th and 9th abdominal segments, consisting of 2 setae. On the mesothorax VIII is distinctly set off from the coxa, the spiracles of the 2nd to the 7th abdominal segments inclusive are not larger than the insertion place of III. Circles of hooks completely biserial. On the 9th abdominal segment setae VIII are not farther apart than on the 8th. Prespiracular shield placed obliquely so that V lies lowest down, seta IV ~~xxxxxxxxxxxx~~ strongly approaching it. 2nd ocellus closer to the 3rd than to the 1st. Only the 3rd, 4th, and 6th ocelli normally pigmented.

This species is very polyphagous; Centaurea [etc.]. Also spins up the needles of young shoots of Pinus silvestris into tubes and causes the latter to die by gnawing.

June through July, Aug. in 2 generations.

The caterpillars investigated were found by Disque on August 7 1902 near Speyer on Solidago virgaurea and on Sept. 15, 1902 on Calluna; they come from the Bavarian State Collection.

The genus Choristoneura Lederer 1859

Diagnosis: Group VII on the 1st, 2nd, and 7th abdominal segments consisting of 3 setae, on the 8th and 9th abdominal segments of 2 setae. On the mesothorax VIII distinctly set off from the coma. The spiracles of the 2nd to the 7th abdominal segments inclusive distinctly larger than the insertion place of seta III. Circles of hooks completely biserial. The spiracles of the prothorax and 8th abdominal segment round, while those of the other segments are elliptical and essentially smaller. On the 9th abdominal segment the setae VIII are not farther apart than they are on the 8th. The 2nd ocellus is equally far removed from the 1st and the 3rd.

While murinana was formerly in the genus Cacoecia, diversana belonged to the genus Tortrix. The putting of the two spp. together in this genus is justified by the larval morphology.

Spp. of Choristoneura.

1 (2) Parapodia laterally with a black chitin shield (fig. 224). Head black — murinana

2 (1) Parapodia laterally without chitin shield (fig. 116), head red-brown or only spotted red-brown — diversana

C.murinana (Hübner 1822)(1524)

Caterpillars green, strongly granulated by microscopically small black spinules. Head, Cervical shield, thoracic legs, and insertion places of setae of the prothoracic pinaculi black. Cervical shield distinctly parted. Adfrontalia distinctly emarginate at the level of seta Frl-l (fig. 28). Spiracleon the 1st abdominal segment larger than on the 2nd.

According to Wachtl (1882) the eggs are laid on the needles in July overlapping like the tiles of a roof. The caterpillars hatch first in the following spring, spin up the early growth and eat the young needles at the base. Pupation takes place in ground litter. According to Koch (1859) and Fankhauser (1893) pupation takes place between the needles of older shoots. Different Abies spp. have been reported as food plants, particularly Abies pectinata.

The caterpillars investigated from the Bavarian State Collection were found by Disque on June 2, 1900 in Lauterecken on Abies alba.

C.diversana (Hübner 1822)(1601)

Body light or brownish green with light or dark brown pinaculi. Head brown to red-brown. Cervical shield greenish or brown, sometimes with indistinct brown marking (fig. 29). The adfrontalis not emarginate toward setae Frl-l, the spiracles of the 1st and 2nd abdominal segments of the same size and elliptical. Anal comb with 4-6 spines.

May and June in leaf rolls and flower buds. This species lives polyphagously on Pirus malus, P.communis, Syringa, Lonicera, Salix, and Ononis.

The caterpillars investigated from the Bavarian State Collection were found by Disque June 5, 1911 near Speyer on Prunus cerasus and Medicago.

The genus Archips Hübner 1822
Syn. Cacoecia Hübner 1818 part.

Diagnosis: Group VII on the 1st, 2nd, and 7th abdominal segments of 3 setae, on the ... 8th, and 9th segments of 2 setae. On the mesothorax VIII is distinctly set off from the coxa, IIIa is dorsocraniad from III. The spiracles of the 2nd abdominal segment distinctly larger than the insertion place of seta III, they are especially large on the prothorax and 8th abdominal segment. 2nd ocellus equidistant from the 1st and 3rd. On the prespiracular shield the distance of setae VI and IV is twice as great as the distance from IV and V. On all abdominal segments setae V and IV are diagonally situated.

Obraztsov (i.lit.) divided the previous genus Cacoecia into the genera Choristoneura, Cornicacoecia, Archips, Syndemis, Parasyndemis, Ptycholomoides, and Clepsis partim.

This genus includes the typical species of the former genus Cacoecia. The genus Cacoecia can be well characterizied from its larval systematics, yet further larvomorphological differences permit this classification to be justified with one exception. The species lafauryana, which Obraztsov places in a monotypical genus, Cornicacoecia, I am unable to separate morphologicallyfrom the genus Archips and therefore am leaving it in this genus.

Species of Archips.

1	(2)	Head yellow, on the cervical shield IIIa is equidistant from IX and III	lafauryana
2	(1)	Head brown to black, IIIa on the cervical shield is mostly farther removed from III than from IX.	
3	(8)	On the prespiracular shield setae V, IV, and VI are arranged in a line whereby the latter is inserted far from the margin (fig. 32).	
4	(5)	Prothoracic spiracle elliptical	podana
5	(4)	Prothoracic spiracle round.	
6	(7)	Setae VIII on the 8th and 9th abdominal segments equally far removed from each other	xylosteana
7	(6)	Setae VIII are farther apart on the 9th abdominal segment than on the 8th	piceana
8	(3)	On the prespiracular shield seta IV is somewhat ventrad from the line between V and VI, the latter is not inserted farther from the margin of the pinaculum than is seta V.	
9	(10)	Parapodia laterally blackly chitinized (fig. 224)	crataegana
10	(9)	Parapodia not chitinized, of the same color as the body (fig. 116)	
11	(12)	Head black	sorbiana
12	(11)	Head chestnut brown	rosana

Archips lafauryana (Ragonot 1875 (1516)

From a communication by letter Obraztsov erected a genus of its own for this species. But since the caterpillar cannot be morphologically separated from those of the following species, I am not accepting this transfer.

Body green, only weakly granulate, darker on the dorsum. Head yellow with eye- and genal-spots, Cervical and anal shields greenish. The spiracles of the prothorax and 8th abdominal segment are very large and completely round. On the prespiracula shield VI is farther from the margin than V, IV stands with these two setae in one line (fig. 32). On the 8th abdominal segment III is ventrocraniad from the spiracle with IIIa on a common pinaculum, the setae II are not farther apart than setae I.

May, June between spun-up leaves on Myrica gale, where it also pupates. Occurrence rare. Sorhagen found it on the peat moors of West Germany.

The caterpillers, investigated came from Sorhagen who found them on June 30, 1892 in the vicinity of Hamburg on Myraca gale [sic!].

Archips piceana (Linné 1758)(1506)

Caterpillar dirty green, head darkbrown or black., cervical shield edged brown-black (fig. 30). Pinaculi and Thoracic legs brown. On the 8th abdominal segment III stands ventro-craniad from the spiracle with IIIa on a common crescent shaped pinaculum. On the cervical shield III is farther removed from IIIa than from IX. The setae II on the 8th abdominal segment are mostly somewhat farther removed from each other than setae I Body strongly granulate by reason of microscopically small black spinules.

Statements on the biology of the caterpillars in forest literature are somewhat contradictory probably as a result of confusion with Rhyacionia (Evetria) duplana. According to Baer (1909) and Trägårdh (1915) the caterpillars, in the fall, live in tubes prepared from 6-8 needles and in the spring go over to feeding on the young needles of the early growth. The latter are also occasionally fed upon, whereby the importance of the forest pest is substantially increased. Pinus, Picea, Abies, Larix, and Juniperus have been reported as food plants, of these the first-named in preferred.

Locality: Tennenloher Forest May 18, 1951, between spun-up needles of Pinus silvestris.

Archips podana (Scopoli 1763)(1507)

Body grass green with light pinaculi, head and cervical shield red-brown, the latter dark edged (fig. 31). Sometimes the head and the anal shield are black. Seta III is found, on the 8th abdominal segment, on a round pinaculum before the spiracle together with IIIa, at the same level with the spiracle. On the cervical shield the distance from III to IIIa is greater than from IIIa to IX. Also in this caterpillar setae VIII on the 9th abdominal segment are somewhat farther apart than on the 8th. Spiracles of the prothorax and the 8th abdominal segment again are strikingly large and elliptical. The body of the caterpillar is only very weakly granulate so that there can be no more talk of microscopically small spinules.

May to July between spun-up leaves, mostly on the terminal shoot. The caterpillar is very polyphagous and therefore is met with very frequently everywhere. The following have been reported as host plants: Betula, Clematix, [etc.]

Locality: Tennenloher forest on May 25, 1951 on Betula between spun-up leaves of the terminal shoot.

Archips crataegana (Hübner 1822) (1512)

Body blackish, head, cervical shield, anal shield, thoracic legs, and pinaculi black. On the 8th abdominal segment III stands on a pinaculum with IIIa right before the spiracle. On the cervical shield the distance of setae IX and IIIa is greater than that of IIIa and III. Setae VIII on the 8th and 9th segments are equidistant from each other. Prothoracic spiracle still somewhat larger than that on the 8th abdominal segment but somewhat more elliptical. On the prespiracular shield VI is not farther removed from the margin than V. Parapodia laterally black-chitinized (fig. 224). Body strongly granulated by reason of small black spinules.

May, June between spun-up leaves on Prunus, Sorbus, Pirus malus, Quercus, Populus, Crataegus, Salix. Pupation in a web on the leaf.

Locality: Rathsberg on May 25,1952 on Quercus.

Archips xylosteana (Linné 1728)(1513)

Caterpillar whitish gray or gray green, head, cervical shield, pinaculi, anal shield, thoracic legs dark brown to black (fig. 35). On the 8th abdominal segment, III and IIIa are found on a round pinaculum which is somewhat ventrocraniad from the spiracle. Setae VIII on the 8th and 9th abdominal segments are equally far apart. Setae II on the 8th abdominal segment are not farther apart than setae I. On the prespiracular shield seta VI is inserted farther from the margin than V is (fig. 32). On the cervical shield seta IX stands closer to IIIa than to III. The large spiracles of the prothorax and 8th abdominal segment are round. Parapodia black-chitinized on the sides (fig. 224).

May, June on Quercus, Prunus [etc.]. The caterpillars build true leaf rolls in that they roll the leaf in mostly from the apex. Pupation also occurs in the roll. One generation; the eggs overwinter.

The caterpillars investigated, coming from the Bavarian State Collection, were found by Disque on June 15, 1898 near Speyer on Corylus.

A.rosana (Linné 1758)(1514)

Body light green, often dark olive green. Pinaculi light. Head chestnut brown, cervical shield and thoracic legs dark brown, anal shield greenish-yellow. On the 8th abdominal segment the pinaculum with IIIa and III lies exactly in front of the spiracle. On the prespiracular shield VI is not inserted farther from the margin than is V, IV stands somewhat ventrad from the [other] two setae. Parapodia laterally not chitinized. Setae II on the 8th abdominal segment are not farther from each other than setae I.

May to July gregarious at first in leaf-webs, later singly in leaf rolls in which pupation also takes place. Food plants: Rosa, Ribes, [etc.]

Locality: Erlangen water works on May 10, 1952, between spun-up leaves on Prunus spinosa.

A.sorbiana (Hübner 1822)(1515).

Body dark-green-gray or olive green with brown thoracic pinaculi, the rest are light. Head black, cervical shield brown, dark spotted or bordered (fig. 36). Anal shield yellow-brown. Seta III with IIIa on the 8th abdominal segment on one large round pinaculum, which is found exactly in front of the spiracule. The prothoracic spiracle is larger than that of the 8th abdominal segment. This species agrees with the preceding species in the other morphological characters.

April to June in leaf rolls on Quercus,[etc.]

Locality: Rathsberg on May 18, 1951 on Quercus.

The genus Cacoecimorpha Obraztsov 1954

Diagnosis: Seta group VII on the 1st, 2nd, and 7th abdominal segments of 3 setae, on the 8th and 9th abdominal segments, of 2 setae. On the 8th abdominal segment III is craniad from the spiracle, situated on the same level as this is. Spiracle of the 2nd abdominal segment distinctly larger than the insertion place of seta III. 2nd ocellus equidistant from the 1st and the 3rd.

This monotypical genus was erected by Obraztsov as new. The sole species pronubana was previously in the genus Tortrix. The resultsof his investigation can be confirmed from the larval morphology. While in all spp. of the Tortricini group VII on the 7th abdominal segment consists of 2 setae, in this species as in other spp. of Archipsini, it shows 3 setae. Since this genus is closest to the other spp. of the Genus Archips, formerly Cacoecia, as a result of placement of the ocelli and the size of the spiracles, I also consider the new generic designation admissible.

Cacoecimorpha pronubana (Hübner 1822)(1573)

The catepillar is ashy-gray with light pinaculi. Head brown, cervical shield honey-yellow with black spots (fig. 37), Anal shield brownish, thoracic legs brown. On the 9th abdominal segment the setae VIII are farther removed from each other than on the 8th, on the prespiracular shield IV is ventrad from the line from V to VI. Body strongly granulate by reason of microscopically small brown spinules.

May to June and Sept, Oct. in 2 generations, polyphagous on Daphne cnidium, Asphodelus, Arbutus, Nepeta, and Rosmarinus. According to Schütze (1931) and Eckstein (1933) this species does not occur in Germany.

The caterpillars investigated are from the collection by Disque.

Locality: southern France April 9, 1897.

The genus Syndemis Hübner 1825

Diagnosis: Spiracle of the 8th abdominal segment larger than that of the prothorax. On the 9th abdominal segment setae VIII are farther apart than on the 8th. Seta IV on the prespiracular shield is ventrad from V and VI. For the rest the characters agree with Archips.

This genus was separated off from the previous genus Cacoecia by Obraztsov, which seems to me to be justified with respect to the relations of size of spiracles.

Syndemis musculana (Hübner 1822)(1925).

Body ventrally yellow-green, dorsally dark gray-green, with large raised light pinaculi. Sometimes dorsally with 2 light longitudinal stripes. Head yellowish with dark eye- and genal-spots. Cervical shield yellowish with a large black spot between II and III (fig.38). Anal shield greenish, sometimes also spotted. The great similarity of this species with the genus Ancylis in coloring is very striking. Still the spiracles are distinctly larger than in that genus. Parapodia with about 45 hooklets, not laterally chitinized. On the 8th abdominal segment III is ventrocraniad from the spiracle. On the prespiracular shield IV is somewhat ventrad from setae V amd VI.

Primary feeding time begins the last of Aug. and lasts to Sept. Overwinters still as a caterpillar, pupation in March. This species is very polyphagous and lives in leaf-rolls which are not always as regular as stated in the literature. Food plants: Genista, Solidago, [etc.].

Locality: Spardorf on Aug. 25, 1953 on Lysimachia, Rathsberg on Aug. 26 1953 on Rubus.

The genus Parasyndemis Obraztsov 1954

Diagnosis: The spiracles, even those of the prothorax and 8th abdominal segment are elliptical, parapodia with not more than 46 hooklets. On the 9th abdominal segment setae VIII are not farther apart than on the 8th. This genus agrees with the genus Archips in all other characters.

This genus too was erected by Obraztsov by splitting up the earlier genus Cacoecia. As is evident from the diagnosis of the genus, the larvae differ but little.

P.histricana (Frölich 1828)(1523).

Body green, pinaculi not chitinized, head in the earlier instars dark brown, later light brown with eye- and genal-spots. Cervical shield anteriorly light, posteriorly dark edged (fig. 39). Anal shield yellowish green, thoracic legs brown. Parapodia with not more than 45 hooklets, on the 9th abdominal segment setae VIII are not farther from each other than on the 8th. All spiracles elliptical.

Data on biology in the forest literature differ. Oviposition occurs the first of July in double rows on the needles of Picea excelsa. According to Mitterberger (1910) who reared the larvae ex ovo, they hatch in mid-July. Whether this is the case in nature or whether the eggs overwinter could not yet be demonstrated. The caterpillars have hitherto been found only in the spring between spun-up leaves of the preceding year, from which they then go over to the early growth. The feeding on the shoots causes them to curve like post-horns, as is also the case with Rhyacionia buoliana. 10 to 30 year old stands of spruce are especially attacked.

The spp. investigated from the Bavarian State Collection at Munich came from Schütze who had found them in the vicinity of Rachlau on June 12, 1902 on Picea excelsa.

The genus Ptycholomoides Obraztsov 1954.

Diagnosis: Claws of thoracic legs long and stretched out and lightly curved only on the tip (fig. 40). Seta III on the 8th abdominal segment situated dorsocraniad from the spiracle.

Obraztsov separated this monotypical genus off from the former genus Cacoecia. They differ very substantially by reason of the above named characters so that the separation seems justified by the morphology of the larva.

P.aeriferana (Herrich-Schaeffer 1851)(1527).

The caterpillar is green and only weakly granulate. It has not 2 olive colored dorsal longitudinal stripes, as Spule (1910) wrote, but 3; head light brown with dark spots, cervical shield yellowish on the sides and in the middle black (fig. 41), anal shield yellow-green. Setae VIII on the 9th abdominal segment farther apart than on the 8th. All spiracles elliptical, the biserial circles of hooks of the parapodia consist of 36 to 40 hooklets.

May, June between spun-up needles on Larix. Schütze (1931) has already characterized the occurrence under the bark of Acer platanoides, reported by Kennel (1908) and Suuler (1910) as inadmissible.

The caterpillars investigated from the Bavarian State Collection at Munich came from Schütze himself. He found them in the vicinity of Rachlau on June 12, 1902, between spun-up needles on Larix.

The genus Aphelia Hübner 1825

Diagnosis: Circles of hooks of parapodia completely biserial, group VII on the 7th abdominal segment consisting of 3 setae, on the 9th, of 2. Setae VIII on the 9th abdominal segment not farther apart than on the 8th. On the mesothorax VIII is distinctly set off from the margin of the coxa. Spiracle of the 2nd abdominal segment distinctly larger than the insertion place of seta III. 2nd ocellus closer to the 3rd than to the 1st.

The species grouped together in this old genus were separated off from the former genera Tortrix Meyrick and Eulia Hübner by Obraztsov. Larvally they also form a very homogeneous group which is separated by 3 setae in group VII on the 7th abdominal segment from the genus Tortrix in its new concept, as well as the other Tortricini with 2 setae in the corresponding place. Therefore it seems to me that this transfer is completely justified also from the view point of larval systematics. The spp. investigated by me are dividedinto 2 subgenera. The 1st, to which only one species belongs, differs from the 2nd by only a typical marking of the cervical and anal shields (fig. 42, 43), but morphologically there is no great difference between the larvae. Since separation of subgenera is possible in this way, I am concluding that it can be so separated in the assumption that a stronger differentiation of the adults will probably justify it.

1 (2) Cervical and anal shields light-brown, black marked (fig.42, 43) Aphelia sg
2 (1) Cervical and anal shields uniformly dark-brown or black Zelotherses sg

Subgenus Aphelia Hübner 1825
Aphelia (Aph.) viburniana (Fabricius 1787)(1578).

Caterpillar dark-blue-gray or olive-green, laterally lighter. Pinaculi lighter than the body and not chitinized, head light brown, cervical and anal shields light brown with black marking (fig. 41 and 42). Circles of hooks of parapodia biserial with about 50 hooks. The setae VIII are somewhat farther apart on the 9th than on the 8th abdominal segment. Spiracle of the 1st and 2nd abdominal segments of the same size, body strongly granulate.

April to June polyphagous, hither found on Lotus, Alisma, Ledum, Pastinaca, Centaurea, Coronilla, Lysimachia, Viburnum, Salix repens in leaves spun together, on Pinus silvestris in spun-up early growth.

The caterpillars investigated from the Bavarian State Collection had been found by Disque on May 10, 1896 near Speyer on Pastinaca, Plantago lanceolatum, and Centaurea nigra.

Subgenus Zelotherses Lederer 1859.

1 (4) Pinaculi light, only weakly or not chitinized.
2 (3) Setae II farther apart on the 8th abdominal segment than are setae I, head yellow-brown, dark-marked paleana
3 (2) Setae II not farther apart on the 8th abdominal segment than are setae I, head black amplana
4 (1) Pinaculi black-brown, strongly chitinized ochreana

Aphelia (Zeloth.) paleana (Hübner 1793)(1585)

Caterpillar black with white pinaculi, head yellow-brown and dark-marked. Cervical, anal shields, and thoracic legs black. On the 8th abdominal segment setae II are farther apart than are setae I. A distinctly visible, microscopically small seta before the parapodia. Parapodia with biserial circles of hooks of about 50 hooklets. Spiracle of the

1st segment elliptical, that of the 8th abdominal segment round. Body strongly granulate by microscopicall small black spinules.

May, June between spun-up leaves on Vaccinium myrtillus, Quercus, Scabiosa, Inula, Rhinanthus, Caltha, Petasites albus, P.niveus, Circium and Luzula.

Locality: Potsdam May 19, 1896, Sorhagen on Rubus.

Aphelia (Zeloth.) amplana (Duponchel 1836)(1588)

Caterpillar black with light pinaculi, head, cervical and anal shields, and thoracic legs black. On the 8th abdominal segment the setae II are not farther apart than are setae I. Otherwise this species agrees completely with the preceding one, morphologically.

This species does not occur in Germany. According to Kennel (1908) only on the coasts of Southern Europe and Northwest Africa.

Jan. to March on Scilla maritima and Asphodelus.

Locality: Oran/Algeria on March 15, 1900.

Aphelia (Zeloth.) ochreana (Hübner 1822)(1549).

Caterpillar dark olive green, strongly granulate by reason of microscopically small brown spinules. Head, cervical shield, thoracic legs, and pinaculi black-brown to black, the last strongly chitinized. Head sometimes lighter and black spotted. On the 8th abdominal segment setae I and setae II are just as far apart, seta III ventrocraniad from the spiracle. Parapodia laterally black-chitinized (fig. 224).

April, May on lower plants, especially on Anemone pulsatilla, rare.

The caterpillars investigated from the Bavarian State Collection had been found by Krone on May 1, 1902 in the vicinity of Vienna on Arabis turrita.

The genus Clepsis Guenée 1845

Diagnosis: Spiracles of the2nd to the 7th abdominal segments inclusive not larger than the insertion place of seta III situated above them; if larger than group VII on the 9th abdominal segment consists of only 1 seta, or on the 8th abdominal segment the distance between setae II is less than that between setae I. Setae VIII on the 9th segment of the abdomen not farther apart than on the 8th. Circles of hooks of the parapodia biserial on all sides. Group VII consists of 3 setae on the 1st, 2nd, and 7th abdominal segments.

The spp. of this genus were formerly partly in the genus Tortrix, partly in the genus Cacoecia. They agree in the above named characters so far as to form a group and differ from the other spp. of their former genera quite substantially. It is not so distinct in the species steineriana which could just as well be referred to the genus Aphelia from the systematics of the larvae. According to Obraztsov's system, all former Cacoecia species were divided up into several genera from which the species of this genus are separated by distinctly smaller spiracles. In the Tortrix species accepted in this genus, the difference from the genus Tortrix, as conceived today by Obraztsov, is so great that their belonging to another tribe is justified by the larvae. While in spp. of this genus seta-group VII on the 7th abdominal segment always consists of 3 setae, in the present genus Tortrix, as in all other spp. of the Tortricini, there are only 2 setae present in the corresponding place.

Since the spp. of this genus also show great differences in the adults, Obraztsov split this genus up into 3 subgenera. I can also follow this splitting up, as is evident from the following key.

Subgenera of Clepsis.

1	(2)	On the mesothorax, seta VIII ismmoved up very close to the coxa	sg. Clepsis
2	(1)	On the mesothorax, seta VIII is distinctly set off from the coxa	
3	(4)	On the 9th abdominal segment, the group VII consists of 1 seta	sg. Pseudamelia
4	(3)	On the 9th abdominal segment, the group VII consists of 2 setae	sg. Siclobola

Subgenus Clepsis Guenée 1845

Diagnosis: On the mesothorax, VIII stands very close to coxa.

C.(C.) helvolana Frölich 1828.
syn. rusticana Treitschke 1830 (1597).

Body brownish-yellow, dorsally somewhat darker with 2 weakly developed lighter longitudinal stripes. The pinaculi are only weakly raised from the body. Head light brown with dark eye- and genal-spots. Cervical and anal shields and the thoracic legs, yellowish green. Only the 3rd, 4th, and 6th ocellus are so heavily pigmented that they are black while the other 3 seem to be white. Spiracles elliptical, spiracle margin strengthened, therefore projecting somewhat above the body. On the 2nd abdominal segment the spiracles are not larger than the insertion place of seta III. On the 7th and 8th abdominal segments setae I and II are always equally far apart. Circles of hooks on the parapodia biserial with about 35 hooklets, those of the caudal disk with about 25 hooklets.

The caterpillar shows up in Aug., overwinters as an adult caterpillar and pupates in the spring. They live between spun-up leaves on Vaccinium myrtillus, Dorycnium, Gentiana amarella, Lotus, Convallaria polygonatum.

Locality: Aachen Sept. 28, 1905 on V.myrtillus, Disque.

Subgenus Pseudamelia Obraztsov 1955.

Diagnosis: Seta group VII consisting of only 1 seta on the 9th abdominal segment.

C.(P.) unicolorana (Duponchel 1835)(1582).

Body dirty gray-brown, strongly granulate by reason of microscopically small spinules. Head, Cervical and Anal shields, pinaculi and thoracic legs brown, head darker than the cervical shield. Circles of hooks of parapodia biserial with about 30 hooklets, caudal disk with about 20. On the abdominal segments IIIa and III are found on a pinaculum which is situated craniad from the spiracle on the same level with it, on the 8th abdominal segment. On the 9th abdominal segment, setae VIII are somewhat closer together than on the 8th. 2nd ocellus closer to the 3rd than to the 1st. On the 9th abdominal segment the pinaculum with setae II is triangular.

This species does not occur in Germany, it has been reported only from southwestern Europe and northwest Africa. According to Kennel (1908) it was found in March on Asphodelus, surely having overwintered from the fall.

The caterpillars from the Bavarian State Collection that were examined, were found on Asphodelus on April 8, 1905.

Subgenus Siclobola Diakonoff 1947.

Diagnosis: Group VII on the 9th abdominal segment always consisting of 2 setae, and on the mesothorax VIII is distinctly set off from the coxa.

Spp. of the subgenus Siclobola.

1 (2) Spiracle of the 2nd abdominal segment larger than the insertion place of seta III standing above it; on the 8th abdominal segment the distance between setae II is less than that between setae I steineriana
2 (1) Spiracle of the 2nd abdominal segment not greater than the insertion place of the setae III standing above it; on the 8th abdominal segment the distance between setae II not less than that between setae I.
3 (6) The 2nd ocellus equally far from the 1st and the 3rd.
4 (5) On the 8th abdominal segment III is craniad from the spiracle, on the same level with it. Body strongly granulate by reason of microscopically small spinules. Pinaculi brown unifasciana
5 (4) On the 8th abdominal segment III is ventro-craniad from the spiracle. Body only very weakly granulate, spinules not to be recognized. The pinaculi only weakly developed and of the same color as the body strigana
6 (3) The 2nd ocellus is closer to the 3rd than to the 1st.
7 (8) Parapodia with a strongly chitinized black-brown shield on the side (fig.224) costana
8 (7) Parapodia with no chitinized conspicuous shield on the side semialbana

C.(S.) steineriana (Hincken 1821)(1591)

Body yellowish to gray-green, dorsally more strongly granulate than ventrally. The insertion places of the setae and the spiracles black, the pinaculi, on the other hand, are not always black. Head yellow, posteriorly black spotted, cervical and anal shields brownish and dark spotted or punctate [NB-The German word may also mean "dotted"]. (Fig. 44). I could not determine whether the cervical shield can be developed black, as Eckstein reports (1933). The spiracles are elliptical, on the 2nd abdominal segment they are larger than the insertion place of the seta III standing above them. On abdominal segments 1 to 7 inclusive, IIIa is found beside pinaculum III. Anal comb of 6 spines. The biserial circles of hooks of the parapodia have about 40, those of the caudal disk about 30, hooklets. 2nd ocellus closer to the 3rd than to the 1st.

May, June on Veratrum album, Anemone hepatica, Dentaria bulbifera, Luzula albida, Sanicula, Vaccinium myrtillus and uliginosum between spun-up leaves and in the stem.

The caterpillars from the Bavarian State Collection which were investigated had been found by Chretien on June 2, 1899, on Veratrum.

C.(S.) unifasciana (Duponchel 1843)(1528)

Body violet green and strongly granulate. Head light brown withdark eye- and genal-spots. Cervical and anal shields, thoracic legs, and pinaculi brown. According to Kennel (1908) the pinaculi and the anterior margin of the cervical shield are black. In the spp. investigated by me, on the other hand, the pinaculi were dark brown (fig. 45) and the cervical shield was darker in the posterior half than in the anterior. The spiracles are round, on the prothorax they are surrounded by a strong chitinized brown margin and on the 2nd abdominal segment they are not essentially larger than the insertion place of seta III. The latter is on the same level with the spiracle on the 8th abdominal segment. On the 7th and 8th abdominal segments setae II are not farther apart than are setae I. On the mesothorax the common pinaculum of setae I and II is not drawn out caudad. Anal comb

of 5 to 6 spines. On the cervical shield II is ventrocaudad from I, setae VIII on the 9th abdominal segment not farther apart than on the 8th abdominal segment. Parapodia with about 60 hooklets. The setae of group VII stand in a line on the 1st and 2nd abdominal segment.

May, June on Ligrustrum vulgare, according to Disque overwintering from July on, in connection with which the caterpillar is supposed to feed on withered leaves on the ground during this period. Shows up frequently only in its own areal, in western and southern Europe, also Asia Minor, northwest Africa, and nosthwest Russia; rare elsewhere.

Locality: Speyer on May 3, 1900 on Ligrustum and withered leaves, Disque.

Clepsis (S.) strigana (Hübner 1822)(1531)

Body yellow green and only veryweakly granulate. The pinaculi are not raised from it. Head yellow green with dark eye- and genal spots, cervical and anal shields without any marking. Spiracles round, on the 8th abdominal segment III is found somewhat ventrocraniad from the spiracle. On the 2nd abdominal segment the spiracle is not larger than the insertion place of the seta III standing above it. Setae VIII on the 9th abdominal segment are not farther apart than on the 8th. On the 2nd abdominal segment the 3 setae of group VII do not stand in one line. 2nd ocellus equidistant from the 1st and 3rd.

The caterpillar lives between spun up leaves and shoots on Gnaphalium, Euphorbia, Artemisia campestris, Senecio, Jurinea, Spiraea ulmaria, Lactuca scariola, and various spp. of Sedum. Most frequent occurrence in May and June. Disque found it also in July, according to Kennel (1908). Since fresh butterflies were also found in Sept., it is assumed that 2 generations occur in the period from May to Sept.

The caterpillars from the Bavarian State Collection that were investigated were found in Friedrichsfeld on Artemisia campestris on May 26, 1890.

C.(S.) costana (Fabricius 1798)(1529).
syn. spectrana (Treitschke 1830).

Kennel (1908) described the caterpillar as dark green or brown green; the caterpillars that I brought in, in the fall, for rearing were always brown. The pinaculi are very light and weakly chitinized. Head, cervical and anal shields, and the thoracic legs black-brown. Parapodia and caudal disk with a black-brown shield on the side (fig. 224). Spiracle of the 2nd abdominal segment not larger than the insertion place of the seta III standing above it. Spiracles elliptical on the 8th abdominal segment already strongly rounded. Setae VIII on the 9th abdominal segment not farther apart than on the 8th. On the 1st abdominal segment the setae of group VII stand in one line and on the 2nd, in a triangle. On the cervical shield seta IX is closer to IIIa than to seta III.

The caterpillar lives from April to Oct. in several generations in spun-up parts of plants of the most varied water plants. The following have been reported: Iris pseudacorus, Scirpus lacustris, Euphorbia palustris, Comarum palustre, Epilobium hirsutum, Nasturtium palustre, Glyceria spectabilis, Cicuta, Symphytum, Phragmites, Spiraea ulmaria, Urtica, etc. I found the caterpillars especially abundant in late summer and in the fall feeding in spun-up still green capsules of Iris pseudacorus.

Locality: Dechsendorfer Weiher on Aug. 20, 1953, on Iris pseudacorus.

C.(S.) semialbana (Guenée 1845)(1518).

Head brown yellow with dark spots, body dirty brown-green with brownish subdorsal lines, cervical shield black-brown, anterior half lighter (fig. 46); moreover it is a

striking fact that the immediate vicinity of seta II is whitish. On the parapodia the pinaculum of group VII is brown. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III standing above it. The spiracle of the 1st abdominal segment is twice as large. On the 9th abdominal segment setae VIII are not farther apart than on the 8th, seta III is found on the 8th abdominal segment on the same level with the spiracle. 2nd ocellus closer to the 2nd than to the 1st [sic!].

April, June, and Sept., Oct. in leaf rolls on Lonicera caprifolium, xylosteum, Rosa, Chelidonium, Lilium candidum and Urtica. The adult flies from June to the last of Aug. wherefore 2 generations are presumed which are not sharply separated from each other in time. 1st generation Sept. to April, the second June.

The caterpillars from the Bavarian State Collection which were investigated had been found by Disque on April 28, 1896, on L.candidum.

The 3 following monotypical genera Adoxophyes, Capua, and Batodes (according to a communication by letter) were erected by Obraztsov by splitting the genus Capua. Kennel (1908) wrote that the genus Capua differed only very little from Cacoecia and withdrew this genus entirely. This cannot be defended from the larval morphology for they differ by way of the circles of hooks which have smaller hooklets on the anterior margin and are uniserial, while they are larger on the posterior end and biserial — from former Cacoecia spp. very distinctly, these having uniform biserial circles of hooklets. Accordingly the genus Capua has a right to exist by reason of this formation of the circles of hooklets. As already indicated above, Obraztsov had separated this genus into the three following ones. Although his bases are unknown to me, I would like to follow him in this since it is possible for me to take up the separation according to morphological characters.

The genus Adoxophyes Meyrick 1881.

Diagnosis: Hooklets of the parapodia anteriorly smaller and approximately of the same size to each other, while those on the posterior margin are distinctly larger and distinctly biserial. Spiracles of abdominal segments 2 to 7 inclusive not larger than the insertion place of seta III.

A.reticulana (Hübner 1822)(1503.

Caterpillar dark green, the yellowish pinaculi are small, head, thoracic legs yellowish, cervical and anal shields of the body color or also yellowish. Cervical shield finely granulate, 2nd ocellus closer to the 3rd than to the 1st. Number of hooklets on the parapodia about 50. On the 8th abdominal segment III is found on the same level with the spiracle. Setae VIII on the 9th abdominal segment are farther apart than on the 8th.

May to Aug. in 2 overlapping generations, very polyphagous between spun-up leaves on Lonicera, Betula, Salix, Populus, Alnus, Prunus, Rosa, Solanum dulcamara, Humulus, Rubus, and Vaccinium. Very abundant.

Locality: Erlangen Reichswald on May 28, 1951 between spun-up leaves on Betula.

The genus Capua Stephens 1834.

Diagnosis: Circles of hooks of parapodia anteriorly smaller and of approximately the same size while on the posterior margin they are distinctly larger and distinctly biserial. Spiracles of abdominal segments 2 to 7 inclusive not larger than the insertion places of seta III. On the 9th abdominal segment seta I has come so close to seta III that their pinaculi are contiguous or fused.

C.favillaceana (Hübner 1822)(1504).

Caterpillar rather dirty green, head yellow, cervical shield, pinaculi, and thoracic legs light brown. Body strongly granulate by reason of microscopically small brown spinules. 2nd ocellus equidistant from the 3rd and the 1st. Circles of hooks of about 35 hooklets. On the cervical shield IIIa is equidistant from III and IX. On the 8th abdominal segment III is found on the same level with the spiracle on a reniform pinaculum. On the 9th abdominal segment setae VII are not substantially farther apart than on the 8th, on the mesothorax VIII is found on the margin of the coxa.

July to Oct., probably overwintering, on Carpinus betulus, Sorbus aucuparia, and Rubus.

The larvae from the Bavarian State Collection that were investigated had been found on July 28, 1911 near Brussells on Quercus and in Paris on Aug. 27, 1889.

The genus Batodes Guenée 1845.

Diagnosis; Hooklets on the parapodia anteriorly smaller and of approximately the same size while on the posterior margin they are distinctly larger and distinctly biserial. Spiracles of abdominal segments 2 to 7 inclusive not larger than the insertion places of setae III. On the 9th abdominal segment seta I is equidistant from III and II, the pinaculi are therefore distinctly separated from each other.

B.angustiorana (Haworth 1811)(1502).

Caterpillar greenish yellow or brownish green, head greenish yellow or brownish with dark eye- and genal-spots. Cervical shield greenish or brownish and on the sides mostly dark-marked, anal shield brownish. Body dorsally more strongly granulate than ventrally. 2nd ocellus equidistant from the 1st and the 3rd. The circles of hooks consist of about 42 hooklets. On the prespiracular shield setae V, IV, and VI are arranged in a line so that IV stands closer to V. Spiracles elliptical, on the 8th abdominal segment III is on the same level with the spiracle, on the first abdominal segment it is dorsocaudad from the spiracle. Setae VIII on the 9th abdominal segment not farther apart than on the 8th, and on the mesothorax they are right on the margin of the coxa. Setae II on the 8th abdominal serment not farther apart than setae I.

According to Kennel (1908) the caterpillar lives in England in May, in southern regions already in March and April, polyphagously on Taxus baccata, Crataegus, Laurus, Smilax, and Pirus.

The caterpillars from the Bavarian State Collection that were investigated were found by Disque on May 17, 1911 at Speyer on T.baccata and on May 11 on Lonicera.

The genus Ptycholoma Stephens 1829.

Diagnosis: Group VII consists of 2 setae on the 1st, 2nd, and 7th abdominal segments.

By reason of this character the genus occupies a special place among the Archipsini. Since in the Tortricini group VII on the 7th abdominal segment also consists of 2 setae, it should be tested whether a kindred relationship to this tribe may not also be established from the adult systematics.

Ptycholoma lecheana (Lederer 1758)(1553).

Caterpillar dorsally dirty green and strongly granulate, ventrally yellowish and weakly granulate. The pinaculi are light and hardly chitinized. Head yellow-brown, black bordered, cervical shield yellow, black-marked on the side (fig. 47). The 2nd ocellus equidistant from the 1st and the 3rd, on the prespiracular shield setae V, IV, and VI stand in one line. Spiracle of the 2nd abdominal segment larger than the insertion place of seta III. On the 8th abdominal segment III is ventrocraniad from the spiracle. Setae VIII are farther apart on the 9th than on the 8th abdominal segment. Parapodia with about 40 hooklets.

April to May in spun-up leaves, polyphagous on Populus, Quercus, Fagus, Acer, Ulmus, Salix, Sorbus, Tilia, Fraximus, Crataegus, Prunus padus, and avium.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 30, May 2, and May 24, 1896 near Speyer on Quercus, Fraxinus, and Tilia.

The genus Lozotaenioides Obraztsov 1954,

Diagnosis: On the 9th abdominal segment setae VIII are farther apart than on the 8th, and on the mesothorax VIII is distinctly set off from the coxa. 2nd ocellus closer to the 3rd than to the 1st. Circles of hooks biserial. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III.

This genus too was erected by Obraztsov by splitting up the heterogeneous genus Tortrix. Like all other Archipsini it differs from the Trotricini by 3 setae in group VII on the 9th abdominal segment. The difference between this genus and the next genus, Lozotaenia is only trifling; the new naming as well as the separation, however, seems to me to be justified from the larval morphology. In Lozotaenia the spiracles of the 2nd abdominal segment are larger than the insertion place of seta III, in the other characters the two genera agree with each other.

L.cupressana (Duponchel 1836) (1552).

Caterpillar reddish brown-green with light pinaculi but brown insertion places for the setae. Head dark brown. Thoracic legs and cervical shield brown, the latter for the most part lighter anteriorly. Anal shield brown-dotted [or brown-punctate] (fig. 49). Bodh strongly granulate. Circles of hooks consisting of about 50 hooklets. On the pre-spiracular shield IV is somewhat ventrad of the line from V to VI. On the cervical shield IIIa is equidistant from IX and III and on the 8th abdominal segment III is on the same level as the spiracle.

March, April, May, June gregariously between spun-up twigs on Cupressus and Juniperus oxycedrus. This species doesnot occur in Germany. Kennel (1908) reports southern France, Catalonia, Andalusia, Central Italy, Dalmatia, and Bithynia as area of distribution.

The caterpillars from the Bavarian State Collection that were investigated were found in June 1897 on Juniperus oxycedrus by Chretien in France.

The genus Lozotaenia Stephens 1829.

Diagnosis: Spiracle of the 2nd abdominal segment larger than the insertion place of seta III.

Obraztsov also separated this group off from the former genus Tortrix. The same thing applies to this genus with respect to larval morphology as to the genus Lozotaenioides. It is separated from the latter by larger spiracles.

Species of Lozotaenia.

1	(2)	Anal shield yellow-green, without any marking	croceana
2	(1)	Anal shield with black marking (fig. 52)	forsterana

L.croceana (Hübner 1822) (1575)
Syn. cupidiana Staudinger 1859

Caterpillar gray-green, head brownish yellow, cervical shield greenish-yellow with a dark spot near seta I and another one between setae II and III (fig. 50). Anal shield of the coloring of the body without any marking. The pinaculi are not always black, as Kennel said (1908) but can also be gray-green. On the 8th abdominal segment, setae II are not farther apart than setae I. Seta III is on the same level as the spiracle.

July, Aug., on Daphne cnidium, Helianthemum, Pistacia lentiscus, Dorycnium; this species does not occur in Germany but only in southern France, Spain, and Sicily.

The caterpillars from the Bavarian State Collection that were examined were found in France in April 1900.

L.forsterana (Fabricius 1781)(1576).

Caterpillar green, dorsally gray-green, ventrally mostly somewhat lighter, with large light pinaculi but dark setal insertion places. Head light brown with dark clypeus and spots. Cervical shield light brown with black spots on the side and at the posterior margin (fig. 51). Anal shield yellow with black distinctly delimited spots on the side (fig. 52). Body dorsally more strongly granulate than ventrally. On the 8th abdominal segment setae II are not farther apart than setae I, seta III is on the same level as the spiracle. About 45 hooklets on the parapodia, about 35 on the caudal disk. On the pre-spiracular shield IV is somewhat ventrad from the line from V to VI.

May, June between spun-up leaves or needles on Vaccinium spp., Sedum, Hedera helix, Lonicera, Ribes, Larix, Pinus picea. This species is rare.

The caterpillars from the Bavarian State Collection that were examined were found on May 19, 1896 near Brussels on Vaccinium myrtillus and also on Stachys silvatica.

The genus Paramesia Stephens 1829

Diagnosis: On the mesothorax VIII is found on the coxa, the setae of group VII on the 8th abdominal segment placed transversely to the ventral Mediana.

The genus can be well characterized by these two characters.

P.gnomana (Clerck 1759)(1496).

Caterpillar yellow to gray-green, head brownish yellow, cervical and anal shields, and the thoracic pinaculi brown, while the others and the anal shield [sic!] are yellowish green. Body only weakly granulate. Spiracles of the same size, not larger than the insertion place of seta III. 2nd ocellus equidistant from the 1st and the 3rd. On the cervical shield II is ventrocraniad from I. Setae IV and V stand diagonally on all abdominal segments. On the 9th abdominal segment seta I is equidistant from II and III. Circles of hooks biserial.

May, June polyphagous on different leafy trees, also on Vaccinium myrtillus, Stachys, and Iris. In many regions very abundant, rare in others.

Locality: Erlangen June 6, 1951 on Betula.

The genus Paraclepsis Obraztsov 1954

Diagnosis: Seta VIII on the mesothorax stands on the coxa. The setae of groups VII on the 8th abdominal segment are placed parallel to the ventral Mediana.

Obraztsov has also separated this monotypical genus - as he informed me by letter - off from the genus Tortrix. The difference from that genus is so great even in the larvae that this separation is justified as is evident from the differentiational characters already set forth for the Archipsini and Tortricini.

P.cinctana (Schiffermiller 1776)(1556).

Caterpillar greenish brown, head, cervical shield, pinaculi, and thoracic legs black-brown, anal shield light brown, dark dotted [or dark punctate](fig. 53). Body strongly granulate by microscopically small brown spinules. IIIa on the cervical shield is farther from III than from IX. Spiracles elliptical, not larger on the 2nd abdominal segment than the insertion place of seta III. On the 8th abdominal segment seta III is somewhat dorsocraniad from the spiracle. Circles of hooks biserial, with about 40 hooklets on the parapodia, 30 on the caudal disk. On the 9th abdominal segment setae VIII are not farther apart than on the 8th. On the pre-spiracular shield setae IV, V, VI stand in a diagonal line, in which V is situated the lowest down.

May, June and Sept. in 2 generations; the caterpillar lives in a webby tube on Anthyllis vulneraria, Artemisia and other herbaceous plants, also on Genista and Sarothamnus.

The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on May 31, 1904 near Rachlau in a spun tube in moss.

The genus Philedone Hübner 1825

Diagnosis: 2nd ocellus equidistant from the 1st and 3rd, the spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. On the mesothorax VIII is on the margin of the coxa.

This genus formerly included besides others the following 3 species which Obraztsov distributed in the 3 genera Philedone, Philedonides, and Hastula. As is evident from the diagnosis for the genus, Hastula is readily separated from the larval morphology, wherefore I join Obraztsov in this case. On the other hand it is impossible to separate Philedone and Philedonides from the morphology wherefore I am leaving these two spp. in this genus.

Species of Philedone.

1 (2) Anal shield with typical brown marking (fig. 55), body with brown pinaculi — geringiana
2 (1) Anal shield without dark marking, pinaculi large and light — prodromana

P.geringiana (Schiffermiller 1776)(1482).

Caterpillar light to gray green, the thoracic pinaculi brown, while the others are light and only the setal insertion places are dark. Cervical shield only lightly punctate [or dotted] while the anal shield is yellow and marked all round with dark spots (fig. 55). The body is dorsally more strongly granulate than ventrally. On the 9th abdominal segment setae VIII are not farther apart than on the 8th. The distance between setae II on the 8th abdominal segment is less than that between setae I. Setae

IV and V on all abdominal segments are diagonally arranged. On the pre-spriacular shield setae V, IV, and VI stand in a line, in which V is lowermost. On the cervical shield IIIa is equidistant from III and IX. There are about 45 hooklets in the biserial circles of hooks on the parapodia, about 35 in those of the caudal disk.

May, June on the lower leaves or on the ground in a spun tube or in a leaf spun together like a pod. Vaccinium uliginosum, Lotus corniculatus, Scabiosa columbaria, Plantago media, Potentilla tormentilla, Statice armeria are known as food plants.

The caterpillars from the Bavarian State Collection that were examined, were found by Hinneberg on May 9 on Medicago minima and on June 13 on Potentilla near Potsdam.

P. prodromana (Hübner 1815-1816)(1484).

The caterpillar of this species was not hitherto described even in Kennel's (1908) monograph.

Caterpillar green with large light pinaculi, head yellow to light brown with dark eye- and genal-spots. Cervical and anal shields greenish yellow without any marking. Spiracles brown, thoracic legs brownish. The body of the caterpillar is strongly granulate. The biserial circles of hooks of the parapodia consist of about 30 hooklets. On the 9th abdominal segment setae VIII are not farther apart than on the 8th. The distance between setae II on the 8th abdominal segment is less than that between setae I and seta III is on the same level with the spiracle. On the pre-spiracular shield setae V, IV, and VI are diagonally arranged, in which V is the lowermost. On the cervical shield IIIa is equidistant from III and IX.

June, July, Aug. to the first of Sept., in spun-up leaves or leaf-folds on Potentilla anserina, Daucus carota, and Mentha spp.

The caterpillars from the Bavarian State Collection that were examined were found by Chretien on July 14, 1891 on Ononis fructicosa.

The genus Hastula Milliere 1857.

Diagnosis: On the mesothorax VIII is distinctly set off from the margin of the coxa. On the 9th abdominal segment setae IV, V, and VI stand at a right angle on a correspondingly formed pinaculum. On the 8th abdominal segment the setae II and the setae I are equally far apart.

The one species of this genus, which I was able to examine, was hitherto in the genus Philedone from which Obraztsov separated it. Since it differs by the above cited characters from the genus Philedone, this can also be considered as justified from the larval morphology.

H. joannisiana (Ragonot 1888)(1487).

Caterpillar gray-green, head and pinaculi black-brown, cervical shield and thoracic legs dark-brown, anal shield gray-brown. The caterpillar is strongly granulate before the cervical shield, otherwise only weakly granulate. Parapodia laterally dark-brown, strongly chitinized, the biserial circles of hooks consisting of about 40 hooklets. Spiracles elliptical, only a little larger than the insertion place of setae III on the 2nd abdominal segment. On the 9th abdominal segment (fig. 57) these are on the same level as the spiracle. Setae VIII on the 8th and 9th abdominal segments are equidistant from each other. On the pre-spiracular shield setae V, IV, and VI stand in a diagonal line.

May on Lavendula stoechas and Santolina. Occurs only in France.

The caterpillars from the Bavarian State Collection that were examined, had been found by Chretien near Digue in June on Santolina.

The genus Sparganothis Hübner 1825.

Diagnosis: Circles of hooks on parapodia biserial even on the side. 2nd ocellus closer to the 3rd than to the 1st, all uniformly developed. Spiracle of the 8th abdominal segment as large as pinaculum III, on the 2nd abdominal segment larger than the insertion place of seta III.

The caterpillars of this monotypical genus are intermediate between the genera Cacoecia and Pandemis. They are so close to both that several characters must be drawn upon to be able to separate them. For this reason I cannot follow Obraztsov (1946) who introduced a family of its own for this monotypical genus and am leaving the genus close to its nearest relatives in the Archipsini.

S.pilleriana (Schiffermiller 1776)(1505).

Caterpillar greenish white or gray-white with somewhat lighter greenish pinaculi. Head, neck, thoracic legs dark brown to black, the cervical shield sometimes somewhat darker on the side. Parapodia not laterally chitinized. On the cervical shield IIIa is somewhat farther from III than from IX, on the prespiracular shield IV stands on a horizontal with V and VI. Group VII on the 1st, 2nd, and 7th abdominal segments consists of 3, on the 8th and 9th abdominal segment, of 2 setae. On the 8th abdominal segment the distance between setae I and between setae II is the same, seta III is infront of the spiracle. On the 9th abdominal segment I and III stand on separate pinaculi, setae II and on the other side IV, V, and VI, stand on a common pinaculum. Setae VIII are not farther apart [on the 9th] than on the 8th abdominal segment. Body strongly granulate.

The caterpillars live from Sept. until pupation in May, very polyphagously on Stachys, Asclepias, Iris, Clematis, Humulus, Plantago, Sedum, and are sometimes very injurious on Vitis vinifera. The feeding is done in the fall on seeds and leaves, in the spring on leaves and buds.

Locality: Zeil a/Main on May 15, 1951, on Clematis and V.vinifera.

The genus Pseudargyrotoza Obraztsov 1954.

Diagnosis: Circles of hooks of parapodia uniserial, on the 7th abdominal segment group VII consists of one seta.

The caterpillar of this monotypical genus with the species conwagana erected by Obraztsov occupies so distinct a separate position that the genus is very obviously valid. It differs very strongly from spp. of the other Tortricinae which perhaps Obraztsov knew as indicated by the fact that he cited this genus as the last of the Archipsini. Peculiarly enough the greatest relations to the Phaloniinae consist not in the morphology but also in the biology. This would have induced me to refer the genus to this subfamily also, had not Obraztsov informed me that there is no basis for it in the adult systematics. It must therefore be treated as a case of extraordinarily strong convergence.

Pseudargyrotoza conwagana (Fabricius 1775)(1569).

Caterpillar yellowish, head and cervical shield brownish yellow, pinaculi only weakly developed, spiracles hardly perceptible. Body strongly granulate by reason of microscopically small spinules. Circles of hooks on the parapodia uniserial, of 20-27 hooklets, those of the caudal disk of 15; on the pre-spiracular shield IV is equidistant from V and VI, the spiracle is found almost above VI. Group VII consists of 2 setae on the 2nd abdominal segment, of only one seta on the 7th, 8th, and 9th. On the 9th abdominal segment VI is absent, setae I and III are found on a common pinaculum. On the 8th abdominal segment III is dorsocraniad from the spiracle. Setae IV and V are arranged vertically on the 1st abdominal segment. 2nd ocellus equidistant from the 1st and the 3rd, seta O-2 is ventrad from the 1st ocellus and not ventrocaudad (fig. 58). The coronal suture is shorter than the width of the adfrontalia.

Sept., Oct. in fruits of Ligustrum, Berberis, Fraxinus. Pupation in a web on the ground. Abundant in many regions, rare in many.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 12 near Speyer in the fruits of Ligustrum.

Tribe Cnephasiini.

Diagnosis: Circles of hooks biserial (except for longana). On the 9th abdominal segment I and III are on separate pinaculi and on the mesothorax IIIa is dorsad or dorso-craniad from III. If these characters are not all present, then setae VI must be absent on the 9th abdominal segment, setae IV and V must be of approximately the same length on the abdominal segments and the coronal suture must be longer than the adfrontalia are wide, or Group VII consists of 2 setae on the meso- and meta-thorax.

The tribe erected by Obraztsov, as is already evident from the diagnosis, is not homogeneous. It can be divided up into 3 groups of genera from the caterpillars.

1. Tortricodes
2. Cnephasia, Cnephasiella, and Neosphaleroptera
3. Doloploca, Exapate, Olindia, Eulia, Eana, and Trachysmia.

But since the immediately succeeding tribe of the Tortricini is so much the more uniformly delimited by the putting together of the different genera, the erection of this tribe seems to me to be suitable.

Genera of the Cnephasiini.

1	(2)	On the mesothorax and the metathorax, group VII consists of 2 setae (fig. 60)	Tortricodes
2	(1)	On the mesothorax and the metathorax, group VII consists of 1 seta.	
3	(8)	Seta VI lacking on the 9th abdominal segment.	
4	(7)	Setae I and III are found on a common pinaculum on the 9th abdominal segment.	
5	(6)	The 3rd ocellus is conspicuously larger than the others, setae V and IV are vertically arranged on the 1st abdominal segment	Cnephasia
6	(5)	The 3rd ocellus is not larger than the others, setae V and IV are diagonally arranged on the 1st as well as on all the other abdominal segments	Cnephasiella
7	(4)	Setae I and III stand on separate pinaculi, on the 9th abdominal segment.	
8	(3)	Seta VI present on the 9th abdominal segment.	

9 (12) Setae VIII are farther apart on the 9th abdominal segment than on the 8th.

10 (11) The setae of the anal shield are moved back from the margin. Seta III on the 8th abdominal segment is dorsocraniad from the spiracle. The spiracles of the 2nd to the 7th abdominal segment are larger than the insertion place of seta III. The 2nd ocellus is equidistant from the 1st and 3rd Doloploca

11 (10) On the anal shield the setae stand quite outside at the margin. Seta III is found on the 8th abdominal segment craniad or ventrocraniad from the spiracle. The spiracles of the 2nd to the 7th abdominal segments are not larger than the insertion place of seta III. 2nd ocellus closer to the 3rd than to the 1st Exapate

12 (9) On the 9th abdominal segment setae VIII are not farther apart than they are on the 8th.

13 (14) On the mesothorax VIII is at the margin of the coxa. Setae IV and V on the 8th abdominal segment are horizontally arranged. On the prespiracular shield seta IV is equidistant from V and VI Olindia

14 (13) On the mesothorax VIII is found beside the coxa, setae V and IV are diagonally arranged on the 8th abdominal segment. On the pre-spiracular shield seta IV is closer to V than to VI.

15 (16) Seta III on the 8th abdominal segment is ventrocraniad from the spiracle Eulia

16 (15) Seta III on the 8th abdominal segment is dorsocraniad from the spiracle.

17 (18) The spiracles of the 2nd to the 7th abdominal segments inclusive are larger than the insertion place of seta III. On the 8th abdominal segment setae II are farther apart than setae I. Eana

18 (17) The spiracles of the 2nd to the 7th abdominal segments inclusive are not larger than the insertion place of seta III. On the 8th abdominal segment setae II are not farther apart than setae I Trachysmia

The genus Tortricodes Guenée 1845.

Diagnosis: On the mesothorax and metathorax 2 setae of group VII are found above the thoracic legs (fig. 60).

This monotypical genus occupies a special position within the Tortricidae by reason of this certainly primitive character.

T. tortricella (Hübner 1796)(1638).

Caterpillar redbrown with 3 yellowish dorsal longitudinal stripes. Also the sides and the pinaculi of the caterpillar are yellowish. Head dark brown, often with light spots. Cervical shield light brown, laterally black brown (fig. 59). Circles of hooks biserial. 2nd ocellus equidistant from the 1st and 3rd. Spiracles round, somewhat larger on the 2nd abdominal segment than the insertion place of seta III. On the prespiracular shield IV is ventrad from V and VI and equidistant from both. Group VII on the 1st and 2nd abdominal segments of 3 setae, on the 7th, 8th, and 9th abdominal segments of 2 setae. On the 1st and 2nd abdominal segments VIIb is brought much closer to VIIc than VIIa. On the abdominal segments IIIa is not on one pinaculum with III. On the 8th abdominal segment III is dorsocraniad from the spiracle. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. Setae IV and V of the abdominal segments are of approximately the same length. On the 9th abdominal segment I and III are on separate pinaculi; on the other hand IV, V, and VI are on a common pinaculum.

May, June between spun-up leaves, especially on Quercus but also on Carpinus betulus, Prunus spinosa, Corylus, and Tilia.

Locality: Erlangen on May 25, 1952 on Quercus.

The genus Cnephasia Curtis 1826.

Diagnosis: On the 9th abdominal segment setae I and III are found on a common pinaculum, seta VI is lacking. The 3rd ocellus is distinctly larger than the others (fig. 62). The coronal suture is considerably longer than the width of the adfrontalia and setae IV and V of the abdominal segments are of approximately the same length, vertically arranged on the 1st abdominal segment.

The two spp. occurring in Germany and marked by these common characters, differ from the other genera morphologically, strongly enough to justify this genus. It is nearest the genera Cnephasiella and Neosphaleroptera.

Species of Cnephasia.

1 (2) Circles of hooks of parapodia uniserial — longana
2 (1) Circles of hooks of parapodia biserial — wahlbomiana

C. longana (Haworth 1811)(1608)

Caterpillar light gray or green gray with 2 light dorsal and one lateral longitudinal stripe. The pinaculi are light, but the insertion places for the setae are black. Head light brown with eye- and genal spots, often additionally with dark spots. Cervical shield light brown or greenish with dark spots (fig. 61). Body only weakly granulate. Circles of hooks of parapodia uniserial with 15-16 hooklets, caudal disk with about 10; 2nd ocellus closer to the 3rd than to the 1st. On the prespiracular shield IV is ventrad from V and VI and equidistant from both. Group VII on the 1st abdominal segment consisting of 2 setae, on the 2nd and 7th abdominal segments of 3 setae, and on the 8th and 9th of 1 seta. On the 9th abdominal segment setae II stand on separate pinaculi which are mostly contiguous, setae VIII are farther apart than on the 8th segment. On the mesothorax VIII is distinctly set off from the margin of the coxa. Seta III on the 8th abdominal segment is dorsocraniad from the spiracle. On the 1st abdominal segment to the 7th inclusive IV and V are vertically arranged. The spiracle of the 2nd abdominal segment is larger than the insertion place of seta III.

April, May, June, mostly in spun-up flowers of Chrysanthemum, Ranunculus bulbosus, Convolvulus arvensis, Sinapis, Lychnis, Bellis, Centaurea, Aster, Antehmis. In Chrysanthemum the petals of the ligulate flowers are spun together over the tubular flowers. Distributed in northwest Germany, Holland, England, Andalusia, the Canaries, Sicily, Sardinia, Greece, Piedmont, Dalmatia, and in the northwestern part of Asia Minor.

The caterpillars from the Bavarian State collection that were examined were found on June 14, 1905 near Brussels on Chrysanthemum leucanthemum.

C. wahlbomiana (Linné 1758)(1622)

In this species the cut of the wing, the coloring, and the marking are so different that many imaginal systematists have taken the trouble to separate several spp. out of the different forms. Thus Heinemann and Rebel were able to differentiate 3 spp., chrysantheana, pasivana, and wahlbomiana with some varieties. For England, Meyrick established the 3 spp., chrysanthemana, virgaureana, and pascuana. According to the views of Snellen and especially Kennel (1908) this is one species because there are transitions in all the varying characters. The genital apparatus of all forms, according to Kennel,

is supposed to be the same. Recently Obraztsov occupied himself with this problem and even arrived at 10 spp.: longana, communana, orthoxyana, spenninicolana, chrysantheana, asseclana, pascuana, alticolana, genitalana, and cupressivorana. Since determination without extensive comparison material cannot be very accurate, I could not obtain sufficient caterpillars to try to get at this problem from the morphology of the larvae. For this reason I am retaining the designation wahlbomiana for this species complex.

The caterpillars, like the imagoes, are very variable in coloring. As for the morphology, I could detect only fluctuations in the number of setae in group VII.

Body light green, head gray green to black green with black pinaculi. Head light brown [sic.], cervical shield with lighter body coloring yellowish, brown spotted or edged, in dark caterpillars black brown. Also the thoracic legs in this case are blackbrown. The color of the anal shield varies with the body coloring from yellowish green to black brown. Parapodia biserial, laterally uniserial, with 26 to 30 hooklets, caudal disk with 18 to 20 hooklets. In dark caterpillars the parapodia are laterally black-brown chitinized. 2nd ocellus closer to the 3rd than to the 1st, the 3rd is strikingly enlarged (fig. 62). On the cervical shield II is ventrocaudad from I, seta IIIa is closer to III than to II. On the prespiracular shield IV is equidistant from V and VI and ventrad from both. On abdominal segments 1 to 7 inclusive IIIa is not found on a common pinaculum with III, setae II are always farther apart than setae I. Group VII consists of 3 setae on the 1st and 2nd abdominal segments, of 2(1) on the 7th and 8th, and of one seta on the 9th abdominal segment. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. The distinctly developed anal comb consists of 5-6 spines. Spiracle of the 2nd abdominal segment larger than the insertion place of seta III. On the mesothorax IIIa is dorsad or dorsocaudad from III.

April, May, June very polyphagous in spun-up leaves, shoots and flowers of herbaceous plants such as Ajuga reptans, Chrysanthemum, Anthemis, Aster, Medicago sativa, Rumex, Origanum, Solidago virgaurea, Hypericum, Hieracium.

Locality: Erlangen May 17, 1954 between spun-up terminal leaves of young shoots on Genista tinctoria.

The genus Cnephasiella Adamczewski 1936.

Diagnosis: The 3rd ocellus is notlarger than the others, on the 1st abdominal segment setae V and IV, as on all other abdominal segments, are diagonally placed. Otherwise the characters of the preceding, very closely related genus Cnephasia apply to this genus also.

Of this genus, which consists of only 2 spp., only incertana occurs in Germany. It differs only in the above characters from the preceding genus Cnepahsia. The differences in larval morphology appear too small for erection of a genus of its own.

C.incertana (Treitschke 1835)(1624).

Caterpillar dark green to blackish. Pinaculi black, often light, but then with dark insertion places for the setae. Head yellow-brown, black-edged. Cervical and anal shields, and the thoracic legs black. Circlesof hooks of the parapodia always biserial laterally uniserial, the hooklets on the sides smaller. Group VII consists of 3 (sometimes 2) setae on the 1st abdominal segment, always of 3 on the 2nd abdominal segment of 2 on the 7th abdominal segment, and of 1 seta on the 8th and 9th abdominal segments. On all abdominal segments, III is dorsocraniad from the spiracle, on the mesothorax IIIa is dorsocraniad from III. Otherwise the characters given for wahlbomiana apply.

April to June between spun-up leaves mostly on the tips of sprouts and flowers on Lotus, Chrysanthemum, Ranunculus; according to Schütze (1933) aslo on Achillea, Centaurea, Cerastium, Chaerophyllum, Echium, Globularis, Lithospermum, Medicago, Ononis, Plantago, Primula, Dianthus, Rumex, Saxifraga, Trifolium, and Vicia.

Locality: Erlangen on May 12, 1952 on Trifolium.

The genus Neosphaleroptera Réal 1955

Diagnosis: Circles of hooks biserial, seta VI is absent on the 9th abdominal segment and I and III stand on separate pinaculi.

The monotypical genus erected by Obraztsov is very close to the two preceding ones. It differs from them by the fact that on the 9th abdominal segment I and III are on separate pinaculi. This difference is great enough to consider the erection of this genus justified.

N.nubilana (Haworth 1811)(1630)

Caterpillar light green, pinaculi of the body color. Head light brown, cervical shield brownish green, often dark-edged. Parapodia biserial with about 35 hooklets, laterally not chitinized. 2nd ocellus equidistant from the 1st and 3rd, all of the same size; on the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, almost equidistant from both. Group VII on the 1st and 2nd abdominal segments consists of 3 setae, 2 on the 7th and 8th, and only 1 on the 9th. On the abdominal segments IV and V are of approximately the same length. On the 8th abdominal segment the distance between setae II is somewhat greater than that between setae I. Seta III is found on the same level as the spiracle. On the mesothorax VIII is distinctly set off from the margin of the coxa.

The caterpillar lives between spun-up leaves from Sept. on, overwinters, and pupates in May. Crataegus, Prunus, Pirus, and Betula are known as food plants.

Locality: Spardorf on May 22, 1953 on Crataegus.

The genus Doloploca Hübner 1825

Diagnosis: Circles of hooks biserial, on the 9th abdominal segments I and III are on separate pinaculi. Seta VI is present. On the mesothorax IIIa is dorsocaudad from III. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. Spiracle of the 2nd abdominal segment larger than the insertion place of seta III. On the 8th abdominal segment III is dorsocraniad from the spiracle. On the anal shield the setae are somewhat moved back from the margin.

Only the following species of this genus occurs in Europe. It is nearest the genus Exapata from which it is readily separated by the larval morphology as is evident from the diagnosis.

D.punctulana (Schiffermiller 1776) (1633)

Caterpillar dorsally olive-green with 2 lighter longitudinal stripes, ventrally light green. Head red-brown or light-brown and dark spotted. Fig. 63 shows the black spotty marking of the cervical shield which has a yellow green background. One spot is found between setae II and III, seta IX stands on a second spot, and a long black spot reaches from the median line up to setae I and X. Body dorsally more strongly granulate than ventrally. Parapodia with about 37, caudal disk with about 35, hooklets. 2nd ocellus equidistant from the 1st and 3rd. On the prespiracular shield V,IV, and VI are

arranged in a line, on the cervical shield IIIa is equidistant from III and IX. On all abdominal segments IIIa is not on the pinaculum of seta III, setae IV and V are diagonally arranged. On the 8th abdominal segment (fig. 64) the distance between setae II and between setae I is the same. Group VII consists of 3 setae on the 1st, 2nd, and 7th abdominal segments, of 2 setae on the 8th and 9th. On the anal shield the setae are moved back from the margin.

June, July between spun-up leaves and shoots on Ligrustum and Lonicera. In many regions abundant, in others rare; distributed in South Germany, Switzerland, Austria, Hungary, and SW Russia.

The caterpillars that were examined from the Bavarian State Collection were found by Disque on July 2, 1884 near Speyer on Ligustrum vulgaris.

The genus Exapate Hübner 1825.

Diagnosis: Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment III is before the spiracle, at the same level or somewhat lower. On the anal shield the outer setae are found right on the margin. Otherwise the diagnostic characters of the preceding genus Doloploca apply.

The genus which consists of 2 spp., also makes a homogeneous group from the larval morphology, the two spp. of which differ but little.

Species of Exapate.

1 (2) On the prespiracular shield seta IV stands in a line with V and VI. Seta III on the 8th abdominal segment is found somewhat ventrocraniad from the spiracle. Thoracic legs gray-green — congelatella

2 (1) On the prespiracular shield seta IV is ventrad from V and VI. Seta III on the 8th abdominal segment is on the same level as the spiracle. Thoracic legs dark brown — duratella

E. congelatella (Clerck 1759)(1641).

The caterpillar is light green with 2 still lighter dorsal longitudinal stripes. Head yellowish green with black spots, just so the cervical shield is yellowish and black spotted (fig. 65). Body only very weakly granulate. The biserial circles of hooks on the parapodia consist of about 40 hooklets. 2nd ocellus closer to the 3rd than to the 1st. On the mesothorax IIIa is dorsocaudad from III. Setae VIII are distinctly set off from the coxa. On the 8th abdominal segment III stands before the spiracle but somewhat lower, setae II somewhat farther apart than setae I. On the 9th abdominal segment VI is present, I and III are found on separate pinaculi. Setae VIII on the 9th abdominal segment are farther apart than on the 8th.

May to July between spun-up leaves on Lonicera, Berberis, Crataegus, Prunus spinosa, Pirus, Salix, Ulmus, Ribes, Rubus idaeus, Rhamnus, Syringa.

The caterpillars from the Bavarian State Collection that were examined were reared by Kennel on April 30, 1903 at Dorpat ex ovo.

duratella (Heyden 1864)(1642)

Caterpillar dirtyish brown green with 2 dorsal light longitudinal stripes. Head light brown, posteriorly dark-marked. Cervical shield yellowish with small black specks (fig. 66). Thoracic legs dark brown. Body dorsally more strongly granulate than

ventrally. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. On the prespiracular shield IV is ventrad from V amd VI. Seta IIIa on the mesothorax is dorsocaudad from III, on the 8th abdominal segment it is on the same level as the spiracle. On the 9th abdominal segment I and III are found on separate pinaculi, IV, V, and VI on a common pinaculum. On the 8th abdominal segment setae II are farther apart then setae I, on the 9th abdominal segment the distance between setae VIII is greater than on the 8th abdominal segment. The spiracle of the 2nd abdominal segment is not greater than the insertion place of seta III. The setae on the anal shield are right on the margin.

The caterpillars live between spun-up needles of Larix, presumably also on other plants. This species has been found only in the Swiss and French Alps.

The caterpillars from the Bavarian State Collection that were examined were found by Chretien in July 1898 in the alps on Larix.

The genus Olindia Guenée 1845

Diagnosis: On the 9th abdominal segment I and III are on separate pinaculi, VI is present, setae VIII are farther apart than on the 8th abdominal segment. On the mesothorax VIII stands on the coxa.

Now after being split up by Obraztsov, this genus contains only one species, while rectifasciana and hybridana were placed in a new genus. Unfortunately these two spp. are not at my disposal so that I can determine whether this splitting is also justified from the larval morphology.

As for the one species of this genus, this can be readily separated from the other Cnephasiini.

O.ulmana (Hübner 1822) (1645)

Caterpillar yellowish green, head yellow, dard-brown marked. Cervical shield, pinaculi, thoracic legs black brown to black. Body strongly granulate by microscopically small brown spinules. On the cervical shield the distance from IIIa to IX is less than to III, on the prespiracular shield IV is ventrad from V amd VI, equidistant from both. The 3rd, 4th, and 6th ocelli are contiguous, while there is a greater distance between the others. Group VII has 3 setae on the 1st, 2nd, and 7th abdominal segments, 2 setae on the 8th and 9th. On the 8th abdominal segment the distance between setae II is less than that between setae I, III is dorsocraniad from the spiracle, IV and V are horizontally arranged. On all abdominal segments IIIa is on the pinaculum of III, IV is distinctly longer than V. On the 9th abdominal segment I and III are on separate pinaculi, setae IV, V, and VI are on a common pinaculum. Setae VIII are not farther apart than on the 8th abdominal segment. Spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III. On the anal shield the last two setae are moved far back (fig. 67).

May, June in leaves that are spun together, on Aquilegia vulgaris, Ranunculus ficaria, Chrysoplenium, Mercuralis, Galeobdolon luteum, and Vaccinium.

The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on May 14, 1906 in Rachlau on Oxalis acetosella.

The genus Eulia Hübner 1825.

Diagnosis: Seta VI present on the 9th abdominal segment, setae VIII not farther apart then on the 8th abdominal segment. Seta III is found on the same level as the spiracle on the 8th abdominal segment. On the mesothorax VIII is distinctly set off from the coxa.

According to Obraztsov's new classification this genus contains only one species. It can also be well characterized larvo-morphologically as is evident from the key and the diagnosis.

Eulia ministrana (Linné 1758) (1562)

Caterpillar green, head brown-red, cervical shield, anal shield, pinaculi, and thoracic legs yellowish green. Body strongly granulate by microscopically small light spinules. The 2nd ocellus is closer to the 3rd than to the 1st. On the cervical shield the distance between setae III and IIIa is somewhat greater than that between IIIa and IX. Group VII counts 3 setae on the 1st, 2nd, and 7th abdominal segments, 2 on the 8th and 9th. Circles of hooks biserial, parapodia not chitinized on the sides. On the prespiracular shield IV stands in a line with V and VI and is considerably closer to V than to VI. On the abdominal segments setae IV and V are of approximately the same length and are diagonally situated. Spiracle of the 8th abdominal segment twice as large as that of the 2nd.

The larval stage extends from the end of Aug. to April. The caterpillar at first lives in the folded tip of the leaf, later in a web-tube open on both sides. Before pupation in April this is closed. The following have been named as food plants: Betula, Alnus, Rhamnus, Sorbus, Rosa, Corylus, Fagus, Quercus, and Tilia.

Locality: Erlangen, Aug. 24, 1951 on Rhamnus, Quercus.

The genus Eana Billb. 1820.

Diagnosis: Seta VI present on the 9th abdominal, setae VIII not farther apart than on the 8th segment. Seta III is found on the 8th abdominal segment dorsocraniad from the spiracle. The spiracles of the 2nd to the 7th abdominal segments are larger than the insertion places of seta III standing above them.

Of this genus only 3 spp. occur in Germany of which I could, unfortunately, investigate only one. This can be readily separated from the larval morphology.

Eana argentana (Clerck 1759)(1607).

I could not find a description of the larva in the literature. Kennel (1908) wrote: "The larva is supposed to live on grass roots. The adult flies in June and July more to moist grass plots." The following description is from the caterpillars which I found in the Bavarian State Collection.

Caterpillar red-brown, head, cervical shield, anal shield, pinaculi, and thoracic legs black brown. Also the parapodia are black-brown chitinized on the side (fig. 224). Head often lighter but then marked with dark behind. The body is strongly granulate. 2nd ocellus closer to the 3rd than to the 1st. Circle of hooks biserial, composed of about 60 hooklets. On the cervical shield IIIa is equidistant from IX and III; II stands ventrocaudad from I. On the prespiracular shield IV stands in a diagonal line with V and VI, in this case V is lowest down. On the 1st, 2nd, and 7th abdominal segments, group VII contains 3 setae, on the 8th and 9th, 2 setae. While they are situtated in one line on the 1st abdominal segment, they are in a triangle c

the 2nd. On all abdominal segments, the distance between setae II is greater than that between setae I. On the 9th abdominal segment IV, V, and VI stand on a common pinaculum, setae VIII are not fabther apart than on the 8th abdominal segment. Spiracles elliptical, on all abdominal segmentsthey are larger than the insertion places of setae III. On the 8th abdominal segment III is dorsocraniad from the spiracle, on the mesothorax VIII is distinctly set off from the margin of the coxa (fig. 68).

The caterpillars from the Bavarian State Collection that were examined had been found on July 18, 1894, on Mt. Canigou in the Pyrenees of southern France.

The genus <u>Trachycmia</u> Guenee 1845.

Diagnosis: Seta VI present on the 9th abdominal segment, setae VIII not farther apart than on the 8th. On the mesothorax VIII is set off from the coxa distinctly. On the 8th abdominal segment setae II are not farther apart the setae I, seta III is dorsocraniad from the spiracle. On the 2nd to the 7th abdominal segments the spiracles are not larger than the insertion places of III.

This monotypical genus is nearest the genus Eulia and can be readily separated larvo-morphologically by the above characters.

<u>Trachysmia rigana</u> (Sodoffsky 1829)(1558)

Caterpillar gray-green, head, cervical shield ocher yellow. Body strongly granulate. Parapodia biserial ~~mxxthexlstyx2ndyxandx7thxabdominalxsegmen~~ with about 30 hooklets. The 2nd ocellus closer to the 3rd than to the 1st. Group VII consists of 3 setae on the 1st, 2nd, and 7th abdominal segments, of 2 setae on the 8th and 9th. On the cervical shield IIIa is closer to IV. than to III, on the prespiraculs shield IV stands in a line with V amd VI, very strongly approaching seta V. Setae I and III are found on separate pinaculi on the 9th abdominal segment, IV, V, and VI on a common pinaculum. On all abdominal segments IIIa stands beside the pinaculum of III.

Two generations, the first in May and June, the second from Sept. on, probably overwintering. The caterpillar lives on the ground in a spun tube on Anemone pulsatilla.

The caterpillars of the Bavarian Station Collection that were examined were found by Cretien Sept. 2, 1899 in La Garranne/South France on Anemone rustia.

The tribe Tortricini.

Diagnosis: Circles of hooks biserial. On the 9th abdominal segment, I and III are found on separate pinaculi, if on a common pinaculum, then IV and V are approximately of the same length on the abdominal segments and the coronal suture is distinctly longer than the adfrontalia are wide. Group VII on the 2nd abdominal segment consists of 3 setae, on the 7th always of 2 setae. On the 9th abdominal segment, VI is present, setae VIII are not farther apart than on the 8th. (Exception - Acleris comariana).

The Tribe erected by Obraztsov is also very uniform larvo-morphologically. All genera belonging to it are characterized by the fact that group VII on the 2nd abdominal segment consists of 3 setae, on the 7th of 2 and seta VI on the 9th abdominal segment is always pœsent. By these 3 characters it differs distinctly from all genera of the other Tortricinae tribes.

Genera of the Tortricini

1 (8) On the 9th abdominal segment, setae I and III stand on a common pinaculum or their pinaculi are contiguous and the body is strongly granulate, or on the 8th abdominal segment group VII consists of only one seta.

2 (3) On the mesothorax VIII is found on the margin of coxa, the large violet pinaculi stand out distinctly from the yellow body Spatalistis

3 (2) On the mesothorax VIII is distinctly set off from the coxa.

4 (7) Circle of hooks on the parapodia completely biserial, spiracle of the 2nd abdominal segment larger than the insertion place of seta III.

5 (6) Setae IV and V are vertically situated ... on the 1st abdominal segment. Cervical shield black-brown Aleimma

6 (5) Setae IV and V are diagonally situated also on the 1st abdominal segment. Cervical shield greenish Tortrix

7 (4) Circle of hooks of the parapodia biserial but laterally uniserial, spiracle of the 2nd abdominal segment not larger than the insertion place of III Croesia

8 (1) On the 8th abdominal segment group VII always has 2 setae, on the 9th abdominal segment setae I and III are found on separate pinaculi; if these are contiguous then the body is not or is only very weakly, granulate Acleris

The genus Aleimma Hübner 1825

Diagnosis: On the 9th abdominal segment setae I and III stand on a common pinaculum, on the 1st abdominal segment setae IV and V are vertically situated.

This genus stands very close to the following two monotypical genera. Since, however, I can separate them larvo-morphologically from the characters to be taken frmm the diagnosis, I am staying with Obraztsov's classification.

Aleimma loeflingiana (Linné 1758)(1571).

Caterpillar light to brownish green, head, cervical shield, anal shield, pinaculi, and thoracic legs black-brown to black. Body strongly granulate by microscopically small brown spinules. Parapodia biserial, chitinized black-brown on the side. On the certical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. On the prespiracular shield IV is found almost in a line with V and VI, IV being somewhat closer to V. Group VII has 3 setae (often 2 setae) on the 1st and 2nd abdominal segments, 2 setae on the 7th, 8th, and 9th. On the 9th abdominal segment I and III are on a common pinaculum, setae VIII are twice as far apart as on the 8th abdominal segment. On the mesothorax VIII is distinctly set off from the coxa, IIIa stands dorsocraniad from III. On abdominal segments 1 to 7, IIIa is found on the margin of pinaculum III, on the 8th abdominal segment III is ventrocraniad from the spiracle. On the 2nd abdominal segment the spiracle is larger than the insertion place of III. 2nd ocellus equidistant from the 1st and 3rd.

May, June in leaf-rolls on Quercus.

Locality: Spardorf, June 1, 1954, on Quercus.

The genus Tortrix Linné 1758.

Diagnosis: On the 9th abdominal segment setae I and III are on a common pinaculum, or they are contiguous and the body is very strongly granulate. Spiracle of the 2nd abdominal segment larger than the insertion place of III.

Obraztsov recognized great differences among spp. of the former genus Tortrix and from this sometimes erected new genera, sometimes referred them to other genera. Only one species — viridana — was seen by him as Tortrix. The old genus Tortrix is not uniform larvo-morphologically, on the other hand, the new one can be readily separated from the genera that are closest to it.

Tortrix viridana Linné 1758 (1572).

Caterpillar green, head, thoracic legs, and pinaculi black-brown, often only the thoracic pinaculi are as dark as the head. while the abdominal ones are gray-green. Cervical and anal shields greenish or brownish-green. Parapodia laterally chitinized black-brown (fig. 224). Body strongly granulate with microscopically small spinules. The 2nd ocellus is closer to the 3rd than to the 1st. Spiracle of the 2nd abdominal segment larger than the insertion place of seta III. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setae on the 7th, 8th, and 9th abdominal segments. On the 9th abdominal segment the setae VIII are twice as far apart as on the 8th, on the mesothorax VIII is distinctly set off from the coxa. On all abdominal segment setae IV and V are diagonally situated.

May, June in the first two instars only on Quercu, later the caterpillars also go over to other deciduous trees or herbaceous plants, even Urtica. During the first two instars they live in the buds, later they go over to feeding on the leaf, in doing which several leaves will be spun together. Since this species shows up very abundantly in many years and causes regional defoliation, a great deal has become known about its biology. Gasow (1925) has written an extensive monograph.

Locality: Erlangen on May 14, 1951, on Quercus.

The genus Spatalistis Meyrick 1907

Diagnosis: On the mesothorax VIII stands on the margin of the coxa, on the 9th abdominal segment I and III are on a common pinaculum. Spiracle of the 2nd abdominal segment not larger than the insertion place of III.

The species belonging to this genus also differs larvo-morphologically just as strongly as by reason of the endophytic habits of spp. related to it so that this monotypical genus seems to be justified.

Spatalistis bifasciana (Hübner 1787)(1570).

The caterpillar of this species has not yet been described even in Kennel's (1908) monograph. The following description was made from caterpillars from Disque's collection that were examined.

Caterpillar yellow with large violet pinaculi. Head, cervical shield, and thoracic legs brown, cervical shield dark edged (fig. 69). On the anal shield there is a violet-brown transverse stripe (fig. 70) between the anterior margin and the first setae. 2nd ocellus closer to the 3rd than to the 1st, body strongly granulate. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands in a line with V and VI, IV being somewhat closer to V. On the mesothorax IIIa is dorsocraniad from III. Group VII on abdominal segments 1 to 6 has 3 setae, on segments 7, 8, and 9 - 2 setae. On all the abdominal segments V is distinctly shorter than IV, on the 1st abdominal segments these two setae are vertically situated, on the others they are diagonally arranged. Seta IIIa stands on the margin of pinaculum III. On the 8th abdominal segment setae II are farther apart than setae I, III stands before the spiracle, at the same level with this. On the 9th abdominal segment I and III are found on a common pinaculum, the same as IV, V, and VI (fig. 71). The distance between setae VIII

on the 9th abdominal segment is not greater than on the 8th. Spiracles round, on the 2nd abdominal segment not larger than the insertion place of seta III. Anal comb with 8 spines.

The caterpillar lives the last of July, Aug., Sept., and Oct. Since it was also found in April, it is assumed that it overwinters. The adult flies in May and June. According to former statements it can be found on fruits of Vaccinium myrtillus and uliginosus, according to Sand, on the other hand, it is found in fruits of Rhamnus cathartica and Cornus mas. Wide-spread in West Europe, Lower Austria, Steiermark, Galicia, and North Italy.

The caterpillars from the Bavarian State Collection that were examined, were found July 22, 1906 in Trippstadt/Baden in fruits of Vaccinium myrtillus (Disque).

The genus Chroesia Hübner 1825.

Diagnosis: The biserial circles of hooks are uniserial on the sides. On the 9th abdominal segment I and III are on a common pinaculum, or group VII consists of only one seta on the 8th abdominal segment.

According to Obraztsov's new system (i.lit.) this genus embraces the 3 spp. occurring in Germany, bergmanniana, forskaleana, and holmiana. The first two were formerly in the genus Tortrix, the third in the genus Acalla. It is therefore not surprising that only the two former Tortrix spp. are larvo-morphologicallyuniform while holmiana agrees completely with spp. of the former genus Acalla, now Acleris. For this reason I am tempted to refer holmiana back again to its former co-geners. To be sure bergmanniana and forskaleana differ distinctly within the genus Chroesia but agree in the special development of the circles of hooks.

Spp. of Chroesia

1 (2) On the 8th abdominal segment group VII consists of 2 setae, on the 9th I and III are found on a common pinaculum

2 (1) On the 8th abdominal segment group VII consists of 1 seta, on the 9th I and III are found on separate pinaculi

bergmanniana

forskaleana

Chroesia bergmanniana (Linné 1758)(1568).

Caterpillar yellowish or greenish-white with pinaculi of the same color. Head, cervical and anal shields, and thoracic legs black-brown to black. Also the parapodia are laterally chitinized dark-brown. 2nd ocellus equidistant from the 1st and the 3rd. On the cervical shield the distance from IIIa to IX is greater than that from IIIa to III. On the prespiracular shield IV is closer to V than to VI. On the mesothorax IIIa is dorsocraniad from III, seta VIII distinctly set off from the coxa. On all abdominal segments IV and V are diagonally situated. On the 8th abdominal segment, setae II and setae I are equidistant from each other, III is found on the same level as the spiracle. On the 9th abdominal segment setae I and III are on a common pinaculum. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setaeon the 7th, 8th, and 9th. On the 9th abdominal segment setae VIII only only a little farther apart than on the 8th. The circles of hooks on the parapodia have 28-30 hooklets and are laterally uniserial. Spiracles round, on the 2nd abdominal segment they are not larger than the insertion place of seta III.

May and the first of June on spp. of roses, especially Rosa canina, also on Rhamnus cathartica. The caterpillar spins up the tip leaves with the flower buds and destroys the latter. This species very abundant with us.

Locality: Erlangen May 25, 1952, on Rosa canina.

Chroesia forskaleana (Linné1758) (1564).

Caterpillar yellowish-white, head, cervical and anal shields greenish, body not or only very weakly granulate. 2nd ocellus equidistant from the 1st and the 3rd. On the cervical shield the distance between IIIa and III, as well as that between IIIa and IX almost of the same size. On the prespiracular shield IV is ventrad from V and VI, equidant from both. On the mesothorax IIIa is dorsad from III. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setae on the 7th and 9th abdominal segment, but only 1 seta on the 8th. On all abdominal segments, IV and V are diagonally situated. On the 8th abdominal segment III is lower down than the spiracle, on the 9th abdominal segment I and III stand on separate pinaculi. Setae VIII on the 9th abdominal segments are somewhat farther apart than on the 8th. The spiracles are round, on the 2nd abdominal segment not larger than the insertion place of seta III. The parapodia are not laterally chitinized, their circles of hooks are uniserial on the sides.

May, June, at first between spun-up flowers, later in leaf rolls on Acer, also on Rosa centifolia.

The caterpillars from the Bavarian State Collection that were examined were found by Disque on May 14, 1912, near Speyer on Acer platanoides.

The genus Acleris Hübner 1825.

Diagnosis: Group VII on the 2nd abdominal segment consisting of 3 setae, on the 7th 8th, and 9th abdominal segments of 2 setae. On the 9th abdominal segment I and III stand on separate pinaculi; if these are contiguous the body of the caterpillar is not or in only weakly granulated. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. Circles of hooks biserial, seta VI always present on the 9th abdominal segment.

This genus is very uniform both larvo-morphologically as well as imaginally. This can already be seen from the fact that the different systems do not differ in putting the species together. Obraztsov referred holmiana only to the preceding genus. Since this species agrees completely with the spp. of this genus larvo-morphologically I am again putting holmiana in the genus Acleris.

1	(4)	The pinaculi of setae I and III on the 9th abdominal segment are contiguous.	
2	(3)	Circles of hooks of parapodia biserial	permutana
3	(2)	Circles of hooks of parapodia anteriorly uniserial, posteriorly biserial	& variegana
4	(1)	On the 9th abdominal segment I stands on a separate pinaculum which is equidistant from II and III.	
5	(10)	Setae II are on separatepinaculi on the 9th abdominal segment which are often contiguous but never form a single pinaculum.	
6	(9)	On the mesothorax IIIa is dorsocaudad or dorsad from III.	
7	(8)	Head yellow.	aspersana
8	(7)	Head dark-brown to black	lubriciana
9	(6)	On the mesothorax IIIa is dorsocraniad from III	ferrugana
10	(5)	Setae II on the 9th abdominal segment are on a common pinaculum.	
11	(14)	The biserial circles of hooks of the parapodia are uniserial on the anterior margin (fig. 184).	
12	(13)	Head yellow	shepherdana
13	(12)	Head dark-brown to black	logiana
14	(11)	Circles of hooks of the parapodia completely biserial.	
15	(30)	On the cervical shield IIIa is equidistant from III and IX.	
16	(25)	Head yellow to yellowish brown.	
17	(18)	On the 1st abdominal segment group VII consists of 2 setae	emargana
18	(17)	On the 1st abdominal segment group VII consists of 3 setae.	
19	(20)	Thoracic legs brown	mixtana
20	(19)	Thoracic legs yellow to greenish.	
21	(22)	Spiracle of 2nd abdominal segment distinctly larger than the insertion place of seta III.	hippophaeana
22	(21)	Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III.	
23	(24)	Cervical shield with a brown spot between II and III (fig. 79)	literana
24	(23)	Cervical shield yellowish, without any marking	schalleriana
25	(16)	Head dark-brown to black.	

26 (27) On the prespiracular shield setae V, IV, and VI are situated in a horizontal line — querciana
27 (26) On the prespiracular shield setae V, IV, and VI are arranged in a diagonal line in which case V is the lowest down.
28 (29) On the mesothorax IIIa is dorsocraniad from III, the cervical shield is uniformly darkbrown to black. The pinaculi are very small and black — contaminana
29 (28) On the mesothorax IIIa is dorsocaudad from III, the cervical shield is often only half black-brown (fig. 75), pinaculi large and light — boscana
30 (15) On the cervixal shield the distance between setae IIIa and III is distinctly greater than that between IIIa and IX.
31 (32) Head dark brown — fimbriana
32 (31) Head yellow.
33 (36) Cervical shield black-brown spotted or all black-brown.
34 (35) On both sides between II and III the cervical shield has a black spot (fig. 72), on the prespiracular shield setae V, IV, and VI are situated in a horizontal line — latifasciana
35 (34) The cervical shield is black on the sides, in which case III also stands on a black ground, or all black-brown. The setae V, IV, and VI stand in a diagonal line, V being the lowest down — holmiana
36 (33) Cervical shield yellowish-green, not spotted.
37 (38) IIIa is dorsocraniad from III on the mesothorax — hastiana
38 (37) IIIa is dorsocaudad from III on the mesothorax — sparsana

Acleris latifasciana (Haworth 1811)
syn. schalleriana Fabr. 1815 (1469) according to Obraztsov

Caterpillar greenish white, head brownish yellow with dark eye- and genal spots. Cervical shield brownish-green, on either side with a sharply contrasting spot between II and III (fig. 72), the seta IIIa closer to IX than to III. 2nd ocellus equidistant from the 1st and 3rd, spiracles elliptical, very small and nearly round on the 2nd abdominal segment. On the 8th abdominal segment III is somewhat ventrocraniad from the spiracle, setae II not farther apart than setae I. Setae VIII on the 9th abdominal segment farther apart than on the 8th.

Two generations: May, June, and Aug. The caterpillar lives between spun-up leaves and flowers on Symphytum officinale, Vaccinium myrtillus, Spiraea aruncus.

The caterpillars from the Bavarian State Collection that were examined were found by Mitterberger on June 12, 1901 at Vienna on Spiraea aruncus.

In the Bavarian State collection I also found the variation comparana living on Comarum. The differences from the one just described are: Cervical shield dark-edged (fig. 73), thoracic legs and thoracic pinaculi brown. Otherwise there is complete agreement in color and morphology.

Acleris sparsana (Schiffermiller 1776)
syn. spoensana Fabricius 1787 (1464).

Caterpillar green, head brownish green with a dark eye spot. 2nd ocellus equidistant from the 1st and 3rd. Spiracle of the 2nd abdominal segment greater than the insertion place of seta III. On the cervical shield IIIa is closer to IX than to III. On the prespiracular shield IV stands in a line with V and VI, somewhat closer to V. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. On the 8th abdominal segment III is ventrocraniad from the spiracle, setae II are not farther apart than setae I. Parapodia biserial, not laterally chitinized.

May, June, July in spun-up leafy cover on Acer, Carpinus betulus, Fagus, Quercus, Sorbus.

The caterpillars from the Bavarian State Collection that were examined were found by Disque on June 5, 1887 near Speyer on Acer campestris.

Acleris contaminana (Hübner 1796-99)(1480).

Caterpillar light-er to dark-er dirtyish-green, head brown, cervical shield dark-brown, thoracic legs blackish. On the cervical shield IIIa is equidistant from IX and III, on the prespiracular shield IV stands in a diagonal line with V and VI, IV being closer to V. On the mesothorax IIIa is dorsocraniad from III. Setae II on the 8th abdominal segment farther apart than setae I. Otherwise there is complete agreement with the preceding species.

May, June, spinning up leaves and flower buds of Crataegus, Prunus, Pirus, Rosa, Quercus, and Corylus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque May 27, 1888 near Speyer on Prunus spinosa.

Acleris asperana (Hübner 1822) (1471).

Caterpillar whitish green to greenish brown, according to Meyrich green. Head honey-yellow with eye- and genal-spots. Body very weakly granulate. 2nd ocellus equidistant from the 1st and 3rd. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands in a line with V and VI, IV being nearer V. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setae on the 7th, 8th, and 9th. On the 8th abdominal segment III is ventrocraniad from the spiracle, setae II standing somewhat closer together than setae I. On the 9th abdominal segment setae II are found on separate pinaculi which are contiguous, setae VIII not farther apart than on the 8th abdominal segment. The anal comb consists of 6 spines. Seta VIII on the mesothorax stands right on the margin of the coxa.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque May 31, 1892 near Speyer on Sanguisorba.

Acleris ferrugana (Schiffermiller 1776)(1473)

Caterpillar green, head, cervical shield, thoracic legs, and prespiracular shield black-brown to black, the other pinaculi are of the body coloring, but they are strongly outstanding. 2nd ocellus equidistant from the 1st and 3rd. On the cervical shield IIIa is farther from III than from IX, on the mesothorax IIIa stands dorsocraniad from III. Group VII has 3 setae on the last and 2nd abdominal segments, 2 setae on the 7th, 8th, and 9th. Spiracle of the 2nd abdominal segment not larger than the insertion placeof seta III. On the 8th abdominal segment III is ventrocraniad from the spiracle, setae II not farther apart than setae I. On the 9th abdominal segment setae II stand on separate pinaculi, which often are contiguous, setae VIII farther apart than on the 8th abdominal segment.

Two generations: May, June, and Aug., Sept. The caterpillars live gregariously between leaves spun together into caterpillar nests on Quercus, Betula, Fagus, Populus tremula, Alnus, Prunus cerasus, Pirus communis, Rubus idaeus.

Locality: Reichswald on June 4, 1951 in birch leaves that had been spun together.

Acleris quercinana (Zeller 1849)(1477)

Caterpillar green, head, cervical shield, thoracic legs dark-brown. Setae II on the 9th abdominal segment on a common pinaculum. On the mesothorax IIIa and III are vertically situated or IIIa is dorsocaudad from III. Otherwise the catepillar also completely agrees with ferrugana. Also the adults are hard to differentiate.

May, June between spun-up leaves on Quercus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 6, 1906 near Speyer on Quercus.

Acleris shepherdana (Stephens 1852) (1472).

Caterpillar green or yellowish, head grayish brown with dark eye and genal spots. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands with V and VI on one line, in which case IV is twice as close to V as to VI. On the mesothorax IIIa and III are vertically situated or IIIa is somewhat dorso caudad from III. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment the setae II are not farther apart than setae I. On the 9th abdominal segment setae II stand on a common pinaculum, setae VIII are farther apart than on the 8th abdominal segment. On the mesothorax VIII is distinctly set off from the margin of the coxa.

May, June between spun-up leaves on Spiraea ulmaria and Sanguisorba officinalis. A 2nd generation whose caterpillars occur in Aug. and Sept. is assumed.

The caterpillars from the Bavarian State Collection that were invextigated had been found by Disque on June 1, 1890 near Grünstadt on Spiraea.

Acleris schalleriana (Linné 1761).
syn. logiana Schiffermiller 1776 (1452).

Caterpillar pale green or yellowish green, head, cervical shield ocher yellow. 2nd ocellus somewhat closer to the 3rd than to the 1st. On the prespiracular shield IV is somewhat ventrad from V and VI, being closer to V. The seta IIIa is found, on the mesothorax, dorsocraniad from III, VIII is distinctly set off from the margin of the coxa. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. The setae II on the 8th abdominal segment are not farther apart than setae I. On the 9th abdominal segment setae II are found on one pinaculum, setae VIII are farther apart than on the 8th abdominal segment. Parapodia laterally not chitinized. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setae on the 7th, 8th, and 9th. On the cervical shield IIIa is equidistant from III and IX.

June to Aug. in a leaf fold on Viburnum lantana and opulus.

Locality: Knetzgau/Main on Aug. 18, 1953, on Viburnum.

Acleris variegana (Schiffermiller 1776)(1455)

Caterpillar yellowish or greenish yellow with light pinaculi. Head, cervical shield yellowish- or greenish-brown. Head with a dark eye spot, genal spot lacking. Body weakly granulate. Spiracle of prothorax elliptical, that of the 8th abdominal segment is round. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield VI, IV, and V are situated on one line, IV being closer to V. Also on the 8th abdominal segment setae II are farther apart than setae I, III lying ventrocraniad from the spiracle. On the 9th abdominal segment the pinaculi of setae I and III are contiguous. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. Parapodia with about 50 hooklets.

May to July between 2 leaves spun together on Crataegus, Pirus malus, P.communis, Prunus spinosa, P.avium, Rosa, Poterium, Corylus, Ulmus, Vaccinium myrtillus.

Locality: Rathsberg on July 1, 1951, between spun-up leaves on Prunus avium.

Acleris permutana (Duponchel 1836)(1454).

Caterpillar green, head yellow with eye- and genal spots. Cervical shield yellowish with 2 dark specks on either side (fig. 74), one between II and III, a smaller one between I and II. Thoracic legs and the thoracic pinaculi are brown, the others of the same color as the body. Circles of hooks of the parapodia with about 30 hooklets, anteriorly they are smaller and uniserial, posteriorly larger and biserial. Caudal disk with about 20 hooklets. Body very weakly granulate. 2nd ocellus equidistant from the 1st and the 3rd. Spiracle of the 2nd abdominal segment not larger than the insertion place of the seta III. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands in a line with V and VI, IV being closer to V. On the mesothorax seta IIIa is dorsocaudad from III, seta VIII is distinctly set off from the margin of the coxa. On the 8th abdominal segment setae II are not farther apart than setae I. On the 9th abdominal segment the pinaculi of setae I and III are contiguous, setae II standing on a common pinaculum.

No description of the caterpillar was at hand. I was able to make it from caterpillars coming from the Bavarian State Collection.

June, July between spun-up leaves on Prunus spinosa and Rosa.

The caterpillars from the Bavarian State Collection that were examined were found by Disque on July 4, 1906, in Grünstadt on Rosa.

Acleris boscana (Fabricius 1794)(1457).

Caterpillar green with lighter pinaculi, weakly granulate. Head, cervical shield, prespiracular shield, and thoracic legs dark brown, cervical shield often dark only for half of it (fig. 75). On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is situated in a diagonal line with V and VI. V is the lowest down. Seta IIIa on the mesothorax is dorsocaudad from III. Group VII has 3 setae on the 1st and 2nd abdominal segments, 2 setae on the 8th, 7th, and 9th. The distance between setae II on the 8th abdominal segment is greater than that of setae I, seta III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II are situated on a common pinaculum, I being equidistant from II and III. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. 2nd ocellus equidistant from the 1st and the 3rd.

2 generations: May, June, and Aug., between two leaves of Ulmus campestris that have been spun up on each other.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 1, 1901 near Speyer on Ulmus campestris.

Acleris logiana (Clerck 1759)
syn. niveana Fabricius 1787 (1459)

Caterpillar greenish white with monochromatically colored pinaculi, head, prespiracular shield, and thoracic legs . . . . brown to black-brown. Cervical shield brown, black on the sides (fig. 76). Body weakly granulate, 2nd ocellus equidistant from the 1st and 3rd. On the cervical shield III a is found considerably closer to IX than to III, on the prespiracular shield IV is situated in a horizontal line with V and VI, IV is closer to V. On the mesothorax IIIa is dorsad or dorsocaudad from III. The distanct of setae II on the 8thabdominal segment is just as great as that between setae I. On the 9th abdominal segment I is equidistant from II and III. Hooklets of the parapodia are smaller on the anterior margin and approximately of the same size, on the posterior they are larger and distinctly biserially arranged. Parapodia with 28 to 30, caudal disk with about 25 hooklets. Anal comb of 6 spines.

Data on biology are very divergent. I found the caterpillar the last of May and in June, and again the last of July and in Aug., so that 2 generations seem to be certainly assumed. The caterpillar lives only on Betula in spun leaves, mostly by twos.

Locality: Erlangen Röthelheim on Betula. The caterpillars brought in Aug. 1, 1952 pupated July 12 and the adult emerged Aug. 30.

Acleris holmiana (Linné 1758) (1479)

Caterpillar yellowish or pale green, head yellowish or light brown with dark eye- and genal spots, cervical shield black or apically black-marked, thoracic legs brown. The body is only weakly granulate. The 2nd ocellus is equidistant from the 1st and 3rd. On the cervical shield IIIa is closer to IX than to III, seta II is ventrodaudad from I. On the obliquely-set prespiracular shield IV is closer to V than to VI, on the mesothorax seta VIII is distinctly set off from the coxa. On the abdominal segments setae IV and V are diagonally situated, IIIa does not stand on the pinaculum of seta III. On the 8th abdominal segment the distances between setae II and setae I are the same, III is found ventrocraniad from the spiracle. Setae II are found on a common, setae I and III on separate pinaculi on the 9th abdominal segment (fig. 77). The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. The spiracles are elliptical, on the 2nd abdominal segment not larger than the insertion place of seta III. Anal comb present.

May, June between spun-up leaves, also flower buds of Crataegus, Prunus, and Pirus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 7, 1902 near Speyer on Prunus spinosa and Crataegus.

Acleris hastiana (Linné 1758)(1446)

Caterpillar pale green, head brownish green with dark eye and genal spots. Cervical and anal shields yellowish green. Head and cervical shield are often supposed to be also darkbrown to black. The 2nd ocellus is equidistant from thelst and the 3rd. On the cervical shield IIIa is closer to IX than to III. Spiracle of the 2nd abdominal segment not greater than the insertion place of seta III. On the 9th abdominal segment I and III are on separate pinaculi, setae II on a common one. Parapodia with biserial circles of hooks, laterally not chitinized. On the mesothorax IIIa is dorsocraniad from III.

Two generations: May, June and July,Aug. In leaf rolls on Salix, also Populus.

Locality: Erlangen Röthelheim on June 14, 1951 on Salix.

Acleris hippophaeana (Heyden 1865) (1453).

Caterpillar whitish or gray-white, head brownish with dark eye- and genal-spots. Cervical shield on the posterior margin mostly somewhat more strongly brown. Body only very weakly granulate. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is situated in a line with V and VI, IV being closer to V. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I. Circle of hooks of the parapodia biserial with about 40 hooks. 2nd ocellus somewhat closer to the 3rd than to the 1st. On the mesothorax IIIa is dorsocraniad from III.

June, August between leaves of the apices of twigs spun together on Hippophae rhamnoides.

The larvae from the Bavarian State Collection that were investigated had been found by Disque on July 23, 1898 near Bern on Hippophae rhamnoides.

Acleris mixtana (Hübner 1822)(1451)

Caterpillar green with somewhat darker dorsal median line. Head yellowish brown with a dark eye spot. Cervical and anal shields yellowish-green. Thoracic legs and spiracles brownish. Pinaculi of the same color as the body. Body only weakly granulated. 2nd ocellus somewhat closer to the 3rd than to the 1st. On the cervical shield III is not farther removed from IIIa than from IX. On the prespiracular shield the setae V, IV, and VI are diagonally situated, on the mesothorax IIIa is somewhat dorsocraniad from III. The setae IV and V on all body segments are diagonally placed, III on the 8th abdominal segment is ventrocraniad from the spiracle. Setae II on the 8th abdominal segment not farther apart than setae I. On the 9th abdominal segment setae II stand on a common pinaculum, setae I and III on separate pinaculi, parapodia with about 40 to 50 brown hooklets.

June to the beginning of Sept. between spun-up shoots on Calluna and Erica.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 10, 1905, on Erica arborea.

Acleris fimbriana (Thunberg 1791)(1450)

Caterpillar light to dark green. The head is brown, cervical shield green, posteriorly dark-edged, or the head and the cervical shield are black-brown. Prespiracular shield and thoracic legs dark brown, the pinaculi of the same color as the body. Body granulated. On the cervical shield IIIa is farther from III than from IX. On the mesothorax IIIa is dorsocraniad from III, VIII distinctly set off from the margin of the coxa. On the abdominal segments IV and V are always diagonally situated. On the 1st to the 6th abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th abdominal segments of 2 setae. On the 8thabdominal segment III is ventrocraniad from the spiracle, on the 9th setae II are on a common pinaculum, I and III on separate pinaculi. The setae VIII are farther apart than on the 8th abdominal segment. 2nd ocellus cloer to the 3rd than to the 1st.

According to Disque, between spun-up leaves on Prunus spinosa in Aug., according to other authors on Vaccinium uliginosum from June on.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 12, 1902, on Prunus spinosa.

Acleris lubricana (Mann 1867)(1478)

Caterpillar dirty green, head black, cervical shield brown, black on the sides (fig. 78), often also all black. Also the prothoracic pinaculi and the thoracic legs are black-brown. Body very weakly granulate, on the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands in a diagonal line with V and VI, V being lowest down. Seta IIIa is found dorsocaudad from III on the mesothorax and VIII is distinctly set off from the margin of the coxa. On the 9th abdominal segment not only I and III but also setae II are found on pinaculi of their own. Setae VIII are farther apart on the 9th than on the 8th abdominal segment. Parapodia with about 40 hooklets, spiracles elliptical on the 2nd abdominal segment, somewhat larger than the insertion place of seta III.

According to Disque the caterpillar occurs in May between spun up leaves on Prunus spinosa. This species was found by Disque only in the Rheinpfalz in addition to the Tyrol and in the Caucasus.

The caterpillars from the Bavarian State Collection that were examined were also found by Disque on June 3, 1885 in the vicinity of Speyer.

Acleris literana (Linné 1758)(1458)

No description of the caterpillar is at hand, there is also still doubt on the biology. The following description I was able to make from caterpillars in the Bavarian State Collection found by Disque.

Caterpillar green with pinaculi of the same color. Head yellow to brownish yellow and dark eye- and genal-spots. Cervical shield yellowish green with a dark spot between the setae II and III (Fig.79). Body not or only very weakly granulate. 2nd ocellus equidistant from the 1st and 3rd. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV stands in a horizontal line with V and VI. On the mesothorax IIIa is dorsad from III, the seta VIII is distinctly set off from the margin of coxa. The distance between setae II is greater even on the 8th abdominal segment than between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment I and III are on separate pinaculi, setae II on a common pinaculum, setae VIII further apart than on the 8th abdominal segment. The spiracles are elliptical, on the 2nd abdominal segment they are in the order of magnitude of the insertion place of seta III.

May, June between spun-up leaves on Quercus, the caterpillars of a 2nd generation are supposed to occur in Aug.

The caterpillars of the Bavarian State Collection that were examined had been found by Disque on May 22, 1892 near Speyer on Quercus.

Acleris emargana (Fabricius 1775)(1440).

Caterpillar light green or pale green, head brownish yellow, cervical shield and anal shield greenish to yellowish green. The pinaculi are of the same color as the body, spiracles yellow and elliptical. 2nd ocellus from the 1st and 3rd equidistant. On the cervical shield IIIa is equidistant from III and IX, II somewhat ventrocaudad from I. The prespiracular shield is diagonal, also the setae IV and V on all abdominal segments. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III lies ventrocraniad from the spiracle. On the 9th abdominal segment I is equidistant from II and III, setae II on a common pinaculum. Setae IV, V, and VI are likewise on a common pinaculum. ~~Setae VII~~ The distance between setae VIII is larger than on the 8th abdominal segment. Parapodia biserial with about 50 to 60 hooklets. Anal comb of 6 spines. In the other characters this species agrees with other spp. of Acleris (fig. 80).

May, June, and July between spun-up leaves on different spp. of Salix and Populus as well as on Betula alba.

The caterpillars that were examined had been found by Disque on June 7, 1901 near Speyer on Salix.

Tr.:R.Ericson
1960

Subfamily Olethreutinae
syn. Epibleminae Kennel 1908.

No extensive characters can be found in larval systematics for this subfamily. This is not surprising since according to Kennel (1908) even the adult systematics are not uniform. I was able to separate it from the other subfamilies only according to the tribes. For this reason I would like to waive making a diagnosis of the subfamily.

In 1946 Obraztsov recognized this non-uniformity and divided the subfamily up into 3 tribes. These can be readily separated from each other, as well as from the other two subfamilies, larvo-morphologically, I arrived at deviating results only in two cases. I removed the monotypical genus Eucosmomorpha Obraztsov (i.lit.) from the Laspeyresiini and again placed albersana with woeberiana in the Eucosmini.

The genus Ancylis, in my opinion, belongs not to the Eucosmini, but rather to the Olethreutini. The foundations for these two changes will be given in detail in the conclusion to the diagnoses of the tribes.

Tribes of the Olethreutinae

1 (8) Setae I and III on the 9th abdominal segment are always found on a common pinaculum. On the abdominal segments, V is at most half as long as IV or the coronal suture is not longer than the adfrontalia are wide at the level of the apex of clypeus.
2 (3) Group VII consists of 2 setae on the 7th and 8th abdominal segments, of one seta on the 9th. On the 1st to the 7th abdominal segments inclusive IV and V are vertically situated or seta VI is lacking on the 9th abdominal segment. If IV and V are situated vertically only on the 1st abdominal segment, then on the 8th abdominal segment III is not found on the same level as the spiracle — Eucosmini pars
3 (2) Caterpillars not provided with the characters cited under 2.
4 (5) On the 9th abdominal segment group VII consists of only 1 seta — Laspeyresiini
5 (4) On the 9th abdominal segment group VII consists of 2 setae.
6 (7) On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae and on the mesothorax IIIa is dorsocraniad from III — Subgenus Dichroramphodes
7 (6) On the 1st, 2nd, 7th, and 8th abdominal segments group VII does not simultaneously count 2 setae, if this happnes then on the mesothorax IIIa is dorsocaudad from III — Eucosmini pars
8 (1) On the 9th abdominal segment setae I and III are found on separate pinaculi, if on a common pinaculum, then on the abdominal segments setae IV and V are approximately of the same length or the coronal suture is considerably longer than the adfrontalia are wide at the level of the apex of clypeus. — Olethreutini

Tribe Laspeyresiini.

Diagnosis: Group VII on the 9th abdominal segment consists of only one seta, if of 2, then it also consists of 2 setae on the 2nd abdominal segment and on the mesothorax IIIa is dorsocraniad from III. On the 9th abdominal segment setae I and III are found on a common pinaculum. When group VII on the 7th and 8th abdominal segments consists of 2 setae, and of one seta on the 9th, then VI must be present on the 9th abdominal segment or IV and V must be diagonally situated on abdominal segments 1 to 7 inclusive. If IV and V are vertically placed on the 1st abdominal segment then on the 8th, III must be situated on the same level as the spiracle.

This tribe is also very uniform larvo-morphologically. The collection of the genera in the Laspeyresiini by Obraztsov (1946) seems to be so much the more suitable as the subfamily is not uniform. This tribe can be readily separated from the other two, the Eucosmini and especially the Olethreutini. Only a few converging characters between the Laspeyresiini and Eucosmini make it necessary to draw on several characters for separation.

Obraztsov had placed one species — woeberiana — of the former genus Grapholitha in the genus Enarmonia of the Eucosmini. This transfer also proved to be larvo-morphologically admissible since group VII on the 9th abdominal segment consists of 2 setae. On the other hand he still left albersana — which has so much in common with woeberiana that the two are difficult to separate — in the Laspeyresiini. Even the name of this monotypical genus Eucosmomorpha permitted a conclusion that it had kindred relations with Eucosmini. Obraztsov informed me by letter that albersana and woeberiana occupied an intermediate position between the Laspeyresiini and the Eucosmini and he referred albersana to the Laspeyresiini since it is closer imagino-morphologically to this tribe, and referred woeberiana, which is closer to the Eucosmini, to that tribe. But since the two spp. agree larvo-morphologically so strongly in primary characters that separation would cause difficulty and since they fit into the Eucosmini very well indeed, I am placing albersana and woeberiana in the genus Enarmonia and referring it to the Eucosmini.

Genera of the Laspeyresiini.

1 (2) Group VII consists of 2 setae on the 1st, 7th, and 8th abdominal segments, circles of hooks completely uniserial, on the mesothorax IIIa is dorsocraniad from III, setae IV and V on a common pinaculum Dichrorampha

2 (1) Group VII on the 1st, 7th, and 8th abdominal segments does not simultaneously consist of 2 setae, or on the mesothorax IIIa is dorsocraniad from III, or on the mesothorax IV and V are found on separate pinaculi. Circles of hooks of the parapodia uni- or bi-serial.

3 (4) On the 1st abdominal segment group VII counts 3 setae, on the 7th and 8th abdominal segments, 2 setae, on the 9th abdominal segment setae II, and on the mesothorax setae IV and V, always stand on a common pinaculum. The circles of hooks are biserial, if uniserial then the body of the caterpillar is not beset with ~~small white~~ spinules, or is provided only with little ~~snow~~ white ones. The caterpillars are never red, on the mesothorax, VIII stands for the most part very near the coxa Pammene

4 (3) On the 1st abdominal segment, group VII does not simultaneously consist of 3 setae and on the 7th and 8th segments of 2 setae, or on the mesothorax IV and V are found on separate pinaculi, or on the 9th abdominal segment setae II are so found. The circles of hooks are uni- or bi-serial. If uniserial then the body is provided with small red or brown spinules, or on the mesothorax VIII is distinctly set off from the coxa.

5 (6) On the mesothorax VIII is found on the coxa, group VII counts 2 setae on the 7th and 8th abdominal segments, on the 9th abdominal segment setae II stand on separate pinaculi Lathronympha

6 (5) On the mesothorax VIII is distinctly set off from the margin of the coxa, or approaches it. If Group VII consists of 2 setae on the 7th and 8th abdominal segments, setae II are found on a common pinaculum on the 9th abdominal segment Laspeyresia

The genus Dichrorampha Guenee 1845

Diagnosis: Circles of hooks uniserial, on the 1st, 7th and 8th abdominal segments group VII consists of 2 setae, on the mesothorax IIIa is dorsocraniad from III, setae IV and V are always on a common pinaculum.

In 1935 Obraztsov had again put the genera Eemimene and Lipoptycha together in this genus. He differentiated 3 subgenera within the genus. The first two embrace the former Eemimene spp., the 3rd, the former Lipoptycha spp. Larvo-morphologically this genus is well delimited in contract to the others, as is evident from the key. Also the subgenera can be readily separated, only acuminatana shows a transition to the subgenus Dichroramphodes.

Subgenera and spp. of Dichrorampha.

1 (4) On the 2nd abdominal segment group VII consists of 3 setae, setae VIII are farther apart on the 9th abdominal segment than on the 8th, seta VI always present on the 9th abdominal segment sg. Lipoptycha
2 (3) Parapodia with 20-25 (22) hooklets plumbana
3 (2) Parapodia with 34 to 38 (36) hooklets saturnana
4 (1) On the 2nd abdominal segment group VII consists of 2 setae, if of 3 then setae VII on the 8th and 9th abdominal segments are equally far apart, or seta VI is absent on the 9th abdominal segment.
5 (6) Group VII counts 2 setae on the 2nd and 9th abdominal segments sg. Dichroramphodes agilana
6 (5) On the 2nd abdominal segment group VII counts 3, or on the 9th, 1 seta sg. Dichrorampha
7 (8) On the 2nd abdominal segment group VII consists of 3 setae acuminatana
8 (7) On the 2nd abdominal segment group VII consists of 2 setae
9 (10) Circles of hooks on the parapodia circular, with 35 to 40 (38) hooklets simpliciana
10 (9) Circles of hooks of parapodia elliptical with not more than 30 (18 to 25) hooklets
11 (12) ~~Circles of hooks of the parapodia elliptical~~ Number of hooklets of the caudal disk 8 to 8 (7), cervical shield light brown like the head sequana
12 (11) Number of hooklets of the caudal disk 10 to 12 (10,11), cervical shield yellow, always lighter than the light brown head.
13 (14) On the 1st abdominal segment setae IV and V are vertically situated potiverella
14 (13) On the 1st abdominal segment setae IV and V are diagonally arranged alpinana

The Subgenus Dichrorampha Guenee 1845.

Diagnosis: On the 8th abdominal segment III is on the same level as the spiracle, on the mesothorax IIIa is dorsocraniad from III, on the cervical shield IIIa is closer to III than to IX. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th, of 1, or on the 2nd abdominal segment of 3 setae.

The species of this subgenus that were examined are very uniform larvo-morphologically except acuminatana which shows a transition to the next.

Dichrorampha (Dichr.) potiverella (Linné 1758)(2284)

Caterpillar whitish, body granulate, head light brown, cervical shield somewhat lighter. A darkeye spot extends above the 3rd, 4th, and 6th ocellus. Cervical shield well

developed, anal shield only weakly so. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, approximately equidistant from both. On the abdominal segments the spiracles are very small, on the 1st abdominal segment IV and V are vertical, on the others, diagonal. On the 9th abdominal segment (I and III), (II and II), (IV and V and VI) are always on common pinaculi, the setae VIII farther apart than on the 8th abdominal segment. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th, of 1. The uniserial circles of hooks count 24 on the parapodia, 10 to 12 hooklets on the caudal disk.

Statements on biology are somewhat divergent. Kennel (1908) wrote of 2 generations, which certainly does not apply. I found the already larger caterpillars in Nov. in the root stock of Achillea millefolium. A wolldeveloped spinning capacity enabled them to close off the galleries from the outside. Pupation took place the last of April and May, the adults flew from June to Aug. The caterpillars were found in roots of Chrysanthemum vulgaris and corymbosum also. This species is very abundant.

Locality: Erlangen, Water works on Oct. 8, 1951, in the root-stock of Achillea millefolium.

D.(D.) alpinana (Treitschke 1830) (2285).

The caterpillar of this species is very similar to the foregoing in coloring, morphology, and biology. Caterpillar whitish, body strongly granulate, head light brown with a dark genal spot, cervical and anal shields yellowish. The 3rd, 4th, and 6th ocelli are black while the others are weakly pigmented and therefore seem to be white. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Spiracles elliptical, of the same size on the 1st and 2nd abdominal segments. Setae IV and V — differing from petiverella — are diagonally situated on all abdominal segments. The elliptical uniserial circles of hooks of the parapodia count 25, those of the caudal disk, 10 hooklets. Otherwise there is agreement with petiverella.

The caterpillar lives from Sept. to April in roots of Achillea millefolium and Tanacetum. The caterpillars from the Bavarian State Collection that were examined had been found by Disque near Speyer in roots of A.millefolium.

D.(D.) sequana (Haworth 1811)(2282).

Caterpillar whitish, head light brown with dark eye and genal spots, cervical shield likewise light brown. Body strongly granulate because of microscopically small spinules. On the cervical shield IIIa is closer to III than to IX. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. Spiracles elliptical, of the same size on the 1st and 2nd abdominal segments and larger than the insertion place of seta III. Setae IV and V are diagonally situated on all abdominal segments. On the 8th abdominal segment III is somewhat ventrocraniad from the spiracle, the distance between setae II is somewhat greater than that between setae I. On the 9th abdominal segment setae VIII are farther apart than on the 8th. Circles of hooks of the parapodia elliptical with about 25 hooklets, caudal disk with 7 hooklets. On the 1st, 2nd, 7th, and 8th abdominal segments groups VII counts 2 setae, on the 9th 1 seta.

The caterpillar lives until April in roots of A.millefolium and Tanacetum. The adult flies in May and June. The caterpillars from the Bavarian State Collection that were examined had been found by Disque Oct. 18, 1908 and Apr. 9, 1909 near Speyer in roots of A.millefolium.

D.(D.) simpliciana (Haworth 1811)(2288).

Caterpillar whitish, head chestnut brown with a dark eyespot. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI,

equidistant from both. Group VII consists of 2 setae on the 1st, 2nd, 7th, and 8th abdominal segments, of 1 seta on the 9th. On the 1st and 8th abdominal segments setae IV and V are nearly vertically situated. Spiracles round, of the same size on the 1st and 2nd abdominal segments, larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and that between setae I is the same size, on the 9th abdominal segment, I and III, as well as IV, V, and VI stand on common pinaculi. Setae VIII somewhat farther apart than on the 8th abdominal segment. Circles of hooks of the parapodia with about 38 hooklets.

Sept. to April in roots and lower part of the stem of Artemisia vulgaris. The caterpillars from the Disque collection that were examined were found on March 7, 1906 near Bruxelle in roots of Artemisia vulgaris.

D.(D.) acuminatana (Zeller 1846)(2298).

Caterpillar whitish, granulate by reason of small spinules. Head brown with a dark genal spot, cervical shield brownish, 3rd, 4th, and 6th ocellus dark, the others weakly pigmented and therefore white. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Group VII consists of 2 setae on the 1st abdominal segment, 3 on the 2nd, 2 on the 7th and 8th, 2 on the 9th, often of 1 seta. On all abdominal segments IV and V are diagonally situated. On the 8th abdominal segment setae II and I are equally far apart, III is on the same level as the spiracle. On the 9th abdominal segment setae II, as well as I and III, are found on one pinaculum, seta VI is absent. Setae VIII are equally far apart on the 8th and 9th abdominal segments. The uniserial round circles of hooks of the parapodia count 14, those of the caudal disk, 7 hooklets.

Sept. to April and June to July in the shoots of Chrysanthemum leucanthemum. The caterpillars from the Bavarian State collection that were examined had been found by Disque on March 18, 1902 near Speyer on C.leucanthemum.

The subgenus Dichroramphodes Obraztsov 1953.

Diagnosis: On the 1st, 2nd, 7th, and 8th and 9th abdominal segments, Groups VII counts 2 setae.

D.(D.) agilana (Tengström 1847)(2289).

There is no description of the larvae as yet, the statements on bionomy going still very divergent. The following description was taken from the material in the Bavarian State Collection.

Caterpillar dirty white, granulated by reason of microscopically small spinules. Head light brown, cervical shield yellow, pinaculi shining gray. The ocelli are uniformly developed. On the cervical shield IIIa is somewhat closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the apodous abdominal segments group VII always consists of 2 setae, on the 1st abdominal segment Iv and V are vertically situated, diagonally on the others. Spiracles larger than the insertion place of III. The distance between setae II and that between setae I is of the same size on the 8th abdominal segment, III stands on the same level as the spiracle. On the 9th abdominal segment setae II are found on a common pinaculum, and so are I and III, as well as V and VI, while IV is separated from the last. Setae VIII on the 8th and 9th abdominal segments are equally far apart. The elliptical uniserial circles of hooks of the parapodia count 20 little hooks.

According to Kennel (1908) the caterpillar lives until May in roots of Tanacetum, the adults fly in June; according to Schütze (1931) the caterpillars live in May and

Ohanel.p.Larvalsyst.der
Insekten, No.3(1958);1-269.

The Larval Systematics of Leaf-rollers. By
Bernhard Swatschek.

Key to spp. of Laspeyresia [pp.87-90].

1 (18) On the 8th abdominal segment seta III stands dorso-cranially from the spiracle, or setae IV and V are horizontally arranged on the 8th abdominal segment. Circles of hooklets always uniseriate.
2 (5) Adfrontalia not reaching the posterior margin of the head (fig. 85 and 93).
3 (4) On the anal plate there are 8 setae, IV and V stand diagonally on all abdominal segments, III lies dorsocranially from the spiracle on the 8th abdominal segment cosmophorana
4 (3) On the anal plate there is an irregular number of setae, about 20, always more than 8. Setae IV and V stand horizontally on all abdominal segments. The site of seta III is found on the 8th abdominal segment, 4 to 5 setae dorsocranially from the spiracle fissana
5 (2) Adfrontalia reaching all the way or nearly to the posterior margin of the head.
6 (13) III is found ventrocranially from the spiracle or on the same level with it, on the 8th abdominal segment.
7 (10) Seta VI is lacking on the 9th abdominal segment, group VII on the 7th abdominal segment mostly consists of only one seta.
8 (9) Circles of hooklets of parapodia with 18 to 22(20) hooklets, the spiracle of the prothorax considerably larger than that of the 1st abdominal segment servillana
9 (8) Circles of hooklets of parapodia with 10 to 14(12) hooklets, the spiracles of the prothorax and 1st abdominal segment of the same size microgrammana
10 (7) Seta VI present on the 9th abdominal segment, group VII on the 7th abdominal segment consists of 2 setae.
11 (12) Group VII with 3 setae on the 1st and 2nd abdominal segments succedana
12 (11) Group VII with 2 setae on the 1st and 2nd abdominal segments aurana
13 (6) Seta III on the 8th abdominal segment stands dorsocranially from the spiracle.
14 (15) Setae IV and V on the 8th abdominal segment diagonally arranged. On the 9th abdominal segment, VI is separated off from IV and V strobilella
15 (14) On the 8th abdominal segment setae IV and V are horizontally arranged. On the 9th abdominal segment, VI stands on a common pinaculum with IV and V, or VI is lacking.
16 (17) Circles of hooklets with 20-24 hooklets, seta VI is absent on the 9th abdominal segment orobana
17 (16) Circles of hooklets on the parapodia with 28 to 30 hooklets, seta VI on the 9th abdominal segment present dorsana
18 (1) III stands ventrocranially from the spiracle or on the same level with it, on the 8th abdominal segment, or setae IV and V are vertically to diagonally arranged on the 8th abdominal segment. Circles of hooklets uni- or bi-seriate.
19 (30) Circles of hooklets biseriate or the hooklets stand so close together and differ so much in size that they cannot be conceived of as uniseriate.

52 (53) On the 8th abdominal segment setae III are on the same level with the spiracle, the latter is not larger than the spiracles of the other abdominal segments. tetragrammana

53 (52) On the 8th abdominal segment setae III stand ventrocranially from the spiracle which is twice as large as those of the other abdominal segments internana

54 (49) Setae IV and V diagonally arranged on the 1st abdominal segment.

55 (56) Cervical and anal plates darkly punctate*(fig.87) nigricana

56 (55) Cervical and anal plates not darkly punctate [or dotted]*.

57 (58) 1st and 2nd ocelli white, the others black, 2nd ocellus closer to the 1st than to the 3rd. Number of hooklets on the prolegs 16 to 18, setae VIII on the 9th abdominal segment somewhat farther apart than on the 8th pallifrontana

58 (57) All ocelli seem black, 2nd ocellus equally far from the 1st and the 3rd, number of hooklets of prolegs 12, setae VIII on the 8th and 9th abdominal segments equally far apart compositella

59 (48) On the 9th abdominal segment, seta VI stands on a separate pinaculum, or IIIa is dorsally or dorsocaudally from III on the mesothorax.

60 (69) On the 9th abdominal segment, setae VIII are farther apart than on the 8th, or seta VI on the 9th abdominal segment stands on its own pinaculum.

61 (66) Setae VIII on the 9th abdominal segment are farther apart than on the 8th.

62 (63) The distance between setae VIII on the 7th abdominal segment is greater than that between VIII and VII. Caterpillar red, strongly "granulated" with red spinules amplana

63 (62) On the 7th abdominal segment the distance between setae VIII is less than that between VIII and VII. Caterpillar white, weakly granulated, no spinules splendana + -var. reaumurana

64 (65) IV and V on the 1st abdominal segment diagonally arranged. Cervical plate not divided reaumurana

65 (64) IV and V on the 1st abdominal segment vertically arranged, cervical plate divided splendana

66 (61) Setae VIII on the 8th and 9th abdominal segments equally far apart.

67 (68) Number of hooklets of parapodia 18 to 22(20), of the prolegs 11 to 14(11) fagiglandana

68 (67) Number of hooklets of parapodia 12 to 14(13), of the prolegs 6 to 8(7) adenocarpi

69 (60) On the 9th abdominal segment IV, V, and VI are found on a common pinaculum. The distance between setae VIII is not greater than on the 8th abdominal segment.

70 (71) The adfrontalia do not reach the posterior margin of the head (fig. 93) caecana

71 (70) Adfrontalia reaching to the posterior margin of the head.

72 (73) Group VII on the 1st and 2nd abdominal segments consisting of 2 setae corollana

73 (72) Group VII on the 1st and 2nd abdominal segments consisting of 3 setae.

74 (75) Circles of hooklets of parapodia open on the side (fig. 91) leguminana

75 (74) Circles of hooklets of parapodia closed also on the side.

(77) Spiracles of 1st and 8th abdominal segments equally large, 2nd ocellus equally far removed from the 1st and the 3rd. On the pre-spiracular plate V is the same level as VI or V is lower oxytropidis

20 (29) Group VII on the 2nd abdominal segment with 3 setae.
21 (26) Group VII on the 1st abdominal segment consists of 3 setae.
22 (25) Setae VIII on the 8th and 9th abdominal segments equally far apart.
23 (24) About 20 hooklets on the parapodia lathyrana
24 (28) About 40 hooklets on the parapodia nebritana
25 (22) Setae VIII on the 9th abdominal segment farther apart than on the 8th funebrana
26 (21) Group VII on the 1st abdominal segment consists of 2 setae.
27 (28) Setae IV and V on abdominal segments 1 to 7 diagonally arranged gemmiferana
28 (27) Setae IV and V on the 1st abdominal segment vertical, on the other segments they are vertically to diagonally arranged perlepidana
29 (20) Seta-group VII on the 2nd abdominal segment consisting of only 2 setae malcolmiae
30 (19) Circles of hooklets entirely uniseriate.
31 (78) Group VII on the 7th abdominal segment consisting of 2 setae.
32 (47) Seta-group VII on the 8th abdominal segment consisting of 2 setae.
33 (40) On the 9th abdominal segment, VI is found on a common pinaculum with IV and V.
34 (35) Setae IIIa and II on the mesothorax stand on separate pinacula janthinana
35 (34) Setae IIIa and III on the mesothorax stand on a common pinaculum.
36 (37) Setae VIII are farther apart on the 9th abdominal segment than on the 8th roseticolana
37 (36) Setae VIII not farther apart on the 9th abdominal segment than on the 8th.
38 (39) On the 9th abdominal segment setae II stand on a common pinaculum discretana
39 (38) On the 9th abdominal segment setae II stand on separate pinacula. coniferana
40 (33) On the 9th abdominal segment, VI is separated from IV and V onto a pinaculum of its own.
41 (46) On the mesothorax setae IV and V stand on a common pinaculum.
42 (43) On the 9th abdominal segment setae II stand on separate pinacula pactolana
43 (42) On the 9th abdominal segment setae II stand on a common pinaculum.
44 (45) About 15 hooklets on the parapodia, about 8 on the prolegs coronillana
45 (44) About 30 hooklets on the parapodia, 18 to 25 on the prolegs pomonella + var. putaminana
46 (41) On the mesothorax setae IV and V do not stand on a common pinaculum zebeana
47 (32) On the 8th abdominal segment group VII consists of one seta.
48 (59) On the 9th abdominal segment, setae IV, V, and VI stand on a common pinaculum, and on the mesothorax IIIa is found dorsocranially from III.
49 (54) On the 1st abdominal segment setae IV and V are vertically arranged.
50 (51) On the 8th abdominal segment the distance between setae II is smaller than that between setae I inquinatana
51 (50) On the 8th abdominal segment setae II are farther apart than setae I.

77 (76) Spiracles of 8th abdominal segment greater than those of the 1st, 2nd ocellus closer to the 1st than to the 3rd, on the pre-spiracular plate V is higher than VI illutana

78 (31) Group VII on the 7th abdominal segment consists of 3 or 1 seta.

79 (80) Group VII on the 7th abdominal segment consists of - setae duplicana

80 (79) Group VII on the 7th abdominal segment consists of 1 seta gallicana

Tr.:R.Ericson
2/24/60

June in the upper part of the stem of Chrysanthemum leucanthemum, feeding on this until they get to the flower buds and then hollowing out the pedicel. Pupation in an earthen cocoon. These opposed statements can probably be traced back to faulty determination of the adults which are difficult to identify.

The caterpillars from the Bavarian State Collection examined by me had been found by Stange on April 27, 1904, at Friedland on Tanacetum.

The subgenus Lipoptycha Lederer 1859.

Diagnosis: On the 2nd abdominal segment, Group VII consists of 3 setae, on the 9th abdominal segment setae VIII are farther apart than on the 8th. Seta III is found ventrocraniad from the spiracle on the 8th abdominal segment.

D.(L.) plumbana (Scopoli 1763)(2309).

Caterpillar whitish, granulated by reason of microscopically small spinules, with shining pale gray pinaculi. Head light brown with a dark genal spot, cervical shield yellowish. The 1st and 2nd ocelli are lighter than the others. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Setae IV and V are practically horizontally situated on the 8th abdominal segment, diagonally on the others. On the 2nd abdominal segment group VII counts 3 setae, on the 7th and 8th, 2, and on the 9th, 1 seta. Spiracles round, of the same size on the 1st and 2nd abdominal segments but larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is smaller than that between setae I. III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II are found on a common pinaculum, and so are I and III, as well as IV, V, and VI, setae VIII being farther removed from each other than on the 8th abdominal segment. The uniserial circles of hooks of the parapodia count 22, of the caudal disk 10 hooklets.

Sept. to Apr. in roots of Achillea millefolium. Hinneberg found the caterpillar on Artemisia also. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 28, 1901, near Speyer in roots of A.millefolium.

D.(L.) saturnana (Guenee 1845)(2307).

Caterpillar whitish, granulated by reason of microscopically small spinules. Head light brown, with a dark genal spot, 1st and 2nd ocelli lighter than the others. Cervical shield yellow, pinaculi brownish gray. On the cervical shield IIIa is equidistant from III and IX, on all abdominal segments IV is diagonally situated with V, on the 8th abdominal segment the distance between setae II corresponds to that between setae I or is greater. Parapodia with 36, caudal disk with 30 hooklets, in the other characters the larva of this species agrees with those of the foregoing species.

Sept. to April in roots of Tanacetum vulgare, the adults fly from May to July.

The caterpillars from the Bavarian State Collection that were examined had been found by De Crombrügghe on March 15, 1905 near Brussels in the root of Tanacetum vulgare.

The genus Laspeyresia Hübner 1825.

Diagnosis: On the 9th segment always, on the 8th abdominal segment for the most part, group VII consists of one seta. If it consists of 2 setae on the 8th abdominal segment then setae II on the 9th abdominal segment are on separate pinaculi or III and IIIa on the mesothorax are on separate pinaculi.

According to a communication by letter Obraztsov again, like Kennel (1908) placed the genera Grapholitha Heinemann and Carpocapsa Treitschke together in this genus and also attached the monotypical genus Corbylophora Kennel to it. The first two genera cannot be separated larvo-morphologically. Also Corbylophora does not differ generically from them according to the larvae. As a consequence of this agreement with Obraztsov's investigation, I am holding to his concept.

On the other hand he separated the spp. juliana, albersana, and woeberiana from this genus which has proved correct larvo-morphologically also. He again referred juliana back to the genus Pammene whose caterpillars, as in this species, can be recognized at first glance by the large brown pinaculi. The other two spp. he placed in two new genera. This too proved to be larvo-morphologically correct for here there are always 2 setae present in group VII on the 8th and 9th abdominal segments, which is never the case in spp. of the genus Laspeyresia. The difference between these two spp. was so great in Obraztsov's view that he referred woeberiana to the Eucosmini, which is also favored by the morphology of the caterpillars, while he left albersana still in the Laspeyresiini and in the monotypical genus Eucosmomorpha. But since albersana with respect to the larvae stands so close to woeberiana that it is difficult to separate the two, I am putting albersana and woeberiana in the genus Enarmonia of the Eucosmini.

Key to spp.

[Translated and sent to Mr. Capps Feb. 24, 1960.]

Laspeyresia micrograммana (Buenee 1845)(2174).

Caterpillar whitish, granulated by reason of small white spinules, head light brown, cervical shield brown-gray, dark punctate, anal shield small and light brown. On the cervical shield IIIa is somewhat closer to III than to IX, II stands somewhat ventrocaudad from I. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa on the mesothorax is dorsocaduad from III. On the 1st and 2nd abdominal segment group VII counts 3 setae, on the 7th, 8th, and 9th, 1 seta. On the 8th abdominal segment the distance between setae II and between setae I is the same, III being ventrocraniad from the spiracle, IV and V horizontally situated. On the 9th abdominal segment setae II stand on a common pinaculum, so do I and III, as well as IV and V, seta VI being absent. The distance between Setae VIII is the same on the 8th and 9th abdominal segments. Spiracles elliptical, the same size on all segments. The uniserial circles of hooks of the parapodia count 12, those of the caudal disk about 11 hooklets.

Aug. to Sept. in seed pods of Ononis spinosa. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 25, 1888 near Speyer in seeds of O.spinosa.

L.cervillana (Duponchel 1836)(2173)

Caterpillar whitish, strongly granulated by brown spinules with large brown gray pinnaculi. Head black to black-brown, cervical shield, thoracic legs also black-brown. Anal shield brown. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV standswith V and VI in a line, somewhat closer to V. On the mesothorax IIIa is dorsocraniad from III. The number of setae in group VII fluctuates in this species. On the 1st and 2nd abdominal segment it mostly consists of 3, often of 2 setae, on the 7th abdominal segment, mostly of 1, sometimes of 2 setae, on the 8th and 9th abdominal segments always of 1 seta. On the 1st abdominal segment IV and V are still diagonally situated, horizontally so on the others. The pinaculum of seta III reaches up to the spiracle. The distance between setae II and between setae I on the

8th abdominal segment is the same, ... III is found with the spiracle on the same level. On the 9th abdominal segment setae II stand on a common pinaculum, so do I and III, as well as IV and V, VI being absent. The uniserial round circles of hooks of the parapodia count 18-21, those of the caudal disk about 13, hooklets. The prothoracic spiracles are larger and more strongly elliptical than the others.

Aug. to April in twig swellings of Salix caprea, more rarely in other Salix spp. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 5, 1885 near Speyer on Salix caprea.

Laspeyresia succedana (Schiffermiller 1776)(2171).

Caterpillar whitish with faint light brownish pinaculi. Head yellow brown with dark eye and genal spots. Cervical and anal shields brownish, additionally dark punctate (figs. 81 and 82) [or dotted]. On the prespiracular shield IV is somewhat ventrad from V and VI, equidistant from both. On the mesothorax IIIa lies dorsad from III. On the 1st and 2nd abdominal segment, group VII counts 3 setae, on the 7th, 2, on the 8th and 9th, 1 seta. Setae IV and V are diagonally situated on abdominal segments 1 to 7, horizontally situated on the 8th, and III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, as well and I and III, also IV, V, and VI stand on common pinaculi. The distance between setae VIII on the 9th abdominal segment is not larger than on the 8th. The pinaculum of seta III does not reach up to the spiracle. The round unicerial circles of hooks of the parapodia count 15-20, the caudal disk about 10, hooklets.

June to Sept. in 2 generations in the pods of Genista, Sarothamnus, Cytisus, Lotus, and Ulex.

The caterpillars from the Bavarian State Collection examined had been found by Disque on Aug. 1, 1896, near Speyer in pods of Genista tinctoria.

L. malcolmiae (Walsingham 1903).

Caterpillar whitish, granulated by reason of small brown spinules. Head, cervical shield dark brown, anal shield brownish, dark punctate [or dotted] (fig. 83) on the anterior margin. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is almost as far removed from III as from IX, on the prespiracular shield IV is ventral from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII very close to the coxa. On the abdominal segments IV is situated diagonally with V, the spiracles are round, and on the 2nd abdominal segment they are not larger than the insertion place of seta III. On the 8th abdominal segment setae II ago farther apart than are setae I, III lies on the same level as the spiracle. On the 1st, 2nd, and 7th abdominal segments group VII counts 2 setae, 1 on the 8th and 9th abdominal segments. On the 9th abdominal segments, setae II, also I and III, as well as IV, V, and VI are found on common pinaculi. The seta VI can sometimes be somewhat set off from IV and V. The circles of hooks of the parapodia are biserial, uniserial on the sides, and count about 30, those of the caudal disk about 20, hooklets.

I could find a description of the caterpillar nowhere in the literature. The accompanying information is taken from the material found in the Bavarian State Collection. No data on biology is found in the literature. The caterpillars from the Bavarian State Collection that were examined had been found by Krone on June 20, 1907, in Gravosa (Dalmatia) in fruits of Capparis.

L. oxytropidis (Martini 1912).

Caterpillar yellowish-white, granulated by white spinules, head light- to dark-brown, cervical shield brownish, slightly punctate (fig. 84)[or dotted]. On the cer-

vical shield IIIa is nearly equidistant from III and IX, on the prespiracular shield IV stands in the middle, somewhat ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, seta VIII distinctly set off from the coxa. On all abdominal segments IV is diagonally situated with V, nearly vertically so on the 8th. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th 2, and on the 8th and 9th abdominal segments 1 seta. On the 8th abdominal segment setae II are not farther apart than setae I, III is somewhat ventrocaudad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV with V and VI, stand on common pinaculi. The prothoracic spiracle is larger than that of the 8th abdominal segment. The round unisorial circles of hooks of the parapodia count 22, those of the caudal disk 11, hooklets.

July in seeds of Oxytropis pilosa. The adults fly May and June. This species was known only from Thuringia and Asia Minor.

The caterpillars from the Bavarian State Collection that were examined had been found by Martini, who was the first to describe this species, on July 10, 1910, in Sömmerda (Thür.) in seeds of Oxytropis pilosa.

L.adenocarpi (Ragont 1875)(2168).

Catepillar dirty white, with large brown-gray pinaculi, head and cervical shield dark brown, the small anal shield brownish. Body granulated by small brown spinules. The distance between the 1st and 2nd ocelli somewhat less than that between the 2nd and 3rd. On the cervical shield IIIa is somewhat closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both, on the mesothorax IIIa is dorsocraniad from III. On the 1st abdominal segment group VII counts 2 to 3 setae, 3 on the 2nd,* 1 each on the 8th and 9th. Setae IV and V are diagonally situated on all abdominal segments. On the 8th abdominal segment setae II, whose pinaculi are contiguous, are closer together than setae I, III is somewhat ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV and V are found on common pinaculi, VI on a separate one. The prothoracic spiracles are larger than the others. *insert: 2 on the 7th,

July in fruits of Adenocarpus parvifolius, adults May, June. This species occurs only in France. Theccaterpillars of the Bavarian State Collection that were examined had been found by Lafanry on July 21, 1901 in Saugues (France) in fruits of Adenocarpus parvifolius.

L.corollana (Hübner 1822)(2181).

Caterpillar whitish, head light brown without eye and genal spots, cervical shield yellowish brown. 1st and 2nd ocelli weakly pigmented and therefore seeming to be lighter than the others. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is in the middle, ventrad from V and VI. On the 1st, 2nd, and 7th abdominal segments, group VII counts 2 setae, only 1 seta on the 8th and 9th. On all abdominal segments IV and V are diagonally situated, V always half as large as IV. The pinaculi are very small, spiracles of the 2nd abdominal segment not larger than the insertion place of seta III. The distance between setae II, even on the 8th abdominal segment, is larger than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI, are on common pinaculi, the distances between setae VIII not larger than on the 8th abdominal segment. On the mesothorax VIII is very close to the margin of the coxa. The unisorial circles of hooks on the parapodia are open on the side (fig. 91) and count about 20 hooklets, the caudad disk about 15. The prothoracic spiracle is elliptical and larger than the others.

Aug. to March in twig swellings which were made beforehand by larvae of Saperda populnea on Populus tremula. The caterpillars from the Bavarian State Collection that were investigated had been found by Disque on Sept. 4, 1907 near Speyer on Populus tremula.

Laspeyresia cosmophorana (Treitschke 1835)(2184).

Caterpillar whitish, head light brown, cervical shield yellowish, anal shield very small. Body only very weakly granulate. On the cervical shield IIIa is equidistant from III and IX, II ventrocraniad from I. The prespiracular shield is diagonally placed, IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsad or dorsocaudad from III, VIII close to the margin of the coxa. Setae IV and V on the 1st abdominal segment are vertically situated, diagonally situated on the others. The distance between setae II is larger than that between setae I even on the 8th abdominal segment. On the 9th abdominal segment setae I and III, as well as IV and V, are found on a common pinaculum, setae II on separate pinaculi, VI on a pinaculum of its own. The uniserial closed circles of hooks of the parapodia count 12, those of the caudal disk 6, hooklets (fig. 79).

Oct. to April in the bark of canker-like scars on Picea excelsa and Pinus silvestris. The caterpillars examined from the Bavarian State Collection had been found by Baer on Sept. 8, 1906 near Tharandt in damaged spruce bark.

L. illutana (Herrich-Schäfer 1851)(2189).

Caterpillar brownish white, head brown without genal spots, cervical shield brown. The 2nd ocellus is closer to the 1st than to the 3rd, and the 4th is closer to the 3rd than to the 6th. Body strongly granulate. On the cervical shield IIIa is closer to III than to IX, on the diagonally set prespiracular shield IV is ventrad from V and VI equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII is set off from the coxa. Group counts 3 setae on the 1st and 2nd abdominal segments, 2 on the 7th, only 1 on the 8th and 9th. On all abdominal segments IV and V are diagonally situated. The spiracles are elliptical, not larger on the 2nd abdominal segment than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae I and III, as well as IV, V, and VI are on common pinaculi, setae VIII not farther apart than on the 8th abdominal segment. The uniserial closed circles of hooks of the parapodia count about 20, those of the caudal disk about 14 hooklets.

July, Aug. in the cones and Chermes galls on Picea excelsa and Abies alba, then goes for transformation into rotted wood, pupation only in the spring. The adult flies in May, June.

The caterpillars from the Bavarian State Collection that were examined were found by Schütze on Aug. 15, 1906 near Rachlau in cones of Abies alba.

L. pactolana (Zeller 1840)(2190).

Caterpillar whitish, granulated by small white spinules. Head light brown, with dark eye and genal spots, cervical and anal shields light brown. The 2nd ocellus is closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII is distinctly set off from the coxa. On the 1st and 2nd abdominal segments group VII counts 3 setae, 2 on the 7th and 8th, and 1 on the 9th. Setae IV and V are diagonally arranged on all abdominal segments. On the 8th abdominal segment setae II are not farther apart than setae I, III

is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, as well and IV, V, and VI are found on separate pinaculi, I and III on a common pinaculum. The uniserial, closed all round, circles of hooks of the parapodia count 15, the caudal disk 8, hooklets.

Aug. to April in the bast of Picea excelsa, mostly at the base of the whorls. Infestation is indicated by the appearance of excrement. Pupation takes place in the same location. The caterpillars from the Bavarian State Collection that were examined were found by Disque on Apr. 28, 1898, near Speyer on Picea excelsa.

L.duplicana (Zetterstedt 1840)(2204).

Caterpillar dirty white, head, cervical shield brown, cervical shield darker than the head, anal shield brownish, pinaculi hardly developed. Body strongly granulate by reason of small brown spinules. The 1st and 2nd ocelli are lighter than the others, the 2nd stands closer to the 1st that to the 3rd. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. The prespiracular shield is is diagonally set, IV is ventrad from V and VI and equidistant from both. On the mesothorax IIIa is dorsad or dorsocaudad from III, the seta VIII close to the coxa. Setae IV and V on the 1st abdominal segment are vertically situated, on the others, diagonally situated. The distance between setae II is greater, even on the 8th abdominal segment, than that between setae I. On the 9th abdominal segment setae I and III, as well as IV and V are on common pinaculi, while setae II are on separate pinaculi. Also VI is found on a pinaculum of its own. The uniserial closed circles of hooks of the parapodia consist of about 12, the caudal disk of about 6 hooklets.

Oct. to Apr. in the bark of canker-like places on Abies alba and Picea excelsa. The caterpillars from the Bavarian State Collection that were examined had been found by Baer on Nov. 8, 1906 near Tharandt (Saxony) in damaged bark of Picea excelsa.

L.leguminana (Zeller 1846)(2213).

Caterpillar yellowish white with gray-brown pinaculi, head red-brown with dark eye and genal spots. Cervical and anal shields gray brown and dark dotted [or punctate]. Body granulate by brown spinules. The 2nd ocellus is brought closer to the 1st, the 4th to the 3rd. On the cervical shield IIIa is closer to III than to IX, II is exactly ventrad from I. The prespiracular shield is diagonally set, IV is ventrad from the line from V to VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III. On all abdominal segments IV is diagonally arranged with V. The spiracles of the 1st to the 7th abdominal segments are not larger than the insertion place of seta III. IIIa is found on the margin of the pinaculum of III, which is emarginated toward the spiracle. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th of 2, on the 8th and 9th of one seta. On the 8th abdominal segment the distance between setae II, whose large pinaculi are contiguous or are fused together, is not greater than that between setae I, seta III is somewhat ventrocraniad from the spiracle. On the 9th abdominal segment, setae II, I and III, as well as IV, V, and VI stand on common pinaculi. The spiracles of the 1st and 11th segments are distinctly elliptical and twice as large as the others. The uniserial, laterally open circles of hooks of the parapodia count about 24, those of the caudal disk about 20 hooklets (see fig. 91).

Oct. to Apr. in the bark, in a "web-gut" covered with excrement on Fagus and Acer pseudoplatanus. The caterpillars of the Bavarian State Collection that were examined had been found by Schüzte in Rachlau on April 1, 1896 and on Sept. 10, 1896 in the bark of Fagus or Acer pseudoplatanus.

Laspeyresia gallicana (Guenee 1845)(2223).

Caterpillar yellowish brown, granulated by small brown spinules. Head dark brown, cervical shield somewhat lighter, also the anal shield and the thoracic legs brown. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III. On the abdominal segments setae IV and V are practically vertically situated. The spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III. On the 1st and 2nd abdominal segments group VII counts 3 setae, 1 seta on the 7th, 8th, and 9th abdominal segments. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, as well as I and III, are on a common pinaculum, VI is sometimes absent. The uniserial closed circles of hooks on the parapodia count about 18, those of the caudal disk about 9 hooklets.

Sept., Oct. in seeds of Angelica silvestris, Daucus carota, also Dipsacus silvestris, Heracleum, and Peucedanum. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 15, 1895, near Speyer in seeds of A.silvestris and Heracleum.

L.zebeana (Ratzeberg 1840)(2163).

Caterpillar light gray, head black, cervical shield, anal shield, thoracic legs brown, pinaculi brownish. Body granulate by small brown spinules. The 2nd ocellus is brought closer to the 1st, the 4th to the 3rd, the 1st and 2nd ocelli are lighter than the others. The spiracles are elliptical, distinctly larger on the 2nd abdominal segment than the insertion place of seta III. The prothoracic spiracle is as large as the prespiracular shield. On the 1st abdominal segment group VII counts 2(1), on the 2nd 2(3), on the 7th and 8th abdominal segments also 2, on the 9th 1 seta. On the abdominal segments IIIa is distinctly set off from III, IV is diagonally situated with V always. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment I and III stand on a common pinaculum, setae II on separate pinaculi. Also VI is found on an independent pinaculum. The uniserial circles of hooks of the parapodia consist of 15, those of the caudal disk of 12 to 14 hooklets. The setae of the mesothorax stand on separate pinaculi (fig. 86).

The caterpillars live from autumn, after twice overwintering, until April in twig swellings on Larix. The caterpillars that were examined from the Bavarian State Collection had been found by Disque on Nov. 1, 1901 near Speyer on Larix.

L.fagiglandana (Zeller 1841)(2258).
syn. grossana Haworth 1829 (2258) according to Obraztsov.

Caterpillar reddish white, the separate segments saddled carmine red with red pinaculi, head light brown, cervical and anal shields reddish yellow. Body only very weakly granulate. On the cervical shield IIIa is closer to III than to IX, II is ventrocaudad from I. On the prespiracular shield IV stands ventrad from V and VI, nearly equidistant from both, V twice as long as VI, IV still longer. On all abdominal segments IV is diagonally arranged with V. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 2 setae, on the 8th and 9th, 1 seta. On the 8th abdominal segment III is on the same level with the spiracle, IIIa on the margin of the pinaculum of III. Setae VIII are equally far apart on the 8th and 9th abdominal segments. On the 9th abdominal segment the pinaculi of setae II are not yet distinctly fused, I and III stand on a common pinaculum, VI is farther from V than V is from IV. In group VII on the 1st and 2nd abdominal segments VIIa is somewhat farther from VIIb and VIIc. The spiracles are small and round, the uniserial circles of hooks of the parapodia count 18 to 21 (19), the caudal disk 11 to 14 hooklets.

Aug. and Sept. in fruits of Fagus silvatica. The beechnuts lying on the ground are always empty and provided with the exit hole. The caterpillars overwinter and transform in the ground or in rotted wood. The adult flies May to July.

Locality: Erlangen-Rathsberg on Sept. 8, 1953, in beechnuts.

L. splendana (Hübner 1822)(2259).

Caterpillar whitish with pinaculi of the same color, head light brown (figs. 18 and 19), cervical and anal shields yellowish. Body very weakly granulate. The uniserial circles of hooks of the parapodia count 14-21, those of the caudal disk 7-9 hooklets. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th and 8th segments of 1 seta. The distance between setae VIII is distinctly greater on the 9th than on the 8th abdominal segment. Setae IV and V stand vertically on the 1st abdominal segment. In all other larvo-morphological characters there is complete agreement with the preceding sp.

Aug., Sept. in acorns, overwinters in a glass-like brown cocoon in the ground and pupates therein the next spring. Very abundant.

Locality: Erlangen Sept. 5, 1951 in acorns.

var. reaumurana (Heinemann 1865)(2259).

Does not differ essentially from splendana in coloring or morphology. Parapodia with 16-21, caudal disk with 7-8 hooklets.

Sept. Oct., the caterpillar lives in fruits of Castanea vesca. This species agrees with splendana in biology.

Locality: Neustadt/Weinstrasse on Oct. 16, 1951 in fruits of Castanea vesca. Very abundant in the Rhenish Palatinate.

L. inquinatana (Hübner 1822)(2212).

Hitherto this species belonged to the monotypical genus Corbylophora Kennel (1908). Obraztsov recently referred it to this genus. Larvo-morphologically there is no generic difference from other Laspeyresia spp.

Caterpillar whitish, head, cervical shield brown, anal shield and the pinaculi of the 9th abdominal segment light greenish-gray; body granulate by miscoscopic, small white spinules. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, seta VIII on the margin of the coxa. Seta IV on the 1st abdominal segment is vertically situated with V, on the others it is diagonally situated, the spiracles are round, not larger on the second abdominal segment than the insertion place of seta III. On the 1st and 11th segments the spiracles are twice as large. The distance between setae II on the 8th abdominal segment is less than that between setae I, III stands somewhat ventrocraniad from the spiracle. On the 9th abdominal segment setae II, as well as I and III, also IV, V, and VI are on common pinaculi. The round uniserial circles of hooks of the parapodia count 17, those of the caudal disk 8 hooklets.

Oct. in fruits of Acer. The adult flies in May and June. Details on biology not known. Probably transforms under scales of bark as in Pammene regiana. The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Oct. 24, 1892 near Postdam in fruits of Acer.

Laspeyresia nigricana (Fabricius 1794)(2160).

Caterpillar yellowish white, head light brown, eye- and genal-spots only weakly indicated. Cervical shield, pinaculi, and anal shield gray-brown, cervical shield and anal shield additionally dark punctate [or dotted](fig. 87, 88). Body granulate by small brown spinules. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX. On the prespiracular shield IV is ventrad from V and VI equidistant from both. IIIa on the mesothorax is dorsocraniad from III. On all abdominal segments setae IV and V are diagonally situated. On the 1st and 2nd abdominal segments, group VII consists of 3 setae, on the 7th of 2, on the 8th and 9th of 1 seta. Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I, on the 9th setae II, as well as I and III, also IV, V, and VI stand on common pinaculi. The uniserial circles of hooks of the parapodia count 17-20, those of the caudal disk 12 hooklets.

The caterpillar lives July and Aug., in pods of seeds on Vicia cracca, Pisum sativum, Orobus tuberosus, Lathyrus, etc. Sometimes there are 2 generations because the first caterpillars develop rapidly and their adults still have time for oviposition. Overwintering takes place in an earthen cocoon, in which transformation occurs the following spring. Adults fly June, July.

Locality: Knetzgau/Main on July 28, 1953 in pods of Pisum sativum. The caterpillars from the Bavarian State Collection that were investigated had been found by Disque near Speyer on Aug. 5, 1897 in pods of P.sativum, Vicia cracca, and Orbus.

L.amplana (Hübner 1822)(2260).

Caterpillar light or dark brick-red, head light brown, cervical and anal shields yellowish red. Body strongly granulate. 1st and 2nd ocellus lighter than the others, the 2nd closer to the 1st, the 4th closer to the 3rd. On the cervical shield the distance between setae IIIa and III is less than that from IIIa to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, seta VIII close to the coxa. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 2 and on the 8th and 9th 1 seta. On all abdominal segments IV is diagonally situated with V. On the 7th abdominal segment the distance between setae VIII is greater than that from VII to VIII. On the 9th abdominal segment setae II stand on separate pinaculi, I and III on a common pinaculum, while VI is separated from IV and V. Setae VIII are farther apart than on the 8th abdominal segment. The uniserial circles of hooks of the parapodia count about 20 hooklets which are smaller on theouter margin and there often leave an open space. Caudal disk with about 8 hooklets.

Sept, Oct., in fruits of Quercus, according to Sorhagen also in fruits of Corylus, Juglans, and Castanea. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 13, 1901 near Speyer, in acorns.

L.pomonella (Linné 1752)(2257).

Caterpillar whitish with reddish tinge. Head and cervical shield light or dark brown. Cervical and anal shields with dark punctures [or dots](fig. 89, 90). Body not or only very weakly granulate. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI equidistant from both, V twice as long as VI, IV still longer. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th and 8th 2 setae, and on the 9th 1 seta. On the abdominal segments IIIa stands on the pinaculum of III, or their pinaculi are fused. On the 1st abdominal segment IV is vertically situated with V on the others, they are diagonally situated. Spiracles elliptical, on the 2nd abdominal

segment larger than the insertion place of seta III. On the 8th abdominal segment setae II and I are equally far from each other, on the 9th abdominal segment setae II as well as setae I and III stand on common pinaculi, VI is separated from IV and V. A microscopically small seta can be recognized before the pinaculum of setae I and III. Setae VIII on the 9th abdominal segment are not farther apart than on the 8th. The uniserial circles of hooks of the parapodia count 28 to 35 (30) hooklets, those of the caudal disk about 26 (cf. figs. 1-8, 10, 11, and 13).

The abundant caterpillar commonly known as "Obstmade" [i.e., fruitworm] lives from July on in apples and pears; as soon as it is mature it spins a web under scales of bark or in rotten wood. Transformation first in the spring, the adult flies from May to Aug. 2 partial generations show up.

Locality: Erlangen; Sept. 8, 1951 in apples.

var. putaminana (Staudinger 1859)(2257).

The caterpillar is dirty white, but agrees in morphology and biology with pomonella.

Lives in walnuts and transforms in the spring.
Locality: Atzelsberg on Nov. 5, 1951, in walnuts.

L.coniferana (Saxesen 1840)(2187).

Caterpillar whitish, strongly granulated by microscopically small brown spinules. Head light brown with weakly developed eye- and genal-spots, cervical shield still somewhat lighter. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is ventrad from V and VI. On the 1st abdominal segment IV is vertically situated with V, diagonally situated on the others. The spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III from whose pinaculum IIIa is separated. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III stands ventrocraniad from the spiracle. On the 9th abdominal segment setae II are found on separate pinaculi, I and III, also IV, V, and VI on common pinaculi. The distance between setae II on the 9th abdominal segment is not greater than on the 8th. On the mesothorax VIII is very close to the margin of the coxa. The uniserial round circles of hooks on the parapodia count 15, those of the caudal disk 10 hooklets.

Sept. to May in resin exudate on Pinus and Abies. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 1, 1898, near Speyer under resinous bark of Pinus silvestris.

L.strobilella (Linné 1758)(2177).

Caterpillar whitish, head light to dark-brown, cervical shield yellowish. Body strongly granulate. The 3rd, 4th, and 6th ocellus is darker than the others, the 2nd closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, the prespiracular shield stands diagonally, seta V being lowest down. IIIa on the mesothorax is dorsocraniad from III. On all the abdominal segments IV is diagonally situated with V. The spiracles are elliptical, on the 2nd abdominal segment no larger than the insertion place of seta III. III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II are found on separate, I and III on a common pinaculum, VI is separated off from IV and V. The uniserial circles of hooks of the parapodia count 22 to 25, those of the caudal disk 6-8 hooklets. On the 8th abdominal segment the distance between setae II is less than that between setae I.

Aug. to March in cones of Picea excelsa and Abies alba. The caterpillars from the Bavarian State Collection examined had been found by Hofmann Oct. 10, 1885 near Stuttgart in cones of A.alba and by T.Hinneberg on Nov. 20, 1891 near Postdam in cones of P.excelsa.

Laspeyresia aurana (Fabricius 1775)(2222).

Caterpillar dirty white, head, cervical shield, anal shield and thoracic legs black-brown, pinaculi light brown, body granulate. On the cervical shield IIIa is closer to III than to IX, II is ventrocaudad from I. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa on the mesothorax is dorsocaudad from III, the seta VIII distinctly set off from the coxa. Setae IV and V on the 8th abdominal segment are horizontally, on the others diagonally situated. On the 1st, 2nd, and 7th abdominal segments, group VII counts 2 setae, on the 9th 1 seta. The small round spiracles on the 2nd abdominal segment are not larger than the insertion place of seta III. On the 9th abdominal segment setae II, as well as I and III, also IV, V, VI stand on common pinaculi. The uniserial laterally open circles of hooks of the parapodia count 14-16 hooklets.

Aug., Nov., Oct. in spun-up seeds of Heracleum.

Locality: Spardorf on Oct. 4, 1951 in spun-sup seeds of Heracleum.

L. janthinana (Duponchel 1835)(2224).

Caterpillar reddish, head and anal shield light brown, cervical shield lighter, anal shield darkly punctate (fig. 92)[or dotted]. Body strongly granulate by small red spinules. 2nd ocellus much closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. Setae IIIa and III stand on separate pinaculi, on the mesothorax, they are frequently contiguous. On the 1st and 2nd abdominal segment, group VII consists of 3 setae, on the 7th and 8th of 2, on the 9th of 1 seta. On all abdominal segments setae IV and V are diagonally situated, IIIa not on the pinaculum of III. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found somewhat ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, VI are situated on common pinaculi. The uniserial closed circles of hooks of the parapodia count about 35, those of the caudal disk 20-25 hooklets.

Sept., Oct. in ripe fruits of Crataegus, overwinters under scales of bark or in rotten wood, where they pupate in the spring. The caterpillars from the Bavarian State Collection examined had been found by Disque on Sept. 10, 1882 near Speyer in fruits of Crataegus.

L. caecana (Schläger 1847)(2169).

Caterpillar whitish, head ocher yellow to pale brown, cervical shield lighter; the body, which is weakly granulate by reason of fine white spinules, has a conspicuously elongated form. The adfrontalia do not reach up to the posterior margin of the head (fig. 93). The 2nd ocellus is much closer to the 1st, the 4th to the 3rd. The 3rd, 4th, and 6th ocelli are darker than the others. On the cervical shield IIIa is somewhat closer to III than to IX. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsad or dorsocaudad from III, seta VIII being close to the coxa. On all abdominal segments IV is diagonally arranged with V, IIIa is not found on one pinaculum with III. On the 1st and 2nd abdominal segments, group VII counts 3 setae, on the 7th 2, on the 8th and 9th 1. The spiracles of the 2nd abdominal segment are somewhat larger than the insertion place of seta III. On the 7th and 8th abdominal segments the distance between setae II is not greater than that between setae I, on the 9th abdominal segment setae II, I and III, as well as IV, V, VI stand on common pinaculi. The uniserial elliptical circles of hooks of the parapodia count about), those of the caudad disk about 15 hooklets (fig. 94).

Aug., Sept., Oct. in the stem of Ononis spinosa and Onobrychis. The caterpillars from the Bavarian State Collection examined had been found by Hinneberg on Aug. 25, 1891, in the stem of Ononis spinosa.

Laspeyresia gemmiferana (Treitschke 1835)(2166).

Caterpillar greenish or gray-white, head light brown with dark eye and genal spots. Cervical shield, pinaculi, and anal shield brown, cervical shield dark dotted [or punctate](fig. 95). Body strongly granulate by brown spinules. On the cervical shield setae IIIa, III, and IX stand very close to each other, on the prespiracule shield seta IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII very close to the margin of the coxa. On all abdominal segments, IV and V are diagonally arranged. On the 1st abdominal segment group VII counts 2 setae, on the 2nd 3, on the 7th 2, and on the 8th and 9th 1 seta. (Sometimes on the 8th, 2 setae). Also on the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found somewhat ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI lie on common pinaculi. The circles of hooks of the parapodia are biserial on the inside, uniserial on the side (see fig. 177) and count 35 to 40 hooklets. The caudal disk consists also of 35-40 hooklets.

The caterpillar lives in July in pods of Lathyrus pannonica.

The caterpillars of the Bavarian State Collection investigated had been found by Krone on June 12, 1902 near Vienna in pods of Lathyrus pannonica.

L. tetragrammana (Staudinger 1879)(2185).

Caterpillar whitish, reddish saddled, head light brown with weakly developed eye and genal spots, cervical shield and anal shield brownish yellow. Body granulated by miscropically small brown spinules. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the abdominal segments IV and V are diagonally situated on the 1st vertically. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th of 2, on the 8th and 9th of 1 seta. On the 8th abdominal segment III is found on the same level with the spiracle, on the 9th the setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. Setae VIII are not farther apart on the 9th abdominal segment than on the 8th. On the mesothorax VIII is very close to the coxa. The prothoracic spiracles are elliptical, the others round, on the 2nd abdominal segment not larger than the insertion place of seta III. The round uniserial circles of hooks count 20 to 24, those of the caudal disk about 15 hooklets.

Sept. to April in stem of Humulus. The caterpillars from the Bavarian State Collection that were examined had been found in part by Hinneberg on Feb. 12, 1891, near Potsdam, in part by Krone on Feb. 22, in Vienna in the stem of Humulus.

L. compositella (Fabricius 1775)(2194).

Caterpillar whitish, later reddish-white, before pupation scarlet-red, head yellowish brown, cervical and anal shields lighter to darker brown. On all abdominal segments IV and V are diagonally situated, on the 8th abdominal segment the distance between setae II is greater than that between setae I. The uniserial circles of hooks on the parapodia count about 18, those of the caudal disk about 12 hooklets. Otherwise there is complete morphological agreement with the preceding species.

Two generations, June, beginning of July, and Aug., Sept. On Medicago sativa, also between spun up tip leaves on Trifolium. The caterpillars from the Bavarian State Collection that were examined had been found by Disque near Speyer on Oct. 13, 1908 and Aug. 23, 1909 on Medicago sativa.

Laspeyresia internana (Guenée 1845)(2193)

Caterpillar whitish, later reddish, especially the dorsal part of the segments. Head brown, cervical shield yellow to brownish, sometimes posteriorly dark edged. Anal shield brownish. Body granulated with microscopically small spinules. On the 1st abdominal segment the setae IV and V are vertically, on the others diagonally, situated. On the 8th abdominal segment the distance between setae III is greater than that between setae I, III is found ventrocraniad from the spiracle. [sic!] The spiracles of the abdominal segments are not larger than the insertion place of seta III. The round uniserial circles of hooks of the parapodia count about 15, those of the caudal disk about 11 hooklets.

This species occurs in England, France, Andalusia, and Belgium, not in Germany.

The caterpillar lives from July to the last of Sept. in pods of Ulex scorpius. The caterpillars from the Bavarian State Collection that were examined were found by de Joannis July 5, 1905 on Ulex scorpius.

L.coronillana (Zeller 1846)(2217).

Caterpillar whitish with brownish gray pinaculi, head, thoracic legs, and cervical shield brown, the latter dark dotted [or punctate](fig. 96), anal shield dark brown, before it two large dark dots [or punctures]. The 2nd ocellus is closer to the 1st, the 4th to the 3rd, the 2nd and 1st are lighter than the others. On the cervical shield IIIa is closer to III than to IX, the prespiracular shield is diagonally situated so that V stands higher than VI. IIIa is found dorsocaudad from III on the mesothorax, seta VIII quite close to the coxa. On all abdominal segments IV is diagonally situated with V. The spiracles of the 2nd abdominal segment are somewhat larger than the insertion place of seta III, whose pinaculi are emarginated toward the spiracle. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 8th and 8th [sic! ?misprint for 7th and 8th] setae, on the 9th 1 seta. On the 9th abdominal segment VI is separated off from IV and V. The uniserial closed circles of hooks on the parapodia count about 20 hooklets.

July, Sept. in pods of Coronilla varia. The caterpillars from the Bavarian State Collection that were examined had been found by Krone near Vienna on Aug. 12, and Sept. 10 in pods of C.varia.

L.pallifrontana (Zeller 1849)(2208).

Caterpillar at first whitish, later scarlet red, head yellowish brown, cervical shield dark brown, anal shield brownish. 4th ocellus equidistant from the 3rd and 6th. The prespiracular shield is horizontally situated, IV ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III. The pinaculi of setae III are only weakly developed on the abdominal segments. The spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th 2, on the 8th and 9th 1 seta. On the 8th abdominal segment the distance between setae II is somewhat greater than that between setae I, III stands on the same level as the spiracle. On the 9th abdominal segment the pinaculi of setae II are not always fused, VI stands on a common pinaculum with IV and V. The distance between setae VIII on the 9th abdominal segment is somewhat greater than on the 8th. The uniserial circles of hooks of the parapodia count 18-23, those of the caudad disk 14-18 hooklets. In other morphological characters it agrees with coronillana.

The caterpillar lives the last of July to the first of Sept. in pods of Astragalus glycyphyllus. The caterpillars of the Bavarian State Collection examined had been found by Sequo near Speyer in pods of A.glycyphyllus. The caterpillars brought in July 28 were white, while they were already scarlet red from Aug. 6, 1906. The caterpillars of many spp. of Laspeyresia become reddish before pupation.

Laspeyresia fissana (Frölich 1828)(2209).

The young larvae are yellowish with small reddish punctures. Head, cervical and anal shields dark-brown, 2 dark punctures [or dots] before the latter. The mature caterpillars are whitish, with a dark-violet-brown saddle, with light dorsal longitudinal streaks. Kennel (1908) wrote of spots which certainly correspond to the dark areas produced by the longitudinal striping. Head light brown, cervical shield dark brown, in the middle lighter (fig. 98). The adfrontalia do not reach up to the posterior margin of the head (fig. 97). The 2nd, 3rd, and 4th and 6th ocelli stand in one line (fig. 101). On the cervical shield IIIa is closer to III than to IX, the prespiracular shield is diagonally situated so that VI is situated lower down than V. The setae I and II, IIIa and III, as well as IV and V stand on the mesothorax on separate pinaculi (fig. 102). On the 1st abdominal segment group VII counts 2 setae, on the 2nd 3, on the 7th 3(2), on the 8th 2(1), and on the 9th 1 seta. On the 9th abdominal segment the pinaculi of setae I, II, and III are fused into one shield on which about 16 setae are found by reason of the appearance of secondary setae (fig. 100), on the site of seta III on the 8th abdominal segment there are 3 to 4 setae dorsocraniad from the spiracle (fig. 99). Also on the anal shield secondary setae show up additionally so that there are about 20 of them present. The uniserial circles of hooks of the parapodia are open on the side and have about 12, those of the caudal disk about 10 hooklets.

Otherwise the characters agree with those of other Laspeyresia spp., but because of the secondary setae and the horizontal situation of IV and V as well as the number of setae in group VII on thelst and 2nd abdominal segments one might think that he had a gelechiid caterpillar before him. But since the food plants, the time of appearance, and the peculiar marking of the cervical shield agree with the descriptions given hitherto, it cannot be assumed that there is a confusion present. It should be tested whether the adults do not differ generically from Laspeyresia spp.

The caterpillar lives from July to the last of Sept. in pods of Vicia cracca. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 12, 1908 in pods of V.cracca near Speyer.

L. orobana (Treitschke 1830)(2216).

Caterpillars orange colored, head, cervical shield, pinaculi, anal shield, and thoracic legs dark brown, sometimes the head is light brown and the cervical shield only posteriorly dark edged and dark dotted [or punctate] (fig. 103). The young caterpillars are still whitish. Body granulated by small brown spinules. 2nd ocellus closer to the 1st. On the cervical shield IIIa is closer to III than to IX, the prespiracular shield is horizontally situated. IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is found dorsocraniad from III, seta VIII is distinctly set off from the coxa. On the abdominal segments IIIa is separated off from the pinaculum of seta III, IV and V are diagonally situated but they are horizontally situated on the 8th. The spiracles are round, somewhat larger on the 2nd abdominal segment than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not larger than that between setae I, III is dorsocraniad from the spiracle. Setae II, also I and III, as well as IV and V are found on common pinaculi on the 9th abdominal segment, VI is lacking. Group VII counts 2 setae on the 1st abdominal segment, more rarely 1 seta, 3 on the 2nd, 1-2 on the 7th, and always 1 seta on the 8th and 9th segments. The uniserial round circles of hooks of the parapodia count 20-24, those of the caudal disk about 15 hooklets.

July to the last of Sept. in pods of Vicia cracca and different Orobus spp.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on July 27, 1905, near Speyer, in pods of V.cracca.

Laspeyresia dorsana (Fabricius 1775)(2214).

The caterpillar looks very much like that of orobana. Body orange, granulated by small brown spinules. The pinaculi are not brown as in orobana, but the same color as the body or at most brownish on the thoracic segments. Head, cervical and anal shields brown, sometimes lighter, sometimes darker, cervical shield mostly light brown. Group VII counts 3(2) setae on the 1st abdominal segment, 3 on the 2nd, 2(1) on the 7th, 1 on the 8th and 9th abdominal segments. On the 9th abdominal segment, VI is present and situated on a common pinaculum with IV and V. Spiracle of 2nd abdominal segment not larger than the insertion place of seta III. The uniserial round circles of hooks of the parapodia count 28-30, those of the caudal disk 17, hooklets. There is agreement with orobana in the other characters.

The larvae lives from June to the last of Sept. in pods of Vicia cracca, Orobus, and Pisum. The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on July 25, 1895 near Potsdam in pods of V.cracca.

L.nebritana (Treitschke 1830)(2161)

Caterpillar whitish, finely granulated, head light brown, cervical and anal shields whitish or gray-brownish, cervical shield dark punctate [or dotted]. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX. The prespiracular shield is horizontally placed, IV ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsad from III, seta VIII close to the coxa. On all abdominal segments IV and V are diagonally situated, the spiracles are round; on the 2nd abdominal segment not larger than the insertion place of seta III, IIIa is always set off from pinaculum III. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found ventrocraniad from the spiracle (fig. 104). On the 9th abdominal segment, setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. The biserial circles of hooks of the parapodia are uniserial on the side and count about 40, those of the caudal disk about 25 hooklets. Thereby it is to be distinctly separated from nigricana.

Aug. and first of Sept. in pods of Colutea arborescens and other Papilionaceae. The caterpillars from the Bavarian State Collection that were examined had been found in part by T.Krone on Aug. 13 near Vienna, in part by Hinneberg on Aug. 16,1902 near Potsdam in pods of C.arborescens.

L.roseticolana (Zeller 1849)(2162).

Caterpillar reddish, head ocher yellow to light brown with dark eye and genal spots. Cervical and anal shields light greenish brown, dark dotted [or punctate] (fig. 105, 106). Pinaculi of the same color as the body. Body strongly granulated by small spinules. On the cervical shield IIIa is somewhat closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both and much longer. On the mesothorax IIIa is dorsad from III, VIII distinctly set off from the coxa. On the abdominal segments setae IV and V are diagonally, but on the 1st nearly vertically, situated. Spiracle of 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment setae II are not farther apart than setae I. Group VII counts 3 setae on the 1st and 2nd abdominal segments, 2 on the 7th and 8th, 1 on the 9th. Setae II, also I and III, as well as IV, V, and VI are found on common pinaculi on the 9th abdominal segment. The distance between setae VIII is not larger than on the 8th abdominal segment. Anal shield with 4-6 spines. The uniserial, round circles of hooks of the parapodia count 30 to 38(35), those of the caudal disk about 18 hooklets.

The caterpillar lives from the last of Aug. to Sept. in fruits of Rosa canina. The Thereafter the caterpillars go into rotten wood for pupation which first takes place in the spring. The adult flies in May and June.

Locality: Rathsberg on Aug. 22, 1953, in Hagebutten. [i.e., hips or haws].

Laspeyresia funebrana (Treitschke 1835)(2159).

Caterpillar carmine red, head dark brown, cervical and anal shields brownish and dark dotted [or punctate] (fig. 107 and 108). Body strongly granulate. On the mesothorax IIIa is dorsocaudad or dorsad from III. Seta VIII is close to the coxa. On the abdominal segments setae IV and V are diagonally situated, sometimes also vertically on the 1st. Spiracles of the 2nd abdominal segment of the side of the insertion place of seta III. Group VII counts 3 setae on the 1st and 2nd abdominal segments, 2 on the 7th, 2 or 1 on the 8th, and always 1 on the 9th. The circles of hooks of the parapodia are biserial on the inside, uniserial on the side, and count 35-40 hooklets standing very close together. Caudal disk with 30-35 hooklets. Otherwise the larvo-morphological characters agree with roseticolana.

This caterpillar, which is known as the "plum-maggot", lives from July to the first of Oct. in fruits of Prunus spp., especially P.domestica. Very abundant and injurious everywhere. Locality: Erlangen, Aug.28, 1951, in plums.

L.discretana (Wocke 1861)(2210).

Caterpillar yellowish, strongly granulated by brown spinules. The large pinaculi are brown gray, head black brown, cervical shield lighter, anal shield small and brown. On the cervical shield IIIa is closer to III than to IX, on the mesothorax IIIa is dorsad from III, VIII is close to the coxa. On all abdominal segments setae IV and V are diagonally situated, IIIa stands on the margin of pinaculum III. Spiracles elliptical, on the 2nd abdominal segment somewhat larger than the insertion place of seta III. On the 8th abdominal segment setae II are not farther apart than setae I, the pinaculi are contiguous or fused, III is found on the same level with the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. Setae VIII are not farther apart than on the 8th abdominal segment. The uniserial round circles of hooks of the parapodia count 27-30, those of the caudal disk about 15 hooklets.

Aug. to Sept. in the undermost part of the stem near the root of Humulus lupulus. The caterpillars of the Bavarian State Collection that were examined had been found by Disque on Aug. 23, 1908 near Speyer in the lower stem of Humulus.

L.perlepidana (Haworth 1811)(2207).

No description of the larva is available, the following information refers to the material from the Bavarian State Collection.

Caterpillar greenish white, head yellow or light brown with dark eye and genal spots. Cervical and anal shields brown, the latter dark dotted [or punctate] (fig. 109). On the 9th abdominal segment the pinaculum of setae II is brown. Body strongly granulate by brown spinules. 2nd ocellus closer to the 3rd than to the 1st. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. IIIa is found dorsocraniad or dorsad from III on the mesothorax, the spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On all abdominal segments IIIa is separated from the pinaculum of seta III, IV and V are vertically situated on the 1st abdominal segment, on the others, vertically to diagonally situated. The pinaculi are very small. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I,

III is ventrocraniad from the spiracle. On the 9th abdominal segment, setae II, also I and III, as well as IV, V, and VI are found on common pinaculi, setae VIII are not farther apart than on the 8th abdominal segment. Group VII counts 2 setae on the 1st abdominal segment, 3 on the 2nd, 2 on the 7th, and 1 seta on the 8th and 9th segments. The hooklets on the parapodia are very different in size and stand very close beside each other so that the circles of hooks cannot be unequivocally described as biserial. Parapodia and caudal disk with about 30 hooklets.

June, July between leaves spun together on Orobus, Vicia, and Lathyrus. The adult flies April and May. The caterpillars of the Bavarian State Collection that were examined had been found by Petry on June 26, 1906 near Nordhausen between two leaves spun flat against each other.

L.lathyrana (Hübner 1822)

sym. scopariana Herrich-Schäffer 1843-44 (2182).

Caterpillar yellowish-white, head strongly granulated by small spinules. Pinaculi light. Head ocheryellow or pale brown with dark eye and genal spots. Cervical and anal shields of the body coloring. The 2nd ocellus is equidistant from the 1st and 3rd, on the cervical shield the distance between setae IIIa and III, like that between IIIa and IX is approximately the same. The prespiracular shield is diagonally situated, V being lower down than VI, seta IV equidistant from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII is very close to the coxa. On all abdominal segments IV is diagonally situated with V, IIIa does not stand on the pinaculum of seta III. The spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment, setae I and III, as well as IV, V, and VI stand on common pinaculi, the setae VIII are not farther apart than on the 8th abdominal segment. On the 1st and 2nd abdominal segments, group VII counts 3 setae, 2 on the 7th, 1 on the 8th and 9th. The circles of hooks of the parapodia count about 20, those of the caudal disk 18-20 hooklets. With that the size of the hooklets differs.

June, July in spun up shoots of Genista and Spartium, in March and April according to Barren, in the roots. The adults flies in April and May. The caterpillars of the Bavarian State Collection that were examined had been found by Disque on June 4, 1905, on Genista tinctoria and G.sagittalis.

The genus Pammene Hübner 1825.

Diagnosis: On the 1st and 2nd abdominal segments group VI counts 3 setae, 2 on the 7th and 8th, 1 on the 9th. Setae II, also I and III, as well as IV, and V on the 9th abdominal segment are on common pinaculi. On abdominal segments 1 to 8, V is hardly half as large as IV. The circles of hooks are mostly biserial, if uniserial then the body of the caterpillar is not supplied with spinules or is supplied only with small white spinules. The caterpillars are always white or yellowish white and for the most part have large gray-brown pinaculi.

Key to spp. of Pammene

1 (4) On the 9th abdominal segment VI stands on its own pinaculum not on a common pinaculum with IV and V. The pinaculi are hardly perceptible and are the same color as the body.

2 (3) The circles of hooks of the parapodia are completely uniserial, those of the caudal disk count about 15 hooklets — spinana

3 (2) The circles of hooks of the parapodia are biserial, caudal disk with about 20 hooklets — populana

4 (1) The setae IV, V, and VI on the 9th abdominal segment stand on a common pinaculum. (Pinaculi mostly chitinized and brown).

5 (22) Circles of hooks of the parapodia biserial, sometimes only on the side turned toward the ventral Mediana. If completely uniserial then on the 8th abdominal segment III is dorsocraniad from the spiracle.

6 (9) Circles of hooks of the parapodia completely biserial.

7 (8) Cervical shield yellow, brown punctate*[or dotted], prespiracular shield not chitinized and white, on the anal shield only the cranial half is brown punctate*(fig. 112). Setae IV and V are diagonally situated on the 8th abdominal segment — fimbriana

8 (7) Cervical shield, prespiracular and anal shields strongly chitinized and completely brown. Setae IV and V on the 8th abdominal segment are vertically situated — splendidulana

9 (6) Circles of hooks of the parapodia on the side turned toward the ventral Mediana biserial, uniserial on the lateral side or completely uniserial (see fig. 177).

10 (11) Seta III on the 8th abdominal segment is dorsocraniad from the spiracle, on the mesothorax VIII is distinctly set off from the margin of the coxa — amygdalana

11 (10) Seta III is found on the 8th abdominal segment ventrocraniad from the spiracle or on the same level as this is. On the mesothorax VIII is very close to the coxa.

12 (15) Setae IV and V are horizontally situated on the 8th abdominal segment.

13 (14) IIIa on the 1st to the 7th abdominal segments moreover stands on the margin of the pinaculum of III — trauniana

14 (13) On the 1st to the 7th abdominal segments IIIa is distinctly set off from the pinaculum of III — regiana

15 (12) Setae IV and V are diagonally or vertically situated on the 8th abdominal segment.

16 (17) Setae IV and V stand vertically on the abdominal segments — costipunctana

17 (16) Setae IV and V are diagonally placed on the abdominal segments, or at least on the 5th, 6th, 7th, and 8th.

18 (21) The cranial half of the anal shield is dark brown, otherwise lighter (fig. 121).

19 (20) On the anal shield on the brown transverse band, are found dark punctures [or dots] additionally (fig. 121) — albugiana

20 (19) On the anal shield no dark dots are found on the brown transverse band — argyrana

21 (18) Anal shield completely brownish, with dark punctures [or dots] which are distributed over the whole anal shield (fig. 124) — juliana

22 (5) The circles of hooks of the parapodia are completely uniserial III is found ventrocraniad from the spiracle or on the same level with this, on the 8th abdominal segment.

23 (24) Pinaculi light brown, head, anal shield brown, parapodia brown-chitinized on the side — rhediella

24 (23) Pinaculi yellowish-white like the body, head yellowish to light brown, anal shield yellowish, parapodia not brown-chitinized on the side.

25 (26) Caudal disk with about 15 hooklets, cervical shield uniformly dark brown — nitidana

26 (25) Caudal disk with about 8 hooklets, cervical shield yellowish or pale brown — weirana

Pammene spinana (Duponchel 1843)(2240).

Caterpillar whitish, head yellow to light brown, cervical shield approximately the same color as the body, posterior dark bordered (fig. 110). Body white-granulated. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is equidistant from V and VI. On the mesothorax IIIa is dorsad from III, VIII is close to the margin of coxa. On the abdominal segments setae IV and V are diagonally situated, IIIa does not stand on one pinaculum with III. The distance between setae II on the 8th abdominal segment is greater than that between setae I. On the 9th abdominal segment VI does not stand with IV and V on a pinaculum, the distance between setae VIII is greater than on the 8th abdominal segment. The prothoracic spiracles are elliptical, the others round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. The circles of hooks are uniserial, on the parapodia consisting of 20-24, on the caudal disk of 15 hooklets.

May in spun up flowers of Crataegus and Prunus spinosa, according to Schmidt also on Alnus. The caterpillars examined from the Bavarian State Collection had been found by Disque on May 25, 1905 near Speyer in spun-up flowers on Crataegus.

Pammena [sic.!] populana (Fabricius 1787)(2241)

Caterpillar greenish white, head black-brown to black, cervical shield anteriorly of the body color or brownish, posteriorly dark brown to black (fig. 111). Pinaculi and anal shield of the body color or the anal shield is brownish. On the 8th abdominal segment the distance between setae II not greater than that between setae I, the circles of hooks of the parapodia are uniserial on the outside, elsewhere biserial. Parapodia with 24-30, caudal disk with about 20 hooklets. In the other larvo-morphological characters this species agrees with the preceeding.

May, June in shoots of Salix caprea and other spp. of Salix, but also between spun-up young shoots. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 8, 1906, near Speyer in shoots of Salix caprea.

Pammene fimbriana (Haworth 1829)(2225)
syn. inquilina Fletcher 1938 according to Obraztsov.

Caterpillar yellowish white with large dark brown pinaculi. Head dark brown, cervical shield yellowish white, dark bordered and in the middle dark punctate [or dotted]. Of the anal shield the cranial half is dark brown and black punctate [or dotted], the caudal half whitish (fig. 112). 2nd ocellus closer to the 1st than to the 3rd. On the mesothorax on the anterior margin microscopically small setae are to be recognized (fig. 113). Seta IIIa stands dorsocraniad from III. On the abdominal segment IIIa is found on the margin of the pinaculum of III (fig. 114). On the 8th abdominal segment the distance between setae II is not smaller than that between setae I, III is found on the same level with the spiracle. On the 9th abdominal segment the dorsal pinaculi lie very close beside each other or are contiguous, a microseta can be distinctly recognized before III (fig. 115), seta VI is found on a pinaculum with IV and V. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. The spiracles are round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. The circles of hooks are completely biserial, parapodia with about 50, caudal disk with about 40 hooklets.

June to Aug. in galls on Quercus, mostly [galls of] Andricus, then from Aug. until pation ~~ixxiixxxixxdx~~ in March it lives in rotten oak twigs. The caterpillars from the Bavarian State Collection that were examined had been found by Stange on July 8, 1902 near Friedland in Andricus galls on Quercus.

Pammene splendidulana (Guenee 1845)(2228).

Caterpillar white with large black-brown pinaculi, head, cervical shield, prespiracular shield and the whole anal shield black brown to black. The 2nd ocellus is equidistant from the 1st and 3rd, on the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is equidistant from V and VI. On the abdominal segments IV and V are vertically situated. The prothoracic spiracles are elliptical, the others round, on the 2nd abdominal segment no larger than the insertion place of seta III. Anal comb with 6 spines. The completely biserial circles of hooks of the parapodia count about 40, those of the caudal disk about 25 hooklets (fig. 116). This species agrees larvo-morphologically in other characters with the preceding.

June between two leaves of Quercus spun upon one another, goes for overwintering and pupation in the spring, under the bark or into rotten wood. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 10, 1906 near Speyer between 2 oak leaves spun upon one another.

Pammene amygdalana (Duponchel 1843)(2231a).
syn. lobarzewskii Nowicki 1865 (2232).

Caterpillar whitish, head light brown, cervical and anal shields and pinaculi the same color as the body. The body is supplied with small white spinules. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th is nearer the 3rd than the 6th. On the cervical shield IIIa more strongly approaches III than it does seta IX. On the prespiracular shield IV is equidistant from V and VI and stands in one line with them. Seta IIIa on the mesothorax is dorsocraniad from III, seta VIII is distinctly set off from the margin of the coxa. On the 1st and 2nd abdominal segments group VII counts 3 (sometimes 2) setae, 2 on the 7th and 8th segments, 1 on the 9th. On all abdominal segments setae IV and V are diagonally arranged. On the 8th abdominal segment the distance between setae II is not greater, mostly it is somewhat less than that between setae I, III is found dorsocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. The uniserial circles of hooks of the parapodia count about 22, those of the caudal disk about 10 hooklets. The spiracles of the 1st and 11th segments are elliptical, the others round, on the 2nd abdominal segment somewhat larger than the insertion place of seta III.

As Obraztsov informed me in a letter, lobarzewskii is only a synonym of amygdalana.

The caterpillar lives from July until in the spring in galls of Diplolepis quercusfolii where pupation also takes place. Before emergence of the adults the pupa comes out [of the gall]. The caterpillar is known only from Galicia and Austria.

The caterpillars from the Bavarian State Collection that were examined had been found by Krone on Feb. 10, 1898 near Vienna in galls of Diplolepis quercusfolii.

Pammene trauniana (Schiffermiller 1776)(2245).

Caterpillar whitish with gray-brown pinaculi, granulated by small white spinules. Head and anal shield brown, cervical shield little different from the body coloring and provided with dark dots [or punctures] on the posterior margin (fig. 117). The distances between the ocelli are rather uniform. On the mesothorax, there is one distinctly recognizable microseta before pinaculum I with II, 2 such setae before pinaculum IIIa with III, and again one before the pinaculum VII. Seta VIII on the mesothorax is very close beside the coxa. Setae IV and V are horizontally arranged on the 8th abdominal segment, diagonally situated on all the others. On all abdominal segments IIIa stands on the margin of pinaculum III. Spiracle of 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment the distance of setae II is less than that between setae I, III is found ventrocraniad from the spiracle. On the 9th ab-

dominal segment a microseta can be plainly recognized before pinaculi I and III. Setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is somewhat greater than on the 8th abdominal segment. The parapodia count about 26 hooklets, the lateral ones of which are smaller than those on the inner margin of the circle of hooks. Caudal disk with about 17 hooklets.

Aug. to Sept. in fruits of Acer campestris, then under the bark until pupation in April. The caterpillars from the Bavarian State Collection that were examined had had been found by Disque on Oct. 5, 1908, near Gimmeldingen (Rhenish Palatinate) in seeds of A.campestris.

Pammene regiana (Zeller 1849)(2244).

Caterpillar whitish, strongly granulate by white spinules, head light brown, cervical shield yellowish, dark punctate [or dotted] on the posterior margin (fig. 118). The gray pinaculi are conspicuously large. Anal shield brown, sometimes lighter so that darker points are to be seen (fig. 119). 2nd ocellus somewhat closer to the 1st, 4 somewhat nearer the 3rd. The microsetae on the mesothorax are not clearly recognized since the body is strongly granulated. On the abdominal segments 1 to 7, IIIa is distinctly set off from the pinaculum of seta III. The parapodia count 25-32 hooklets, the outer ones are smaller than the others. The caudal disk counts about 16 hooklets. This species agrees with trauniana in the other larvo-morphological characters.

Aug. to Sept. in fruits of Acer pseudoplatanus, platanoides. Under the bark from Oct. until pupation in March.

Locality: Erlangen, Burgberg on Sept. 14, 1953, in fruits of Acer platanoides.

P.costipunctana (Haworth 1811).

Caterpillar whitish, head yellowish brown, cervical and anal shields and the large pinaculi are graybrown, body strongly granulated. 2nd ocellus closer to the 1st than to the 3rd. On all abdominal segments IIIa stands on the pinaculum of seta III and IV is always vertically arranged with V. On the 8th abdominal segment setae II and setae I are equally far removed from each other, III is found on the same level as the spiracle. On the 9th abdominal segment the distance between setae VIII is greater than on the 8th. Anal comb with 6 spines. The circles of hooks of the parapodia are biserial, but they are uniserial on the side and count about 25 hooklets, the caudal disk also has about 25 hooklets. In the other characters there is also agreement with the two preceding spp.

I could not find a description of the larvae in the literature.

Aug. to March in galls of Biorrhiza pallida.

Locality: Erlangen-Spardorf on Aug. 20, 1951, in galls of B.pallida.

Pammene albuginana (Guenee 1845)(2232)
syn. gallicolana Zeller 1846 (2231).

Caterpillars whitish, strongly granulate by white spinules. The large pinaculi are graybrown, head light or dark brown. Cervical shield yellowish, in the middle and on the posterior margin dark punctate [or dotted], anal shield brown, sometimes only anteriorly brown and dark punctate [or dotted], posteriorly lighter (fig. 120, 121). The microsetae can be distinctly recognized on the mesothorax, as described for trauniana. Setae IV and V on all abdominal segments are diagonally, or only on the 1st 3 abdominal segments vertically, situated. On the 8th abdominal segment the distance between setae II is not less than that between setae I, III is found ventrocraniad from the spiracle.

All spiracles are round. The circles of hooks of the parapodia are biserial, but uniserial on the side, and count 37-40 hooklets. Those of the caudal disk about 25. Anal comb likewise consisting of 6 spines. In other characters this species agrees larvo-morphologically with costipunctana and trauniana.

Aug. to March in galls of Biorrhiza pallida.
Locality: Erlangen-Spardorf on Oct. 11, 1951 in galls of B.pallida.

Pammene argyrana (Hübner 1822)(2226).

Caterpillar whitish with large brown pinaculi, strongly granulate by small white spinules, head light brown, cervical shield whitish, posteriorly and on the side dark bordered (fig. 122). Anal shield is dark-brown to black from the anterior margin up to the first setae, but without darker dots, posteriorly white. On the 8th abdominal segment III is found on the same level as the spiracle. The biserial circles of hooks of the parapodia are uniserial on the side and count about 30, those of the caudal disk about 20 hooklets. The prespiracular shield is diagonally set so that V is lower down than VI. In all other characters there is larvo-morphological agreement with albugiana.

According to Kennel (1908) and Schutze (1931) the caterpillar is supposed to live from June to Aug. in oak galls and then under mossy bark on Quercus up to pupation in March. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 21 or on Dec. 6, 1910, near Speyer under the bark of Quercus.

Pammene juliana (Curtis 1836)(2237)

Eckstein (1933) referred this species to the genus Carpocapsa which would correspond to the present genus Laspeyresia. This can, larvo-systematically, be considered wrong with great assurance for the caterpillar is white and has the large brown-gray pinaculi typical for most Pammene spp. Also morphologically it agrees completely with the genus Pammene.

Caterpillar whitish, granulated by small white spinules. Head light brown, cervical shield whitish with dark dot-[or puncture]marking (fig. 123). The large pinaculi are gray-brown, the anal shield is completely brown and additionally provided with dark dots [or punctures], which are distributed over the whole anal shield (fig. 124). The prespiracular shield is horizontal, IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, in addition to the usual setae, distinctly recognizable microsetae are found in the anterior part of the segment - one before the pinaculum of (I+II), 2 before the pinaculum of (IIIa+III), and one before VII (see fig. 113). The spiracles on the 1st and 11th segments are elliptical, while the others are more round, on all abdominal segments IIIa is on the margin of pinaculum III, setae IV and V are always diagonally arranged. On the 8th abdominal segment setae II and setae I are equidistant from each other, the pinaculi of I and II are so large that they are contiguous. On the 9th abdominal segment, there is a microseta before the dorsal pinaculi (see fig. 115), IV, V, and VI stand on a common pinaculum. The distance between setae VIII is greater than on the 8th abdominal segment. On the mesothorax VIII is set off from the margin of coxa. The biserial circles of hooks on the parapodia are uniserial on the side and count about 30-33 hooklets those on the caudal disk about 22.

The caterpillar lives from Aug. to Oct. in fruits of Quercus, Fagus, Castanea vesca, and Acer and finally under the bark or in moss on the trunks until pupation in March, April. The caterpillars from the Bavarian State Collection that were examined had been foun by Disque in part on Apr. 16, 1893 near Speyer under oak bark, in part on Feb. 16 in northen France in moss on beech trunks.

Pammene rhediella (Clerk 1759)(2254)

Caterpillar whitish, strongly granulate, head, cervical and anal shields, thoracic legs brown; if the cervical shield is somewhat lighter than darker spots can be recognized on the side and on the posterior margin (fig. 125). The pinaculi are light brown. The distance between the ocelli is equal, on the cervical shield IIIa is closer to III than to IX. Seta IV on the prespiracular shield is ventrad from V and VI and is equidistant from both. On the mesothorax VIII is set off from the coxa. On all abdominal segments IIIa stands on the margin of pinaculum III, setae IV and V are always diagonally situated. The spiracles are round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. On the 9th abdominal segment VI and IV and V stand on a common pinaculum. The parapodia are brown chitinized on the side, their uniserial circles of hooks counting about 26 hooklets.

The caterpillar lives in July and Aug. in the flowers and then in the unripe fruits of Crataegus, also Pirus and Prunus domestica.

Locality: Erlangen, Aug. 1, 1953, in unripe fruits of Crataegus.

Pammene nitidana (Fabricius 1794)(2250)

Caterpillar whitish, finely granulate by small white spinules. Head yellow to pale brown, cervical shield dark brown, anal shield small, pale brownish. The pinaculi are only weakly developed and not to be recognized. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is equidistant from V and VI. The prespiracular shield is only very weakly indicated. The seta IIIa on the mesothorax is dorsad from III, the microsetae are not to be recognized, seta VIII very strongly approaches the coxa. On all abdominal segments IV is diagonally arranged with V, on the 8th abdominal segment setae II and setae I are equally far from each other, III is found ventrocraniad from the spiracle. On the 9th abdominal segment the dorsal microsetae are lacking, setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. On the 8th and 9th abdominal segments setae VIII are equally far apart. The spiracles are elliptical, on the 2nd abdominal segment only somewhat larger than the insertion place of seta III. The uniserial circles of hooks of the parapodia count about 21, those of the caudal disk about 15 hooklets.

Sept., Oct. between two leaves spun up together on Quercus. Kennel (1908) writes that the caterpillars are also supposed to occur on Betula and Castanea. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 7, 1902 near Speyer between 2 leaves on Quercus that had been spun up together.

Pammene weirana (Douglas 1850)(2249).

Caterpillar whitish, finely white-granulate. Head light brown or yellowish with darker eye and genal spots. Cervical and anal shields whitish or yellowish. On the 2nd abdominal segment II is dorsocraniad from the spiracle, as also in nitidana. The uniserial circles of hooks of the parapodia count about 20-22, those of the caudal disk about 8 hooklets. In other characters this species agrees larvo-morphologically completely with nitidana.

The caterpillar lives in June and then in Sept. and Oct. between two leaves on Fagus silvestris that have been spun up together, it is still questionable whether it actually also lives on Carpinus betulus and Castanea vesca. The caterpillars from the Bavarian State Collection that were investigated had been found by Disque on Sept. 16, 1896, near Speyer on F.silvestris.

The genus Lathronympha Meyrick 1926.

Diagnosis: On the 1st and 2nd abdominal segment group VII counts 3 setae, 2 on the 7th and 8th, and 1 on the 9th. On the mesothorax VIII is found on the coxa, on the 9th abdominal segment setae II do not stand on a common pinaculum.

This monotypical genus was erected by Meyrick in 1926 and retained by Obraztsov. The one species belonging to it was previously in the genus Grapholitha and later in the genus Semasia. According to Obraztsov's new system the spp. of Grapholita (Laspeyresia) are in the Laspeyresiini, the spp. of Semasia in the Eucosmini. Since group VII on the 9th abdominal segment consists of one seta as in the Laspeyresiini, Lathronympha comes closer to these genera than to the Eucosmini. Great differences from the genus Laspeyresia, as is evident from the key, larvo-systematically justify retention of the monotypical genus.

Lathronympha hypericana (Hübner 1822)(2022).

Caterpillar whitish, strongly granulated by small brown spinules. Head light to dark brown, cervical and anal shields, thoracic legs, and pinaculi as well as the prespiracular shield dark brown. The 2nd ocellus is equidistant from the 1st and 3rd, on the cervical shield IIIa is closer to III than to IX. Seta IV of the dark brown prespiracular shield is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsad from III, seta VIII stands on the coxa. On all abdominal segments IIIa is distinctly set off from the pinaculum of seta III, IV and V are diagonally situated, sometimes nearly vertical on the 1st abdominal segment. On the 8th abdominal segment the distance between setae II is not smaller than that between setae I, III is found on the same level with the spiracle or somewhat lower down. Setae II on the 9th abdominal segment do not stand on a common pinaculum but on 2 pinaculi which are contiguous. Setae I and III, as well as IV, V, and VI on the 9th abdominal segment are found on common pinaculi. Setae VIII on the 8th and 9th abdominal segments are approximately equally far apart. The uniserial circles of hooks of the parapodia count 19-21, those of the caudal disk 8-10 hooklets.

The caterpillar lives from April to the last of July in 2 to 3 generations between spunup tip-leaves, flowers or fruits of Hypericum perforatum.

Locality: Erlangen on May 8, 1952 between spun-up leaves on H.perforatum.

The tribe Eucosmini.

Diagnosis: On the 9th abdominal segment setae I and III are always on one common pinaculum. On the abdominal segments V is at most half as long as IV, the coronal suture is not longer than the adfrontalia are wide at the level of the clypeus-apex (fig. 170). On the 9th abdominal segment, group VII counts 2 setae, if only one, then on the 7th and 8th abdominal segment group VII must consists of 2 setae, of one seta on the 9th and VI must be wholly lacking on the 9th abdominal segment or IV must be vertically arranged with V on all abdominal segments. If setae IV and V are vertically placed only on the 1st abdominal segment, then III on the 8th abdominal segment is not found on the same level with the spiracle.

According to Obraztsov's most recent investigations, the Olethreutinae were divided up into 3 tribes of which the Eucosmini stand between the Laspeyresiini and Olethreutini. Even larvo-morphologically we come to the exceptions to this classification discussed below. Larvo-systematically, I find myself compelled to change the

delimitation on the one hand with respot to the Laspeyresiini and on the other hand to the Oelthreutini. As Obraztsov wrote me, the monotypical genus Eucosmorpha and the genus Enarmonia occupy an intermediate position from the Laspeyresiini to the Eucosmini, in which Eucosmorpha albersana is closer to the Laspeyresiini and Enarmonia woeberiana to the Eucosmini. For this reason he referred Eucosmomorpha to the Laspeyresiini and indicated the imaginally weaker kindred relations to the Eucosmini by the naming of the genus, and referred Enarmonia to the Eucosmini. The two spp. Eucosmomorpha albersana and Enarmonia woeberiana earlier stood side by side in one genus and are larvomorphologically hard to separate from each other. Since like all Eucosmini species they have 2 setae in group VII on the 9th abdominal segment, instead of one as in the Laspeyresiini, I am referring Eucosmomorpha albersana to the Eucosmini and placing it beside woeberiana in the genus Enarmonia. In my opinion I am supported by Meyrick's system (1927) - he referred albersana to the genus Eucosma.

I have come to a second result differing from Obraztsov, with respect to delimitation of the Eucosmini from the Olethreutini. Obraztsov cited the genus Ancylis as the last of the Eucosmini and informed me, in reply to my questions, that Ancylis also shows imaginal kindred relations to the Olethreutini, but is still closer to the Eucosmini.

In all species of Eucosmini setae I and III stand on a common pinaculum on the 9th abdominal segment and on the abdominal segments V is at most half as long as IV. On the other hand, in the genus Ancylis - as in most of the Olethreutini, setae I and III on the 9th abdominal segments are always on separate pinaculi and on the abdominal segments V is nearly as long as IV. Since in this case it is a matter of a fundamental character with which I myself can separate about a hundred species of Eucosmini examined by me, from the Oelthreutini, moreover also there are imaginal kindred relations to the Olethreutini, I am referring the genus Ancylis to the Olethreutini.

The species profundana must also be re-assigned; it has already caused difficulties in regard to its placement in the imaginal system. In Rebell's catalog (1901) it is placed in the genus Olethreutes (Argyroploce), in Kennel (1908) in the genus Semasia, in Spuler (1910) in the genus Epinotia, in Meyrick (1927) again in the genus Argyroploce (Olethreutes). As Obraztsov told me in a letter he placed it in the genus Eudemis of the Eucosmini.

But the classification of the spicies is indisputable larvo-morphologically. Since on the 9th abdominal segment setae I and III stand on separate pinaculi and on the abdominal segments setae IV and V are practically of the same length this species can only be placed in the tribe of the Olethreutini so that only Rebel's and Meyrick's views can be larvo-systematically defended. Since this species agrees in its larvae, with the generic characters of Olethreutes (Argyroploce), I am again placing profundana in this genus.

Genera of the Eucosmini.

1 (2) On the 7th and 8th abdominal segments seta group VII consists of 2; on the 9th only of one seta. The circles of hooks of the parapodia are biserial or at least biserial on the posterior margin. On the 9th abdominal segment setae IV, V, and V stand on a common pinaculum. Setae VIII on the 9th abdominal segment are never farther apart than on the 8th Notocelia

2 (1) The caterpillars are not simultaneously equipped with the characters cited under couplet 1.

3 (14) On the 9th abdominal segment setae IV, V, and V stand on separate, not on a common, pinaculum, if VI is absnet then group VII on the parapodia [sic!] counts 4 setae. On the 1st and 2nd abdominal seg-

ments group VII consists of 3, on the 9th of 2 setae. The 4th ocellus is equidistant from the 3rd and 6th. (All caterpillars occur only on conifers).

4 (5) On the parapodia group VII counts 4 setae (fig. 139) Petrova
5 (4) On the parapodia group VII counts 3 setae.
6 (9) Cervical shield granulated by microscopically small spinules, or group VII on the 7th abdominal segment consists of 3 setae.
7 (8) On the 7th abdominal segment group VII counts 3 setae Barbara
8 (7) On the 7th abdominal segment group VII counts 2 setae Coccyx
9 (6) The cervical shield is quite smooth, microscopically small spinules absent. On the 7th abdominal segment group VII consists of 2 setae.
10 (13) Behind the spiracle of the abdominal segment is found seta IVa additionally, the one on the 8th abdominal segment is always to be clearly recognized.
11 (12) Hooklets of the circles of hooks on the parapodia irregularly sized so that the circles of hooks seem to be biserial rather than uniserial. Clavigesta
12 (11) The hocklets of the circles of hooks on the parapodia are uniformly sized so that the circles of hooks are distinctly uniserial Rhyacionia
13 (10) Seta IVa is lacking behind the spiracles of the abdominal segments, even on the 8th Pseudococcyx
14 (3) Caterpillars not simultaneously equipped with the characters cited under couplet 3.
15 (16) On the 8th abdominal segment III is dorsocraniad from the spiracle, setae II are not closer together than setae I. On the 9th abdominal segment, VI is present Pseudeucosma
16 (15) On the 8th abdominal segment III is ventrocraniad from the spiracle or on the same level with this. If III is dorsocraniad from the spiracle then seta VI is absent from the 9th abdominal segment or the distance between setae II on the 8th abdominal segment is less than that between setae I.
17 (26) The circles of hooks are completely uniserial and the spiracle of the 2nd abdominal segment is larger than the insertion place of seta III. If on the 1st and 2nd abdominal segments group VII consists of 2 setae, then setae VIIa, VIIb, and VIIc must be arranged in a triangle on the base of the parapodia.
18 (19) On the 7th abdominal segment group VII counts 3 setae. On the ventral aspect of the caudal disk are found 4 setae of which 2 stand on 1 pinaculum Thiodia
19 (18) On the 7th abdominal segment group VII consists of 2 setae or there are only 3 setae on the ventral aspect of the caudal disk of which each stands on a pinaculum of its own.
20 (21) The black-brown anal shield is granulated by microscopically small spinules Foveifera
21 (20) The anal shield is smooth, not granulated by microscopically small spinules.
22 (25) On the prespiracular shield seta IV is ventrad from V and VI, or seta III on the cervical shield is closer to IIIa than to IX.
23 (24) On the 8th abdominal segment setae II are farther apart than setae I. On the mesothorax IIIa is dorsad or dorsocaudad from III. In case of doubt the distance between setae VIII on the 9th abdominal segment is larger than on the 8th Eucosma

24 (23) On the 8th abdominal segment setae II are not farther apart than setae I, mostly they are even closer together, or on the mesothorax IIIa is dorsocraniad from III Epiblemma

25 (22) On the prespiracular shield setae V, IV, and VI are situated in a line and on the cervical shield IIIa is at least as far from III as from IX Acroclita

26 (17) The circles of hooks are completely or section-wise biserial, but if uniserial then the spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III, or group VII consists of 2 setae on the 1st and 2nd abdominal segments and setae VIIa, VIIb, and VIIc are situated in a row on the base of the parapodia.

27 (28) On the 1st abdominal segment group VII consists of 2 setae, on abdominal segments 1 to 7 inclusive, IV and V are vertically arranged Pardia

28 (27) On the 1st abdominal segment group VII consists of 1 to 3 setae if of 2 then IV and V are not vertically arranged on abdominal segments 1 to 7, but rather at most on the 1st abdominal segment.

29 (30) Cervical shield medianly drawn out toward the head (fig. 168), the spiracles are all very large and very strongly elliptical. Caterpillar up to 30 mm long Cacochroa

30 (29) Caterpillar not provided with the characters cited under 29.

31 (32) On the 7th abdominal segment, group VII consists of 3 setae and on the mesothorax seta VII stands on the coxa or right on the margin of the coxa. Caudal disk with 20-25 hooklets Enarmonia

32 (31) On the 7th abdominal segment group VII consists of 2 setae, if of 3 then on the mesothorax seta VIII is distinctly set off from the coxa and the caudal disk is provided with 30-35 hooklets.

33 (34) On the prespiracular shield setae V, IV, and VI are arranged in a diagonal line in which case V is the lowest. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. On the mesothorax IIIa is dorsocraniad from III and on the cervical shield the distance between IX and IIIa is greater than that between IIIa and III. Parapodia laterally brownchitinized Spilotana

34 (33) Caterpillars not with all the characters cited under 33, at the same time.

35 (36) There is a darker chitinized "sole-spot" [i.e., ?spot shaped like the sole of a slipper, etc.] in the middle of the parapodia, on the 8th abdominal segment III is dorsocraniad from the spiracle (fig. 172) Gypsonomoides

36 (35) Parapodia without the chitinized "sole-spot" in the middle, on the 8th abdominal segment III is mostly ventrocraniad from the spiracle or on the same level as this.

37 (48) On the prespiracular shield setae V, IV, and VI stand in a line and on the 1st abdominal segment IV and V are vertically arranged, or on the mesothorax IIIa is found dorsocraniad from III, or setae II on the 9th abdominal segment are found on separate pinaculi. On the 7th abdominal segment group VII always consists of 2 setae.

38 (43) On the mesothorax IIIa is dorsocraniad from III and on the cervical shield the distance between III and IIIa is at least as great as that between IIIa and IX. On the 1st and 2nd abdominal segments, group VII consists of 3 setae, always.

39 (40) Circles of hooks on the parapodia completely biserial Zeiraphera

40 (39) The circles of hooks of the parapodia are biserial, but laterally or cranially they are uniserial (fig. 184 and 177).

41 (42) On the 1st abdominal segment setae IV and V are diagonally arranged on the 2nd abdominal segment the spiracles are larger than the insertion place of seta III Rhopobota

42 (41) On the 1st abdominal segment setae IV and V are vertically arranged and on the 2nd abdominal segment the spiracles are not larger than the insertion place of seta III — Gypsonoma nitidulana

43 (38) On the mesothorax IIIa is dorsocaudad from III, if dorsocraniad then on the cervical shield seta III is closer to IIIa than to IX. On the 1st and 2nd abdominal segments group VII consists of 2 or 3 setae.

44 (45) On the 1st abdominal segment group VII counts 2 setae — Gypsonoma

45 (44) On the 1st abdominal segment group VII counts 3 setae.

46 (47) Seta VIII stands very close to the margin of coxa on the mesothorax, on the cervical shield III is closer to IIIa than seta IX and on the mesothorax IIIa is dorsocraniad from III — Gibberifera

47 (46) Seta VIII on the mesothorax is distinctly set off from the coxa, on the cervical shield III is at least as far removed from IIIa as seta IX and on the mesothorax IIIa is dorsad or dorsocaudad from III — Griselda

48 (37) On the prespiracular shield seta IV is ventrad from V and VI and on the 9th abdominal segment setae II are always found on a common pinaculum. If on the prespiracular shield IV, V, and VI are arranged in one line, then setae IV and V stand diagonally on the 1st abdominal segment and IIIa is dorsad or dorsocaudad from III on the mesothorax — Epinotia

The genus Enarmonia Hübner 1825-26.

Diagnosis: Coronal suture not substantially longer than the adfrontalia are wide at the level of the clypeus apex. Setae I and II on the 9th abdominal segment stand on one pinaculum, on the 7th abdominal segment group VII counts 3, on the 8th and 9th segments, 2 setae. Seta VIII on the mesothorax stands on the coxa or very close to the margin of the coxa.

The two spp. of this genus are, according to most older systems, in the genus Laspeyresia. Obraztsov (1951) referred woeberiana to the genus Enarmonia, which can be completely justified larvo-morphologically; on the other hand he erected the monotypical genus Eucosmomorpha of the Laspeyresiini*. But since this species stands in one genus with woeberiana and the two are very hard to separate, I am re-adding albersana to woeberiana in the genus Enarmonia.

*insert: for albersana

Spp. of Enarmonia.

1 (2) On the 9th abdominal segments the pinaculi of (I,III) and (II,II) are contiguous or are even fused to a spot of chitin. Cervical and anal shields with small dark punctures [or dots] (fig. 126 and 127) — woeberiana

2 (1) On the 9th abdominal segment pinaculi (I,III) and (II,II) are distinctly separated from each other. The cervical shield is provided with a large dark spot between setae II and III (fig. 128). Anal shield not punctate [or dotted]. — albersana

Enarmonia woeberiana (Schiffermüller 1776)(2157).

Caterpillar whitish, strongly granulated by small brown spinules, head light brown, cervical shield, pinaculi, anal shield pale brownish gray, moreover on the cervical shield there are frequently dark punctures [or dots] around seta III (fig. 126), on the anal shield there are such dots between the anterior margin and the first setae (fig. 127). Second ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is ventrad from V

and VI, somewhat closer to V. Seta VIII on the mesothorax is found right on the margin of the coxa. The distance between setae II and setae I is the same on the 8th abdominal segment. On all abdominal segments IV and V are diagonally arranged, on the 8th II is ventrocraniad from the spiracle, IIIa is not on one pinaculum with III. On the 8th abdominal segment the pinaculi (I,III) and (II,II) are fused to a spot of chitin or at least they are contiguous, the setae IV, V, and VI are found on one pinaculum. The spiracles are elliptical, twice as large on the 8th abdominal segment as on the 2nd, these not larger than the insertion place of seta III. On the 1st, 2nd, and 7th abdominal segments group VII counts 3 setae, on the 8th and 9th, 2 setae. The circles of hooks of the parapodia are biserial, but uniserial on the side. Parapodia with about 36, caudal disk with about 20 hooklets.

Sept. to June in bast of Pirus and Prunus, in which the infestation is betrayed by appearance of excreta and flow of gum. The larvae of the Bavarian St.Coll. examined, had been found by Disque near Speyer on 4/23/11 on Prunus cerasus and persica.

Enarmonia albersana (Hübner 1822)(2155).

Caterpillar yellowish white, head, cervical shield light brown to ocheryellow, on the cervical shield a dark spot is found between setae II and III (fig. 128). Body granulated by small brown spinules. On the cervical shield IIIa is somewhat farther removed from III than from IX. Spiracles of 2nd abdominal segment not larger than the insertion place of seta III, on the 8th abdominal segment III is found on the same level as the spiracle. On the 9th abdominal segment the pinaculi (I,III) and (II,II) are distinctly separated from each other. The biserial circles of hooks of the parapodia are also uniserial on the side and count about 30, those of the caudal disk about 25 hooklets. This species agrees with woeberiana in the other characters.

Aug. and Sept. between spun up leaves on Lonicera and Symphoricarpus.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Aug. 24, 1891 near Potsdam and by Disque on Sept. 30 near Speyer on Symphoricarpus.

The next 5 genera arose by splitting up of the former genus Evetria. The latter can be well characterized by larvo-morphological characters. But since among the caterpillars of the spp. belonging to it, there are distinct differences which lead to the same grouping of spp., as Obraztsov undertook to make in his imagino-systematic point of view, I am also differentiating the 5 genera.

The genus Rhyacionia Hübner 1825.

Diagnosis: On the 9th abdominal segment setae IV, V, and VI stand on separate, not on a common, pinaculum. On the 7th, 8th, and 9th abdominal segments, group VII counts 2 setae. On the abdominal segments, especially clearly on the 8th, seta IVa is found behind the spiracle. Cervical shield not granulated, circles of hooks uniserial. On the mesothorax VIII is distinctly set off from the coxa, group VII counts 3 setae on the parapodia.

Spp. of Rhyacionia

1 (2) Circles of hooks on the parapodia with about 48 hooklets — pinivorana
2 Circles of hooks of the parapodia with 10-20 hooklets.
3 (4) On the 8th abdominal segment the distance between setae II is greater than that between setae I, on the 9th abdominal segment setae II do not stand on a common pinaculum — buoliana
4 (3) On the 8th abdominal segment the distance between setae II is less than that between setae I, on the 9th abdominal segment setae II are found on a common pinaculum — duplana

Rhyacionia buoliana (Schiffermiller 1776)(1851).

Caterpillar reddish brown, strongly granulated by microscopically small brown spinules. Head black to blackbrown, cervical shield, thoracic legs black brown. Cervical shield not granulated. 2nd ocellus closer to the 1st than to the 3rd. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. The pinaculi on the mesothorax are only weakly indicated, also setae IIIa and III, as well as IV and V do not stand on distinctly developed pinaculi. On all abdominal segments IV and V are diagonally arranged, seta IVa is found behind the spiracles (see fig. 131, 132). The spiracles are round, on the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment setae II are farther apart than setae I, III is found dorsocraniad from the spiracle, IVa behind this (fig. 129). On the 9th abdominal segment setae II stand on separate pinaculi, I and III on a common pinaculum, setae IV, V, and VI stand alone or only the pinaculi of IV and V are sometimes fused. The distance between setae VIII on the 9th abdominal segment is not greater than on the 8th. The parapodia are blackbrown chitinized on the sides (see fig. 224), their uniserial circles of hooks count 18-20, those of the caudal disk 15-18 hooklets.

Much has already been reported in forest literature on the biology of this abundant forest pest. The adult flies in June and July, the egg-larvae hatch in July and Aug., and feed in the buds which are then hollowed out on the inside. The separate buds are then conspicuously stuck together by the resin flow. In the primary feeding time the following spring the caterpillars sometimes feed in the shoots. Pupation occurs in April and May in the hollowed out buds from which the pupae creep before emergence of the adults Different spp. of Pinus, especially younger stands (12-25 year old trees) come into question as food plants.

Locality: Erlangen on April 20, 1951, on Pinus silvestris.

R.pinivorana (Zeller 1846)(1848).

Caterpillar redbrown, strongly granulated by small brown spinules. Head black to black-brown, cervical shield (fig. 130), thoracic legs black-brown, anal shield somewhat lighter, dark punctate [or dotted]. On the abdominal segments setae IV and V as a rule are diagonally arranged, but nearly horizontally situated on the 8th abdominal segment, IVa is found behind the spiracle (fig. 131 and 132). Setae VIII on the 9th abdominal segment are farther apart than on the 8th. The uniserial circles of hooks of the parapodia count about 48, those of the caudal disk about 35 hooklets. This species agrees larvo-morphologically with buoliana in other characters.

The caterpillar is already living in buds of Pinus silvestris in the fall, but is found in the last instars for the most part only in April and May. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 1, 1904 near Speyer on Pinus silvestris.

R.duplana (Hübner 1822)(1844).

Caterpillar light yellow-brown, waxy colored, granulated by microscopically small spinules. Head dark brown, the cervical shield paler brown, anal shield of the same color as the body. 2nd ocellus closer to the 1st than to the 3rd. On all abdominal segments IV is diagonally arranged with V. On the cervical shield IIIa is somewhat closer to III than to IX. On the 8th abdominal segment the distance between setae II is less than that between setae I, on the 9th abdominal segment (fig. 133) setae II are found on an indistinct pinaculum, setae VIII are farther apart than on the 8th abdominal segment. The spiracles are only very weakly developed. Parapodia not dark-brown chitinized on the sides. The count of hooklets on the parapodia amounts to 14-18, that of the caudal disk about 10. Otherwise there is no larvo-morphological difference between buoliana and pinivorana.

The adult is already flying in March and April and oviposits on the winter buds from where the caterpillars eat their way downward into the early growth. The hollowed-out shoots bend down, dry up, and finally break off. Pupation occurs in May, the first of June; the pupae overwinter in the shoots that have been eaten out or in a web in the angle of a branch. Different Pinus spp. have been reported as host plants.

The caterpillars from the Collection that were examined had been found by Disque on June 5, 1897 near Thalhaus.

The genus Clavigesta Obraztsov 1946.

Diagnosis: On the 9th abdominal segment setae IV, V, and VI do not stand on a common pinaculum. On the 7th, 8th, and 9th abdominal segments group VII counts 2 setae. On the abdominal segments seta IVa is found behind the spiracle. The hooklets on the parapodia are of irregular sizes so that the circles of hooks seem to be more biserial than uniserial.

Obraztsov erected this monotypical genus as new in 1946, larvo-morphologically it stands nearest the preceding in which the cervical shield is likewise not granulate and seta IVa is found on the abdominal segments behind the spiracle. The only, but great, difference consists in the development of the "circle-feet" [i.e., prolegs with circles of hooks on them, ?parapodia, or ? caudal disks, or ?both together].

C. sylvestrana (Curtis 1850)(1846).

Caterpillar reddish brown to violet gray, strongly granulated by small brown spinules. Head black brown to black, cervical shield brown, posteriorly black edged (fig. 134), dark-punctate [or dotted] along the separation line. Anal shield black punctate [or dotted] (fig. 135). The pinaculi of the mesothorax are not distinctly developed (fig. 136). On the 8th abdominal segment the distance between setae II is less than that between setae I, on the 9th abdominal segment the setae VI II are farther apart than on the 8th. The hooklets of the "circle feet" are of different sizes so that these are rather to be called biserial than uniserial. Parapodia with about 35, caudal disk with about 30 hooklets. Pinaculi hardly developed. This species agrees with R. buoliana in other characters.

The caterpillar lives from Aug. to April. in buds and shoots, in May mostly in the ♂ inflorescences of Pinus silvestris, P. maritima, and picea. The adult flies in June. This species occurs only in North Germany, Belgium, France, and England.

The caterpillars from the Bavarian State Collection that were examined had been found by de Crombrügghe on May 31, 1902 near Brussels in ♂ inflorescences of P. maritima.

The genus Barbara Heinrich 1923.

Diagnosis: On the 9th abdominal segment setae IV, V, Vi do not stand on a common pinaculum, on the 7th abdominal segment group VII consists of 3 setae, on the 8th and 9th abdominal segments of 2 setae.

This monotypical genus also seems to be larvo-morphologically justified, since on the 7th abdominal segment group VII consists of 3 setae while in closely related genera it counts only 2 setae. It agrees in this character only with the genus Petrova, but differs from this genus in the number of setae of group VII on the parapodia. This genus is nearest the genus Coccyx in which the cervical shield is likewise granulate and seta a is not found behind the spiracles of the abdominal segments.

Barbara margarotana (Herrich-Schäffer 1856)(1853).

Caterpillar greenish brown, strongly granulate by small brown spinules. Head, cervical shield, thoracic legs, and anal shield black-brown, the area around the insertion places of the setae on the anal shield is lighter. (Fig. 137). Cervical shield granulated but more weakly so than in Coccyx posticana. On the prespiracular shield, IV is ventrad from V and VI, equidistant from both. On the abdominal segments seta IVa is absent, III is dorsocraniad from the spiracle, on the 8th abdominal segment it is exceptionally ventrocraniad or on the same level as the spiracle. The distance between setae II on the 8th abdominal segment is larger than that between setae I. On the 9th abdominal segment setae VIII are farther apart than on the 8th, an additional seta shows up occasionally beside setae II and III. The uniserial circles of hooks of the parapodia count 22, those of the caudal disk about 16 hooklets. In the other characters important for differentiation this species agrees with Rhyacionia buoliana.

April to March in cones of Abies alba and nordmanni. This species has been reported from West Germany, Lower Austria, Bohemia, and Silesia.

The caterpillars from the Collection that were examined were found by Disque in cones of Abies nordmanii near Sanssouci.

The genus Petrova Heinrich 1923.

Diagnosis: Group VII on the parapodia counts 4 setae.

This monotypical genus is also completely justified larvo-morphologically, for it does not happen elsewhere in caterpillars of the Tortricidae that group VII consists of 4 setae on the parapodia (fig. 139).

Petrova resinella (Linné 1758)(1855).

Caterpillar yellow-brown with small dark pinaculi, head, cervical shield dark-brown. Anal shield lighter brown. Head and cervical shield may also be lightbrown sometimes. Body strongly granulated by small brown spinules, cervical shield not granulated. The 4th ocellus is equidistant from the 3rd and the 6th (fig. 138). On the 1st and 2nd abdominal segments Group VII counts 3 setae, on the 3rd to the 6th, 4 setae, on the 7th, 3, and on the 8th and 9th abdominal segments 2 setae. Setae IV, V, and VI on the 9th abdominal segment do not stand on a common pinaculum, VI is sometimes lacking. On all abdominal segments IV is vertically arranged with V, III on the 8th abdominal segment is dorsocraniad from the spiracle, IVa is not present, the distance between setae II and setae I is equally great. Setae VIII on the 8th and 9th abdominal segments are about equally far apart, the spiracles are round and so large that they can be recognized as brown dots even with the naked eye. The uniserial circles of hooks of the parapodia (fig. 139) count 19-21 (20), the caudal disk about 13-14 hooklets

Pupation takes place in April and May, the adults fly in May and June. The caterpillar overwinters twice, it lives in the bast of various spp. of Pinus and produces galls from the resin flowing out which are unicameral in the 1st year, bicameral in the 2nd. This species is also very abundant in the environs of Erlangen.

Locality: Erlangen Reichswald, the whole year through in resin galls of Pinus silvestris.

The genus Coccyx Treitschke 1830.

Diagnosis: On the 9th abdominal segment, setae IV, V, and VI do not stand on a common pinaculum, on the 7th, 8th, and 9th abdominal segments group VII counts 2

setae, the cervical shield is granulated by small spinules. The 2nd ocellus is equidistant from the 1st and 3rd. On the abdominal segments seta IVa is not present. On the 8th abdominal segment III is found on the same level as the spiracle.

Larvo-morphologically this genus comes nearest the genus Barbara by reason of the granulated cervical shield as well as in other characters, but differs from this by the possession of 2 setae in group VII on the 7th abdominal segment.

Spp. of Coccyx.

1 (2) IV arranged vertically with V on the 1st abdominal segment posticana
2 (1) IV arranged diagonally with V on the 1st abdominal segment turionana

Coccyx posticana (Zetterstedt 1840)(1847),

Caterpillar redbrown, head and cervical shield black to black-brown, anal shield lighter brown. Body and cervical shield granulated by microscopically small spinules. On the cervical shield IIIa is equidistant from III and IX, of the prespiracular shield group only setae IV and VI stand on a pinaculum, V in front of it (fig. 140). The pinaculi are not distinctly developed also on the mesothorax (fig. 141). On the 1st abdominal segment IV and V are vertically situated, on the 8th horizontally situated, on the rest diagonally situated. On the 7th, 8th, and 9th abdominal segments group VII counts 2 setae, on the others 3 setae. IIIa on the 1st to the 7th abdominal segments is dorsocraniad from the spiracle, III above it. Seta IVa not present. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II are not found on a common pinaculum, the distance between setae VIII is somewhat greater than on the 8th abdominal segment. Parapodia not chitinized on the side, the circles of hooks count about 16, those of the caudal disk about 14 hooklets.

Aug. to Apr. in buds of Pinus silvestris. The caterpillas from the Bavarian State Collection that were examined had been found by Disque on Oct. 6, 1900 near Speyer in buds of P.silvestris.

Coccyx turionana (Hübner 1822)(1849)

Caterpillar light-dirtybrown, head black, cervical shield small, dark-brown. Cervical shield granulated by small spinules. On the 1st abdominal segment IV and V are diagonally arranged. In all other characters this species completely agrees with posticana.

June to April in buds of Pinus silvestris and Abies.

Locality: Erlangen Reichswald, March 15, 1952 in buds of P.silvestris. The caterpillars from the Bavarian State Collection were found by Disque on Oct. 30, 1911 near Speyer.

The genus Pseudococcyx Obraztsov i.lit.

Diagnosis: On the 9th abdominal segment setae IV, V, and VI are not found on a common pinaculum, on the 7th, 8th, and 9th abdominal segments group VII counts 2 setae. On the abdominal segments seta IVa is lacking behind the spiracles, the cervical shield is not granulated.

This monotypical genus also stands nearest the preceding larvo-morphologically, yet the cervical shield is not granulated by microscopically small spinules and III is dorsocraniad from the spiracle on the 8th abdominal segment.

Pseudococcyx tessulatana (Staudinger 1871)(1852).

No ~~previous~~ description of the caterpillar is on hand.

Caterpillar yellowish to reddish brown, head, cervical shield brown, the latter dark-bordered behind (fig. 142). Body strongly granulated by small spinules, pinaculi brown developed. 2nd ocellus closer to the 1st than to the 3rd, cervical shield not granulated. Prespiracular shield only weakly indicated, seta IV is equally far from from V and VI. The distance between setae II on the 8th abdominal segment is somewhat less than that between setae I or it is the same. III is dorsocraniad from the spiracle, IV and V horizontally situated. On all other abdominal segments IV and V are diagonally placed. The distance between setae VIII on the 8th and 9th abdominal segments is approximately equal. The hooklets of the uniserial circles of hooks are smaller on the side than those turned toward the Mediana. Parapodia and caudal disk with about 22 hooklets.

The caterpillar lives from Sept. to Apr. in fruits of the cypress. This species does not occur in Germany. It was known only from Spain, South France, North Italy, and Asia Minor

The caterpillars from the Bavarian State Collection that were examined had been found by Krone on July 6, 1908, near Gravosa (Dalmatia) in fruits of Cupressus.

The genus Spilotana Stephens 1829
syn. Tmetocera Lederer 1859

Diagnosis: On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th segments 2 setae. Setae II, as well as setae I and III, on the 9th abdominal segment stand on common pinaculi. The distance between setae VIII on the 9th abdominal segment is larger than on the 8th. The biserial circles of hooks are uniserial on the side. On the prespiracular shield setae V, IV, and VI are situated on a diagonal line.

This genus can be readily characterized larvo-morphologically. Hitherto only one European species belongs to it, now, according to Obraztsov who conceived of the variety lariciana as a good species, it consists of 2 spp. However, larvo-systematically, as is evident from the key and the descriptions, the difference is so small that lariciana could be conceived of as a variation. But since Obraztsov investigated a differentiated stage in the imagines and there are small differences between the caterpillars, lariciana mostly occurring on Larix, I would like to join in with his concept.

Spp. of Spilotana.

1 (2) Spiracles of prothorax elliptical, caterpillar reddish-brown, occurrs mostly on various deciduous trees ocellana
2 (1) Spiracles of prothorax round, caterpillar gray-brown, occurs mostly on Larix lariciana

Spilotana ocellana (Schiffermiller 1776)(2255).

Caterpillar reddish-brown, strongly granulated by small brown spinules. The large shining pinaculi are mostly of the body coloring. Head, cervical shield black. Anal shield lighter or darker brown. 2nd ocellus equidistant from the 1st and 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield the distance from IX to IIIa is greater than from IIIa to III. On the prespiracular shield setae IV, V, and VI are situated in a diagonal line, in which V is situated lowest down. Seta IIIa on the mesothorax is dorsocraniad from III, seta VIII distinctly set off from the coxa. On the 1st abdominal segment IV is vertically situated with V, on the others they are diagonally ar-

ranged, IIIa stands on the margin of the pinaculum of III only on the 8th abdominal segment. On the others IIIa is distinctly set off from it. Spiracles of the 1st and 2nd abdominal segments the same size, on the 2nd they are round and not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not greater than that between setae I III is found on a large pinaculum somewhat ventrocranied from the spiracls. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI, stand on common pinaculi, the distance between setae VIII is larger than on the 8th abdominal segment. The prothoracic spiracles are elliptical. The parapodia are chitinized dark-brown on the side (see fig. 172) their biserial circles of hooks consist of about 36 hooklets and are uniserial on the side. Caudal disk with about 20 hooklets.

May, June very polyphagus, first between spun-up tip-leaves, later in individual leaves on different fruit trees, as well as Alnus, Crataegus, Sorbus, etc.

Locality: Tennenloher Wald on June 13, 1951 in a leaf roll on Alnus.

S. lariciana (Heinemann 1863)(2255a).

Caterpillar gray-brown, strongly granulate by small brown spinules. Head, cervical shield, anal shield, thoracic legs black-brown to black, the large shining pinaculi of the body color. Spiracles of the 1st abdominal segment distinctly larger than on the 2nd, also on the protnorax they are round. Parapodia with about 33, caudal disk with about 24 hooklets. In all other characters this species agrees larvo-morphologically with ocellana.

Obraztsov considers lariciana a separate species, while it was formerly considered as only a variety of ocellana.

May, June between spun up tufts of needles on Larix, but also forces its way into the short shoots. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 21, 1896 between spunup needles and in the short shoots of Larix.

The genus Thiodia Hübner 1825.

Diagnosis: Group VII counts 3 setae on the 1st, 2nd, and 7th abdominal segments, 2 setae on the 8th and 9th. The circles of hooks are uniserial. 4 setae are found on the ventral side of the caudal disk, two of which always stand on one pinaculum. On the 9th abdominal segment setae II, as well as I and III, also IV, V, and VI are found on common pinaculi.

Only one species occurs in central Europe, 4 more were known from Anatolia.

Thiodia citrana (Hübner 1822)(2035)

I could not find a description of the larva anywhere, the following is taken from the caterpillars from the Bavarian State Collection that were examined.

Caterpillar yellowish-white, strongly granulated by small brown spinules. Head, cervical shield black-brown to black, pinaculi and anal shield lighter brown, the latter with darker dots [or punctures] (fig. 143). On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III, IV and V on all abdominal segments are diagonally arranged, or vertically on the first abdominal segment. Seta IIIa on the abdominals segments always stands on the margin of pinaculum III. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found on the same level as the spiracle. On the 9th

abdominal segment setae VIII are farther apart than on the 8th. The uniserial circles of hooks of the parapodia count about 20, those of the caudal disk about 10 hooklets.

According to Schütze (1931) Aug. to May in spun-up flowers of Achillea millefolium, Artemisia, and Anthemis, according to Disque also in the stem.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 16, 1896 near Speyer in the upper part of the stem of Artemisia vulgaris.

The genus Foveifera Obraztsov 1946

Diagnosis: On the 1st to the 7th abdominal segments group VII counts 3 setae, on the 8th and 9th 2 setae. Anal shield granulated by microscopically small spinules. On the 9th abdominal segment setae II are found on separate pinaculi, I and III, as well as IV, V, and VI on common pinaculi.

Obraztsov chose this new designation for the earlier genus name Rhyacionia since the earlier name was already given to the Evetria relatives.

Foveifera hastana Hübner 1822 (2016)
syn. torridana (Lederer 1859) according to Obraztsov.

The caterpillar is dark-brown, strongly granulated by small brown spinules. Head chestnut brown, cervical and anal shields nearly black, pinaculi brown. The clypeus reaches onto the posterior margin of the head (fig. 144). 2nd ocellus closer to the 3rd than to the 1st. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. The seta IV on the prespiracular shield stands ventrad from V and VI, being somewhat closer to V, on the mesothorax setae I, II, IIIa, III, IV, and V are arranged in one line (fig. 145). On the 1st abdominal segment IV is vertically, on the 8th horizontally, on the others diagonally placed with V. Spiracles of the 2nd abdominal segment larger than the insertion place of seta III, IIIa is distinctly set off from the margin of pinaculum III. On the 8th abdominal segment setae II are not farther apart than setae I, III is ventrocraniad from the spiracle. The distance of setae VIII is greater on the 9th abdominal segment than on the 8th. The uniserial circles of hooks of the parapodia count 16-20, those of the caudal disk about 14, hooklets.

May between spun-up leaves on Scabiosa, Succisa pratensis; also Gnaphalium and Hieracium were reported as food plants. The caterpillars from the Bavarian State Collection that were examined had been found by Eppelsheim on May 26, 1895 between spun-up leaves on Scabiosa.

The genus Eucosma Hübner 1822

Diagnosis: The circles of hooks of the parapodia are uniserial, the spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment setae II are farther apart than setae I, on the mesothorax IIIa is dorsad or dorsocaudad from III.

The species - trisignana - I am referring to the genus Epinotia since it has biserial circles of hooks. For the same reason I am returning pauperana to the genus Epinotia.

Subgenera and spp. of Eucosma.

1	(12)	Circles of hooks of parapodia elliptical and the 4th ocellus is closer to the 3rd than to the 6th	sg Eucosma
2	(3)	On the 9th abdominal segment setae II stand on a common pinaculum	albidulana
3	(2)	On the 9th abdominal segment setae II are on separate pinaculi.	
4	(7)	Caudal disk with 5-7 hooklets.	
5	(6)	Anal shield brown, dark dotted [or punctate] (fig. 149)	cana
6	(5)	Anal shield of the body color, not dark dotted	hohenwartiana
7	(4)	Caudal disk with 10-12 hooklets.	
8	(9)	Parapodia with 12 hooklets	fulvana
9	(8)	Parapodia with 16 to 20 (20) hooklets.	
10	(11)	Anal shield with dark dots [or punctures] (fig. 152)	scutana
11	(10)	Anal shield without dark dots [or punctures]	expallidana
12	(1)	Circles of hooks of the parapodia circular, if elliptical then the 4th ocellus is equidistant from the 3rd and the 6th	sg. Phaneta
13	(20)	Seta VI is lacking on the 9th abdominal segment.	
14	(15)	Seta III on the 8th abdominal segment is dorsocraniad from the spiracle	pupillana
15	(14)	Seta III on the 8th abdominal segment ventrocraniad from the spiracle.	
16	(17)	Parapodia with 17, caudal disk with 12 hooklets	maritima
17	(16)	Parapodia with 14, caudal disk with 8-10 hooklets.	
18	(19)	Cervical shield light brown, dark spots on the posterior margin (fig. 157)	latiorana
19	(18)	Cervical shield uniformly light brown, without any marking	aemulana
20	(13)	Seta VI is present on the 9th abdominal segment.	
21	(22)	On the 7th abdominal segment, group VII counts 3 setae	metzneriana
22	(21)	On the 7th abdominal segment group VII counts 2 setae.	
23	(24)	On the 9th abdominal segment setae II are found on separate pinaculi	conterminana
24	(23)	On the 9th abdominal segment setae II are found on a common pinaculum.	
25	(26)	Group VII consists of 2 setae on the 1st and 2nd abdominal segments	nigromaculana
26	(25)	Group VII consists of 3 setae on the 1st and 2nd abdominal segments.	
27	(28)	On the 8th abdominal segment, setae IV and V are horizontally situated	incana
28	(27)	On the 8th abdominal segment, setae IV and V are diagonally situated.	
29	(30)	Seta III on the 8th abdominal segment is found on the same level as the spiracle. On the 2nd abdominal segment III is situated exactly dorsad from the spiracle, the pinaculum of IIIa is hardly raised from the body	lacteana
30	(29)	Seta III on the 8th abdominal segment is ventrocraniad from the spiracle. On the 2nd abdominal segment IIIa is dorsocaudad from the spiracle, IIIa stands on a pinaculum that is distinctly raised from the body	aspidiscana

The subgenus Eucosma Hübner 1822

Diagnosis: Circles of hooks elliptical and the 4th ocellus closer to the 3rd than to the 6th.

This subgenus embraces only former Epiblema spp.

Eucosma (E.) albidulana (Herrich-Schäffer 1854)(2082)

Caterpillar yellowish white, red-saddled, yellowish white on the boundary [sic!] of the segment. Head light to dark brown, cervical shield brownish dark dotted [or punctate] (fig. 146). Body with microscopically small white little hairs. The 4th ocellus is closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX. On the mesothorax IIIa is dorsocaudad from III, VI is closer to IV than to III, the seta VIII is distinctly set off from the coxa. On all abdominal segments IV is diagonally situated with V, all spiracles are elliptical and also they are larger than the insertion place of seta III on the 2nd abdominal segment. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found on the same level as the spiracle. Setae II, also I and III, as well as IV, V, and VI stand on common pinaculi on the 9th abdominal segment. On the 1st and 2nd abdominal segments group VII counts 3 setae, sometimes 2, on the 7th and 8th abdominal segments, 2 setae, and on the 9th, 1, more rarely 2, setae. The uniserial circles of hooks of the parapodia are elliptical and count about 20 hooklets, those of the caudal disk 8-10. The setae of group VII on the parapodia are arranged in a triangle.

According to Spuler (1910) and Schütze (1931) the caterpillar lives on Artemisia spp. Helichrysum, Gnaphalium arenarium, Serratula cinerea. The adult flies in June and July But since Hinneberg found the caterpillars also on Aug. 24, it is to be assumed that they occur from Aug., after overwintering, until in May as is the case with the following very closely related species.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg near Potsdam on Aug. 24, 1900 in flower-heads of Serratula tinctoria.

Eucosma (E.) hohenwartiana (Schiffermiller 1776)
syn. scopoliana Haworth 1811 (2085)

Caterpillar pale reddish yellow with small white hairs. Head yellowish to light brown, cervical and anal shields of the body color. The 4th ocellus is closer to the 3rd than to the 6th, ocelli 1, 2, and 5 are lighter. The spiracles of the prothorax are elliptical, those of the abdominal segments rounded. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae (sometimes on the 9th of 1). Setae II on the 9th abdominal segment stand on separate pinaculi. The uniserial elliptical circles of hooks of the parapodia count 13-15, those of the caudal disk about 6 hooklets. This species and albidulana agree completely, larvo-morphologically, in the other characters.

This species shows up in 2 generations. The adults fly in June, July, and Aug., Sept. The caterpillars live in July and then in the fall until April, May, in flower heads of Carduus, Cirsium, and Centaurea. But overwintering takes place in an earthen cocoon.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque near Speyer on Sept. 9, 1903, in flower heads of Centaurea jacea.

Locality: Erlangen-Rathsberg on Aug. 15, 1953, in flower heads of C.jacea.

Eucosma (E.) fulvana (Stephens 1834)(2084)

Caterpillar yellowish, dorsally red-saddled, the boundaries of the segments are also yellowish. Pinaculi lighter than the body, head light brown, cervical shield yellowish or reddish, anal shield reddish. In young caterpillars the body is paler, head, cervical shield and anal shield darker. Body strongly granulated by small white spinules. The 4th ocellus is closer to the 3rd than to the 6th, the 1st, 2nd, and 5 are

lighter than the others. On the 1st and 2nd abdominal segments, group VII counts 3 setae, 2 on the 7th, 8th, and 9th. On the 9th abdominal segment setae II stand on separate pinaculi, also VI is separated from IV and V. Setae VIII on the 9th abdominal segment are somewhat farther apart than on the 8th. The uniserial circles of hooks of the parapodia count about 12, those of the caudal disk about 10 hooklets. This species agrees with albidulana in other characters.

According to Disque the caterpillar lives in Aug. and Sept. only in flower heads of Picris, according to Meyrick in Centaurea scabiosa, according to other authors also in C.jacea and Cirsium lanceolatum.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 27, 1902 in flower heads of Picris hieracioides near Speyer.

Eucosma (E.) cana (Haworth 1811) (2096).

Caterpillar brownish yellow, strongly granulated. Head, cervical and anal shields, and thoracic legs brown and to be sure darker than in hohenwartiana. Cervical shield dark punctate [or dotted] (fig. 148) near setae X, I, and III, also the anal shield is dark punctate [or dotted] (fig. 149). 3rd ocellus closer to the 4th then to the 6th, the 2nd, 1st, and 5th ocelli are lighter (fig. 147). On the 8th abdominal segment the distance between setae II is greater than that between setae I (fig. 150). On the 9th abdominal segment setae II are found on separate pinaculi, IV, V, and VI do not always stand on a distinctly developed pinaculum. Setae IV and V are diagonally situated on all abdominal segments, but on the first [illegible] nearly vertically situated; IIIa on the abdominal segments does not stand on the pinaculum of III. Only on the prothorax are the spiracles distinctly elliptical, on the abdominal segments they are more round. The elliptical uniserial circles of hooks of the parapodia count 16-20, the caudal disk about 7 hooklets. The additional characters reported for albidulana also show up in this caterpillars.

Aug., Sept. in flower heads of different Compositae, most abundant on Cirsium oleraceum. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 28, 1907 in flower heads of C.lanceolatum.

Eucosma (E.) scutana (Constant 1893)(2087).

Caterpillar whitish, strongly granulated by small white spinules. Head brown, cervical shield light brown, dark punctate [or dotted] (fig. 151), also the anal shield is dark punctate [or dotted] (fig. 152). 2nd ocellus closer to the 3rd than to the 6th, the 1st, 2nd, and 5th ocelli lighter. The elliptical uniserial circles of hooks of the parapodia count about 20, those of the caudal disk about 10 hooklets. In all other larvomorphological characters this species agrees with cana.

According to Kennel (1908) the caterpillar lives from the last of Aug. and Sept. in flowers of Serratula hirsuta. The adult flies in July and Aug.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept.9, 1903, near Speyer in flower heads of S.tinctoria.

Eucosma (E.) expallidana (Haworth 1811) (2088).

Caterpillar yellowish white, sometimes faint reddish. Head yellow to light brown, cervical shield and anal shield yellowish. On the cervical shield along the separation suture and near setae I and III are found dark punctures [or dots](fig. 153). Anal shield (fig. 154) not punctate. On the 1st and 2nd abdominal segment group VII counts 3 setae, on the 7th, 8th, and 9th abdominal segments 2 setae. This species agrees with scutana in the other characters.

Aug. and Sept. in flower heads of Picris hieracioides. According to Meyrick the caterpillar is also supposed to occur on Sonchus arvensis. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 4 and Sept. 17, 1911 near Speyer in heads of P.hieracioides.

The subgenus Phaneta Stephens 1852.

Diagnosis: Circles of hooks of the parapodia circular, if elliptical than the 4th ocellus is equidistant from the 3rd and 6th.

This subgenus embraces predominantly spp. of the former genera Semasia, Epinotia, and Epiblema.

Eucosma (Phaneta) nigromaculana (Haworth 1811)(1972)

Caterpillar yellowish white, strongly granulated by small spinules. Head, cervical and anal shields, and the thoracic legs light brown. The ocelli are uniformly strongly chitinized, the 3rd ocellus equidistant from the 4th and 6th. On the cervical shield IIIa is closer to III than to IM, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa stands on the mesothorax dorsocraniad from III (fig. 155), seta VI closer to IV than to III, VIII distinctly set off from the coxa, on the 1st and 2nd abdominal segments as well as on the 7th and 8th group VII counts 2 setae, on the 9th only one. On the 1st abdominal segment IV is vertically arranged with V, diagonally arranged on the others, IIIa is distinctly set off from the pinaculum of seta III. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is ventrocraniad from the spiracle. Setae II, also I and III, as well as IV, V, and VI, are found on common pinaculi on the 9th abdominal segment, the distance between setae VIII is not greater than on the 8th abdominal segment. The round uniserial circles of hooks of the parapodia count about 16, those of the caudal disk 8-11 hooklets. On the parapodia the setae of group VII are arranged in a triangle.

The adult flies June, July, the caterpillar lives from July on in flower heads of Senecio jacobaea and after wintering in an earthen cocoon, transforms [into the pupa]. The caterpillars from the Bavarian State Collection that were investigated had been found by Disque on April 14, 1883 on Senecio jacobaea near Speyer.

E.(P.) aspidiscana (Hübner 1822)(2049)

Caterpillar reddish yellow, strongly granulated by small yellow granules. Head and cervical shield light or dark brown, the cervical shield dark punctate [or dotted] (fig. 156). Anal shield brownish, pinaculi large and gray shining. Setae IV and V on all abdominal segments are diagonally arranged, the spiracles of the 2nd abdominal segment being larger than the insertion place of seta III and somewhat larger than on the 1st abdominal segment. On the ventral side of the caudal disk I could discover only 3 setae. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th 2 setae. On the 9th abdominal segment the distance between setae VIII is greater than on the 8th. The uniserial round circles of hooks consist of about 22, those of the caudal disk about 16 hooklets.

The adult flies April and May, the caterpillar lives in Aug. and Sept. between spun-up flowers and then in the stem in which it, having matured, overwinters. ~~Senecio~~ Solidago virgaurea is the true food plant while the appearance on Aster aurellus and Chrysocoma linospyris by Schütze (1931) is doubted.

Eucosma (Phaneta) aemulana (Schläger 1849)
syn. tripoliana Barrett 1880 (2032) according to Obraztsov.

Caterpillar pale reddish yellow, strongly granulate by small white spinules. Head, thoracic legs dark brown, cervical and anal shields light brown, pinaculi hardly developed. On the mesothorax IIIa is dorsocaudad from III, VI is approximately equidistant from III and IV, the seta VIII is distinctly set off from the coxa. On the 1st and 2nd abdominal segments group VII counts from 1 to 3 setae, on the 7th and 8th, 2, and on the 9th 1 seta. The spiracles are very small, on the 8th abdominal segment III is ventrocraniad from the spiracle. On the 9th abdominal segment seta VI is absent, setae VIII not farther apart than on the 8th abdominal segment. The setae of group VII are arranged in a triangle on the base of the parapodia. The uniserial round circles of hooks of the parapodia count about 14, those of the caudal disk about 8 hooklets.

Sept., Oct. in flowers of Aster tripolium and amellus, probably overwintering; the adult flies in July and Aug. The caterpillars from the Collection that were examined had been found by Disque on Oct. 10, 1906 in the flowers of A.amellus. The caterpillars of the Munich collection are labelled as tripoliana.

E. (P.) latiorana (Herrich-Schäffer 1851)
syn. aemulana Schläger 1849 (2031) according to Obraztsov.

Caterpillar yellowish white, strongly granulated by small white spinules. Head brown, cervical shield lighter, darker on the posterior margin between setae I and II as well as II and III (fig. 157), anal shield small and brownish. On the 1st and 2nd abdominal segments group VII counts 1 to 2 setae, on the 7th and 8th 2, more rarely 1 seta, on the 9th always one seta. In all other characters there is agreement with the preceding species.

In Oct. the caterpillar lives in the flower and seed heads of Solidago virgaurea, the adult flies in July and Aug. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 18, 1902 near Speyer on Solidago. In this collection the caterpillar is designated as aemulana.

E. (P.) conterminana (Herrich-Schäffer 1851)(2051)

Caterpillar brownish yellow, strongly granulated, head light or dark brown, cervical shield dark brown, prespiracular shield only weakly indicated. The 3rd ocellus is equidistant from the 4th and 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Setae IV and V are not on an undivided pinaculum on the mesothorax (fig. 168), VIII is distinctly set off from the coxa. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th, 2. On all abdominal segments setae IV and V are diagonally situated, IIIa is distinctly set off from the margin of pinaculum III. All spiracles, even on the 2nd abdominal segment, are larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is greater than that between setae I, on the 9th abdominal segment setae II are found on separate pinaculi, setae I and III, as well as IV, V, and VI are on common pinaculi. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. The setae of group VII stand in a triangle on the base of the parapodia, the uniserial elliptical circles of hooks count 20-22, those of the caudal disk 10-12 hooklets.

The caterpillar lives from July to Sept. in flowers of Lactuca sativa, overwinters in the ground, and transforms in the following spring. The adult appears in July. The caterpillars that were investigated came from the Bavarian State Collection.

Eucosma (Phaneta) incana (Zeller 1846)(2046).

Caterpillar yellowish or reddish yellow, strongly granulated by small spinules. Head, cervical shield, thoracic legs, pinaculi, and anal shield brown. 4th ocellus equidistant from the 3rd and 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta VI on the mesothorax is closer to V than to III (cf. fig. 155), VIII distinctly set off from the coxa. The spiracles are elliptical, on the prothorax they are larger than on the abdominal segments. Setae IV and V on the 8th abdominal segment are practically horizontally arranged, diagonally arranged on the others. IIIa on abdominal segments 1 to 7, distinctly set off from the pinaculum of III, on the 8th abdominal segment IIIa is found on the margin of pinaculum III. The distance between setae II on the 8th abdominal segment is greater than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st and 2nd abdominal segment group VII counts 3 setae, 2 on the 7th, 8th, and 9th. The setae of group VII on the base of the parapodia are arranged in a triangle, the uniserial circles of hooks count about 22-25, those of the caudal disk about 14 hooklets.

The caterpillar lives in Sept. and Oct. in twig swellings of Artemisia campestris, overwintering there when reared, in the field, however, they go into the ground for the most part. Pupation in April, the adult flying in May.

Location: Erlangen on Aug. 24, 1953 in swellings of the upper parts of the shoot of Artemisia campestris.

E.(P.)pupillana (Clerck 1759)(2042)

Caterpillar yellowish white, dorsal and subdorsal lines brownish. Body strongly granulated by small yellow spinules. Setae IV and V are ~~mmmmy~~ vertically arranged on nearly all abdominal segments. On the 8th abdominal segment the distance between setae II is greater than the distance between setae I, III is found dorsocraniad from the spiracle. On the 9th abdominal segment the setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. On the 1st, 2nd, and 7th abdominal segments group VII counts 2 setae, as well as on the 8th, on the 9th segment 1 seta. The setae of group VII on the parapodia are arranged in a triangle, the uniserial circles of hooks consisting of about 15, those of the caudal disk of about 11 hooklets. In other characters this species agreed with the preceding.

The caterpillar lives from Oct. to June on Artemisia absinthium and to be sure first in the stem and then it forces its way down to the root-stock. The adult flies June to Aug. The caterpillars from the Collection that were examined had been found by Disque on May 7, 1885 near Stettin in the root-bark of A.absinthium.

E.(P.)lacteana (Treitschke 1835)(2081)

Caterpillar yellowish or reddish, strongly granulated by small spinules, the pinaculi hardly raised from the body. Head dark brown, cervical shield lighter or darker brown, laterally and on the posterior margin dark punctate [or dotted]. The 4th ocellus is equidistant from the 3rd and 6th. On the cervical shield IIIa is closer to III than to IX. Seta IV stands ventrad from V and VI on the prespiraculs shield, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, seta VI equidistant from III and IV, VIII distinctly set off from the margin of coxa. On all abdominal segments setae IV and V are diagonally arranged, IIIa is distinctly set off from the pinaculum of seta III. The spiracle of the 2nd abdominal segment is larger than the insertion place of seta III. On the 8th abdominal segment III is on the same level as the spiracle,

on the 9th setae II, also I and III, as well as IV, V, and VI are found on common pinaculi. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the ventral side of the caudal disk, only 3 setae can be seen. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th, 2 setae, on the parapodia the 3 setae are arranged in a triangle. The uniserial round circles of hooks of the parapodia count about 22, those of the caudal disk 12-14 hooklets.

The caterpillar lives from Aug. to Oct. like incana in stem swellings of Artemisia campestris. The adult flies in June and July. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 20, 1901, near Speyer in twig swellings of A.campestris.

Eucosma (Phaneta) maritima (Westwood 1845) syn. candidulana Nolcke 1870 (2080)

Caterpillar whitish, dorsally brownish red and more strongly granulated than ventrally, the pinaculi are lighter. Head, cervical shield brown. On the mesothorax IIIa is dorsocaudal from III, VI is closer to IV than to III (cf. fig. 155). On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th and 8th 2, and on the 9th 1 seta. On the 1st abdominal segment IV and V are vertically arranged, diagonally on the others. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found ventrocraniad from the spiracle. Seta VI is lacking on the 9th abdominal segment. On the ventral side of the caudal disk there are 4 setae. The uniserial round circles of hooks of the parapodia count about 17, those of the caudal disk about 12 hooklets. Otherwise there is no essential difference from lacteana.

The caterpillar lives from Sept. to May in flowers of Artemisia maritima, absinthium, and vulgaris, the adult flies in July. The overwintering, according to Spuler (1910) takes place in the ground or on the eating place.

The caterpillars from the Bavarian State Collection that were examined had in part been found by Stange on Oct. 18, 1910 near Friedland on A.vulgaris, in part near Stuttgart on Sept. 22, on A.absinthium.

E.(P.)metzneriana (Treitschke 1830)(2043)

Caterpillar yellowish white, head, cervical shield, thoracic legs brown, pinaculi brown but sometimes indistinct, anal shield of the body color. Cervical shield sometimes anteriorly lighter and only on the sides and behind dark. Body strongly granulated. The 4th ocellus is equidistant from the 3rd and 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa stands dorsocaudad from III, VI is somewhat closer to IV than to III (cf. fig. 155), VIII is distinctly set off from the margin of coxa. Spiracles elliptical, even on the 2nd abdominal segment larger than the insertion place of seta III. On all abdominal segments IV is diagonally arranged with V. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st to the 7th abdominal segments group VII counts 3, on the 8th and 9th, 2 setae. The uniserial circles of hooks of the parapodia count about 22, those of the caudal disk 14 hooklets.

The caterpillar lives from Aug. to May in the upper part of the stem of Artemisia vulgaris which then comspicuously swells up and is retarded in growth. The pupa is to be found in the lower part of the stem. According to Schütze (1931) the larva also occurs on A.absinthium. The adult flies June and July. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 18, 1911 near Speyer in the stem of A.vulgaris.

The genus Pseudeucosma Obraztsov 1946

Diagnosis: On the 8th abdominal segment seta III is found dorsocraniad from the spiracle, the setae II are not closer together than setae I. On the 9th abdominal segment, VI is present.

Obraztsov combined former Eucosma (Epiblema) spp. which can also be readily separated larvo-morphologically by the above characters, into this genus. The relationship to the genera Eucosma and Epiblema is also larvo-morphologically distinctly recognized as Obraztsov indicated by the name he gave this genus. Differing from Obraztsov, I find myself compelled to include the former species Eucosma kochiana - which he had placed in the genus Epinotia - in this genus for it differs from other Epinotia spp. by the uniserial circles of hooks and the placement of seta III on the 8th abdominal segment and fits conspicuously well in the genus Pseudeucosma.

Spp. of Pseudeucosma.

1 (4) Group VII on abdominal segments 1 and 2 consists of 2 setae.
2 (3) The circles of hooks of the parapodia count about 15 hooklets, setae IV and V are horizontally arranged on the 8th abdominal segment kochiana
3 (2) Circles of hooks of the parapodia count about 25 hooklets, setae IV and V diagonally or nearly vertically arranged on the 8th abdominal segment caecimaculana
4 ((1) On the 1st and 2nd abdominal segments group VII consists of 3 setae.
5 (6) On the 8th abdominal segment group VII counts 1 seta, the circles of hooks have about 25 hooklets. [sic!] cumulana
6 (5) On the 8th abdominal segment group VII counts 2 setae, the circles of hooks have 30-35 (32) hooklets infidana

Pseudeucosma caecimaculana (Hübner 1822)(2093).

Caterpillar yellowish white, granulated, head ocher yellow to light brown, anal shield, cervical shield yellow. The 1st and 2nd ocelli are lighter than the others, the 4th ocellus is somewhat closer to the 3rd than to the 6th. On the cervical shield IIIa is somewhat closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa on the mesothorax stands dorsocraniad from III, VI is somewhat closer to IV than to III (cf. fig. 155), VIII is distinctly set off from the coxa. The spiracles are elliptical and even on the 2nd abdominal segment they are larger than the insertion place of seta III. On the abdominal segments IV and V are diagonally or nearly vertically arranged. On the 8th abdominal segment setae II are farther apart than setae I, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II are found on separate pinaculi, I and III, as well as IV, V, and VI on common pinaculi. The group VII on the 1st, 2nd, 7th, 8th, and 9th abdominal segments counts 2 setae. The uniserial circles of hooks of the parapodia count about 25, those of the caudal disk about 10 hooklets.

The caterpillars was grown up in May and June on the root of Centaurea jacea, according to Spuler (1910) also on other Centrurea spp., and questionably found on Epilobium and Artemisia. Since the adult flies in June and July it is to be assumed that the caterpillars, as in related spp., are already feeding on the roots in the fall and also overwinters there. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 27, 1896 near Speyer in the root of C.jacea.

P. cumulana (Guenee 1845)(2091)

Pseudeucosma cumulana (Guenee 1845)(2091)

Caterpillar yellowish to orange colored, strongly granulated by small brown spinules. Head dark brown, cervical and anal shields brownish mostly dark punctate [or dotted] (fig. 150 and 160). On the mesothorax VI is equidistant from III and IV. On the abdominal segments IV and V are diagonally, but on the 8th horizontally, arranged. The spiracles of the prothorax are elliptical, more round on the abdominal segments. On the 8th abdominal segment III is dorsocraniad from the spiracle, on the 9th setae II, as well as I and III, and also IV, V, and VI are found on common pinaculi. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th of 2, more rarely 1, on the 8th and 9th of 1 seta. The uniserial circles of hooks of the parapodia count about 25, those of the caudal disk about 15 hooklets. This species corresponds to caecimaculana in the other characters.

The caterpillars live in flowers of Inula montana in July. This species is known only from Austria, Hungary, and South France. The caterpillars from the Bavarian State Collection that were investigated had been found by Chretien in June 1897 near Arville (France) in flowers of I.montana.

P.infidana (Duponchel 1836)(2074).

Caterpillar whitish yellow, strongly granulated, head light brown, cervical shield brownish yellow, anal shield of the body color. On the prespiracular shield IV is ventrad from V and VI, equidistant from both (fig. 161). The ocelli are all uniformly pigmented, the 4th being somewhat closer to the 3rd than to the 6th. Setae IV and V on all abdominal segments are diagonally arranged. On the 9th abdominal segment the pinaculi of setae IV, V, and VI are not yet entirely fused into a uniform pinaculum. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th and 8th 2, and on the 9th 1. The circles of hooks of the parapodia count about 32 hooklets, which are not of uniform size. Caudal disk with about 12 hooklets. The spiracles are conspicuously elliptical and large. In all other characters this species agrees with those reported for caecimaculana.

The caterpillar lives from the fall until July in roots of Artemisia campestris. The adult flies July to Sept.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg in Aug. 1892 near Potsdam in roots of A.campestris.

P.kochiana (Herrich-Schäffer 1851)(2107)

Caterpillar dirty white, strongly granulated by small brown spinules. Head, cervical shield, and thoracic legs black, pinaculi and anal shield gray-brown. The ocelli are uniformly developed, 4th ocellus equidistant from the 3rd and 6th. The spiracles are round, on the 2nd abdominal segment they are larger than the insertion place of seta III. On the 8st abdominal segment IV is vertically arranged with V, horizontally arranged on the 8th, diagonally arranged on the others. On the 1st, 2nd, 7th, and 8th abdominal segments group VII counts 2 setae, on the 9th one. The uniserial round circles of hooks of the parapodia count about 15, those of the caudal disk 9 hooklets. Besides that all the characters reported for caecimaculana show up [in this species].

The caterpillar lives in April and May in the heart shoots or between 2 spun-up leaf stalks on Salvia pratensis. The adult flies in June and July. It is still to be proved whether the caterpillar already shows up in the fall and overwinters, as Kennel (1908) doubtfully reported. The caterpillars from the Bavarian State Collection that were examined had been found by Krone on May 14, 1902 near Vienna on Salva pratensis.

The genus Epiblema Hübner 1825

Diagnosis: The circles of hooks of the parapodia are uniserial, the spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment the setae II are not farther apart than setae I, mostly they are even closer together, or IIIa on the mesothorax is found dorsocraniad from III.

This genus - according to Obraztsov's new system - includes only a part of the former Epiblema-(Eucosma-)-spp. I am also able to separate this genus from its nearest relatives larvo-morphologically. Only the species grandaevana does not agree with the other Epiblema spp. on account of its biserial circles of hooks. In this case I am joining Lederer (1863) and referring it to the monotypical genus Cacochroa.

1 (2) On the 1st and 2nd abdominal segments group VII consists of 2 setae — foenella
2 (1) On the 1st and 2nd abdominal segments, group VII consists of 3 setae.
3 (8) Seta IIIa on the mesothorax is dorsocraniad from III.
4 (5) On the 8th abdominal segment setae II are not farther apart than setae I — farfarae
5 (4) On the 8th abdominal segment setae II are farther apart than setae I.
6 (7) The adfrontalia reach onto the posterior margin of the head, the pinaculi are level with the body, on the 9th abdominal segment setae II stand on separate pinaculi which may be contiguous — trigeminana
7 (6) The adfrontalia do not reach onto the posterior margin of the head (fig. 165), the pinaculi are raised, on the 9th abdominal segment the setae II stand on a common pinaculum — hepaticana
8 (3) Seta IIIa on the mesothorax is found exactly dorsad or dorsocaudad from III.
9 (10) On the 8th abdominal segment setae IV and V are horizontally arranged. — obscurana
10 (9) On the 8th abdominal segment setae IV and V are vertically to diagonally arranged.
11 (12) Parapodia with 22-25, caudal disk with 12, hooklets. The pinaculi are strongly chitinized and dark-brown so that they stand out from the body even under the naked eye — scutulana
12 (11) Parapodia with 20, caudal disk with 10 hooklets, pinaculi only so weakly chitinized and of the same color as the body that they hardly stand out from the body — turbidana

Epiblema foenella (Linné 1758)(2154).

Caterpillar white, weakly granulated, pinaculi of the body color, head brown, cervical and anal shields yellowish. The ocelli are uniformly developed, on the cervical shield II is ventrocaudad from I, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. IIIa on the mesothorax is dorsad from III, VIII is distinctly set off from the coxa. On the abdominal segments IV is diagonally to vertically arranged with V, IIIa - with the exception of the 1st abdominal segment - stands on the margin of pinaculum III. The spiracles are elliptical and even on the 2nd abdominal segment they are larger than the insertion place of seta III. The distance between setae II on the 7th and 8th abdominal segments is less than that between setae I, on the 8th abdominal segment the pinaculi of setae II are contiguous (fig. 162). On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is just as great as on the 8th abdominal segment. On the 1st,

2nd, 7th, 8th, and 9th abdominal segments group VII counts 2 setae, more rarely on the 9th 1 seta. The round uniserial circles of hooks of the parapodia count 30 to 33, those of the caudal disk 14-18 hooklets.

Sept. to April in the roots and in the lower part of the stem of Artemisia vulgaris, preferably in older stems [or trunks]. Very abundant everywhere.

Locality: Erlangen on Oct. 8, 1951, on Sept. 15, 1953 in the root-stock of A.vulgaris.

Spiblema scutulana (Schiffermiller 1776)
syn. pflugiana Haworth 1803-1829 (2143)
syn. luctuosana Duponchel 1826-1838 (2144).

Obraztsov considers the two former spp. pflugiana and luctuosana as one species. Even Rebel as early as in 1901 wrote that these two spp. cannot always be sufficiently distinctly separated. By reason of my own investigations I came to the same result and would like to consider both as one species, since they cannot be separatedas larvae either in coloring or in morphology and biology.

Caterpillar reddish-brown, strongly granulated by small spinules. Head, cervical shield, thoracic legs, and anal shield dark brown, sometimes lighter, the large pinaculi dark brown. On the cervical shield IIIa is closer to III than to IX, II is not ventrocaudad from I. The distance between setae II on the 7th abdominal segment is larger, but on the 8th it is not larger than that between setae I. The pinaculi of setae II are not contiguous. Group VII on the 1st and 2nd abdominal segments counts 3 setae, on the 7th, 8th, and 9th, 2 setae. The uniserial circles of hooks of the parapodia count 22 to 25, those of the caudal disk 12 hooklets. The anal comb consists of 6 spines. The additional characters given for foenella apply to this species also.

The caterpillar lives in the 1st generation June to July in flowering shoots, in the 2nd generation from Sept. to April in stems and roots of Cirsium, Carduus, Carlina. The adult flies in May, June amd July, Aug.

Locality: Erlangen-Rathsberg on Oct. 15, 1952 in stem and root of Centaurea jacea.

E.farfarae (Fletcher 1938)
syn. brunnichiana Frölich 1828 (2150) according to Obraztsov.

The former name of the species was dropped on account of preoccupation.

Caterpillars in the youngest instars whitish, later carmine red and granulated. Head brown, cervical and anal shields and pinaculi reddish yellow, cervical shield also dark punctate [or dotted] (fig. 163). Distance and size of ocelli uniform, on the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On all abdominal segments IV and V are diagonally arranged. The spiracles on the prothorax are elliptical on the other segments round. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. The uniserial circles of hooks of the parapodia consist of 21 to 24 hooklets, the caudal disk of 10-11. Anal comb absent.

The caterpillar lives from Sept. until spring in the main root of Tussilago farfara and then also feeds in the flower stem upwards. According to Supler (1910) also on Petasites and Lappa. The adult flies in June, July. Locality: Erlangen-Rathsberg, on Sept. 9, 1953, in the main root of Tussilago farfara.

Epiblema obscurana (Herrich-Schäffer 1851)(2147)

Caterpillar yellowish-white, white granulated. Head light brown, without eye and genal spots, cervical and anal shields of the body color. Spiracles uniformly developed, the 4th ocellus is somewhat closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. IIIa is dorsocaudad from III on the mesothorax, VI somewhat closer to IV than to III (see fig. 155), setae VIII are distinctly set off from the coxae. The spiracles are all elliptical, even on the 2nd abdominal segment they are larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III. On the 1st to the 7th abdominal segments III is dorsocaudad from the spiracle and IV situated diagonally with V, on the 8th abdominal segment III is on the same level with the spiracle, setae IV and V are horizontally placed. The distance between setae I and setae II on the 7th and 8th abdominal segment is the same size, on the 8th the pinaculi of setae II are contiguous. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, setae VIII are not farther apart than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII counts 3, on the 7th, 8th, and 9th segments 2 setae. The uniserial circles of hooks of the parapodia consist of 18-23, those of the caudal disk of about14 hooklets.

The caterpillar lives from Sept. to April in the lower part of the stem of Inula salicina. The adult [flies in] May, June. The caterpillars from the Bavarian State Collection that were examined had been found by Disque, who was also the first to discover this caterpillar, on Sept. 11, 1903, in the stem of Inula salicina.

E. trigeminana (Stephens 1834)(2103).

Caterpillar reddish yellow, dorsally carmine red-saddled, body granulated. Head light brown, cervical and anal shields of the body color, pinaculi not especially prominent. The adfrontalia reach onto the posterior margin of the head. Of the ocelli only the 3rd, 4th, and 6th are normally pigmented, the others appear lighter, the 4th is closer to the 3rd, than to the 6th. The cervical shield is strongly produced only toward the side (fig. 164), IIIa is closer to III than to IX, on the mesothorax IIIa is dorsocraniad from III, VI is equidistant from III and IV, VIII distinctly set off from the coxa. On all abdominal segments IV is diagonally situated with V, IIIa is distinctly set off from the margin of pinaculum III. The spiracles even on the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment the distance of setae II is larger than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment the pinaculi of setae II are contiguous; I and III, as well as IV, V, and VI stand on common pinaculi, setae VIII are not farther apart than on the 8th abdominal segment. On the 1st and 2nd abdominal segments, group VII counts 3, on the 7th, 8th, and 9th abdominal segments, 2 setae. The uniserial circles of hooks of the parapodia consist of 24, those of the caudal disk of 12 hooklets.

The caterpillar lives in 2 generations in the root bark of Senecio jacobaea. The summer generation in June, the 2nd generation from Sept. to the first of April. Adult in May and July to Aug. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 26, 1911 near Speyer in the root of Senecio jacobaea.

E. hepaticana (Treitschke 1835)(2099).

In the first instars the caterpillar is yellowish, later paler and red-saddled. Body strongly granulated, pinaculi of the body color and raised. Head light brown. The adfrontalia do not reach onto the posterior margin of the head (fig. 165). On the 8th abdominal segment III stands somewhat ventrocraniad from the spiracle, on the 9th setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, setae VIII are only

somewhat farther apart than on the 8th. The uniserial circles of hooks of the parapodia consist of 25, those of the caudal disk of 10 hooklets. Moreover to this species belong all the additional characters given for trigeminana.

The caterpillar lives from Sept. to spring in the stem and root neck of different Senecio spp. Adult June, July.

The caterpillars from the Bavarian State collection that were examined had been found by Schütze on Oct. 31, 1905 near Rachlau in the stem of Senecio nemorensis.

Epiblema turbidana (Treitschke 1835)(2153).

Caterpillar brownish yellow, sometimes somewhat reddish, strongly granulated by white spinules. Head red brown, cervical and anal shields yellowish. The 3rd and 4th ocelli are more strongly pigmented than the others (fig. 166). On the prespiracular shield IV stands in the middle between V and VI. On the mesothorax IIIa is dorsocraniad from III, VI equidistant from III and IV, VIII distinctly set off from the coxa. On abdominal segments I and 8 setae IV and V are vertically arranged, diagonally on the others (fig. 167). The spiracles on the prothorax and 8th abdominal segment are distinctly elliptical, rounded on the others, even on the 2nd abdominal segment larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and that between setae I is the same size, on the 9th abdominal segment, setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. The uniserial circles of hooks of the parapodia consist of 20, those of the caudal disk of 10 hooklets.

The caterpillar lives from Oct. to April in the root of Petasites. The caterpillars from the Bavarian State Collection that were examined had been found by Mitterberger on Oct. 25, 1905 near Steyr (Austria) in the root of P.niveus.

The genus Cacochroa Lederer 1863.

Diagnosis: The circles of hooks of the parapodia at least on the posterior margin are biserial, all spiracles strongly elliptically produced, even on the 2nd abdominal segment larger than the insertion place of seta III (fig. 169). The cervical shield is medianly drawn out toward the head (fig. 168).

The single species of this genus still stands in the genus Epiblema, according to Obraztsov; I am joining in Lederer's opinion however since the caterpillar differs substantially from other Epiblema spp. by the biserial circles of hooks.

C.grandaevana (Zeller 1846)(2067).

Caterpillar yellowish to brownish white, reddish before pupation, the body is strongly granulated by small white spinules. Head redbrown, cervical and anal shields, and pinaculi brownish, the cervical shield additionally dark punctate [or dotted] (fig. 168). The caterpillar becomes 30 mm long and is therefore one of the largest of the tortricids. The 4th ocellus is closer to the 3rd than to the 6th. The cervical shield is drawn out to a point in the middle toward the head (fig. 168), IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. IIIa on the mesothorax is found somewhat dorsocraniad from III, seta VI is closer to IV than to III, VIII distinctly set off from the coxa. On the first abdominal segments IV and V are vertically, on the last [abdominal segments] diagonally arranged. Seta IIIa on the abdominal segments except the 8th is distinctly set off from pinaculum III. The apiracles on all the abdominal segments are elliptical and conspicuously large (fig. 169). On the 8th abdominal segment the distance between setae II is somewhat greater than that between setae I, III is found on the same level with the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on

common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. On the 1st and 2nd abdominal segments, group VII counts 3 setae, on the 7th, 8th, and 9th 2 setae. The biserial circles of hooks of the parapodia count about 38, those of the caudal disk about 18 hooklets.

The caterpillar lives from fall to May in a gray web on the root of Petasites niveus. Adult June, July. The caterpillars from the Bavarian State Collection that were examined had been found by Mitterberger on May 1, 1902 near Steyr on the root of Petasites niveus.

The genus Pardia Guenee 1845.

Diagnosis: Circles of hooks of the parapodia anteriorly irregularly uniserial, posteriorly biserial. On the 1st abdominal segment, group VII consists of 2 setae, on the 1st to the 7th abdominal segment inclusive the setae IV and V are vertically arranged.

Obraztsov's separating the genus off from Epiblema seems to me absolutely right for the circles of hooks of the parapodia are biserial.

P.tripunctana (Schiffermiller 1776)(2138).

Caterpillar reddish brown, strongly granulated by small brown spinules. Head, cervical shield, anal shield, and thoracic legs black-brown, head and cervical shield often also black. The 4th ocellus is somewhat closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. IIIa on the mesothorax is dorsad from III, VIII set off from the coxa. The spiracles on the 1st abdominal segment are elliptical, round on the others; all are larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III, on the 1st to the 7th abdominal segments setae IV amd V are vertically, only on the 8th diagonally, situated. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment again, setae II, also I and III, as well as IV, V, and VI are situated on common pinaculi, setae VIII not farther apart than on the 8th. The hooklets of the parapodia are anteriorly of very uneven sizes, but posteriorly biserial. Parapodia with about 30, caudal disk with about 25 hooklets.

April between spun-up shoots on Rosa. Adult May.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 13, 1902 near Speyer on Rosa.

Locality: Erlangen on May 5, 1954 on Rosa.

The genus Notocelia Hübner 1825.

Diagnosis: The circles of hooks of the parapodia are at least on the posterior margin biserial, group VII consists of 2 setae on the 7th and 8th abdominal segments, on the 9th of 1 seta. The distance between setae VIII on the 9th abdominal segment is not greater than on the 8th, setae IV, V, and VI are found on a common pinaculum on segment 9.

The species of this genus are very close together larvo-morphologically as well as in their biology.

Spp. of Notocelia.

1 (4) Head black or black-brown.
2 (3) The circles of hooks of the parapodia completely biserial, on the 9th abdominal segment seta II stand on a common pinaculum — uddmanniana
3 (2) The circles of hooks of the parapodia are anteriorly uniserial and posteriorly biserial (cf. fig. 184), on the 9th abdominal segment setae II stand on separate pinaculi
4 (1) Head yellow, or yellow and dark bordered.
5 (6) Anal shield of the body color, circles of hooks of the parapodia posteriorly biserial, anteriorly uniserial — rosaecolana
6 (5) Anal shield strongly chitinized and darkbrown, thus distinctly contrasting with the body, the circles of hooks of the parapodia completely biserial.
7 (8) Pinaculi strongly chitinized and dark brown, head yellow — roborana
8 (7) Pinaculi only weakly chitinized and of the body color, head yellow and dark bordered — incarnatana

N. uddmanniana (Linné 1758)(2055).

Caterpillar reddish brown, strongly granulated by brown spinules. Head, cervical shield, pinaculi, thoracic legs and anal shield black-brown to black. On the cervical shield II is ventrocaudad from I, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsad from III, VIII is beside the coma. The spiracles are round and even on the 2nd abdominal segment larger than the insertion place of seta III. On the 1st abdominal segment IIIa is distinctly set-off from the pinaculum and IV is vertically arranged with V, on the other segments IIIa stands on the margin of pinaculum III and the setae IV and V are diagonally arranged. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II as well as I and III, also IV, V, and VI stand on common pinaculi, setae VIII being farther apart than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th and 8th 2, on the 9th 1 seta. On the base of the parapodia the setae of group VII are arranged in a line. The parapodia are brown chitinized on the side (cf fig. 224), the biserial circles of hooks of the parapodia consist of about 25 hooks.

May, June between spun-up leaves shaped like a ball, on Rubus. Adult July to Aug. Locality: Erlangen-Rathsberg May 20, 1951 on Rubus.

N. suffusana (Duponchel 1843)(2060).

Caterpillar reddish brown, strongly granulated by small brown spinules. Head black, cervical shield, thoracic legs, and anal shield black-brown. The coronal suture is not longer than the adfrontalia are wide (fig. 170). The distances between the ocelli are the same. On the cervical shield II is not ventrocaudad from I. The prespiracular shield is diagonally set so that VI is higher than V. IIIa even on the 2nd abdominal segment is set off from the margin of pinaculum III. The setae IV and V on all abdominal segments are vertically situated (fig. 171). On the 8th abdominal segment, the distance between setae II is not greater than that between setae I, III lies ventrocraniad from the spiracle. Setae II on the 9th abdominal segment do not stand on a common pinaculum. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1 seta. The circles of hooks of the parapodia are anteriorly uniserial, posteriorly biserial, and count 21-25 hooklets, those of the caudal disk, 14-15 hooklets. In other characters, this species agrees with uddmanniana.

May between spun-up tips of shoots on Crataegus, Prunus spinosa, Pirus communis. Locality: Erlangen on April 25, 1952, between spun-up leaves on Crataegus.

Notocelia rosaecolana (Doubleday 1850)(2061).

Caterpillar reddish brown, ventrally lighter, strongly granulated by small brown spinules. Head yellowish, thoracic legs and cervical shield black-brown, anal shield of the body color. The prospiracular shield is horizontally placed. Even on the 2nd abdominal segment IIIa is distinctly separated from the margin of pinaculum III. On the abdominal segments IV is vertically arranged with V, on the 8th abdominal segment III is ventrocraniad from the spiracle. On the 1st, 2nd, 7th, and 8th abdominal segments group 7 counts 2 setae, on the 9th 1. The circles of hooks on the parapodia are biserial only on the posterior margin and consist of about 32 hooklets. The caudal disk has 22 hooklets. Besides these, all the additional characters reported for uddmanniana appear.

May, June between spun-up leaves on Rosa. The caterpillars from the Bavarian State Collection that were examined had been found by Himmeberg on May 28, 1892, near Potsdam on Rosa centifolia.

Notocelia roborana (Laspeyres 1805)(2062).

Caterpillar reddish-brown, strongly granulated by small brown spinules. Head yellowish, cervical shield, thoracic legs and anal shield black-brown, pinaculi brown. On the cervical shield III is not ventrocaudad from I. On the horizontally set prespiracular shield IV is arranged with V and VI almost in a line. On the 2nd abdominal segment IIIa is distinctly separated from pinaculum III, the setae IV and V are vertically arranged up to the 8th abdominal segment. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is ventrocraniad from the spiracle. On the 1st, 2nd, 7th, and 8th abdominal segments group VII counts 2 setae, 1 on the 9th. The completely biserial circles of hooks of the parapodia count about 28, those of the caudal disk about 22 hooklets. In the other characters there is agreement with uddmanniana.

May, between spun-up young leaves and buds on Rosa. Adult June. The locality is Erlangen-Spardorf on May 17, 1954, between spun-up young leaves on Rosa canina.

N.incarnatana (Zincken 1821)(2063).

Caterpillar reddish brown, pinaculi of the body color and therefore hard to make out. Body strongly granulated by small brown spinules. Head yellowish, but black-bordered. Cervical shield, thoracic legs, and anal shield black-brown. On the cervical shield II is not ventrocaudad from I, on the mesothorax IIIa is dorsocaudad from III. Even on the 2nd abdominal segment IIIa is distinctly separated from pinaculum III. On the 1st abdominal segment setae IV and V are distinctly vertically arranged, on the other segments vertically to diagonally situated. On the 8th abdominal segment III is found ventrocraniad from the spiracle. The circles of hooks of the parapodia are completely biserial and consist of about 26, those of the caudal disk of about 22 hooklets. This species also grees with uddmanniana in the other characters.

May, June in Rosa leaves that are rolled together. The caterpillars from the Bavarian State Collection that were examined had been found by Krone on May 25, 1902 between spun-up leaves on Rosa pimpinellifolia near Vienna.

The genus Gypsonomoides Obraztsov 1946.

Diagnosis: The circles of hooks of the parapodia are biserial, there is a chitinized plantar spot in the middle. On the 8th abdominal segment III is dorsocraniad from the spiracle.

The separation of this genus from the former Epiblema spp., which Obraztsov (1946) undertook to do, seems to be completely justified larvo-morphologically for the species investigated by me, oculeruana, differs essentially from the caterpillar of Epiblema spp. especially by the biserial circles of hooks.

Gypsonomoides oculeruana (Duponchel 1838)(2116).
Syn. dolitana Fischer 1840 (1970) according to Obraztsov.

The caterpillars from the Bavarian State Collection that were examined had been labelled oculeruana.

Caterpillar dirty white, finely brown-granulate, head, cervical shield, and thoracic legs black. Anal shield brown, pinaculi brownish. The ocelli are situated at uniform distances. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocaudad from III, seta VI is closer to IV than to V (see fig. 155), and VIII is situated on the margin of coma. On the 1st and 2nd abdominal segment group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. Only the spiracles of the prothorax are elliptical, the rest are round, on the 2nd abdominal segment not larger than the insertion place of seta III. On all abdominal segments IV is vertically arranged with V, diagonally on all the others. On the 8th and 9th abdominal segments setae VIII are equally far apart. The parapodia are black-brown chitinized on the side, a chitinized plantar spot (fig. 172) is found in the middle of the biserial circle of hooks. Parapodia with about 35 hooklets, caudal disk with about 18.

The caterpillar lives in April on Teucrium polium. According to Kennel (1908) and Eckstein (1933) this species occurs in SW Germany, Switzerland, France, Piedmont, and Aragon; on the other hand Schütze does not cite it among the spp. occurring in Germany (1931). The caterpillars from the Bavarian State Collection that were examined had been found by Constant on April 15, 1893, near Sainte-Marguerite on T.polium.

The genus Gibberifera Obraztsov 1946.

Diagnosis: The circles of hooks are biserial, on the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th 2 setae. On the mesothorax IIIa is dorsocraniad from III, VIII is on the margin of coma.

Obraztsov separated this genus off from the former genus Epinotia. Since the separation is readily possible larvo-morphologically, I am joining in with him.

Gibberifera simplana Fischer 1836 (1969).

Caterpillar whitish, strongly granulated, head, cervical shield and thoracic legs black, prespiracular shield and insertion places of setae brown, anal shield brownish. The 4th ocellus is closer to the 6th than to the 3rd. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield setae IV, V, and VI stand in one line, VI in the middle. Setae IV and V on the 1st abdominal segment are vertically situated, and then increasingly diagonally situated up to the 8th. The spiracles are round, on the 2nd abdominal segment not essentially larger than the insertion place of seta III. On the 8th abdominal segment setae II are farther apart than setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, I, and III, as well as IV, V, and VI are found on common pinaculi. The distance between setae VIII on the 9th abdominal segment is not greater than on the 8th. The biserial circles of hooks of the parapodia consist of about 50 hooklets.

Aug., Sept. in the overwintered tip leaves of Populus tremula. The adult flies in May. The caterpillars from the Bavarian State Collection that were examined had been found by de Crombrügghe on Aug. 19, 1906, near Brussels on P.tremula.

The genus Gypsonoma Meyrick 1895.

Diagnosis: The hooklets of the circles of hooks are of very irregular sizes or the circles of hooks are biserial. If uniserial then group VII on the 1st and 2nd abdominal segments consists of 2 setae. Setae IV and V are always vertically arranged on the 1st abdominal segment. (Exception nitidulana). Setae of group VII on the parapodia are situated in a line.

As is evident from the key, the genus as erected by Meyrick is readily defended larvo-morphologically. Obraztsov (1946) referred the previous Epinotia sp., nitidulana (=oricotana) to these spp. also; however it is not to be placed in it larvo-morphologically sufficiently exactly since the caterpillar has 3 setae in group VII on the 1st and 2nd abdominal segment. Since the larval difference is too small to be able to give it an effectively based transfer, I am joining in with Obraztsov, but would like to point out that an imagino-systematic investigation should also be made here.

Spp. of Gypsonoma.

1	(10)	On the 1st abdominal segment Group VII consists of 2 setae, parapodia with 30-35 hooklets.	
2	(3)	On the 2nd abdominal segment seta group VII counts 3 setae	aceriana
3	(2)	On the 2nd abdominal segment seta group VII counts 2 setae	
4	(7)	On the 9th abdominal segment group VII consists of 1 seta.	
5	(6)	Parapodia provided with about 30 hooklets, on the 9th abdominal segment setae II are found on a common pinaculum	neglectana
6	(5)	Parapodia with about 20 hooklets, on the 9th abdominal segment setae II stand on separate pinaculi	oppressana
7	(4)	On the 9th abdominal segment setagroup VII consists of 2 setae.	
8	(9)	Circles of hooks of the parapodia of about 45 hooklets, cervical shield of the body color, with a dark brown spot on the side (fig. 173)	minutana
9	(8)	The circles of hooks of the parapodia consist of 30-35 hooklets, cervical shield uniformly darkbrown	dealbana
10	(1)	On the 1st abdominal segment group VII consists of 3 setae, parapodia with 40-45 hooklets	nitidulana

Gypsonoma aceriana (Duponchel 1843)(2008).

Caterpillar dirty brownish, granulated, head, cervical shield, and thoracic legs dark brown to black-brown, anal shield of the body color. The ocelli are uniformly situated. On the cervical shield IIIa is just as far from III as from IX, on the prespiracular shield V, IV, and VI stand on one line. On the mesothorax IIIa is dorsocaudad from III, seta VIII is distinctly separated offfrom the coxa. The spiracles of the abdominal segments are not larger than the insertion places of seta III, the 4th and 5th setae are vertically situated on the 1st abdominal segment, diagonally on the others. On the 8th abdominal segment the distance between setae II is not substantially greater than that between setae I, III situated on a level with the spiracle. On the 9th abdominal segment setae II, I, and III, as well as IV, V, and VI stand on common pinaculi, setae VIII are not farther apart than on the 8th abdominal segment. On the 1st abdominal segment group VII counts 2 setae, on the 2nd 3, and on the 7th, 8th, and 9th 2 setae. The hooklets of the "wreathed legs" [i.e., parapodia?] are not uniformly large so that it is hard to decide whether the circles of hooks are uni- or biserial. Parapodia with 30-35, caudal disk with about 25 hooklets.

May, June in young twigs of Populus from which issue little heaps of excrement. Locality: Erlangen-Spardorf on May 23, 1952, in young shoots of P.alba.

Gypsonoma neglectana (Duponchel 1844)(2011).

The caterpillar is dirty reddish-brown, granulated, head black-brown to black. Cervical shield, anal shield, and thoracic legs brown, the pinaculi brownish. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX. On the mesothorax IIIa is dorsocraniad from III, VI closer to IV than to III (see fig. 155), seta VIII close to coma. On the 1st and 2nd abdominal segment IIIa is distinctly set off from pinaculum III, the spiracle of the 2nd abdominal segment is the same size as the insertion place of seta III. Only on the 1st abdominal segment are setae IV and V are vertically arranged. On the 8th abdominal segment setae II and setae I are equidistant, III lying ventrocraniad from the spiracle. On the 9th abdominal segment setae II, I, and III, as well as IV, V, and VI are on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. On the 1st, 2nd, 7th, and 8th abdominal segments group VII counts 2 setae, on the 9th 1 seta. Parapodia with about 30, caudal disk with about 20 hooklets.

May in buds of Populus nigra and Salix spp. The caterpillars from the Bavarian State Collection that were investigated had been found by Hinneberg on May 5, 1890 in buds of P.nigra.

G.dealbana (Frölich 1828)(2010).

Caterpillar whitish with pale gray pinaculi. Head, cervical shield, thoracic legs dark brown, sometimes the head is yellow brown also. The cervical shield light and dark edged. The body is smooth, the spiracles of the 2nd abdominal segment somewhat larger than the insertion place of seta III. On all abdominal segment, setae IV and V are diagonally arranged. On the 1st, 2nd, 7th, 8th, and 9th abdominal segments, group VII consists of 2 setae. The circles of hooks of the parapodia are irregular, consisting of about 32 hooklets, those of the caudal disk of 12-20.

May at first in the catkins and then bored into the twigs on Corylus, Populus tremula, Salix, Alnus, and Quercus.

Locality: Erlangen-Spardorf on May 15, 1952 on Salix.

G.oppressana (Treitschke 1835)(1975).

Caterpillar brownish white, granulate, head, cervical shield, thoracic legs, pinaculi and anal shield dark brown. 2nd ocellus closer to the 1st than to the 3rd, the 4th is closer to the 3rd than to the 6th. On the mesothorax VI is equidistant from IV and II. Spiracles round, on the 2nd abdominal segment larger than the insertion place of seta III. Setae IV and V on the 1st abdominal segment are vertically, on the others diagonally situated. On the 8th abdominal segment the distance between setae II and that between setae I are the same size. III is found ventrocraniad from the spiracls. On the 9th abdominal segment setae II stand on separate pinaculi, on the other hand I and III, as well as IV, V, and VI stand on common pinaculi. Parapodia with about 20, caudal disk with about 17 hooklets. In addition to these all additional characters given for neglectana belong to this species.

April in leaf buds of Populus. The adult May and first of June.

The caterpillars from the Bavarian State Collection that were examined hadbeen found by Disque on April 17, 1890, near Speyer in leaf buds of P.nigra.

G.minutana (Hübner 1822)(2007).

Caterpillar dirty white to greenish yellow, not granulated. Head brownish yellow, cervical shield approximately of the body color, black edged on the side (fig. 173).

Prespiracular shield and the thoracic pinaculi brown. The ocelli are uniformly situated. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield setae V, IV, and VI stand in a line, IV in the middle. On the mesothorax IIIa is dorsad from III, VI equidistant from III and IV, VIII beside the coxa. The spiracles areround, larger on the 2nd abdominal segment than the insertion place of seta III. Group VII on the 1st, 2nd, 7th, 8th, and 9th abdominal segments counts 2 setae. The biserial circles of hooks of the parapodia count about 45 hooklets. The additional characters given for neglectana also occur in this species.

May between two leaves spun up on each other, [illegible] of Populus, especially P.alba. Adult in May, June, July.

Locality: Knetzgau on the Main May 6, 1952 on P.tremula.

Gypsonoma nitidulana (Zoller 1846)(1989)
Syn. ericetana Herrich-Schäffer 1843-1856 (1990).

As Obraztsov informed me, we have one species in nitidulana and ericetana, as expressed by Kennel (1908) in his Monograph as an assumption. I was able to examine only ericetana in the Bavarian State Collection.

The caterpillar is light brownish, strongly granulated by small brown spinules. Pinaculi, anal shield light-brown, head, cervical shield, and thoracic legs dark-brown. The 4th ocellus is closer to the 3rd than to the 6th. On the prespiracular shield V, IV, and VI stand in one line, on the cervical shield IIIa is equidistant from III and IX. On the mesothorax IIIa is dorsocraniad from III, VI is equidistant from III and IV, VIII set off from the coxa. On the 1st abdominal segment setae IV and V are vertically situated and IIIa is set off from the pinaculum of III, on the other abdominal segments setae IV and V are diagonally arranged and IIIa stands on the margin of pinaculum III. The spiracle of the 2nd abdominal segment is not larger than the insertion place of seta III. On the 8th abdominal segment setae II and setae I are equidistant from each other IV, V, and VI are found on a common pinaculum on the 9th abdominal segment. The biserial circles of hooks of the parapodia are uniserial on the side (see fig. 177) and count 40-45 hooklets.

Caterpillar June and Aug., Sept. in overturned leaf margin or spun-up leaves on low bushes of Populus tremula. The caterpillars from the Bavarian State Collection that were examined had been found on P.tremula.

The genus Zeiraphera Treitschke 1829.

Diagnosis: The circles of hooks of the parapodia are biserial, on the prespiracular shield setae V, IV, and VI are situated in a line. On the cervical shield IIIa is equidistant from III and IX, on the mesothorax IIIa is dorsocraniad from III.

This genus is also very uniform larvo-morphologically.

Spp. of Zeiraphera.

1 (2) On the 9th abdominal segment setae II stand on separate pinaculi, the spiracle of the 2nd abdominal segment is not larger than the insertion place of the seta III standing above it, on the 1st abdominal segment setae IV and V are diagonally arranged ratzeburgiana

2 (1) On the 9th abdominal segment setae II stand on a common pinaculum, the spiracle of the 2nd abdominal segment is larger than the insertion place of seta III, setae IV and V are vertically situated on the 1st abdominal segment.

3 (4) Parapodia black-brown chitinized on the side (see fig. 224). On the 9th abdominal segment IV is separated off from V and VI on a pinaculum of its own — diniana

4 (3) Parapodia not black-brown chitinized on the side, on the 9th abdominal segment setae IV, V, and VI are found on a common pinaculum — isertana

Spilonphera ratzeburgiana (Ratzeburg 1840)(1965).

Caterpillar dirty yellowish green, strongly granulate, head light brown, cervical shield lighter, thoracic legs and pinaculi yellow-brown. The 2nd ocellus is closer to the 1st than to the 3rd. The seta O-1 is found between the 2nd and 3rd ocellus, O-2 in a line with the 1st and 2nd ocellus. Setae IV and V on all abdominal segments, are diagonally arranged, on the 1st and 2nd abdominal segments IIIa is distinctly separated from the pinaculum of III. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On the 8th abdominal segment setae II and setae I are equidistant from each other, III ventrocraniad from the spiracle. On the 9th abdominal segment setae II are found on separate, on the other hand I and III, as well as IV, V, and VI are on common pinaculi. On the 1st to the 6th abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2. The biserial circles of hooks of the parapodia consist of about 32, those of the caudal disk of about 20 hooklets.

According to Baer (1910) the caterpillar lives in May in the tips of early growth of young spruce. The needles and caps of the bud scales were spun up. In case of infestation the bud rudiments were destroyed and the needles on the underside of the shoots were eaten up. The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on May 14, 1902 near Rachlau on Picea excelsa.

E.isertana (Fabr. 1794).
syn. corticana Hübner 1822 (1948) according to Obraztsov.

Caterpillar pale brownish white, strongly granulated. Head, cervical shield brown, sometimes black bordered, pinaculi brownish. Setae IV and V on the 1st abdominal segment are vertically arranged, diagonally situated on all others, on the 9th abdominal segment setae II are found on a common pinaculum. The spiracle of the 2nd abdominal segment is larger than the insertion place of seta III. In other characters this caterpillar agrees with that of ratzeburgiana.

May between spun-up leaves on Quercus, according to Schütze (1951) also in fresh gall apples of Diplolepis quercus-folii.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 22, 1907, near Speyer on Quercus.

E.diniana (Guenee 1845)(1977).

Caterpillar dark gray-green, strongly granulated. Head, cervical shield, pinaculi, thoracic legs and anal shield black-brown. On the cervical shield II is ventrocaudad from I, on the mesothorax 3 distinctly visible microsetae are found before the thoracic legs. Setae IV and V on the 1st abdominal segment are vertically, on the others diagonally situated. Spiracles dark edged and even on the 2nd abdominal segment larger than the insertion place of seta III, on the 2nd abdominal segment IIIa is found on the pinaculum of seta III. On the 8th abdominal segment III is on the same level as the spiracle. Setae II on the 9th abdominal segment stand on a large pinaculum, IV is separated off from V and VI on a pinaculum of its own, the parapodia are black-brown chitinized on the side (fig. 174), the biserial circles of hooks consist of about 40 hooklets.

May, June between spun-upp needles of Larix and Pinus spp. The caterpillars from the Bavarian State Collection examined had been found in July 1898 by Chretien.

The genus Griselda Heinrich 1923.

Diagnosis: On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th, 2 setae, the circles of hooks are biserial or the hooklets are of different sizes. On the cervical shield IIIa is as least as far from III as from IX. On the prespiracular shield setae V, IV, and VI stand in one line.

This genus can also be readily separated from the others larvo-morphologically, it is very close to the foregoing.

Spp. of Griselda.

1	(2)	Parapodia laterally not dark-brown chitinized	fractifasciana
2	(1)	Parapodia laterally dark-brown chitinized (see fig. 224)	vacciniana

Griselda fractifasciana (Haworth 1811)(1992).

Caterpillar graywhite, the pinaculi somewhat darker. The body only weakly granulated. Head, cervical shield brown. On the mesothorax VIII is distinctly set off from the coma. The spiracles are round, on the 2nd abdominal segment somewhat larger than the insertion place of seta III. On the 1st and 2nd abdominal segments IIIa stands beside the pinaculum of seta III. Setae IV and V are diagonally arranged or vertically so only on the 1st [abdominal segment]. On the 9th abdominal segment setae II, I, and III as well as IV, V, and VI are found on common pinaculi, setae VIII not farther apart than on the 8th abdominal segment. On the parapodia the setae of group VII are situated in one line, caudal disk with about 20 hooklets.

June, Aug., Sept. in tubes spun between the basal [or root] leaves, in June also in the stem and in Aug., in the head of Succisa pratensis. The caterpillars that were examined came from Disque's collection.

G.vacciniana (Zeller 1851)(1987).

Caterpillar dirty brownish white, strongly granulated by small brown spinules. Head, cervical shield, thoracic legs black-brown, the thoracic pinaculi brown, the others lighter. Anal shield of the body color or yellowish. The spiracles are round, on the 2nd abdominal segment not larger than the insertion place of seta III. Only on the first abdominal segment is IV vertically situated with V. On the 8th abdominal segment setae II are farther apart than setae I, IV and V are diagonally placed. The parapodia are black-brown chitinized on the side (see fig. 224), the circles of hooks consist of about 40 hooklets. In all other characters the caterpillars of this species agree with those of fractifasciana.

June to Sept. between 2 leaves spun flat upon one another, of Vaccinium myrtillus, V.vitis-idaea, Berberis, Ledum palustre.

Locality: Erlangen-Reichswald on Aug.1, 1952 between spun-up leaves of V.myrtillus.

The genus Acroclita Lederer 1859.

Diagnosis: Circles of hooks uniserial and elliptical, on the prespiracular shield the setae V, IV, and VI are situated in one line, on the cervical shield IIIa is equidistant from III and IX. The spiracles of the 2nd abdominal segment are larger than the insertion place of the seta III standing above them.

This genus, not a species of which occurs in Germany, only 1 species occures in all of Europe, can also be readily separated from other genera by the larvae.

Acroclita consequana (Herrich-Schäffer 1851)(1966).

Caterpillar pale to brownish yellow, granulated by small brown spinules. Head, cervical shield brown or the cervicalshield is yellowish and only the posterior margin brown (fig. 175). Thoracic legs brown, anal shield of the body color. The 4th ocellus is closer to the 5rd than to the 6th, the 2nd equidistant from the 1st and 3rd (fig. 176).. On the mesothorax IIIa is dorsocraniad from III, seta VIII is distinctly set off from the coxa. The spiracles of the prothorax are elliptical, those of the abdominal segments round. On the 2nd abdominal segment the spiracles are larger than the insertion place of seta III. Setae IV amd V are vertically situated on the 1st abdominal segment, diagonally on the others. On the 8th abdominal segment the distance between setae II is larger than that between setae I, III is ventrocraniad from the spiracl On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are found on common pinaculi. The distance between setae VIII is not larger than on the 8th abdominal segment. Group VII on the 1st to the 6th abdominal segments inclusive counts 3 setae on the 7th, 8th, and 9th abdominal segments 2 setae. The setae in group VII on the base of the parapodia are situated in a row. The uniserial, elliptical circles of hooks of the parapodia consist of about 25, those of the caudal disk about 20 hooklets.

June, and Sept., Oct. on Euphorbia paralis, biumbellata, especially on the seeds. Distributed in South France, Spain, Sardiaia, and England.

The caterpillars from the Bavarian State Collection that were examined had been found by Constant on Dec. 15, 1891, at the Gulf of Juan, Spain, on Euphorbia.

The genus Rhopobota Lederer 1859.

Diagnosis: The circles of hooks of the parapodia are biserial, but laterally or anteriorly they are uniserial. On the cervical shield IIIa is at least as far from III as from II. On the prespiracular shield setae V, IV, and VI are situated in a line. On the mesothorax IIIa is dorsocraniad from III, VIII is distinctly set off from the coxa.

This genus has hitherto consisted of one species. Recently Obraztsov also referred the previous species of Epinotia - ustumaculana - to this genus. The caterpillars of these two spp. stand so close together morphologically that they are hard to separate. For this reason I join in with this transfer.

Spp. of Rhopobota.

1 (2) Circles of hooks of the parapodia anteriorly uniserial. The immediate vicinity of the spiracles dark-brown chitinized, anal shield not dark punctate [or dotted] naevana

2 (1) Circles of hooks of the parapodia uniserial on the side, vicinity of spiracles not chitinized, anal shield dark punctate [or dotted] (fig. 178) ustumaculana

Rhopobota naevana (Hübner 1822)(2281).

Caterpillar whitish brown or dirty green with lighter pinaculi. Body strongly granulated by small brown spinules. Head and cervical shield black-brown, prespiracular shield brown, anal shield and insertion places of the setae brownish. The 4th ocellus is somewhat closer to the 3rd than to the 6th. On the abdominal segments IIIa is distinctly set off from pinaculum III, the spiracles are elliptical and surrounded by a chitin margin, on the 2nd abdominal segment larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is larger than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are found on common pinaculi,

setae VIII are not farther apart than on the 8th abdominal segment. Group VII on the 1st to the 6th abdominal segments counts 3 setae, on the 7th, 8th, and 9th segments 2 setae. The circles of hooks of the parapodia are uniserial on the side, otherwise biserial (fig. 177) and consist of about 35 hooklets, the caudal disk is provided with about 25 hooklets.

May, June on Prunus spp., Pirus malus, Crataegus, Rhamnus, Sorbus, Ilex, Vaccinium spp., andErica carnea. The adult June, July.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 24, 1905 near Speyer on Crataegus.

R.ructumaculana (Curtius 1831)(1935).

Caterpillar whitish, strongly granulated by small brown spinules. Head brownish, thoracic legs, cervical shield dark brown, anal shield brown and dark punctate (fig. 178) [or dotted]. The large pinaculi are brown. The 4th ocellus is equidistant from the 3rd and 6th. The spiracles are more elliptical, the spiracular margin not reinforced. On the 9th abdominal segment the pinaculum of setae II has been enlarged into a triangular shield. The anterior half of the circles of hooks is uniserial, the posterior biserial (see fig. 184), they consist of about 40 hooklets. In other characters the caterpillar of this sp. agrees with that of naevana.

May, June between spun-up leaves ofVaccinium myrtillus, V.vitis idaea. The caterpillars from the Bavarian State Collection that were examined had been found by Mees on June 3, 1898 near Herrenwies/Baden between spun-up leaves on Vaccinium vitis idaea.

The genus Epinotia Hübner 1825.

Diagnosis: On the prespiracularshield seta IV is ventrad from V and VI, and on the 9th abdominal segment setae II are always found on a common pinaculum. If setae V, IV, and VI are arranged in a line on the prespiracular shield then setae IV and V stand diagonally on the 1st abdominal segment and on the mesothorax IIIa is found dorsad or dorsocaudad from III.

The earlier genus Epinotia which was rich in spp., essentially differs with respect to composition of spp. from the one which Obraztsov erected on the basis of his new investigations. He distinguishes 6 subgenera within this still large genus. The genus Epinotia still seems to be rather heterogeneous, seen from the larvo-morphological side, but the subgenera form still better delimited groups. The genus and even the subgenera can be larvo-morphologically characterized. In the following I would like to discuss only peculiarities and cases in which I cannot follow Obraztsov.

Obraztsov places former Epiblema spp. in the first subgenus Epinotia. With the exception of kochiana all have biserial parapodia wwhereby they essentially differ from the spp. of Epiblema and agree with other Epinotia spp. Therefore this transfer must be considered as correct from the larvomorphological side also. The species kochiana however not does fit here larvally, for it is substantially closer to the representatives of Epiblema or Eucosma by reason of the uniserial circles of hooks and other characters. Since it was previously in the genus Epiblema (=Eucosma) and larvo-morphologically agrees with the genus Pseudeucosma, I am referring it to Pseudeucosma.

The 2nd subgenus Hamuliger also proved correct from larvomorphological investigations.

In the 3rd subgenus Steganoptycha are again combined former Epiblema spp. (=Eusocma). They differ as larvae by the small spiracles from the present genera Epiblema and Eucos-

ma. If however, preference were given to the development of the circles of hooks in the evaluation, then the spp. nigricana, tedella, and proximana whose caterpillars have uniserial circles of hooks must be returned to the genus Eucosma. The imaginal systematics must be re-examined once more in this place.

Departing from Obraztsov, I am referring trisigmana in this subgenus because it with the biserial circles of hooks does not fit the genus Eucosma.

In the 4th subgenus, there are only spp. which previously belonged to the genus Epinotia. Departing from Obraztsov I am referring the earlier Epinotia species pauperana back again into this subgenus since it has biserial circles of hooks and therefore does not fit in the genus Eucosma. This subgenus is very uniform except for granitana. On the basis of the uniserial circles of hooks it must be placed in the subgenus Phaneta of the genus Eucosma, yet with respect to the small spiracles, it cannot be permitted to stand here either. Here too, imaginal systematics must decide.

The 5th subgenus Proteopteryx includes 2 of the former Epiblema spp., which differ from the true Epiblema spp. by the small spiracles. If it is desired to decide this case from the circles of hooks these two spp. could not be in one subgenus.

Of the 6th subgenus, I was able only to examine Asthenia pygmaena. It is very close to Epinotia spp., yet it could be conceived as in a genus of its own just the same as before, since on the 7th abdominal segment group VII consists not of 2, but rather of 3 setae. This is a matter of opinion for the larval systematist. But since I am assuming that imaginally a strongly kindred relation appears, as Obraztsov must have recognized, I am joining in with his opinion.

Subgenera and Spp. of Epinotia.

1 (10) Spiracles of the 2nd abdominal segment distinctly larger than the insertion place of seta III, the immediate vicinity of the spiracles is mostly chitinized. On the cervical shield IIIa is at least as far from III as from IX. The seta group VII consists of 3 setae on the 1st and 2nd abdominal segments sg. Epinotia

2 (3) Seta VI is lacking on the 9th abdominal segment semifuscana

3 (2) Seta VI is present on the 9th abdominal segment.

4 (5) On the 7th abdominal segment group VII consists of 3 setae sordidana

5 (4) On the 7th abdominal segment group VII consists of 2 setae.

6 (7) On the 1st abdominal segment setae IV and V are vertically situated, and on the 8th abdominal segment IIIa is found with III on a common pinaculum stroemiana

7 (6) On the 1st abdominal segment setae IV and V are diagonally situated and on the 8th abdominal segment IIIa stands beside the pinaculum of III.

8 (9) On the mesothorax seta VIII is found right on the margin of coxa, the cervical shield is uniformly colored ophthalmicana

9 (8) On the mesothorax the seta VIII is distinctly set off from coxa, the cervical shield is yellowish, dark bordered on the posterior margin (fig. 180) solandriana

10 (1) Spiracles of the 2nd abdominal segment not larger than the insertion place of seta III. If larger then on the cervical shield IIIa is closer to III than to IX. On the 1st and 2nd abdominal segments group VII consists of 2 or 3 setae.

11 (12) On the 7th abdominal segment group VII counts 3 setae and on the cervical shield IIIa is at least as far from III as from IX. On the 8th abdominal segment setae II are farther apart than setae I. sg. Asthenia pygmaena

12 (11) On the 7th abdominal segment group VII counts 2 setae, if 3 then on the cervical shield IIIa is closer to III than to IX and on the 9th abdominal segment the distance between setae II is not greater than that between setae I.

13 (14) On the 9th abdominal segment group VII consists of 1 seta, on the 1st and 2nd abdominal segments of 3 setae, and on the cervical shield IIIa is at least as far from III as from IX. sg. Hamuligera trimaculana

14 (13) On the 9th abdominal segment group VII consists of 2 setae, if of one, then on the 1st and 2nd abdominal segments of 2 setae, or IIIa is closer to III than to IX.

15 (30) The 3rd, 4th, and 6th ocelli are arranged in a line in which the 4th is equidistant from the 3rd and 6th sg. Panoplia

16 (19) Seta VI is lacking on the 9th abdominal segment.

17 (18) Setae IV and V on the 9th abdominal segment are on a common pinaculum signatana

18 (17) Setae IV and V on the 9th abdominal segment are on separate pinaculi ramella

19 (16) Seta VI present on the 9th abdominal segment.

20 (23) The posterior margin of the cervical shield is bowed in [or indented) toward seta 2 (fig. 187).

21 (22) Hooklets of circles of hooks black, the caterpillar body dorsally with small hairs granitana

22 (21) Hooklets of the circles of hooks yellowish, caterpillar body dorsally practically smooth nanana

23 (20) Posterior margin of cervical shield not indented toward seta II.

24 (27) Setae IV and V are diagonally situated on the 1st abdominal segment, circles of hooks of the parapodia laterally uniserial (fig. 177).

25 (26) Caudal disk with about 24 hooklets rubiginosana

26 (25) Caudal disk with about 15 hooklets cruciana

27 (24) Setae IV and V on the 1st abdominal segment are vertically situated, the circles of hooks of the parapodia completely biserial.

28 (29) Parapodia with about 35 hooklets, cervical shield brown, not lighter than the body pauperana

29 (28) Parapodia with about 30 hooklets, cervical shield yellow, lighter than the head mercuriana

30 (15) The 4th ocellus is ventrad from the line going from the 3rd to the 6th ocellus and is closer to 3 than to 6.

31 (34) On the 1st abdominal segment group VII consists of 3 setae, IV and V are vertically arranged, on the mesothorax IIIa is dorsocaudad from III sg. Proteopteryx

32 (33) Circles of hooks biserial crenana

33 (32) Circles of hooks uniserial ustulana

34 (31) On the 1st abdominal segment group VII consists of 2 setae, if of 3 then setae IV and V on the 1st abdominal segment are diagonally situated sg. Steganoptycha

35 (33) Seta VI is lacking on the 9th abdominal segment.

36 (37) Parapodia dark chitinized on the side (see fig. 224) provided with 40-50 hooklets bilunana

37 (36) Parapodia not chitinized on the side, provided with 20-25 hooklets penkleriana

38 (35) Seta VI present on the 9th abdominal segment.

39 (44) Circles of hooks of the parapodia uniserial, of 15-25 hooklets. Caudal disk with 10-15 hooklets.

40 (41) On the mesothorax IIIa is dorsocaudad from III, on the 1st abdominal segment group VII consists of 2 setae nigricana

41 (40) On the mesothorax IIIa is dorsocraniad from III, on the 1st abdominal segment group VII consists of 3 setae.
42 (43) Setae II are farther apart on the 8th abdominal segment, than are setae I, caterpillar green, head yellow — proximana
43 (42) On the 8th abdominal segment setae II are not farther apart than are setae I, mostly closer together. Caterpillar redbrown, head black-brown — tedella
44 (39) Circles of hooks of the parapodia biserial, of 35 to 50 hooklets, caudal disk with more than 20 hooklets.
45 (48) On the 1st and 2nd abdominal segments group VII consists of 2 setae.
46 (47) On the 9th abdominal segment group VII consists of 1 seta — nisella
47 (46) On the 9th abdominal segment group VII consists of 2 setae — trisignana
48 (45) On the 1st and 2nd abdominal segments group VII consists of 3 setae.
49 (50) On the prespiracular shield setae V, IV, and VI stand in one line, on the cervical shield IIIa is equidistant from III and IX — subocellana
50 (49) On the prespiracular shield IV is ventrad from V and VI, on the cervical shield IIIa is closer to III than to IX.
51 (52) Spiracle of the 2nd abdominal segment distinctly larger than the insertion place of seta III — thapsiana
52 (51) Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III.
53 (54) On the mesothorax IIIa is dorsocaudad from III — demarniana
54 (53) On the mesothorax IIIa is dorsocraniad from III.
55 (56) Hooklets of parapodia smaller anteriorly than posteriorly (fig. 184) — immundana
56 (55) Hooklets of parapodia the same size on the anterior and posterior margins — tetraquetrana

The subgenus Epinotia Hübner 1825.

Diagnosis: Spiracles of the 2nd abdominal segment distinctly larger than the insertion place of seta III. On the cervical shield IIIa is at least as far from III as from IX. On the 1st and 2nd abdominal segments group VII always consists of 3 setae.

Epinotia (E.) stroeminana (Fabricius 1781)
syn. similana Hübner 1822 (2135) according to Obraztsov.

Caterpillar yellowish white, strongly granulated by small spinules, pinaculi black-brown. Head, cervical and anal shields, and thoracic legs yellow-brown, sometimes even darker. The ocelli are regularly situated. On the cervical shield IIIa is at least as far from III as from IX. II is ventrodaudad from I. On the prespiracular shield IV is found in the middle between V and VI. On the mesothorax IIIa is dorsocraniad from III, seta VIII distinctly set off from the coxa. The spiracles are found on dark chitin shields. On the abdominal segments IIIa stands on the margin of pinaculum III, on the 1st abdominal segment IV and V are vertically situated, diagonally on the others. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is somewhat lower down than the spiracle. On the 9thabdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. On the 1st and 2nd abdominal segments group VII consists of 3 setae, of 2 setae on the 7th, 8th, and 9tha bdominal segments. Parapodia black-brown chitinized on the side (see fig. 224), their biserial circles of hooks count about 40 hooklets.

June in overturned leaf margin or between spun-up leaves on Betula, also Alnus, especially on the lower bushes.
Locality: Erlangen-Röthelheim on May 25, 1953 on Betula.

Epinotia (E.) ophthalmicana (Hübner 1922) (2123).

Caterpillar dirty greenish white, strongly granulated by small spinules,,pinaculi pale, head and thoracic legs dark brown, cervical shield yellow-brown, anal shield of the body color. The 2nd ocellus is closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th, the 1st, 2nd, and 5th ligher than the others. The spiracles are not found on chitin shields. On the 1st and 11th segments they are elliptical, on the others round and smaller. Setae IV and V on all abdominal segments are diagonally arranged, IIIa separated off from the pinaculum of III. On the 9thabdominal segment VI stands on a pinaculum of its own, but it touches the pinaculum of setae IV and V. The parapodia are not chitinized on the side, their biserial circles of hooks consist of about 40, those of the caudal disk of about 20 hooklets. In other characters the caterpillar of this species agrees with that of the foregoing.

May in cigar-shaped leaf rolls of Populus tremula. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 26, 1901 in leaf rolls on P.tremula.

E. (E.) sordidana (Treitschke 1830)(2127).

Caterpillar greenish to yeelowish-white, granulated, head, cervical shield, and thoracic legs darkbrown. Pinaculi and anal shield lighter brown, in which case the pinaculi of the 1st and last segments are mostly darker. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th is closer to the 3rd than to the 6th. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 1st abdominal segment IIIa is distinctly set off from the pinaculum of III, the spiracle is larger than on the 2nd abdominal segment. Setae IV and V stand diagonally on all the abdominal segments. Parapodia not chitinized on the side, the biserial circles of hooks consisting of about 30 hooklets, those of the caudal disk of about 35. In other characters this species agrees with stroemiana.

May, June, July in leaf rolls or leaves of Alnus glutinosa that have been drawn together.

Locality: Erlangen Brucker Lache on June 13, 1951 in a leaf of Alnus glutinosa folded lengthwise.

E. (E.) semifuscana (Stephens 1834)(2126).

Caterpillar gray-green, strongly granulated by small spinules with pale or brown pinaculi. Head and cervical shield brown, if lighter than dark bordered on the margin. Anal shield dark punctate [or dotted] (fig. 179) on the anterior margin. On the mesothorax distinctly recognizable microsetae are found before the pinaculi of (I+II) and (III+IIIa) as well as before the thoracic legs. The spiracles are found on dark chitin shields, on the 1st and 2nd abdominal segments IIIa is distinctly set off from the pinaculum of III, setae IV and V are diagonally arranged on all segments. On the 9th abdominal segment seta VI is lacking. Parapodia not dark chitinized on the side, their biserial circles of hooks consisting of about 50, those of the caudal disk of 30-40 hooklets. Besides this all additional characters given for stroemiana apply.

May, June between spun-up leaves on Salix caprea, also Myrica gale.

The caterpillars from the Bavarian state Collection that were examined had been found by Disque on May 18, 1914, near Speyer, in leaf rolls on S.caprea.

E. (E.) solandriana (Linné 1758)(2125).

Caterpillar gray-whitish, or greenish gray, strongly granulate. Head dark brown, if lighter, it is dark edged. Cervical shield brown-yellow, dark bordered on the sides and

posteriorly (fig. 180). Pinaculi blackish. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th is closer to the 3rd than to the 6th. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. On the mesothorax IIIa is dorso-caudad from III, VIII distinctly set off from the coxa. The spiracles are found on dark shields, on the 2nd abdominal segment they are larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from the pinaculum, IV and V are always diagonally situated. On the 8th abdominal segment the distance between setae II and that between setae I is approximately of the same size, III is found ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2. The biserial circles of hooks of the parapodia consist of about 40, those of the caudal disk of about 30 hooklets.

May, June, July in leaf rolls on Corylus, Alnus, Betula, Populus tremula, Salix caprea, etc. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 20, 1901 near Speyer on Corylus.

The subgenus Hamuligera Obraztsov 1946.

Diagnosis: On the 1st and 2nd abdominal segment group VII consists of 3 setae, on the 9th of 1 seta and on the cervical shield IIIa is at least as far from III as from IX. The circles of hooks are biserial.

(Epinotia (Ham.) trimaculana Donovan 1806) (2005).

Caterpillar yellowish, strongly granulate, pinaculi brownish to brown. Head, cervical shield, thoracic legs black-brown, anal shield of the body color. The 2nd ocellus is somewhat closer to thelst than to the 3rd. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. On the prespiracular shield IV is ventrad from V and VI equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VI closer to IV than to III, seta VIII distinctly set off from the coxa. The spiracles are round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. IIIa is set off from the pinaculum of III. On all abdominal segments setae IV and V are diagonally situated. On the 8th abdominal segment setae II and setae I are almost equally far apart, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment.

April, May between tip leaves of Ulmus campestris.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 1, 1885 near Speyer on U.campestris.

The subgenus Steganoptycha Stephens 1829.

Diagnosis: On the 1st abdominal segment group VII consists of 2 setae, if of 3 then setae IV and V on the 1st abdominal segment are diagonally situated.

Epinotia (Steg.) subocellana (Donovan 1806)(2118).

Caterpillar yellowish- or greenish-white, only weakly granulated. Head yellowish to light brown with dark eye and genal spots, cervical and anal shields of the body color. On the cervical shield IIIa is equidistant from III and IX, II is ventrocaudad from I. On the prespiracular shield IV stands in a line with V and VI, equidistant from both. IIIa on the mesothorax is dorsocaudad from III, VI is closer to IV than to III, the seta VIII stands close beside the coxa. Spiracles elliptical, on the 2nd abdominal segment not larger than the insertion place of seta III. On all abdominal segments setae IV and

V are diagonally situated, IIIa is distinctly set off from the pinaculum of III on the 1st abdominal segment. On the 8th abdominal segment, setae II are not farther apart than setae I, III is somewhat lower than the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. Groups VII consists of 3 setae on the 1st and 2nd abdominal segments, of 2 on the 7th, 8th, and 9th. The biserial circles of hooks are formed of about 30, those of the caudal disk of about 20 hooklets.

Aug., Sept., and Oct. between two leaves spun up on one another or in a leaf fold on Salix, Populus, and Rhamnus cathartica.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 5, 1883 near Speyer on Salix caprea.

Epinotia (Steg.) bilunana (Haworth 1811)(2128).

Caterpillar gray-white to brownish gray, dorsally more strongly granulate. Head, cervical shield, and thoracic legs black-brown, pinaculi and anal shield brownish gray. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 5th, on the cervical shield IIIa is somewhat closer to III than to IX. Seta IV on the prespiracular shield stands ventrad from V and VI equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VI is closer to IV than to III, setae VIII distinctly set off from the margin of coxa. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III, which is situated dorsocaudad from the spiracle. On all abdominal segments IIIa is distinctly separated from the pinaculum of III, the setae IV and V are vertically situated on the 1st abdominal segment, diagonally on the others. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is absent. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 5th of 1 seta. The parapodia are dark chitinized on the side (see fig. 224) their biserial circles of hooks consisting of 45-50, those of the caudal disk of about 30 hooklets.

April, May in ♂ catkins of Betula.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on March 28, 1896 near Speyer in the ♂ catkins of Betula alba.

E.(S.)thapsiana (Zeller 1847)(2137).

Caterpillar dirty-whitish, every segment with a red transverse saddle mark, granulated by small spinules. Head yellow- to light-brown, cervical shield yellowish to light brown, often with a dark margin (fig. 181). On the 2nd abdominal segment III is dorsad from the spiracle. On all abdominal segments setae IV and V are diagonally arranged, on the 9th IV stands with V and VI on a common pinaculum. On the 1st and 2nd abdominal segments group VII consists of 3 setae, of 2 on the 7th, 8th, and 9th. Parapodia not chitinized on the side, their biserial circles of hooks count 40-45, those of the caudal disk 25-30 hooklets. In addition to these characters all additional characters given for bilunana apply.

June, July on Laserpitium gallicum, Crithmum maritimum, and Anethum foeniculum. Occurs only in Lower Austria, France, and South Europe, Asia Minor and North Africa.

The caterpillars from the Bavarian State Collection that were examined had been found by Chrotien in July 1906 near Digne (French Alps) on Laserpitium gallicum.

Epinotia (Stoganoptycha) demarniana (Fischer 1840) (2115).

Caterpillar brownish, strongly granulated by small brown spinules. Head, thoracic legs and cervical shield brown, the latter paler and dark edged (fig. 182), pinaculi brown, anal shield brownish. The distances of the ocelli apart are uniform, on the cervical shield IIIa is closer to III than to IX, II is ventrocaudad from I. On the mesothorax IIIa is dorsocaudad from III, VI closer to IV than to III (see fig. 155), the seta VIII distinctly set off from the coxa. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III, on the 1st and 2nd abdominal segments they are equally large. Setae IV and V on all abdominal segments are diagonally situated. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, seta III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. Anal comb with 6 spines. Parapodia dark-brown chitinized on the side, their biserial circles of hooks count 35-40, those of the caudal disk 16-24 hooklets.

Sept., Oct. in ♂ catkins of Alnus and Betula.

The caterpillars of the Bavarian State Collection that were examined had been found by Schütze on Oct. 9, 1905 near Rachlau in the catkin of Betula.

E.(S.)immundana (Fischer 1839)(2132).

Caterpillar whitish or greenish gray, dorsally with a reddish tinge and more strongly granulated. Head, cervical shield brownish yellow, the latter dark edged (fig. 183). The pinaculi are large and gray-brown. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, II ventrocaudad from I. Seta IV on the prespiracular shield is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII distinctly set off from the coxa. The spiracles of the 1st and 11th segments are elliptical, the others round, on the 2nd abdominal segment not larger than the insertion place of seta III. On all abdominal segments, IIIa is set off from pinaculum III and IV is diagonally arranged with V. On the 8th abdominal segment, setae II and setae I are equally far apart, III ventrocraniad from the spiracle. On the 9th abdominal segment setae II, I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII not greater than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae, also 3 may appear on the 7th. The biserial circles of hooks of the parapodia consist of 35-40 hooklets, those on the anterior margin being smaller than on the posterior (fig. 184), caudal disk with about 30 hooklets.

2 Generations: the caterpillars of the 1st generation live from April to June in leaf rolls, those of the 2nd generation in Aug., Sept., and Oct. in ♂ catkins of Alnus glutinosa. I found them most readily in the fall in the ♂ catkins two of which were frequently spun together. The caterpillar feeds on the inside of the catkin, but prevents it from falling apart by spinning out. Only empty catkins are found the last of October since pupation takes place in the ground.

Locality: Erlangen, Brucker Lache on Oct. 28, 1953 in the ♂ catkins of Alnus glutinosa, in June, in spun-up leaves.

E.(S.)tetraquetrana (Haworth 1811)(2129).

Caterpillar pale green or yellowish, dorsally somewhat more strongly granulated. Head, cervical shield, and anal shield light brown, cervical shield mostly dark edged.

Pinaculi light or darker brown-gray. The immediate vicinity of the spiracles is chitinized, the hooklets of the circles of hooks are the same size before and behind. In all other characters the caterpillar of this species agrees completely with that of immundana.

Aug. to Oct. on Betula and Alnus, at first in swellings of the twigs then between spun-up leaves. Overwintering between spun-up leaves or on the ground.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 26, 1884, near Speyer on Betula.

E.(S.)miscella (Clerck 1759)(2119).

Caterpillar yellowish- or greenish-white, only weakly granulated. Head, cervical shield and thoracic legs brown, pinaculi brownish. The ocelli are situated at equal distances apart. On the cervical shield IIIa is equidistnat from III and IX. On the mesothorax IIIa is dorsocraniad from III, seta VIII is distinctly set off from the coxa. The spiracles are very small, not larger on the 2nd abdominal segment that the insertion place of seta III. On the 1st abdominal segment setae IV and V are vertically situated, diagonally on the others. On the 8th abdominal segment setae II and setae I are equidistant from each other, III somewhat lower than the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. The distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, and 7th and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. On the parapodia the 3 setae of group VII are situated in a triangle. Parapodia on the side not chitinized, their biserial circles of hooks consisting of 26-30 hooklets.

April, May in catkins of Populus tremula and Salix caprea, according to Spuler (1910) also on Alnus and Acer.

Locality: Erlangen on May 10, 1952 in fallen catkins of P.tremula.

E.(S.)penkleriana (Schiffermiller 1776)(2121).

Caterpillar dirty- or greenish-white, strongly granulated by small brown spinules. Head, cervical shield light brown, the latter punctate [or dotted](fig. 185). Anal shield and thelarge pinaculi brownish. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is somewhat closer to III than to IX. On the prespiracular shield IV is ventrad from V and VI, on the mesothorax IIIa is dorsocaudad from III, seta VIII distinctly set off from the coxa. The spiracles are elliptical, on the 2nd abdominal segment IIIa is distinctly set off from the pinaculum of III and setae IV and V are vertically arranged, diagonally on the others. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, I and III, as well as IV and V stand on common pinaculi, VI is lacking. The distance between setae VIII on the 8th and 9th abdominal segments is equal, the circles of hooks of the parapodia are anteriorly uniserial and become biserial caudad (see fig. 184). Parapodia consisting of 20-24 hooklets. The circles of hooks of the caudal disk are biserial and count about 14 hooklets.

April in buds and catkins of Alnus and Betula.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 11, 1911 near Speyer in buds of A.glutinosa.

E.(S.)nigricana (Herrich-Schäffer 1851)(2108).

Caterpillar reddish brown, strongly granulated by small brown spinules. Head, cervical shield, and thoracic legs black-brown, the pinaculi are only small, sometimes dark on the 9th abdominal segment. The 4th ocellus is closer to the 3rd than to the 6th.

Spiracles very small, on the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is less than that between setae I, III is ventrocraniad from the spiracle. Setae II, also I and III, as well as IV, V, abd VI stand on common pinaculi on the 9th abdominal segment. On the 1st abdominal segment group VII consists of 2 setae, on the 2nd of 2, sometimes of 3 setae, on the 7th, 8th, and 9th of 2 setae. The uniserial circles of hooks of the parapodia count 22 to 24, those of the caudal disk 12-14 hooklets. Otherwise all additional characters cited for nisella apply.

The caterpillar lives until May in buds of Abies alba.

The caterpillars from the Bavarian State Collection that were investigated had been found by Stange on April 22, 1882, near Friedland in buds of A.alba.

E.(S.)tedella (Clerck 1759)(2111).

Caterpillar light brownish with 2 dorsal red-brown longitudinal stripes, body strongly granulate. Head, cervical shield, dark-brown, pinaculi light brown, sometimes darked on the thoracic segments, anal shield gray-brown. The ocelli are very small, the 4th ocellus is somewhat closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta IIIa on the mesothorax is dorsocraniad from III, VI closer to IV than to III, seta VIII distinctly set off from the coxa. Spiracles very small and round, on the 1st and 2nd abdominal segments not larger than the insertion place of seta III. On all abdominal segments setae IV and V are diagonally situated. On the 8th abdominal segment the distance between setae II is not greater than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are found on common pinaculi, setae VIII not farther apart than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII consists of 3, on the 7th, 8th, and 9th of 2 setae. The uniserial circles of hooks of the parapodia consist of about 20 hooklets, which can vary somewhat in size, those of the caudal disk of 10 hooklets.

Aug. to Sept. on Picea excelsa, at first making mines, then feeding on the needles in a web permeated with excrement. Overwintering in the ground litter. Pupation in April and May. Adult May to June. According to Spuler (1910) this species also occurs on Abies alba, Pinus silvestris, and Juniperus, yet this was contested by Schütze (1931).

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 21, 1896 near Speyer on Picea excelsa.

E.(S.)proximana (Herrich-Schäffer, 1851) (2112).

Caterpillar pale green, head, cervical shield yellow-brown, body granulated. On the 8th abdominal segment the distance between setae II is greater than that between setae I, the uniserial circles of hooks of the parapodia consisting of about 20 hooklets, which are not always of the same size. Caudal disk with 10-15 hooklets. In all other morphological characters the caterpillar of this species agrees with that of tedella.

Aug. to Sept., Oct., between spun-up needles on Abies alba, at first making mines, later a needle feeder as in tedella. Overwintering in groundlitter, pupation in April, the adult May to July. The caterpillars from the Bavarian State Collection that were examined had been found by Mitterberger on Oct. 15, 1907 near Steyr on Picea excelsa.

E.(S.)trisignana (Wolcken 1868)(2148).

Caterpillar yellowish white and granulated by small white spinules, head yellow brown. The 2nd, 1st, and 5th ocelli are lighter than the others. The 2nd ocellus is brought closer to the 1st, the 4th to the 3rd. Seta O-1 is found between the 2nd and

3rd ocelli. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocaudad from III, seta VIII distinctly set off from the coxa. Setae IV and V on all abdominal segments are diagonally arranged. Spiracles elliptical and even on the 2nd abdominal segment they are larger than the insertion place of seta III. This on the 1st and 2nd abdominal segments stands exactly above the spiracle, on the 8th abdominal segment it is somewhat dorsocraniad from this. The distance between setae II and that between setae I is equally large on the 8th abdominal segment. On the 9th abdominal segment setae II are found on a common pinaculum, the pinaculum of setae I and III, as well as that of setae IV, V, and VI is fused together. The distance between setae VIII is the same size on the 8th and 9th abdominal segments. On the 1st, 2nd, 7th, 8th, and 9th abdominal segments group VII consists of 2 setae. The biserial circles of hooks of the parapodia consist of 40-48, those of the caudal disk of about 15 to 20 hooklets.

The caterpillar lives from Sept. to April in a web on the root of Inula salicina. The adult flies June, July.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 1, 1905 near Speyer in a web on the root of Inula.

The subgenus Panoplia Hübner 1825.

Diagnosis: The 4th ocellus stands in a line with the 3rd and 6th, being equidistant from both. On the cervical shield IIIa is closer to III than to IX, and on the prespiracular shield IV stands in the middle, ventrad from V and VI. Seta VIII on the mesothorax is distinctly set off from the coxa.

Epinotia (Panoplia) ramella (Linné 1758)(1974).
sym. paykulliana Fabricius 1787 according to Obraztsov.

Caterpillar brownish white, strongly granulated by small spinules. Head, cervical shield, thoracic legs brown, pinaculi and anal shield brownish. The 2nd ocellus is closer to the 1st than to the 3rd. On the mesothorax IIIa is dorsocaudad from III, VI closer to IV than to III (see fig. 155). The spiracles of the 2nd abdominal segment are not distinctly larger than the insertion place of seta III, on all abdominal segments they are round. Setae IV and V on the abdominal segments are diagonally situated, on the1st and 2nd abdominal segments IIIa is distinctly set off from the pinaculum of III. The distance between setae II on the 8th abdominal segment is not greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III stand on common pinaculi, IV and V on separate pinaculi, VI is lacking. On the 1st and 2nd abdominal segments group VII counts 3 or 2 setae, on the 7th and 8th always 2 setae, on the 9th 2 or 1. The biserial circles of hooks of the parapodia consist of about 26, those of the caudal disk of about 14 hooklets.

April, May in catkins of Betula, according to Spuler (1910) in buds and twigs of Betula and Populus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 11, 1903, near Speyer in the catkin of Betula.

E.(P.) signatana (Douglas 1845)(1980).

Caterpillar yellowish, strongly granulate, head and cervical shield brownish yellow. The spiracles are round and small, on the 2nd abdominal segment somewhat larger than the insertion place of seta III. On the 9th abdominal segment setae IV and V are found on a common pinaculum, VI is lacking. On the 1st, 2nd, 7th, and 8th abdominal segments group VII counts 2 setae, 1 on the 9th. The biserial circles of hooks of the parapodia consist of about 30, those of the caudal disk of about 20 hooklets. In other characters this species agrees with ramella.

May, June, July in young heart leaves of Prunus padus.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 24, 1903 near Speyer on Prunus padus.

E.(Pan.)manana (Treitschke 1835)(1984).

Caterpillar dirty brownish or light gray, head black, cervical shield and thoracic legs black-brown, body weakly granulated. Cervical shield bowed in from the posterior margin toward seta II (fig. 187), a dark dot is found behind I. On the mesothorax IIIa is dorsocraniad from III, VI is equidistant from III and IV. The spiracles of the 1st and 2nd abdominal segments are not larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from the pinaculum of III, setae IV and V are diagonally situated. On the 8th abdominal segment the distance between setae II is somewhat greater than that between setae I, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. Setae VIII on the 8th and 9th abdominal segments are equally far apart. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. The circles of hooks of the parapodia count about 22, without the small hooklets, those of the caudal disk about 10 large hooklets.

April, May in needles of Picea excelsa, making mines. Pupation in the web.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 7, 1896 near Speyer on P.excelsa.

E.(P.)granitana (Herrich-Schäffer 1851)(1999).

Caterpillar dirty brownish white, very strongly granulated. Head black-brown, cervical shield, thoracic legs, and setae dark brown. The cervical shield is developed exactly the same as in manana (see fig. 187). The spiracles of the prothorax are thrice as large as those of the 2nd abdominal segment. The circles of hooks of the parapodia consist of about 20, those of the caudal disk of about 15 black hooklets. In all other characters this species agrees larvo-morphologically with manana.

Aug. to March under the bark of Picea excelsa; it was assumed by Schütze in 1931 that even the needles were eaten.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on March 31, 1907 near Speyer under the bark of P.excelsa.

E.(P.)rubiginosana (Herrich-Schäffer 1851)(2000).

Caterpillar yellowish white, strongly granulated, head, thoracic legs, light brown, cervical and anal shields brownish. On the cervical shield IIIa is closer to III than to II, II is ventrodaudad from I. On the mesothorax IIIa is dorsocaudad from III, VI equidistant from IV and III. On all abdominal segments setae IV and V are diagonally situated, on the 1st and 2nd IIIa is distinctly set off from the pinaculum of III. The spiracles of the 2nd abdominal segment are only somewhat larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not larger than that between setae I, III is found ventrocraniad from the spiracle. Setae II, also I and III, as well as IV, V, and VI are found on common pinaculi on the 9th abdominal segment. Group VII on the 1st and 2nd abdominal segments consists of 3 setae, on the 7th, 8th, and 9 of 2 setae. The biserial circles of hooks of the parapodia are uniserial on the side and count about 40 hooklets, those of the caudal disk about 23.

Oct., Nov. between spun-up needls of Picea excelsa and Pinus silvestris, pupation on the ground. The caterpillars from the Bavarian State Collection that were examined d be found by Stange on Oct. 10, 1891 near Friedland on Pinus silvestris.

Epinotia (Panoplia) cruciana (Linne 1761)(2003).

Caterpillar yellowish- or greenish-white, not or only weakly granulate. Head dark brown, cervical shield yellowish mostly dark bordered (fig. 188). On the mesothorax IIIa is dorsocaudad from III, VI equidistant from II and III. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III, IIIa on the 1st and 2nd abdominal segments distinctly set off from the pinaculum of III. On all abdominal segments IV is diagonally arranged with V. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. The biserial circles of hooks of the parapodia are laterally uniserial and count about 31, those of the caudal disk about 15 hooklets.

Caterpillars in April and May first in the bursting buds of Salix caprea and then boring in between the young leaves in the soft tips of the shoots. The caterpillars from the Bavarian State collection that were examined were found by Stange on June 8 near Friedland on Salix caprea, some were found by de Crombrügghe on May 27, 1905, near Brussels.

E.(P.)mercuriana (Frölich 1830)(2001).

Caterpillar gray yellow or greenish white, strongly granulated by brown spinules. Head, cervical shield yellowish to light brown, the latter lighter. On the cervical shield IIIa is closer to III than to IX, II is ventrodaudad from I. On the 1st abdominal segment setae IV and V are vertically, on the others diagonally, situated. Setae II on the 8th abdominal segment are not farther apart than setae I, III is ventrocraniad from the spiracle. The completely biserial circles of hooks of the parapodia count about 30 hooklets. In other characters this species agrees larvo-morphologically with the preceding.

June, July in a web on Dryas octopetala. Obviously in this species it is a matter of an ice-age relict, the same as in the case of the host plant, since it occurs only in the Alps, Scotland, and Scandinavia. The caterpillars from the Bavarian State Collection that were examined had been found by Chretien on June 16, 1899 in the Alps on Dryas octopetala.

E.(P.) pauperana (Duponchel 1843)(1971).

Caterpillar yellowish white with reddish tinge, only weakly granulate. Head light brown, cervical shield brown, sometimes posteriorly dark edged. The 2nd ocellus is equidistant from the 1st and 3rd. On the mesothorax IIIa is dorsocraniad from III, VI equidistant from IV and III. The spiracles are small, on the 2nd abdominal segment not larger than the insertion place of seta III. On the 1st abdominal segment IV is vertically, on the others diagonally, arranged with V. The very small seta IIIa is on the 1st and 2nd abdominal segments distinctly set off from the pinaculum of III. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is ventrocraniad from the spiracle. Setae II, also I and III, as well as IV, V, and VI stand on common pinaculi on the 9th abdominal segment. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th 2 setae. The completely biserial circles of hooks of the parapodia (fig. 189) consist of about 35, those of the caudal disk at least of 20 hooklets.

June in flower buds of Rosa canina.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on June 16, 1897 near Potsdam in flower buds of Rosa canina.

The subgenus Proteopteryx Walsingham 1879.

Diagnosis: The 4th ocellus is closer to the 3rd than to the 6th. On the 1st abdominal segment group VII consists of 3 setae, IV is vertically situated with V, and on the mesothorax IIIa is dorsocraniad from III.

Epinotia (Proteopteryx) crenana (Hübner 1822)(2133).

Caterpillar dirty-grayishwhite, to pale green, not or only weakly granulated. Head, cervical shield ocher yellow, pinaculi of the body color, anal shield brownish-gray. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the prespiracular shield IV is ventrad from V and VI equidistant from both. On the mesothorax IIIa is dorsocaudad from III, VI equidistant from IV and III. Seta VIII distinctly set off from the coma. Spiracles of the 1st and 2nd abdominal segments not larger than the insertion place of seta III, on all abdominal segments IIIa is set off from the pinaculum of III. Setae IV and V on the 1st abdominal segment are vertically, on the others diagonally, arranged. On the 8th abdominal segment setae II and setae I are equally far apart, III ventrocraniad from the spiracle. Setae II, also I and III, as well as IV, V, and VI are found on common pinaculi on the 9th abdominal segment. On the 1st and 2nd abdominal segments group VII counts 3 setae, on the 7th, 8th, and 9th, 2 setae. The biserial circles of hooks of the parapodia consist of about 50, those of the caudal disk of 30-40 hooklets.

June, July, and Oct. in pod-shaped leaves spun together in the form of a pod on Salix caprea.

The caterpillars from the Bavarian State Collection that were examined had been found by Hofmann in June 1885 near Stuttgart on Salix.

E.(P.)ustulana (Hübner 1822)(2142).

Caterpillar dirty white strongly granulated by brown spinules. Head, cervical shield, pinaculi, thoracic legs, and anal shield black-brown to black, the latter lighter on the end (fig. 190). On the cervical shield IIIa is equidistant from III and IX. The 4th ocellus is closer to the 3rd than to the 6th. On all abdominal segments setae IV and V are diagonally set. On the 8th abdominal segment setae II are farther apart than setae I, IIIa stands on the margin of pinaculum III, while it is separated from it on the other abdominal segments. The parapodia are black-chitinized on the side (see fig. 224), their uniserial circles of hooks count 18-20, those of the caudal disk about 14 hooklets. Otherwise all further characters cited for crenana apply.

May, June in shoots of Rubus idaeus and R.caesius spun up in the form of glomerules. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 27, 1887 near Speyer between spun-up tip leaves on Rubus.

The subgenus Asthenia Hübner 1825.

Diagnosis: On the 7th abdominal segment group VII consists of 3 setae and on the cervical shield IIIa is at least as far from III as from IX. Setae II on the 8th abdominal segment are farther apart than setae I. The circles of hooks are biserial.

Epinotia (Asthenia) pygmaeana Hübner 1822 (2012).

Caterpillar light green and granulated, head and cervical shield brownish to dark-brown. On the cervical shield setae IIIa, III and IX stand very close together, II is ventrocaudad from I. On the mesothorax IIIa is dorsocraniad from III, se VIII

distinctly set off from the corm. The spiracles of the prothorax are larger than on the other abdominal segments, on the 1st and 2nd not larger than the insertion place of seta III. On all abdominal segments setae IV and V are diagonally arranged, on the 8th abdominal segment the distance between setae II is greater than that between setae I, IIIa is found with III on a common pinaculum, in which case III is ventrocraniad from the spiracle. Setae II, I and III, IV, V, and VI stand on common pinaculi on the 9th abdominal segment, the distance between setae VIII is not greater than on the 8th abdominal segment. The anal comb is formed of 6 spines. The biserial circles of hooks of the parapodia count about 45, those of the caudal disk about 25 hooklets.

June, July on Picea excelsa, at first mining in fresh needles of the early growth (similarly as tedella), later between spun-up needles. Pupation takes place in Aug. on the ground, the adult flies in May.

The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on June 6, 1906 near Rachlau between spun-up needles on Picea excelsa.

The Tribe Olethreutini.

Diagnosis: On the 9th abdominal segment setae I and III are found on separate pinaculi, if on a common pinaculum then on the abdominal segments setae IV and V are of approximately the same length, or the coronal suture is longer than the adfrontalia are wide.

The division of the Olethreutinae by Obraztsov (1946) into the 3 tribes was not only necessary, since this was a subfamily extremely rich in species, but - as had been demonstrated by larvo-morphological investigations - it permitted erection of 3 morphologically well grounded groups of genera. As always in systematics, the separation of the Eucosmini and the Olethreutini, also brings difficulties with it since there are no sharp boundaries in nature. In this case it is to be decided whether the very uniform genus Ancylis should still be referred to the Eucosmini or to the Olethreutini.

Obraztsov cited the genus Ancylis as the last of the Eucosmini before the Olethreutini. By reason of my larvo-morphological investigations, however, I cam to the decision to place it in the Olethreutini. To my questions, Obraztsov replied that the genus Acnylis shows a transition character in which it is closer imaginally to the Eucosmini than the Olethreutini. He did not give substantiating systematic characters. Nevertheless I am referring the genus Ancylis to the Olethreutini to which it is so close that morphological separation gives rise to difficulties being separated from all Eucosmini quite conspicuously by the following characters.

In the Eucosmini setae I and III on the 9th abdominal segment are always on a common pinaculum and on all abdominal segments seta V in most cases is half as long as seta IV; in general all setae remain shorter.

On the other hand in the genus Ancylis, setae I and III on the 9th abdominal segment are found on separate pinaculi and setae V and IV are of approximately the same length; all setae of the body are somewhat longer than in the Eucosmini. In these characters as well as in the development of the circles of hooks, the different placement of the setae, and also in the whole habitus this genus agrees with the greater part of the Olethreutini.

Only in a single character - and this shall not remain without mention in this place - does it come closer to the Eucosmini, namely by the shorter coronal suture (see fig. 170) which is not substantially longer than the adfrontalia are wide. Still I would consider this as a convergent character which can rise through the flattening of the head.

I was strengthened in my opinion by some convincing transfers of spp., which were undertaken from the side of imaginal systematics. In Spuler's (1910) paper the two spp. profundana and obtusana belong to the genus Epinotia - their caterpillars have setae I and III standing on separate pinaculi on the 9th abdominal segment which is against the rule. Meyrick (1927) in his system placed profundana in the genus Argyroploce (=Olethreutes) and obtusana in the genus Ancylis. These transfers are not better imaginable larvo-systematically. Therefore the systematic value of the position of the setae I and III on the 9th abdominal segment and at the same time the closer relation between Olethreutes and Ancylis is demonstrated.

But the close relationship of the genera Olethreutes and Ancylis is especially distinctly favored by the transfer of achatana from Olethreutes to Ancylis which is now proved to be completely justified larvo-morphologically.

It may also be mentioned here that Obraztsov again placed profundana in the genus Eudemis which I cannot defend for the reasons given, since it would then be the sole species in the Eucosmini in whose caterpillar setae I and III on the 9th abdominal segment stood on separate pinaculi, IV and V on the abdominal segments were of the same length, and the coronal suture was distinctly longer than the adfrontalia were wide.

As for the other genera of the Olethreutini, the larval systematics runs parallel to that of Meyrick (1927). Deviating therefrom Obraztsov placed the genera Polychrosis and Lobesia together in one genus. However, I am following Meyrick since in Lobesia group VII on the 7th abdominal segment consists of 2 setae, in Polychrosis of 3.

The earlier species-rich genus Olethreutes (=Argyroploce) had been divided by Meyrick (1927) into the genera Endothenia and Argyroploce, but Obraztsov divided it into 14 genera according to a list sent to me. I cannot follow this severe dividing up, since the caterpillars are very similar and show no generically separating characters.

According to Rebel (1901) 2 groups of spp. can be detected in the former Olethreutes species. The caterpillars of the 1st group have uniserial, those of the 2nd group biserial circles of hooks. To the first group belong all spp. of the genus Endothenia and some others, which were distributed over 6 additional genera by Obraztsov. On comparison of the systems it is striking that the spp. whose caterpillars have uniserial circles of hooks are cited after each other in the catalog by Rebel (1901) and Spuler (1910) and thereby turn out to be a unit even though this was not yet made known by giving it a name.

Unfortunately Meyrick (1927) did not consider the spp. which did not occur in England but were typical for Germany in his system so that with I can only make inadequate comparisons with his system, but I was able to establish the fact that the caterpillar of fuligana with uniserial circles of hooks also stands in the genus Endothenia and not - as in the case of Obraztsov - in the genus Olethreutes.

Since I cannot follow the severe division according to Obraztsov, I am conforming to that of Meyrick. I hope that my classification of German spp. from the side of imaginal systematics, on which I would like to give some data, will still be checked.

Genera of the Olethreutini.

1 (2) On the 9th abdominal segment setae I and III stand on separate pinaculi, the coronal suture is not longer than the adfrontalia are wide at the level of the apex of clypeus, or the caterpillars are light-green, dorsally gray-green with 2 light longitudinal stripes and light projecting pinaculi; the cervical shield for the most part with black spots Ancylis

2 (1) On the 9th abdominal segment, setae I and III stand on a common pinaculum, if on separate pinaculi then the coronal suture is distinctly longer than the adfrontalia are wide at the level of the apex of clypeus, or the caterpillars do not have the above described typical marking.

3 (6) The circles of hooks of the parapodia are biserial, setae I and III on the 9th abdominal segment stand on a common pinaculum, on the 1st and 2nd abdominal segments group VII counts 3 setae.

4 (5) On the 7th abdominal segment group VII consists of 3 setae — Polychrosis

5 (4) On the 7th abdominal segment group VII consists of 2 setae — Lobesia

6 (5) The circles of hooks on the parapodia are uniserial, if biserial then on the 9th abdominal segment setae I and III must stand on separate pinaculi, or group VII on the 1st and 2nd abdominal segments must count 2 setae.

7 (10) The circles of hooks of the parapodia or the caudal disk are distinctly uniserial (parapodia with not more than 30 hooklets).

8 (9) On the 9th abdominal segment seta I is found before III, on a common triangular pinaculum with it (see fig. 217), on the 8th abdominal segment III is situated dorsocraniad from the spiracle. On the 7th abdominal segment the pinaculi of setae VIII are contiguous — Bactra

9 (8) Caterpillars not equipped with these common characters. — Endothenia

10 (7) The circles of hooks of parapodia and caudal disk are distinctly biserial.

11 (12) On the 9th abdominal segment setae II are on separate pinaculi, on the mesothorax seta VIII is distinctly set off from the coxa — Cymolomia

12 (11) On the 9th abdominal segment setae II stand on a common pinaculum, or seta VIII stands very close to the coxa — Olethreutes

The genus Ancylis Hübner 1825.

Diagnosis: Setae I and III on the 9th abdominal segment are found on separate pinaculi, the coronal suture is not closer [?misprint for no longer?] than the adfrontalia are wide at the level of the apex of clypeus, or the caterpillars are light green, dorsally gray-green with light pinaculi and 2 light longitudinal stripes. Cervical shield mostly black spotted.

The following are also to be named as additional characters which apply to all spp. of this genus.

On the cervical shield IIIa is never closer to III than to IX, on the prespiracular shield the distance between setae IV and VI is twice as great as that between IV and V. Seta IIIa on the mesothorax is dorsocraniad from III, VIII stands very close to the coxa. The setae are very long, on the abdominal segments IV and V are nearly of the same length and are diagonally situated. On abdominal segments 1 to 7 inclusive group VII consists of 3 setae, on the 8th and 9th abdominal segments, of 2 setae, provided special data are not given in the individual spp. On the 9th abdominal segment setae IV, V, and VI stand on a common pinaculum, the distance between setae VIII is not greater than on the 8th abdominal segment. Anal shield always with 8 setae, anal comb mostly consisting of 6 spines. The spiracles are very small, mostly elliptical, the circles of hooks biserial.

As is evident from this, this genus is very uniform larvo-morphologically, therefore determination takes place from typical markings which represent a peculiarity of this genus.

Species of Ancylis.

1	(28)	On the 7th abdominal segment group VII consists of 3 setae.	
2	(7)	Cervical shield uniformly colored, without any marking.	
3	(6)	The 9th abdominal segment is dorsally strongly chitinized so that pinaculi I, II, and III hardly stand out from their surroundings and from one another (see fig. 199).	
4	(5)	Anal shield strongly chitinized, brown	tineana
5	(4)	Anal shield weakly chitinized, greenish and dark-punctate [or dotted] (fig. 203)	unguicella
6	(3)	The 9th abdominal segment not chitinized dorsally so that the pinaculi stand out well from their surroundings and from each other	achatana
7	(2)	Cervical shield greenish, marked by black spots or punctures.	
8	(11)	On the 9th abdominal segment setae II stand on separate pinaculi.	
9	(10)	Anal shield yellowish-green with 2 large black spots and many small dark points [or punctures] (fig. 206). The spiracles lie in large conspicuous dark spots (fig. 204)	biarcuana
10	(9)	Anal shield yellowish without any marking, the spiracles not in dark spots	selenana
11	(8)	On the 9th abdominal segment setae II stand on a common pinaculum.	
12	(21)	Anal shield monochromatic and not black-marked.	
13	(16)	On the cervical shield seta III stands on a black spot (fig. 214 and 192).	
14	(15)	The prespiracular shield and the pinaculum (IIIa+III) on the mesothorax strongly chitinized and brown	upupana
15	(14)	The prespiracular shield and the pinaculum (IIIa+III) on the mesothorax not chitinized and [they are] yellow	deresana
16	(13)	On the cervical shield seta III lies beside a black spot (fig. 215).	
17	(20)	On the cervical shield on both sides between setae II and III there is a dark spot (fig. 215).	
18	(19)	Circles of hooks completely biserial	lactana
19	(18)	Circles of hooks anteriorly uniserial, posteriorly biserial	myrtillana
20	(17)	Cervical shield with 2 large black spots on both sides, one between setae II and III, another one between seta I and the posterior margin of the cervical shield (fig. 209)	mitterbacheriana
21	(12)	Anal shield with black marking or dark dots [or punctures].	
22	(27)	Cervical shield with one black spot on either side.	
23	(24)	On the cervical shield seta III stands on the black spot (fig. 193)	lundana
24	(23)	On the cervical shield seta III stands beside the black spot (fig. 201).	
25	(26)	Anal shield with 2 small black-brown triangles (fig. 202), on the cervical shield the black spot does not reach from the posterior margin to the middle of the cervical shield (fig. 201)	comptana
26	(25)	Anal shield with 2 large black spots (fig. 197), on the cervical shield the spot reaches into the middle of the cervical shield (fig. 196)	siculana
27	(22)	Cervical shield with 2 large and sometimes several small spots (fig. 212)	obtusana
28	(1)	On the 7th abdominal segment group VII consists of only 2 setae.	
29	(30)	On the 9th abdominal segment group VII counts 1 seta, the cervical shield is yellow and black marked (fig. 207)	inornatana
30	(29)	On the 9th abdominal segment group VII counts 2 setae, the cervical shield is uniformly dark brown	diminutana

Ancylis achatana (Schiffermiller 1776)(1943).

Caterpillar reddish gray-brown, head and cervical shield dark-brown to black, pinaculi light with black setae and setal insertion places. Anal shield brown, if lighter on the anterior margin 2 dark rows of dots [or punctures] can be recognized (fig. 191). Body granulated. The spiracles are elliptical, on the 8th abdominal segment they are larger than on the others. Seta IIIa always distinctly set off from the margin of pinaculum III. On the 7th abdominal segment the distance between setae II and that between setae I is the same, less on the 8th, IIIa situated somewhat dorsocraniad from the spiracle. Setae II on the 9th abdominal segment stand on a common pinaculum. The completely biserial circles of hooks of the parapodia count about 40 hooklets.

According to Schütze (1931) the caterpillar lives in May in a tube formed of 2 or 3 leaves spun onto the older twigs. As food plant he gives Crataegus, Spuler (1910) on the other hand, gives Salix caprea, Rubus fructicosa, and Urtica.
The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on May 17, 1906 near Rachlau on Crataegus.

A. deresana (Hübner 1822)(2263).

Caterpillar ventrally yellow-green, dorsally gray-green and more strongly granulated. The large pinaculi are light. Head yellow-brown, cervical shield brownish-green with 2 large and sometimes with several small black spots (fig. 192). Anal shield brownish without marking. The spiracles are elliptical, on the 2nd abdominal segment they are not larger than the insertion place of seta III, on the 8th abdominal segment they are not larger than on the 1st. On all abdominal segments IIIa is distinctly set off from the margin of pinaculum III. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III is on the same level as the spiracle. Setae II on the 9th abdominal segment stand on a common pinaculum. Parapodia with about 50 hooklets.

2 Generations: The caterpillar of the 1st shows up in June, that of the 2nd in Aug., Sept., and Oct., and overwinters also in the overturned leaf. As food plants have been reported Rhamnus frangula, Cornus sanguinea, Vaccinium myrtillus, Prunus spinosa, Rubus idaeus, and Populus.
The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Sept. 17, 1892 near Potsdam on Rubus.

Ancylis lundana (Fabricius 1777)(2264).

Caterpillar ventrally yellow-green, dorsally gray-green and more strongly granulate, the pinaculi light, head brown-yellow with dark eye- and genal spots, cervical and anal shields brownish-green with 2 black spots. On the cervical shield setae III on both sides stand on the dark spots (fig. 193), on the anal shield these are in the middle (fig. 194). Spiracles very small, not larger on the 2nd abdominal segment than the insertion place of seta III, on the 8th not larger than on the 1st, on all abdominal segments IIIa is distinctly set off from the pinaculum of III. On the 8th abdominal segment the distance between setae II and that between setae I is the same or is somewhat greater, III lying on the same level as the spiracle. Setae II on the 9th abdominal segment stand on a common pinaculum. Parapodia with 30-40, caudal disk with about 25 hooklets.

The caterpillars of the 1st generation live in June, those of the 2nd in Aug., in one of the main veins along the folded leaf, its margins are spun up or they live between two leaves of Lathyrus pratensis, niger, vernalis, Orobus niger, and vernus, Vicia, and Trifolium that are spun onto one another. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 9, 1890 between spun-up leaves on Vicia cracca.

Ancylis myrtillana (Treitschke 1830)(2266)

Caterpillar dirty yellowish-green, dorsally more strongly granulate, head brownish yellow with dark eye- and genal spots, anal shield greenish-yellow on both sides with a small sharply delimited black spot between setae II and III (Fig. 195). Anal shield yellowish-green without marking [sic!] The circles of hooks of the parapodia are anteriorly uniserial, posteriorly biserial (see fig. 184) and consist of 25-30 hooklets. In all other morphological characters the caterpillar of this species agrees with that of lundana.

June and Oct. in leaves ventricoosly spun together on Vaccinium myrtillus and uliginosum, according to Kennel (1908) in Oct., which was hitherto still doubted. But since the caterpillars from the Bavarian State Collection were also found in Oct., the 2nd generation is to be considered as assured.

The caterpillars from the Collection were found by Disque on Oct. 1, 1883, near Grünstadt on V.myrtillus.

Ancylis siculana (Hübner 1796)(2267).

Caterpillar light green or gray-green with 2 dorsal lighter longitudinal stripes. Head and cervical shield yellow-brownish, the latter with a black spot between setae I and III (fig. 196). Anal shield of the body color, usually with 2 black spots in the middle (fig. 197). Spiracles elliptical and very small. On all abdominal segments IIIa is separated from the pinaculum of III and stands before the spiracle. Parapodia with about 45, caudal disk with about 35 hooklets. Also all additional characters cited for lundana apply to this species (see fig. 16).

The caterpillar lives in June and July and from Sept. until spring, at first in a leaf folded together, later between 2 leaves spun up on one another on Rhamnus frangula, cathartica, Cornus sanguinea, Ligustrum, Prunus avium.

Locality: Erlangen, Brucker Lache on Sept. 20, 1951 between a folded leaf on R. frangula.

A.tineana (Hübner 1822)(2268).

Caterpillar light greenish-gray, the pinaculi darker. Head yellowish-brown, cervical shield lighter. Anal shield brownish, like the pinaculi. Setae IV and V on all abdominal segments are diagonally arranged (fig. 198). Spiracles very small and nearly round, on the 2nd abdominal segment not larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly separated from the pinaculum of III, on the 8th abdominal segment setae II and setae I are equally far apart. The 9th abdominal segment is dorsally chitinized so that the pinaculi hardly stand out from the body and in contrast to each other (fig. 199). Parapodia black-brown chitinized on the side (see fig. 224). Their circles of hooks are laterally uniserial but biserial elsewhere and consist of 30 to 35 hooklets. Parapodia with 18-20 hooklets. [Misprint for "caudal disk."]

June and Sept. until spring in spun-up tip shoots of young fruit trees; Pirus malus, communis, Prunus domestica, and spinosa. Supposed to occur also on Populus tremula and Crataegus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 9, 1884 near Speyer on Pirus malus.

Ancylis selenana (Guenee 1845)(2269).

Caterpillar greenish-white or yellowish, pinaculi of the body color. Head pale yellowish-brown, cervical shield yellowish with a black spot on both sides between setae II and III (fig. 200). Anal shield yellowish, not marked. On the 9th abdominal segment setae II do not stand on a common pinaculum. The circles of hooks of the parapodia are uniserial on the side and consist of about 35 hooklets, those of the caudal disk of 20. In other characters this species agrees with the foregoing.

June, July, and Oct. between 2 leaves of Crataegus and Prunus spinosa spun up on each other.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 5, 1884 near Speyer on Crataegus and P.spinosa.

A.comptana (Frölich 1828)(2270).

Caterpillar greenish-gray with longitudinal stripes that are not sharp, head, cervical and anal shields lighter to darker brown, cervical and anal shields however mostly brownish-yellow. The cervical shield on both sides with a smaller dark spot between setae II and III (fig. 201), anal shield with 2 small triangular dark spots (fig. 202). The small spiracles are elliptical, on the 2nd abdominal segment of the size of the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, on the 9th abdominal segment setae II stand on a common pinaculum. Parapodia with about 30 hooklets.

In 2 generations, June and from Sept. until in the spring in overturned margins of leaves or spun-up tip leaves of lower plants such a Potentilla, Fragaria, Teucrium, Sanguisorba, and Thymus.

Locality: Erlangen-Rathsberg on June 20, 1952 on P.tormentilla.

Ancylis unguicella (Linné 1758)(2271).

Caterpillar gray to greenish-white, head brown, cervical shield lighter. The anal shield and the large pinaculi are borwn-gray, anal shield dark punctate [or dotted] (fig. 203). Seta IIIa stands on the margin of pinaculum III on the abdominal segments. On the 8th abdominal segment setae II and I are equally far apart. III is found dorsocraniad from the spiracle. The 9th abdominal segment is dorsally chitinized (see fig. 199), so that the pinaculi hardly stand out from the body and in contrast to each other. The completely biserial circles of hooks of the parapodia consist of about 50, those of the caudal disk of about 40 hooklets.

Schütze (1931) considers the biology of this species as still very obscure. He wrote that according to Hofmann the caterpillar occurs in April on Calluna, according to Disque in July and Aug., on Calluna and Erica. On the basis of Hofmann's discoveries and the finding by Disque it can be assumed that the caterpillar, as in other spp., occurs in two generations, namely in June, July and from Sept. until in the spring.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 30, 1902 near Speyer in a web of shoots and sand on Calluna.

In the following 3 spp., according to Obraztsov (i.lit.) it is supposed to be a matter of only one species which he called biarcuana (Stephens 1829 nom.nud.)* To it, in his opinion belongs the ab. inornatana Herrich-Schäfer 1851 and the ab.diminutana Haworth 1822. But since I can separate them even morphologically, which is otherwise very difficult in this genus, I will conceive of them, as hitherto, as independent spp.

*insert: Westwood 1845

Ancylis biarcuana (Westwood 1845)
syn. biarcuana Stephens 1829 nom.nud. (2273) according to Obraztsov.

Caterpillar ventrally yellow, dorsally gray-green, more strongly granulated and with 2 lighter longitudinal stripes. On the side on each segment around the spiracle is found a large, dark, conspicuous spot which does not show up elsewhere in any species (fig.204). Pinaculi light, head yellow-brown, dark-marked, cervical and anal shields and thoracic legs greenish-yellow. There is also found on the cervical shield a large dark spot between setae II and III (fig. 205), another one near I, and sometimes several smaller ones. Also the anal shield is typically marked by 2 large dark spots in the middle in front of which extend small dots [or punctures] (fig. 206). Spiracles very small and elliptical, the prothoracic spiracle larger than that of the 8th abdominal segment. On all abdominal segments IIIa is distinctly set off from pinaculum III. On the 8th abdominal segment setae II are somewhat farther apart than setae I, III is found on the samelevel as the spiracle. Setae II on the 9th abdominal segment stand on separate pinaculi. Differing from inornatana and diminutana group VII on the 7th abdominal segment consists of 3 setae, on the 8th and 9th of 2, also the parapodia are not black-brown chitinized on the side. The circles of hooks of the parapodia are completely biserial and count about 40, those of the caudal disk about 30 hooklets. Anal comb with 6 spines.

July, Aug., and from Sept. until spring in a leaf spun up like a pod on Salix caprea, fusca, and repens.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 12, 1913 near Speyer on Salix.

Ancylis inornatana (Herrich-Schäffer 1851)(2274).

Caterpillar ventrally light, dorsally gray-green, more strongly granulated and with 2 lighter longitudinal stripes. Head light brown, dark-marked, cervical shield yellowish-green, on both sides with a large dark spot on which stands seta III, also 2 smaller spots are found before setae II and I and a large one behind I (fig. 207). Anal shield yellow-green, dark bordered, anteriorly with small dots [or punctures](fig. 208). Spiracles elliptical and very small, IIIa is distinctly set off from the pinaculum of III on all abdominal segments. On the 8th abdominal segment the distance between setae II is somewhat larger than that between setae I; on the 9th abdominal segment setae II do not stand on a common pinaculum. Differing from biarcuana and diminutana group VII on the 7th and 8th abdominal segments consists of 2, on the 9th of 1 seta (I had only 6 caterpillars at my disposal for the investigation). The parapodia on the side are black-brown chitinized (see fig. 224) and bear a biserial circle of hooks of 45-50 hooklets, caudal disk with about 35 hooklets.

Aug. and from Sept. until spring in overturned margin of leaf of Salix caprea and repens.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 1, 1906 near Speyer on Salix repens.

A.diminutana (Haworth 1811)(2276).

Caterpillar ventrally yellow-green, dorsally gray-green and more strongly granulated, with 2 light longitudinal stripes. Pinaculi of the body color. Head, cervical shield and thoracic legs dark brown to black, anal shield brownish. Neither on the cervical shield nor on the anal shield are black spots found, differing from biarcuana and inornatana. The spiracles are elliptical and small, not larger on the 2nd abdominal segment than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from the pinaculum of III. On the 8th abdominal segment setae II and I are equally far removed from one another, on the 9th abdominal segment setae II do not stand on a common pinaculum. Differing from biarcuana and inornatana, group VII

on the 7th, 8th, and 9th abdominal segments consists of 2 setae. Anal comb with 6 spines. The parapodia are black-brown chitinized on the side (see fig. 224), their biserial circles of hooks consist of about 35, those of the caudal disk of about 25 hooklets.

June and from Sept. until spring in the overturned leaf margin of Salix spp.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 9, 1884 near Speyer on Salix caprea.

Ancylis mitterbacheriana (Schiffermiller 1776)(2277).

Caterpillar ventrally yellow-green, dorsally gray-green, more strongly granulated and with 2 light longitudinal stripes. The large prominent pinaculi are lighter than the body, head honey-yellow with 2 dorsal dark spots. Cervical shield of the body color with a large dark spot between setae II and III and a smaller one on the posterior margin near I, sometimes 2 smaller spots are still found in the middle of the cervical shield (see fig. 209). Anal shield yellowish-green, sometimes provided with smaller dark dots [or punctures]. The coronal suture is not longer than the adfrontalia are wide (fig. 210). Spiracles of the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and I is the same, on the 9th abdominal segment setae II stand on a common pinaculum (fig. 211). On the 7th abdominal segment group VII counts 3 setae, on the 8th and 9th, 2 setae. Parapodia not dark-brown chitinized on the side.

Caterpillar July and Sept. until April. in a ventricosely spun-up leaf on Quercus or Fagus. Mostly the leaf is folded along the main vein and the margins are spun together. This species is very abundant.
Locality: Erlangen, Burgberg on Sept. 5, 1951 on Quercus.

A.obtusana (Haworth 1811)(2004).

Caterpillar greenish-yellow, dorsally somewhat darker with 2 lighter longitudinal stripes, pinaculi lighter than the body. Head light brown, cervical and anal shields of the body color and black-marked, on the cervical shield by a large black spot between setae II and III and 2 smaller ones near seta I (fig. 212), on the anal shield by 2 small dark spots in the middle (fig. 213). The spiracles are elliptical, on the 2nd abdominal segment not larger than the insertion place of seta III. On the 8th abdominal segment setae II and I equally far apart, III on the same level as the spiracle. Setae II on the 9th abdominal segment stand on a common pinaculum. Parapodia not dark chitinized on the side; their biserial circles of hooks count about 30 hooklets.

Aug. to Oct. between spun-up leaves on Rhamnus frangula and cathartica.
The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Sept. 17 near Postdam on R.cathartica. Kennel (1908) placed this species in the genus Semasia, Spuler (1901) in the genus Epinotia only later was it referred to the genus Ancylis. This transfer has proved correct by reason of larvo-morphological investigations.

A.upupana (Treitschke 1830)(2279).

Caterpillar greenish-gray, head yellowish-brown, prespiracular shield, thoracic pinaculi, and thoracic legs strongly chitinized and brown, the other pinaculi are lighter. Anal and cervical shields yellowish- the latter marked by a large black spot on the side between setae II, III, IIIa, and IX and a smaller one near I (fig. 214). The small spiracles are nearly round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. The distance between setae II and I on the 8th abdominal segment is the same, on the 9th setae II stand on a common pinaculum. Parapodia with about 35 hooklets.

June and Aug., Sept., Oct. in a leaf of Ulmus that has been ventricosely swollen up spun together on the margins, but also on Quercus and Betula.
Locality: Erlangen, Rathsberg on Sept. 7, 1951 on Ulmus.

Ancylis laetana (Fabricius 1775)(2280).

Caterpillar monochromatically yellowish, likewise the pinaculi. Head black-brown, cervical and anal shields of the body color, cervical shield with a large spot between setae II and III (fig. 215). Anal shield without marking. The small elliptical spiracles are not larger on the 2nd abdominal segment than the insertion place of seta III. On all the abdominal segments IIIa is distinctly set off from the pinaculum of III. On the 8th abdominal segment setae II and setae I are equally far apart, III is on the same level as the spiracle. Setae II on the 9th abdominal segment stand on a common pinaculum. The biserial circles of hooks of the parapodia count about 40, those of the caudal disk about 30 hooklets.

June and Oct. between 2 leaves or in the overturned leaf margin of Populus tremula.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 2, 1885 near Speyer between spun-up leaves on Populus tremula.

The genus Bactra Stephens 1834.

Diagnosis: The coronal suture is longer than the adfrontalia are wide on a level with the apex of clypeus. The circles of hooks of the parapodia are uniserial, on the 9th abdominal segment setae I and III are found on a common triangular pinaculum (fig. 217), on the 7th abdominal segment the pinaculi of setae VIII are contiguous, group VII consists of 3 setae.

This genus, of which only one species occurs in Germany, can be well characterized by the above characters, larvo-morphologically.

Bactra lanceolana (Hübner 1822)(2017).

In the first instars, the caterpillar is greenish-blue, later cloudy whitish with greenish or reddish tinge, strongly granulated by brown spinules. Head, cervical shield dark brown, anal shield and pinaculi light brown. The fronto-lateral suture is bowed in (fig. 216). On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is ventrad from "C" [?misprint for "V"] and VI. Seta IIIa on the mesothorax is dorsocraniad from III, VI equidistant from III and IV, seta VIII is very close beside the coxa. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III, on the 8th abdominal segment it is twice as large. The distance between setae II and that between setae I on the 8th abdominal segment is the same, III is found dorsocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are found on common pinaculi, whereby the pinaculum of setae II is greatly enlarged and I and III stand on a triangular pinaculum (fig.217). The distance between setae VIII on the 8th and 9th abdominal segments is the same. On all abdominal segments setae IV and V are diagonally arranged. On abdominal segments 1 to 7 inclusive group VII consists of 3, on the 8th and 9th of 2 setae. The uniserial circles of hooks of the parapodia count 21-23, those of the caudal disk about 12 hooklets.

April to July in several generations in the lower part of the stem and in the root of Juncus glomeratus, according to Schütze also on Scirpus, Carex ripar, and Eriophorum.
The caterpillars from the Collection ~~xxxxxxx~~ that were examined, were found by Disque on Juncus glomeratus.

The genus Polychrosis Ragonot 1894.

Diagnosis: The coronal suture is longer than the adfrontalia are wide at the height of the apex of clypeus, on the abdominal segments setae IV and V are of approximately the same length, on the 9th abdominal segment I and III stand on a common pinaculum, on the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2 setae. On the ventral side of the caudal disk are found 4 setae, the circles of hooks are biserial.

As Obraztsov informed me in a letter, he combined this genus with the monotypical genus Lobesia and gave it its name. I am not joining him in this for the group VII on the 7th abdominal segment in all Polychrosis spp. consists of 3 setae, on the other hand of 2 setae in Lobesia permixtana.

Spp. of Polychrosis.

1 (2) Setae II on the 9th abdominal segment stand on separate pinaculi ..... euphorbiana
2 (1) Setae II on the 9th abdominal segment stand on a common pinaculum.
3 (6) Parapodia not black-brown chitinized on the side.
4 (5) Circles of hooks of the parapodia completely biserial, they consist of about 35 hooklets ..... botrana
5 (4) Circles of hooks of the parapodia anteriorly uniserial, posteriorly biserial (see fig. 183), consisting of about 20 hooklets ..... artemisiana
6 (3) Parapodia black-brown chitinized on the side (see fig. 224).
7 (8) On the prespiracular shield IV is ventrad from V and VI, equidistant from both ..... staticeana
8 (7) On the prespiracular shield the distance between setae VI and IV is twice as great as that between IV and V ..... cinerariae

Polychrosis euphorbiana (Freyer 1842)(1947).

Caterpillar dark green, strongly granulated. Head yellow, cervical shield and pinaculi black-brown, anal shield greenish or blackish. The 3rd ocellus is equidistant from the 1st and 2nd, the 4th is closer to the 3rd than to the 6th. On the cervical shield IIIa is somewhat farther from III than from IX. Seta IIIa is found on the mesothorax dorsocraniad from III, VI is equidistant from III and IV, seta VIII very close to the coxa. The spiracles of the 2nd and 1st abdominal segment are not larger than the insertion place of seta III. On all abdominal segments setae IV and V are diagonally arranged and IIIa is distinctly set off from the pinaculum of III. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II stand on separate pinaculi, IV, V, and VI on a common pinaculum. The distance between setae VIII is not greater than on the 8th abdominal segment. The completely biserial circles of hooks of the parapodia consist of about 40 hooklets.

June and Aug. to Sept. between spun-up heartleaves and inflorescences of Euphorbia palustris, amygdaloides, and cyparissias.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 28, 1902, near Speyer on E.amygdaloides and cyparissias.

P.botrana (Schiffermiller 1776)(1949).

Caterpillar yellowish-green or brownish-white and granulated, head yellow-brown, cervical shield brownish, sometimes posteriorly dark edged, thoracic legs brownish. The 2nd ocellus is closer to the 3rd than to the 1st, the 4th equidistant from the 3rd and the 6th. On the prespiracular shield IV is equidistant from V and VI. On the 8th

abdominal segment II is somewhat dorsocraniad from the spiracle, on the 9th abdominal segment setae II, also I and II,* as well as IV, V, and VI stand on common pinaculi. Anal comb of 6-8 spines. The biserial circles of hooks of the parapodia consist of about 35, those of the caudal disk of about 25 hooklets. All other characters cited for euphorbiana also apply to this species. [*sic!]

The caterpillars of the 1st generation live in June, July between spun-up flowers, those of the 2nd generation live in Sept., Oct. between spun-up berries, or seeds of Vitis vinifera and Clematis.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 25 in Neustadt/Weinstrasse on V.vinifera and Clematic. Furthermore Prof. Jancke (Neustadt) let me have alcohol material for investigation.

Polychrosis artemisiana (Zeller 1847)(1951).

Caterpillar whitish-gray, granulated, head brownish-yellow with dark eye- and genal-spots. Cervical shield, prespiracular shield, thoracic legs, and anal shield brown; the pinaculi are gray. The ocelli are situated at uniform distances apart. On the cervical shield the setae IIIa, III, and IX are equally far removed from each other, II is somewhat ventrocraniad from I. On the prespiracular shield IV is ventrad from V and VI. Seta IIIa on the mesothorax is dorsocraniad from III, VIII stands close beside the coxa. The spiracles are very small and elliptical, not larger on the 2nd abdominal segment than the insertion place of seta III. On all abdominal segments IV is diagonally arranged with V, IIIa always distinctly separated from the pinaculum of III. On the 8th abdominal segment the distance between setae II is larger than that between setae I, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. The biserial circles of hooks of the parapodia are anteriorly uniserial (see fig. 184) and consist of about 20 hooklets.

June and Sept. in spun-up end shoots of Echium vulgare, Anchusa, Allium oleraceum, and Odontites alba.

The caterpillars from the Bavarian State Collection that were examined had been found by Krone in Sept. 1903 near Vienna on E.vulgare.

P.staticeana (Millière 1864-68)(1957).

Caterpillar brownish-white or more greenish, granulated. Head brown-yellow with darker eye- and genal-spots, cervical shield and thoracic legs dark-brown, anal shield of the body color, dark dots [or punctures] on the anterior margin (fig. 218). The 2nd ocellus is closer to the 3rd than to the 1st., the 4th equidistant from the 3rd and 6th. The spiracles are very small and round, not larger on the 2nd abdominal segment than the insertion place of seta III. Parapodia black-brown chitinized on the side (see fig. 208), their circles of hooks consisting of about 35 hooklets. Moreover to this species apply all additional characters given for artemisiana.

Aug. to May in flowers of Statica Limonium. This species occurs in southern France, not in Germany.

The caterpillars from the Bavarian State Collection that were examined had been found by Constant in southern France on Statice limonium. [NB-different spelling].

Polychrosis cinerariae (Nolcken 1882)(1961).

Caterpillar yellowish-brown, granulated, head, cervical shield, and thoracic legs black-brown, anal shield of the body color, provided with dark dots [or punctures] on the anterior margin (fig. 219). On the cervical shield IIIa is equidistant from III and IX, II is somewhat ventrocraniad from I. The prespiracular shield is diagonally placed, wherefore VI is lower than V, the seta IV is closer to V than to VI. On the mesothorax IIIa is dorsocraniad from III, seta VIII very close to the coxa. The spiracles are very small, on the 2nd abdominal segment not larger than the insertion place of seta III. On all abdominal segments setae IV and V are diagonally arranged, IIIa is always distinctly set off from the pinaculum of III. On the 8th abdominal segment setae II are somewhat farther apart than setae I, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II, also I, and III, as well as IV, V, and VI are found on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. On abdominal segments 1 to 7 group VII consists of 3 setae, on the 8th and 9th abdominal segments of 2 setae. The parapodia are black-brown chitinized on the side (see fig. 224), their biserial circles of hooks consist of about 35 hooklets.

This species has been reported only from south France.

The caterpillars from the Bavarian State Collection that were examined had been found by Chretien on March 26, 1903 near Ville-franche in France on Cineraria.

The genus Lobesia Guenée 1845.

Diagnosis: Setae IV and V of nearly the same length on the abdominal segments, on the 9th abdominal segment setae I and III stand on a common pinaculum. On the ventral side of the caudal disk are found only 3 setae, group VII on the 7th abdominal segment consists of only 2 setae. The circles of hooks of the parapodia are biserial.

This monotypical genus differs from Polychrosis imaginally in wing venation and because of the absence of a brush of hairs on the tibia of the hind legs in the ♂. Nevertheless Obraztsov recently combined this genus with Polychrosis. But since Lobesia differs larvo-morphologically by the number of setae in group VII and on the ventral aspect of the caudal disk, as well as in the placement of setae IV and V on the 8th abdominal segment, I am not joining Obraztsov.

Lobesia reliquana (Hübner 1825)(1963)
syn. permixtana Hübner 1822-25 (1963) according to Obraztsov.

Caterpillar brownish yellow, dorsally with red longitudinal stripes or cloudy brown-red. The body is strongly granulated, dorsally by small setae. The pinaculi are light, sometimes brown on the thorax, head, cervical shield, and anal shield light brown the cervical shield sometimes darker bordered. The 2nd ocellus is closer to the 1st than to the 3rd, on the cervical shield IIIa is approximately equidistant from III and IX, II somewhat ventrocaudad from I. On the prespiracular shield setae V, IV, and VI stand in one line, IV being equidistant from V and VI. Differing from Polychrosis spp., IIIa lies dorsocaudad from III on the mesothorax. Seta VIII on the mesothorax is found very close to the coxa. On the 1st abdominal segment setae V and IV are diagonally arranged, more strongly inclined on the following segments, and finally set horizontally on the 8th abdominal segment (fig. 220). The spiracles are very small, not larger on the 2nd abdominal segment than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and that between I is the same, III is ventrocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, IV, V, and VI are found on common pinaculi. The distance between setae VIII in not larger than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. Parapodia not dark-chitinized on the side, their biserial circles of hooks count about 50, those of the caudal disk about 30 hooklets.

June, May and Sept. [sic!] in the stem tips of Solidago virgaurea and Anchusa officinalis as well as on Betula and Fagus.

The caterpillars from the Bavarian State Collection that were investigated had been found by Disque on Oct. 1, 1917 near Speyer in an overturned leaf on Betula.

The genus Endothenia Stephens 1852.

Diagnosis: Setae IV and V on the abdominal segments are approximately the same length, or the coronal suture is distinctly longer than the adfrontalia are wide at the level of the apex of clypeus. The circles of hooks of the parapodia or of the caudal disk are uniserial, the setae I and III on the 9th abdominal segment mostly stand on one pinaculum.

This genus contains the smaller part of the spp. of the former genus Olethreutes. Now if more spp. are brought together under this genus Endothenia than in Meyrick (1927) it is to be traced back to the fact that many spp. do not occur in England. Also according to Obraztsov there are not so many spp. in this genus for he had split off several genera from the earlier genus Olethreutes to which some of the spp. are distributed. Since all these spp. are marked larvo-morphologically by uniserial circles of hooks and I cannot follow Obraztsov in the new sectioning of the genus, I am combining the following species in this genus. In this case these are only spp. of the former genus Olethreutes.

Spp. of Endothenia.

1	(18)	On the 9th abdominal segment setae I and III stand on a common pinaculum, or their pinaculi are contiguous and are then more or less strongly fused together.	
2	(13)	The 2nd ocellus is equidistant from the 1st and 3rd.	
3	(12)	On the prespiracular shield IV is equidistant from V and VI, the number of hooklets of parapodia and caudal disk is different.	
4	(5)	Seta III on the 8th abdominal segment is ventrocraniad from the spiracle	lapideana
5	(4)	On the 8th abdominal segment seta III is found on the same height as the spiracle or it is dorsocraniad.	
6	(7)	Caudal disk with 13-15 hooklets, the 1st and 5th ocelli more weakly pigmented than the others	oblongana
7	(6)	Caudal disk with 20-25 hooklets, all ocelli uniformly strongly pigmented.	
8	(9)	Spiracles of 1st and 2nd abdominal segments elliptical	gentiana.
9	(8)	Spiracles of 1st and 2nd abdominal segments round.	
10	(11)	The prespiracular shield is only weakly indicated, on the 8th abdominal segment the pinaculum with IV and V is found below the spiracle	roseomaculana
11	(10)	The prespiracular shield is distinctly developed and stands out from the body by the brown coloring. On the 8th abdominal segment the pinaculi with IV and V are found under seta III	lediana
12	(3)	On the prespiracular shield seta IV is closer to V than to VI, the number of hooklets of the parapodia and of the caudal disk amounts to 25	dalecarliana
13	(2)	2nd ocellus closer to the 1st than to the 3rd.	
14	(15)	Parapodia with 24, caudal disk with 14 hooklets	nigricostana
15	(14)	Parapodia with 17 to 20(17), caudal disk with 10 hooklets.	
16	(17)	On the 2nd abdominal segment the spiracle is larger than the insertion place of seta III, IIIa is found with III on one pinaculum	penthinana
17	(16)	On the 2nd abdominal segment the spiracle is of the same size as the insertion place of III, IIIa is distinctly delimited off from the pinaculum of III	fuligana

18 (1) On the 9th abdominal segment setae I and III stand on pinaculi that are distinctly separated from each other.
19 (22) Group VII on the 7th abdominal segment consists of 2 setae.
20 (21) Parapodia dark-brown chitinized on the side (fig. 224), the spiracles of the 1st and 2nd abdominal segments distinctly larger than the insertion place of seta III, on the 8th abdominal segment IIIa stands on the margin of pinaculum III — textana
21 (20) Parapodia not chitinized on the side, the spiracles of the 1st and 2nd abdominal segments not larger than the insertion place of seta III. On the 8th abdominal segment IIIa is distinctly set off from the pinaculum of III — bifasciana
22 (19) On the 7th abdominal segment group VII consists of 3 setae.
23 (26) The 2nd ocellus is equidistant from the 1st and 3rd, the 4th from the 3rd and 6th.
24 (25) Parapodia black-brown chitinized on the side (see fig. 224) — bipunctana
25 (24) Parapodia not chitinized on the side — lucivagana
26 (23) The 2nd ocellus is closer to the 1st than to the 3rd, the 4th is closer to the 3rd than to the 6th.
27 (28) On the 8th abdominal segment III is ventrocraniad from the spiracle — antiquana
28 (27) On the 8th abdominal segment III is dorsocraniad from the spiracle — ericetana

Endothenia lapideana (Herrich-Schäffer 1851)(1891)

Caterpillar yellowish-white, granulated, head, cervical shield, and thoracic legs brown. The ocelli are situated at uniform distances apart. On the cervical shield IIIa is equidistant from III and IX, on the prespiracular shield IV is ventrad from V and VI equidistant from both. Seta IIIa on the mesothorax is dorsocraniad from III, VI is equidistant from III and IV. Seta VIII distinctly set off from the coxa. On all abdominal segments seta IV is diagonally arranged with V, IIIa set off from the pinaculum of III. The spiracles on the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III lies ventrocraniad from the spiracle. On the 9th abdominal segment, setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, on the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2 setae. The uniserial circles of hooks of the parapodia count 27-30 hooklets.

From fall until April in stem and root of Digitalis ambigua.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 21, 1898 near Speyer in the lower part of the stem and in the root of D.ambigua.

As he informed me in a letter Obraztsov combined the next two spp. into one species. Although these two species are very close larvo-morphologically I would like to consider them as independent spp., since morphological differences do appear.

Endothenia oblongana (Haworth 1811)(1877).

Caterpillar citron [or lemon] yellow, strongly granulated, head, cervical shield, and thoracic legs darkbrown, anal shield somewhat lighter. The 1st and 5th ocelli are more weakly pigmented than the others. On all abdominal segments IIIa stands on the margin of the pinaculum of III, the spiracles of the 1st and 2nd abdominal segments are round and larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is somewhat less than that between setae I, III is on the same level as the spiracle. On the 9th abdominal segment the distance between setae VIII is less than on the 8th (fig. 221). Anal comb with 3 spines. The uniserial round circles

of hooks of the parapodia consist of 20 to 25, those of the caudal disk of 12 to 15 hooklets. Moreover to this species apply all additional characters cited for lapideana.

The biology is still not very clear. The caterpillars were found most abundantly in the months from May to Sept., but they also overwinter in seed capsules. Spuler (1910) cites 2 generations, one from Sept. to May, a second one from June, July. The adult flies from April to Sept. The caterpillar is very polyphagous and was found in the flower heads or seed heads or in the roots of Cirsium oleraceum and palustre, Dipsacus, Galeopsis, Euphrasia odontitis, Verbascum, Scabiosa, Stachys, and Plantago.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque near Speyer in part on March 30, 1904 and in part on Nov. 5, 1909 in the rootstock of Plantago.

Endothenia gentiana (Hübner 1822)(1878).

Caterpillar yellowish white, according to Kennel (1908) sometimes also rose red or brown, yellowish, body granulated, Head, cervical shield dark brown, anal shield somewhat lighter brown, the pinaculi brownish-gray. The ocelli are all uniformly strongly pigmented the spiracles large and strongly elliptical, even on the 2nd abdominal segment they are larger than the insertion place of seta III. On the prothorax they stand obliquely forward, on the abdominal segments obliquely backward. The uniserial, large circles of hooks of the parapodia are elliptical and consist of 36, those of the caudal disk of 25 hooklets. In all other characters this species agrees with oblongana.

The caterpillar lives from fall until in the spring in the medullary canal of the fruiting head of Dipsacus fullonum and silvester; according to Stange of Plantago media; according to Gistel also on Gentia acaulis.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on March 22, 1893 near Speyer in the fructification of Dipsacus.

Endothenia roseomaculana (Herrich-Schäffer 1851)(1879).

Caterpillar dark green, granulated, head, cervical shield and thoracic legs blackbrown, pinacul. brownish. The ocelli are uniformly strongly pigmented and situated at the same distance apart. On the cervical shield IIIa is equidistant from III and IX. The prespiracular shield is only very weakly indicated, setae V, IV, and VI stand almost in one line, IV equidistant from V and VI. On the mesothorax IIIa is dorsocraniad from III, VIII distinctly set off from the coxa. The spiracles are larger than the insertion place of seta III even on the 2nd abdominal segment. Setae IV and V are diagonally placed on all abdominal segments, IIIa stands on the margin of pinaculum III, the distance between setae II on the 7th abdominal segment is exactly as great as that between setae I, on the 8th abdominal segment it is less (see fig. 162). The pinaculum with setae IV and V is found under the spiracle on the 8th abdominal segment. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI stand on common pinaculi, in which case I is situated farther forward than II and III. On the 1st to the 7th abdominal segments inclusive group VII consists of 3, on the 8th and 9th, of 2 setae. The round uniserial circles of hooks of the parapodia count about 25-30, those of the caudal disk about 20 hooklets.

From fall until April in a leaf of Pirosa secunda, minor, rotundifolia, and chloranthe spun together in a boat-shape.

The caterpillars from the Bavarian State Collection that were examined had been found on April 16, 1885 near Stettin on Pirola rotundifolia.

Endothenia lediana (Linné 1758)(1380).

Caterpillar brown-red and granulated, head and thoracic legs black, cervical shield, prespiracular shield, and anal shield brown, the cervical shield additionally with darker posterior margin (fig. 222). On the prespiracular shield IV is ventrad from V and VI. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On the 8th abdominal segment the pinaculum with setae V and IV not below the spiracle but rather under seta III. All additional characters given for roseomaculana apply to this species too.

April, May between spun-up tip leaves and flowers of Ledum palustre. Before pupation the caterpillar bores into the tip of the stem. The caterpillars from the Bavarian State Collection examined had been found by Kennel on May 13, 1900 near Dorpat (Estonia) on L.palustre.

Endothenia dalecarliana (Guenee 1845)(1881).

Caterpillar brownish-flesh colored and granulated, head yellow with dark eye- and genal-spots. The cervical shield blackish, anal shield and pinaculi gray-brown. On the prespiracular shield seta IV stands ventrad from setae V and VI, being somewhat closer to V. The margins of the spiracles are also chitinized, on the 2nd abdominal segment, as on all other segments, they are larger than the insertion place of seta III. On the 8th abdominal segment, the pinaculum with setae IV and V is found under seta III. The round, uniserial circles of hooks of the parapodia count about 26, those of the caudal disk about 25 hooklets. In all other characters this species agrees with roseomaculana.

Sept. to May in a spun-together leaf of Pirola rotundifolia, secunda, and also on Ledum palustre.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on May 4, 1894, near Postdam on P.rotundifolia.

E.nigricostana (Haworth 1811)(1867).

Caterpillar yellowish-white and granulated, pinaculi of the body color, cervical shield somewhat darker, head light brown. The 2nd ocellus is somewhat closer to the 1st than to the 3rd (fig. 223). On the cervical shield III is ventrocraniad from I. The prospiracular shield is well developed, IV ventrad from V and VI. The spiracles of the 1st segment are twice as large as those of the [other] abdominal segments which are not larger than the insertion place of seta III. On the 9th abdominal segment the pinaculi of setae I and III are contiguous or sometimes more or less distinctly fused. Parapodia with 24, caudal disk with about 14 hooklets. In all other characters this species agrees with those cited for roseomaculana.

In the fall the caterpillar bores downwards in the stem of Stachys palustris, overwinters in the root, and pupates in the upper part of the stem in the spring. Schütze (1931) found it also in the main root of Lamium.

The caterpillars from the Bavarian State Collection that were examined had been examined by Disque on Feb. 22, 1885 near Speyer in the stem of Stachys palustris.

E.penthinana (Guenee 1845)(1892).

Caterpillar pale yellowish to brownish green and granulated, head and cervical shield black-brown, the large pinaculi are brownish, anal shield pale brown. The 2nd ocellus is closer to the 1st than to the 3rd (see fig. 223), the 4th somewhat closer to the 6th. On the prespiracular shield setae V, IV, and VI are arranged in a diagonal line in which VI is the lowest down, IV being somewhat closer to V. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 9th abdominal segment the pinaculi of setae I and III are contiguous or they are more or less strongly fused with one another. The uniserial, round circles of hooks of the parapodia consist of 17 to 20, those of the caudal disk of about 10 hooklets. This species also agrees with roseomaculana in the other characters.

Sept. to April in the stem of Impatiens noli-tangere.

The caterpillars from the Bavarian State Collection that were examined had been found near Grünstadt in the stem of I.noli tangere.

E.fuligana (Hübner 1822)(1889).

Caterpillar pale greenish and granulated, pinaculi prominent. Head, cervical shield light brown, lighter than in penthinana. On the mesothorax seta VIII stands very close to coxa. The spiracles of the abdominal segments are very small, on the 2nd abdominal segment they are not larger than the insertion place of III, on the 8th III is dorsocraniad from the spiracle. In all other characters this sp. agrees with the foregoing.

From fall until April in the root stock of Ajuga reptans, but also in the lower part of the stem and root of Impatiens noli tangere.

The caterpillars from the Bavarian State Collection that were examined had been found in part by Mitterberger near Steyr, in part by Saalmüller near Erfurt in the root or lower part of the stem of I.noli tangere.

Endothenia textana (Frölich 1828)(1890).

Caterpillar yellowish-brown to brownish-yellow, strongly granulated by small brown spinules, head, cervical shield, thoracic legs, pinaculi, spiracles, and anal shield black-brown. On the prespiracular shield setae V, IV, and VI are diagonally arranged, but V is lower than VI. The spiracles are very small but somewhat larger on the 2nd abdominal segment than the insertion place of seta III. On the 2nd abdominal segment IIIa is distinctly set off from pinaculum III, on the 8th IIIa stands on the margin of pinaculum III which lies dorsocraniad from the spiracle. Setae I and III on the 9th abdominal segment stand on distinctly separated pinaculi. On the 8th abdominal segment, setae II are farther apart than setae I, on the 1st to the 6th abdominal segments inclusive group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. The parapodia are black-brown chitinized on the side (fig. 224); their uniserial circles of hooks count about 22 hooklets.

April, May in the root stock of Scabiosa arvensis, probably overwintering.

The caterpillars from the Bavarian State Collection that were examined had been found by Chretien in May 1890 near Paris in the root stock of Scabiosa arvensis.

E.bifasciana (Haworth 1811)(1929).
syn. decrepitana Herrich-Schäffer 1851 according to Obraztsov.

Caterpillar brownish or light gray, strongly granulated by small brown spinules. Head black-brown, cervical shield, thoracic legs, and anal shield dark brown. The ocelli are situated at uniform distances apart. On the prespiracular shield setae V, IV, and VI stand almost in one line, IV being closer to V. On the mesothorax seta VIII is closer to the coxa. All spiracles are very small, on the 1st and 2nd abdominal segments they are not larger than the insertion place of seta III. On all abdominal segments setae IV and V are diagonally arranged, IIIa is always distinctly set off from the pinaculum of III. On the 8th abdominal segment setae II are not farther apart that setae I, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae I and III stand on distinctly separated pinaculi, setae II, as well as IV, V, and VI on common pinaculi. The setae VIII on the 9th abdominal segment are not farther apart than on the 8th. On abdominal segments 1 to 6, group VII consists of 3 setae, of 2 setae on the 7th, 8th, and 9th. The small uniserial circles of hooks of the parapodia count 18-19, those of the caudal disk about 15 hooklets.

May in ♂ inflorescences of Pinus, especially P.maritima. The caterpillars from the Bavarian State Collection that were examined had been found in part by Disque on May 19, 1904, near Speyer in the ♂ inflorescences of P.silvestris, in part by de Crombrügghe on June 11, 1903, near Brussels on P.maritima.

E.bipunctana (Fabricius 1794)(1933).

Caterpillar dark brown, strongly granulated by small brown spinules. Head and cervical shield black, anal shield light brown. On the 7th abdominal segment the distance between setae II and between setae I is the same, less on the 8th abdominal segment. On the 7th abdominal segment group VII consists of 3 setae, on the 8th abdominal segment III is found on the same level as the spiracle. Parapodia black-brown chitinized on the side (see fig. 224); their uniserial circles of hooks consist of about 30 hooklets which are somewhat irregular in size. In other characters this species agrees with the foregoing.

April and May between spun-up leaves of Vaccinium myrtillus, vitis ieaea, also on Rhododendron.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 25, 1902 near Speyer on V.myrtillus.

Endothenia lucivagana (Zeller 1846)(1925).

According to Obraztsov this species is supposed to be identical with rurestrana. Unfortunately I was unable to examine rurestrana.

Caterpillar pale brownish-gray, strongly granulated by small brown spinules. Head light brown with dark eye and genal spots. Cervical shield dark brown, anal shield lighter. On the mesothorax seta VIII is distinctly set off from the coxa. On the abdominal segments seta III is conspicuously very long. On the 7th abdominal segment group VII consists of 3 setae, the uniserial circles of hooks of the parapodia consist of about 25, those of the caudal disk of 12-14 hooklets. In addition to these characters all the rest cited for bifasciana apply.

April, May, and June on the root neck of Hieracium umbellatum under a dense irregular web. According to Schütze (1931).

The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on H.umbellatum, on June 4, 1904 near Rachlau.

E.antiquana (Hübner 1822)(1945).

Caterpillar yellowish white and granulated, head brown, cervical and anal shields yellowish. The 2nd ocellus is closer to the 1st than to the 3rd, the 4th closer to the 3rd than to the 6th. On the prespiracular shield IV is ventrad from V and VI, equidistant from both, on the mesothorax VIII stands very close beside the coxa. Spiracles elliptical, on the 2nd abdominal segment larger than the insertion place of seta III. On all abdominal segments IIIa stands on the margin of pinaculum III. On the 8th abdominal segment the distance between setae II is less than that between setae I, elsewhere it is more, III lies ventrocraniad from the spiracle on the 8th abdominal segment. The circles of hooks of the parapodia are anteriorly uniserial, posteriorly biserial and consist of 27 hooklets (see fig. 184). The uniserial circles of hooks of the caudal disks consist of about 14 hooklets. In other characters this species agrees with lucivagana and bifasciana.

The caterpillar lives from fall until May in the fleshy root runners of Mentha arvensis, in the root neck of Stachys palustris, and Symphytum officinale.

The caterpillars from the Bavarian State Collection that were examined had been found by Schütze on Oct. 26, 1895 near Rachlau in roots of M.arvensis.

E.ericetana (Westwood 1845)(1944).

Caterpillar whitish and granulated, head brown, cervical and anal shields yellowish. The 1st and 2nd ocelli are more weakly pigmented than the others. On the mesothorax VIII is very close to the coxa. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment III lies dorsocraniad from the spiracle. The circles of hooks of the parapodia are completely uniserial and count about 23, those of the caudal disk about 12 hooklets. In all other characters this sp. agrees with antiquana.

The caterpillar lives like antiquana from fall until May in the root-runners of Mentha arvensis, according to Stange also in roots of Picris. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 25, 1902 near Speyer in the roots of M.arvensis.

The genus Cymolomia Lederer 1859.

Diagnosis: Circles of hooks of the parapodia biserial, on the 9th abdominal segment, setae II stand on separate pinaculi, on the mesothorax VIII is distinctly set off from the coxa.

This monotypical genus can be readily separated larvo-morphologically from the genus Olethreutes which is closest to it, by the characters given above.

Cymolomia hartigiana (Ratzeburg 1840)(1964).

Caterpillar pale greenish and granulated, head light brown with dark eye- and genal-spots, cervical shield brownish-green, thoracic legs brown. The ocelli are situated at the same distances apart. On the cervical shield IIIa is closer to IX than to III, on the prospiracular shield IV is closer to V than to VI. Seta IIIa on the mesothorax is dorso-craniad from III, VIII distinctly set off from the coxa. On all abdominal segments IV is diagonally situated with V and IIIa is not on the pinaculum of III. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III is found on the same level as the spiracle. Setae II, as well as I and III, stand on the 9th abdominal segment on separate pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. On the 1st to the 7th abdominal segment inclusive group VII consists of 3 setae, on the 8th and 9th of 2. The completely biserial circles of hooks of the parapodia count about 45 hooklets.

Oct. to May, at first mining, later between needles of Abies alba and Picea excelsa that havebeen spun together.

The caterpillars from the Bavarian State Collection that were examined had been found on June 6, 1894 near Charlottenburg on Picea excelsa.

The genus Olethreutes Hübner 1822.
syn. Argyroploce Hübner 1825.

Diagnosis: The circles of hooks on the parapodia are biserial, setae I and III on the 9th abdominal segment stand on separate pinaculi or group VII on the 7th abdominal segment consists of 2 setae. The coronal suture is distinctly longer than the adfrontalia are wide at the level of the apex of clypeus, or setae IV and V on the abdominal segments are of approximately the same length.

Obraztsov recently divided this genus up into several small ones. THe informed me that this division is still not satisfactory. Though I can readily separate a part of the species from the larvae by the use of morphological characters, I would like to waive splitting up [the genus] for the time being since this grouping does not coincide with the one by Obraztsov. Instead I would like to indicate only groups of species. In this place then the imaginal systematics must once more intervene. As can be gathered from the key, the 4 following groups can be divided off larvo-morphologically. The first two groups could also form a larger unit, just as the 3rd and 4th groups.

1. variegana and pruniana,
2. schreberiana, siderana, branderiana, and umbrosana,
3. arcuella, cespitana,
4. all the rest of the following spp.

Spp. of Olethreutes.

1 (12) Seta group VII on the 7th abdominal segment consists of 2 setae.
2 (5) On the 9th abdominal segment setae I and III are on a common pinaculum.

3	(4)	On all abdominal segments IV is diagonally situated with V, group VII on the 2nd abdominal segment consists of 3 setae	variegana
4	(3)	On the abdominal segments IV is vertically arranged with V, group VII on the 2nd abdominal segment consists of 2 setae	pruniana
5	(2)	On the 9th abdominal segment setae I [illegible] III are on separate pinaculi.	
6	(11)	On the 9th abdominal segment group VII consists of 1 seta.	
7	(10)	On the 2nd abdominal segment group VII counts 2 setae.	
8	(9)	The distance between setae VIII on the 9th abdominal segment is greater than on the 8th	schreberiana
9	(8)	The distance between setae VIII on the 9th abdominal segment is not greater than on the 8th	sideriana
10	(7)	On the 2nd abdominal segment group VII counts 3 setae	branderiana
11	(6)	On the 9th abdominal segment group VII consists of 2 setae	umbrosana
12	(1)	On the 7th abdominal segment seta group VII consists of 3 setae.	
13	(16)	On the mesothorax seta VIII is distinctly set off from the coxa.	
14	(15)	Spiracles of the 2nd abdominal segment considerably greater than the insertion place of seta III, on the cervical shield IIIa is farther from III than from IX	arcuella
15	(14)	Spiracles of the 2nd abdominal segment not larger than the insertion place of seta III, on the cervical shield IIIa is equidistant from III and IX	cespitana
16	(13)	On the mesothorax seta VIII is quite close to the coxa or on it.	
17	(28)	Setae II on the 9th abdominal segment stand on separate pinaculi.	
18	(21)	2nd ocellus closer to the 3rd than to the 1st.	
19	(20)	Spiracle on the 2nd abdominal segment not larger than the insertion place of seta III, on the 8th abdominal segment III is ventrocraniad from the spiracle.	capreana
20	(19)	Spiracle on the 2nd abdominal segment considerably larger than the insertion place of seta III, on the 8th abdominal segment III is dorsocraniad from the spiracle or on the same level.	rivulana
21	(18)	The 2nd ocellus is equidistant from the 1st and 3rd.	
22	(23)	Spiracle on the 2nd abdominal segment not larger than the insertion place of seta III	soroculana
23	(22)	Spiracle on the 2nd abdominal segment considerably larger than the insertion place of seta III.	
24	(25)	Seta III on the 8th abdominal segment dorsocraniad from the spiracle. On the prespiracular shield seta IV is ventrad from the line from V to VI	semifasciana
25	(24)	Seta III on the 8th abdominal segment is ventrocraniad from the spiracle or on the same level with it. On the prespiracular shield setae V, IV, and VI are situated in one line.	
26	(27)	On the posterior margin of the cervical shield, a black spot is found between setae II and III.	sauciana
27	(26)	Cervical shield uniformly yellow-green without any marking	betulaetana
28	(17)	Setae II on the 9th abdominal segment stand on a common pinaculum.	
29	(34)	The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III.	
30	(31)	Parapodia dark chitinized laterally	undulana
31	(30)	Parapodia not chitinized laterally.	
32	(33)	Caterpillar with a strongly chitinized, brown anal shield	arbutella
33	(32)	Anal shield not strongly chitinized	rufana
34	(29)	Spiracles of the 2nd abdominal segment distinctly larger than the insertion place of seta III.	
35	(40)	The 2nd ocellus is closer to the 3rd than to the 1st.	
36	(37)	Seta III on the 8th abdominal segment dorsocraniad from the spiracle, IIIa not on its pinaculum	palustrana

37 (36) Seta III on the 8th abdominal segment on the same level as the spiracle, IIIa on the margin of pinaculum III.
38 (39) Circles of hooks of the parapodia laterally uniserial, otherwise biserial — lacunana
39 (38) Circles of hooks of perapodia completely biserial — tiedemanniana
40 (35) The 2nd ocellus more strongly approaches the 1st than the 3rd, or it is equidistant from the 1st and 3rd.
41 (44) Circles of hooks of the parapodia laterally or cranially uniserial, otherwise biserial.
42 (43) Circles of hooks circular, seta III on the 8th abdominal segment on the same level as the spiracle. — mygindana
43 (42) Circle of hooks elliptical, seta III on the 8th abdominal segment dorsocraniad from the spiracle — dissolutana
44 (41) Circles of hooks of the parapodia entirely biserial.
45 (50) Parapodia laterally chitinized.
46 (47) Caudal disk provided with about 20 hooklets — dimidiana
47 (46) Caudal disk with about 40 hooklets.
48 (49) Head black — salicella
49 (48) Head brown-yellow — profundana
50 (45) Parapodia laterally not chitinized.
51 (54) Seta III on the 8th abdominal segment is found dorsocraniad from the spiracle.
52 (53) On the prespiracular shield IV is equidistant from V and VI, the 4th ocellus distinctly larger than all the rest. Caterpillar strongly granulated — striana
53 (52) On the prespiracular shield IV is considerably closer to V than to VI, the ocelli are all the same size. Caterpillar hardly granulated — scriptana
54 (51) Seta III on the 8th abdominal segment is situated on the same level with the spiracle, or is lower.
55 (56) On the prespiracular shield seta IV is equidistant from V and VI — hercyniana
56 (55) On the prespiracular shield the distance between setae IV and VI is twice as great as that from V to IV.
57 (58) Prespiracular shield strongly chitinized, black-brown — ochroleucana
58 (57) Prespiracular shield not chitinized, yellowish-green — corticana

Olethreutes variegana (Hübner 1822)(1872).

Caterpillar gray-green and strongly granulated by black spinules, head, cervical shield, thoracic legs, and pinaculi are black-brown to black, anal shield blackish. On the cervical shield setae IIIa, III, and IX are approximately the same distance apart. On the obliquely placed prespiracular shield setae V, IV, and VI are arranged in a line in which the distance between IV and VI is twice to thrice as great as that between setae IV and V. On the mesothorax seta IIIa is dorsocraniad from III on the same pinaculum, VIII stands very close beside the coxa. The spiracles are elliptical, on the 2nd abdominal segment they are larger than the insertion place of seta III. On all abdominal segments IIIa stands on one pinaculum with II [sic!], setae IV and V are diagonally arranged and approximately the same length. The distances between setae II and setae I on the 8th abdominal segment are the same. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are found on common pinaculi. On the 1st abdominal segment group VII counts 2 setae, on the 2nd 3, sometimes 2 setae, on the 7th, 8th, and 9th always 2; parapodia black-brown chitinized on the side, the circles of hooks consisting of more than 40 hooklets.

The caterpillar lives in April and May very polyphagously between spun-up flowers, leaf-buds, and later leaves of Craetagus [sic!], Pirus, Sorbus aucuparia, Prunus avium, Betula, Quercus, and Myrica gale.

Locality: Erlangen, on May 15, 1951, in leaf buds of Pirus malus as well as Crataegus.

Olethreutes pruniana (Haworth 1811)(1873).

Caterpillar light green to gray-green and strongly granulate by small black spinules. Head, cervical shield, thoracic legs, and pinaculi black. On the prespiracular shield IV is somewhat ventrad from V and VI. The surroundings of the spiracles are chitinized. Setae IV and V are vertically situated on the abdominal segments. On the 1st, 2nd, 7th, 8th, and 9th abdominal segments group VII consists of 2 setae. Circles of hooks of the parapodia count 35-40 hooklets. In all other characters this species agrees with variegana.

April, May between spun-up leaves on Prunus, Sorbus aucuparia, Rosa, and Crataegus.
Locality: Erlangen on April 23, 1952 between spun-up leaves on Prunus spinosa.

O.schreberiana (Linné 1761)(1856).

Caterpillar greenish-gray and strongly granulated by black spinules. Head, cervical shield, thoracic legs, and pinaculi black, anal shield brownish. On the abdominal segments IIIa is distinctly set off from pinaculum III, setae IV and V are diagonally situated. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is situated on the same level as the spiracle. On the 9th abdominal segment setae I and III are found on separate pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. Circles of hooks with 35-40 hooklets.

April, May in leaf rolls and between spun-up leaves on Prunus padus.
The caterpillars from the Bavarian State Collection that were examined had been found by Gütschmann on May 17, 1904 near Breslau on Prunus padus.

O.siderana (Treitschke 1835)(1904).

Caterpillar red-brown and strongly granulated by small brown spinules. Head, cervical shield, thoracic legs, pinaculi, and anal shield black or black-brown. The ocelli are arranged at uniform distances apart, on the cervical shield II is somewhat ventrocaudad from I. On the prespiracular shield setae V, IV, and VI are arranged in one line, IV is closer to V than to VI. Seta IIIa is dorsocraniad from III on the mesothorax, VIII very close beside the coxa. The spiracles are rounded, on the 2nd abdominal segment they are larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly separated off from the pinaculum of III, IV is diagonally situated with V, both nearly equally long. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found dorsocraniad from the spiracle. On the 9th abdominal segment setae I and III are on separate pinaculi, setae II, as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is not greater than on the 8th abdominal segment. Anal comb of 6 spines.

I could not find a description of the caterpillar anywhere. The data below were taken from the caterpillars of the Bavarian State Collection that were examined.
May, June in overturned leaf margin on Spiraea aruncus, Japonica, and salicifolia.
The caterpillars from the Bavarian State Collection that were examined had been found by Nagel on June 1, 1908 near Breslau between spun-up leaves on S.aruncus.

O.branderiana (Linné 1758)(1902).

Caterpillar gray-black, strongly granulated by black spinules. Head, cervical shield, thoracic legs, pinaculi, and anal shield pitch-black. The 2nd ocellus is somewhat closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. On the prespiracular shield IV is somewhat ventrad from V and VI The spiracles are rounded, the margins of the spiracles reinforced. On the 8th abdominal segment the distance between setae II and that between setae I is the same. On the 1st abdominal segment

8th of 2, and on
group VII consists of 2, on the 2nd of 3, on the 7th and / the 9th of 1 seta. Parapodia black, strongly chitinized on the side; their biserial circles of hooks consist of about 50 hooklets. In all other characters this sp. agrees with siderana.

May in a leaf roll or under the overturned leaf margin of Populus tremula. The adult flies in June, July.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 21, 1902 near Speyer on Populus tremula.

Olethreutes umbrosana (Freyer)(1919).

Caterpillar blackish-red-brown, strongly granulated by brown spinules. Head, cervical shield, anal shield, and thoracic legs black, pinaculi light brown. The 2nd ocellus iscloser to the 3rd than to the 1st. Seta II on the cervical shield does not lie ventrocaudad from seta I. Spiracles elliptical, the surroundings of the spiracles reinforced chitinized. On the 8th abdominal segment the distance between setae II is less than that between setae I, III is found on the same level as the spiracle. The parapodia are strongly black-brown chitinized on the side, on the 1st to the 6th abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. In addition to these all additional characters given for siderana apply.

April to May polyphagous on weedy plants, preferably Mentha.

The caterpillars from the Bavarian State Collection that were examined had been found by de Crombrügghe on June 6, 1905, near Brussels.

O.arcuella (Clerck 1759)(1896).

Caterpillar red-brown, strongly granulated, head light brown, cervical shield, pinaculi, and anal shield dark-brown. The 2nd ocellus is cloer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is farther from III than from IX. On the prespiracular shield setae V, IV, and VI stand in one line, IV being closer to V. On the mesothorax seta VIII is distinctly set off from the coxa. Spiracles elliptical, on the 2nd abdominal segment larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from the pinaculum of III, setae IV and V are diagonally arranged and nearly equally long. On the 7th abdominal segment the distances between setae II and I are the same, on the 8th the distance between setae II is less. On the 8th abdominal segment III is dorsocraniad from the spiracle. On the 9th abdominal segment setae I and III stand on separate pinaculi, setae II as well as IV, V, and VI stand on common pinaculi. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2 setae. Parapodia on the side, strongly blackbrown chitinized (see fig. 224) their biserial circles of hooks counting about 45, those of the caudal disk about 40 hooklets.

The caterpillar lives in April, probably overwintering from the fall, on the ground, on fallen leaves as well as on withered or fresh parts of plants.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 5, 1909 near Speyer.

O.cespitana (Hübner 1822)(1927).

Caterpillar brown, strongly granulated by small brown spinules. Head light brown, prespiracular shield, cervical shield, thoracic legs, and anal shield dark brown. The ocelli are situated the same distance apart. On the cervical shield setae IIIa, III, and IX are the same distance from each other. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is less than that between setae I. Parapodia with about 40 caudal disk with about 30 hooklets. Besides these all additional characters given for arcuella also apply.

In 2 generations, the 1st in April, the 2nd in June on Spartium and Thymus. Schütze (1931) found it also on Calluna.

The caterpillars from the collection that had been examined were found by Disque on June 10, 1893 near Speyer on Spartium.

Clethreutes capreana (Hübner 1822)(1864).

Caterpillar green to gray-green and not or very rarely only weakly, granulated. Head yellowish-green. The 2nd ocellus is closer to the 3rd than to the 1st, on the cervical shield II stands somewhat ventrocaudad from I, on the prespiracular shield somewhat ventrad from V and VI. [sic?]. On the mesothorax seta VIII is very close to the coxa. The spiracles on the prothorax are elliptical, on the 2nd abdominal segment they are round and not larger than the insertion place of seta III. On the 8th abdominal segment III is ventrocraniad from the spiracle. Parapodia not strongly chitinized on the side. In other characters this species agrees with cespitana.

April, May at first in leaf buds, later under an overturned leaf margin of Salix caprea.

Locality: Erlangen-Spardorf on June 20, 1953 in an overturned leaf margin of S.caprea.

O.rivulana (Scopoli 1763)(1918).

Caterpillar brown- or gray-green, strongly granulated by brown spinules, Head black, cervical shield, thoracic legs dark brown, pinaculi light, anal shield of the body color. 2nd ocellus closer to the 3rd than to the 1st. On the prespiracular shield setae V, IV, and VI are arranged in a line, IV closer to V than to VI. On the mesothorax VIII is very close to the coxa. The spiracles are elliptical, larger on the 2nd abdominal segment than the insertion place of seta III. On all abdominal segments setae IV amd V are diagonally situated and almost equally long, seta IIIa is distinctly set off from pinaculum III. On the 7th abdominal segment the distance between setae II and that between setae I is the same, on the 8th [abdominal segment] the distance between setae II is less. On the 9th abdominal segment setae II, as well as I and III are found on separate pinaculi, IV, V, and VI on a common pinaculum. Setae VIII are not farther apart than on the 8th abdominal segment. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2. The circles of hooks of the parapodia are laterally uniserial, elsewhere biserial and they consist of about 45 hooklets.

May and during the summer in several generations, very polyphagous between spun-up leaves, shoots and flowers on Plantago, Medicago, Scabiosa, Ribes, Galium, Genista tinctoria, Almus, Rubus, and Betula.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on July 7, 1905 near Speyer on M.sativa and Betula.

O.scoriculana (Zetterstedt 1840)(1867).

Caterpillar green-yellow, not or only weakly granulated, the pinaculi are elevated but are of the body color. The ocelli are situated at the same distance apart. On the cervical shield IIIa is equidistant from III and IV, II is ventrocraniad from I. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. The distance between setae II and setae I is the same on the 8th abdominal segment. The biserial circles of hooks of the parapodia count about 40 hooklets. In addition to these characters the ones given for rivulana also apply.

June and Sept., Oct. between spun-up leaves on Betula.
Locality: Erlangen, Burgberg on July 21, 1952 on Betula.

Olethreutes semifasciana (Haworth 1811)(1860).

Caterpillar green with 2 reddish-brown subdorsal longitudinal stripes, head greenish-yellow. The ocelli are at the same distances from each other. On the prespiracular shield IV is somewhat ventrad from V and VI, on the cervical shield IIIa is equidistant from III and IX, II not ventrocaudad from I. The spiracles of the prothorax are elliptical, on the 2nd abdominal segment round and larger than the insertion place of seta III. The circles of hooks of the parapodia are biserial and consist of about 40 hooklets. In the other characters this species agrees with rivulana.

May, June at first in the catkin, later between spun-up leaves on Salix caprea and alba.

Locality: Dechsendorf on June 15, 1953 between spun-up leaves on S.caprea.

O.sauciana (Frölich 1828)(1871).

Caterpillar dirty-green with 2 darker subdorsal longitudinal stripes. Head ocher yellow, cervical shield brownish green, on both sides with a black spot on the posterior margin between setae II and III (fig. 225). The 2nd ocellus is equidistant from the 3rd and 1st, on the cervical shield IIIa is closer to IX than to III. The setae V, IV, and VI stand almost in one line on the prespiracular shield, but IV is closer to V. The spiracles are nearly round, larger on the 2nd abdominal segment than the insertion place of seta III. The distance between setae II on the 8th abdominal segment is greater than than between setae I, III stands on the same level with the spiracle. The entirely biserial circles of hooks of the parapodia count about 50 hooklets. In the other characters the caterpillar of this species agrees with that of rivulana.

May, June between spun-up leaves on Vaccinium myrtillus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 22, 1899 near Speyer on Vaccinium.

O.betulaetana (Haworth 1811)(1866).

Caterpillar yellow-green with prominent pinaculi of the body color. Head ocher yellow with dark eye- and genal-spots, the ocelli situated at the same distances apart. On the cervical shield IIIa is farther from III than from IX, seta II is ventrocraniad from I. On the prespiracular shield setae V, IV, and VI stand in one line, IV being closer to V. Seta VIII on the mesothorax is found very close beside the coxa. On all abdominal segments IIIa is distinctly set off from the pinaculum of III, setae IV and V are diagonally placed and approximately of the same length. Spiracles elliptical. On the 9th abdominal segment setae II, also I and III stand on separate pinaculi, IV, V, and VI are on a common pinaculum, setae VIII not farther apart than on the 8th abdominal segment. Group VII consists of 3 setae on the 1st to the 7th abdominal segments, of 2 setae on the 8th and 9th. The biserial circles of hooks of the parapodia count about 40 hooklets.

April to May between spun-up leaves on Betula.

Locality: Erlangen on May 29, 1952 on Betula.

O.undulana (Schiffermiller 1776).
Syn. urticana Hübner 1822 (1921) according to Obraztsov.

Caterpillar dark brown and strongly granulated by small brown spinules. Head black, cervical shield, thoracic legs, pinaculi and anal shield black-brown. On the cervical shield IIIa is approximately equidistant from III and IX, II is found exactly ventrad from I. On the 1st abdominal segment IIIa is distinctly set off from the pinaculum of III, on the 8th IIIa is on the margin of the pinaculum. The spiracles are elliptical. On the 2nd abdominal segment they are not larger than the insertion place of seta III.

On the 9th abdominal segment setae II, as well as IV, V, and VI stand on common pinaculi, I and III on separate pinaculi. Parapodia strongly black-brown chitinized on the side (fig. 224); their biserial circles of hooks consist of 30 to 40 hooklets. In other characters this species agrees with the preceding.

May, June very polyphagous between spun-up heart leaves on Epilobium, Veronica, Lycopus, Vaccinium, Salix, Betula, Ulmus, Rubus, Ribes, and Urtica.

Locality: Erlangen-Rüthelheim on May 7, 1953 on Betula and Urtica.

Olethreutes arbutella (Linné 1758)(1897).

Caterpillar brownish yellow and strongly granulated by small spinules. Head, cervical shield, thoracic legs, and anal shield black-brown. Only the thoracic pinaculi are brown. On all abdominal segments IIIa is distinctly set off from pinaculum III. The spiracles are rounded to elliptical, on the 2nd abdominal segment they are as large as the insertion place of seta III. Parapodia not black-brown chitinized on the side. The circles of hooks of the parapodia consist of 20-30, those of the caudal disk of about 20 hooklets. In all other characters this species agrees with the foregoing.

Apr., May between spun-up leaves on Vaccinium vitis idaea, uliginosum, and Arctostaphylos.
The caterpillars from the Collection that were examined had been found by Disque in May on Vaccinium.

O. rufana (Scopoli 1763)(1899). *insert: the latter dark-edged.

Caterpillar yellowish-white to gray-green and granulated, head and cervical shield redbrown,* The ocelli are situated the same distances apart. On the cervical shield IIa is approximately equidistant from III and IX, II is ventrocraniad from I. Setae IV, V, and VI on the prespiracular shield are situated in one line, IV closer to V than to VI. On the mesothorax VIII is found very close beside the coxa. Spiracles elliptical, on the 2nd abdominal segment they are not larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III, setae IV and V are diagonally arranged and approximately the same length. On the 7th and 8th abdominal segments setae I and setae II are the same distance apart. On the 9th abdominal segment setae II, as well as IV, V, and VI stand on common pinaculi, I and III on separate pinaculi. On abdominal segments 1 to 7 inclusive group VII counts 3, on the 8th and 9th, 2 setae. Parapodia not dark-chitinized on the side; their circles of hooks consist of about 45 hooklets.

April, May, and July in the root stock of Artemisia, Tanacetum, Sonchus arvensis. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 28, 1917 near Speyer on Achillea on the undermost part of the stem near the root in a slight web.

O. palustrana (Zeller 1846)(1910).

Caterpillar red-brown, strongly granulated by small brown spinules. Head, cervical shield, thoracic legs black-brown, anal shield light brown. The 2nd ocellus is closer to the 3rd than to the 1st (fig. 226). On the cervical shield seta II is ventrocraniad from I. On the prespiracular shield IV is somewhat ventrad from V and VI, IV is closer to V. On the mesothorax VIII is found very close beside the coxa. Spiracles rounded on the 2nd abdominal segment they are larger than the insertion place of seta III. Parapodia not strongly chitinized on the side; their biserial circles of hooks count at least 50 hooklets. Anal comb with 5 to 6 spines. In other characters this species agrees larvo-morphologically with the foregoing.

May, June in a spun tube in the moss Dicranum. The caterpillars from the Bavarian State Collection that were examined had been found by Schütze June 21, 1897 near Rachlau in Dicranum.

Clethreutes profundana (Schiffermiller 1776)(1886).

Caterpillar gray-green, head brown-yellow or yellow with dark eye- and genal-spots, cervical shield gray-green or brownish-green, pinaculi black, anal shield colored like the cervical shield, sometimes like the pinaculi. The 2nd ocellus is closer to the 1st than to the 3rd. On the cervical shield II is ventrocaudad from I. Seta VIII on the mesothorax is very close to the coxa. On the abdominal segments IIIa is set off from the pinaculum of seta III, IV and V are diagonally placed. On the 2nd abdominal segment the spiracles are larger than the insertion place of seta III. On the 9th abdominal segment setae II stand on a common pinaculum, I and III on separate pinaculi. On the 1st to the 7th abdominal segments group VII counts 3, on the 8th and 9th 2 setae. The distance between seta VIII on the 8th and 9th abdominal segments is the same. Parapodia chitinized on the side, circles of hooks consisting of about 40 hooklets.

April to June between spun-up leaves on Prunus, Crataegus, Pirus, and Quercus.
The locality: Erlangen on May 18, 1953 on Pirus malus.

O. lacunana (Schiffermiller 1776)(1922).

Caterpillar red-brown, strongly granulated by small brown spinules. Head black, cervical shield, anal shield, thoracic legs dark-brown, pinaculi brown; the 2nd ocellus is closer to the 3rd than to the 1st. On the cervical shield II is exactly ventrad from I. The spiracles of the 2nd abdominal segment are larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is somewhat smaller than that between setae I. Parapodia dark-brown and strongly chitinized on the side, their biserial circles of hooks are laterally uniserial and consist of 40-50 hooklets. Besides these characters all additional characters cited for rufana apply.

April, May and June, July very polyphagous between spun-up leaves on Caltha, Mentha, Matricaria, Urtica, Lamium, Cirsium, Anthriscus silvestris, Chrysanthemum, Ranunculus, Rubus, Betula, etc.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on June 12, 1906 near Potsdam on Urtica and Mentha.

O. tiedemanniana (Zeller 1845)(1937).

Caterpillar dark-red-brown and strongly granulated by small brown spinules. Head, cervical shield, and thoracic legs black or black-brown, anal shield light brown. On the cervical shield seta IIIa is approximately equidistant from III and IX, on the prespiracular shield IV is somewhat ventrad from V and VI but closer to V. The seta IIIa is found dorsocraniad from III, VIII very close to the coxa, on the mesothorax. Spiracles elliptical and with reinforced margins. Even on the 2nd abdominal segment they are larger than the insertion place of seta III. Setae IV and V on all abdominal segments are diagonally situated and nearly the same length. On the 8th abdominal segment the distance between setae II is somewhat less than that between setae I, III is found on the same level as the spiracle and IIIa stands on the margin of pinaculum III. On the 9th abdominals segment setae II, as well as IV, V, and VI stand on common pinaculi but I and III are on separate pinaculi. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2. The parapodia are strongly black-brown chitinized on the side, their biserial circles of hooks count about 45 hooklets.

June in the lower part of the stem of Equisetum.
The caterpillars from the Bavarian State Collection that were examined had been found by Stange on June 13, 1887 near Friedland in the stem of Equisetum.

Olethreutes mygindana (Schiffermiller 1776)(1898).

Caterpillar redbrown, strongly granulated by small brown spinules. Head black, cervical shield and thoracic legs black-brown, pinaculi and anal shield brown. The ocelli are equally far apart. Spiracles elliptical, but on the 8th abdominal segment they are rounded. On all abdominal segment, even on the 1st, IIIa stands on pinaculum III which has moved up onto the spiracle. [or moved up alongside or against the spiracle]. On the 8th abdominal segment the distances between setae II and I are the same, IIIa lies on the same level as the spiracle. On the 9th abdominal segment, the pinaculi of setae I and III are contiguous. Parapodia not black chitinized on the side. The circles of hooks are uniserial on the anterior margin, biserial on the posterior (see fig. 184) and they consist of about 40 hooklets. Moreover all additional characters given for tiede-manniana apply.

April, May in a web on Vaccinium uliginosum, V.vitis idaea, Myrica gale.
The caterpillars from the Bavarian State Collection that were examined had been found by Meess on Aug. 7, 1901 near Herrenwies (Baden) between spun-up leaves on V.vitis idaea.

O.dissolutana (Stange 1886)(1932).

Caterpillar brownish green, strongly granulated by small brown spinules. Head light brown with dark eye- and genal spots, cervical and anal shields brownish, thoracic legs brown. The spiracles are elliptical, even on the 2nd abdominal segment they are larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III. On the 8th abdominal segment setae II and setae I are the same distance apart. Parapodia not dark chitinized on the side, their biserial circles of hooks are laterally uniserial. Moreover all additional characters cited for tiedemanni-ana apply to this.

May in moss, especially on the trunks of conifers (Stange). Schütze (1931) on the other hand, found it on the ground on Polytrichum. The caterpillars examined from the Bavarian State Collection had been found by Schütze on May 15, 1906 near Rachlau in moss.

O.dimidiana (Sodoffsky 1830)(1875).

Caterpillar lighter or darker gray-green, very strongly granulated by small black-brown spinules, head, cervical shield, thoracic legs, pinaculi, and anal shield black-brown to black. The ocelli are situated at uniform distances apart. On the prespiracu-lar shield IV is ventrad from V and VI but closer to V. On the cervical shield II is ventrocraniad from I, setae IIIa, III and IX are approximately the same distance apart. On the mesothorax IIIa is dorsocraniad from III, setae VIII very close to the coxa. The spiracles are surrounded by a chitin margin, on the 2nd abdominal segment they are some-what larger than the insertion place of seta III, on the 1st abdominal segment IIIa is separated off from pinaculum III, but on the other abdominal segments it stands on pina-culum III. Setae IV and V are diagonally arranged on all abdominal segment and of ap-proximately the same length. On the 8th abdominal segment III is on the same level as the spiracle. On the 9th abdominal segment setae II, also IV, V, and VI are found on com-mon pinaculi, I and III on separate pinaculi, the distance between setae VIII not larger than on the 8th abdominal segment. Parapodia laterally strongly black-brown chitinized, their biserial circles of hooks consisting of about 30, those of the caudal disk of about 20 hooklets.

May, June and Aug., Oct. between spun-up leaves on Betula, Alnus, Tilia, Fagus, Myri-ca gale. Locality: Erlangen-Röthelheim on June 17, 1951 between spun-up leaves on Betula.

Olethreutes salicella (Linné 1758)(1857).

Caterpillar reddbrown and strongly granulated by brown spinules. Head, cervical shield, thoracic legs, pinaculi, and anal shield black-brown to black. The 2nd ocellus is somewhat closer to the 1st than to the 3rd. The spiracles are elliptical and even on the 2nd abdominal segment larger than the insertion place of seta III. On the 1st and 2nd abdominal segments IIIa is distinctly set off from pinaculum III. Parapodia laterally black-brown chitinized their circles of hooks consisting of about 40, those of the caudal disk also of about 40 hooklets. In all other characters this species agrees with the foregoing.

May and July, Aug., between spun-up leaves and shoots of different Salix and Populus species.

Locality:Erlangen on May 15, 1851 on Salix, on July 18, 1951 on Populus.

O.striana (Schiffermiller 1776)(1901).

Caterpillar yellowish-white, granulated, head light-brown, cervical and anal shields yellowish. The 2nd ocellus is somewhat closer to the 1st than to the 3rd. On the prespiracular shield IV is ventrad from V and VI, equidistant from both. Seta II on the cervical shield stands ventrocaudad from I. Spiracles elliptical, even on the 2nd abdominal segment they are larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is less than that between setae I, the pinaculum with setae III and IIIa is dorsocraniad from the spiracle. On the 9th abdominal segment the pinaculi of setae I and III are contiguous but not fused. The biserial circles of hooks of the parapodia count 45-50 hooklets, those of the caudal disk about 40. Parapodia not chitinized on the side. Besides these characters the others cited for dimidiana also apply.

April, May and July in a slight web on the root of Leontodon taraxacum (Taraxacum officinale).

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 8, 1900 near Speyer on L.taraxacum.

O.scriptana (Hübner 1825)(1862).

Caterpillar pale green, head ocher yellow with dark eye- and genal spots. The ocelli are at equal distances apart, on the cervical shield II is ventrad from I. The spiracles of the abdominal segment are round and larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III. On the 8th abdominal segment the distance between setae II is larger than that between setae I, III is dorsocraniad from the spiracle. On the 1st abdominal segment group VII consists of 3 setae, sometimes of 2. This species agrees with dimidiana in the other characters.

May, June, July between spun-up leaves mostly of high old willows.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 29, 1905 near Speyer on Salix vitellina.

O.hercyniana (Treitschke 1830)(1941).

Caterpillar dirty-brown-red, strongly granulated with small brown spinules. Head and thoracic legs black, cervical shield yellowish, posteriorly black edged (fig. 227). On the prespiracular shield setae V, IV, and VI stand in one line, IV closer to V. The immediate vicinity of the spiracles is strongly chitinized. On the 8th abdominal segment setae II and setae I are equally far apart. Parapodia not strongly chitinized on the side, their biserial circles of hooks consisting of about 36 hooklets. In other characters the caterpillar of this species agrees with that of dimidiana.

The caterpillar lives from Sept. to May, at first making mines later between spun-up needles on Picea excelsa. The occurrence on Abies alba and Pinus silvestris was questioned by Schütze (1931), Yet Krone had also found the caterpillar of this species which I myself was able to examine, on Abies alba.

The caterpillars from the Bavarian State Collection that were examined had been found in part by Schütze on May 10, 1912 near Rachlau on P.excelsa, in part by Krone on May 25 near Steyr on Abies alba.

O.ochroleucana (Frölich 1828)(1874).

Caterpillar blackish-breen and strongly granulated. Head, cervical shield, thoracic legs, and prespiracular shield black-brown to black; the pinaculi are light but bear black setae. The ocelli stand at the same distances apart. On the cervical shield IIIa is approximately equidistant from III and IX, II is somewhat ventrocaudad from I. Setae IV, V, and VI stand almost in one line on the prespiracular shield, IV closer to V than to VI. On the mesothorax IIIa is dorsocraniad from III, VIII very close to the coxa. Spiracles rounded, on the 2nd abdominal segment theyare larger than the insertion place of seta III. On all abdominal segments IIIa is distinctly set off from pinaculum III. The approximately equally long setae IV and V are diagonally situated. On the 9th abdominal segment setae II, as well as IV, V, and VI stand on common, I and III on separate, pinaculi. On the 1st to the 7th abdominal segments group VII consists of 3, on the 8th and 9th of 2 setae. Parapodia not dark chitinized on the side, their circles of hooks counting at least 40 hooklets.

The caterpillar lives in 2 generations: in the first in May and June in the 2nd in July between spun-up leaves on Rosa.

Locality: Erlangen-Spardorf on May 25, 1954, between spun-up leaves on Rosa.

.corticana (Hübner 1822)(1865).

Caterpillar gray-green with lighter pinaculi and prespiracular shield. Head, cervical shield, thoracic legs brown, cervical shield sometimes only brown bordered. Setae II on the cervical shield are not ventrocaudad from I. On all abdominal segments IIIa is distinctly set off from pinaculum III. The spiracles are elliptical and even on the 2nd abdominal segment larger than the insertion place of seta III. On the 9th abdominal segment setae II, as well as IV, V, and VI stand on common, I and III on separate, pinaculi. In additional characters this species agrees larvo-morphologically with ochroleucana.

April, May, and June between spun-up leaves on Betula.

Locality: Erlangen-Röthelheim on May 25, 1951 between spun-up leaves on Betula.

The Subfamily Phaloniinae.

Diagnosis: The circles of hooks of the parapodia are uniserial, seta VI is lacking on the 9th abdominal segment, and setae VIII are farther apart than on the 8th abdominal segment, or the $Fr1_1$ stands closer to the $Fr1_2$ than to F_1 (see fig. 235 and 244). The coronal suture is mostly not longer than the adfrontalia are wide at the level of the apex of clypeus.

This subfamily was raised by Meyrick (1927) to the family Phaloniidae and designated as the family Agapetidae by Obraztsov(1950). But in the last piece of writing Obraztsov informed me that this family designation was to be replaced by Phaloniidae. He further wrote me in reply to my questions that the justification for an independent family Phaloniidae could be long discussed. The Phaloniidae lack the vein A-1 of the forewing and the true gnathos which has been replaced functionally by a modified Fultura superior. In most other characters the Phaloniidae and Tortricidae agree and with this and many others form the superfamily of Tortricoidea. The larvo-morphological differences between Tortricinae and Olethreutinae are not so great that I could conceive of them as independent families. Indeed the Phaloniinae can be more readily separated from the other two subfamilies by the above-given characters than the Tortricinae can be separated from the Olethreutinae, yet the larvo-morphological family characters of the Tortricidae also apply to the Phaloniinae. Since I cannot subdivide the subfamily of the Phaloniinae into generic groups which would correspond to the subfamilies of the Phaloniidae sensu Obraztsov, I am retaining this [subfamily]. A further reason for my concept is that in some spp. of the genus Hysterosia seta VI is present on the 9th abdominal segment and in some the circles of hooks of the parapodia are also biserial on the posterior margin and thereby form a transition to the Olethreutinae.

As already stated, I cannot separate any generic groups within the Phaloniinae which would correspond to the division into subfamilies by Obraztsov. The former genera Lozopera, Hysterosia, Phalonia or Cochylis, Euxanthis, and Chlidonia can be readily separated. Obraztsov recently divided the large genera Phalonia and Euxanthis into several small ones. This division I have followed up very closely and was able to come to one which extensively corresponds to it.

Yet as can be seen from the key, several characters had to be used for separation for the spp. of the former large genera are very close together larvo-systematically. The two genera Falseuncaria and Cochylichroa provided for by Obraztsov, could be confirmed by my larvo-systematic investigations and I would like to mention the same, with his assent, as new genera.

The genus Carposina cannot remain in this subfamily since not even the family characters of the Tortricidae apply to its caterpillars. They show closer relations to the Gelechiidae but it is better to consider them as a family of their own as Meyrick has already done (1910) on the basis of his imagino-systematic investigations. Only 2 spp. of the family Carposinidae occur in the Palearctic Region.

Genera of the Phaloniinae.

1 (2) Group VII on the 1st, 2nd, and 7th abdominal segments consists of 3 setae, on the 8th of 2, and on the 9th of 1 seta. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III, on the 8th abdominal segment the latter is found on the same level as the spiracle, or the circles of hooks of the parapodia are sectionally biserial, or seta VI is present on the 9th abdominal segment Hysterosia

2 (1) Seta VII is absent on the 9th abdominal segment, the circles of hooks of the parapodia are completely uniserial, group VII does not consist of 3 setae on the 1st, 2nd, and 7th abdominal segments, of 2 on the 8th, and of 1 on the 9th, or the spiracles of the 2nd abdominal segment are larger than the insertion place of seta III.

3 (4) On the 1st and 2nd abdominal segments group VII consists of 3, on the 8th and 9th of 1 seta Lozopera

4 (3) Group VII does not consist of 3 setae on the 1st and 2nd abdominal segments and of 1 seta on the 8th and 9th, at the same time.

5 (6) On the 1st and 2nd abdominal segments group VII consists of 3 setae and on the 8th abdominal segment setae IV and V are diagonally arranged, if horizontally then on the 9th abdominal segment setae II are found on a common pinaculum and group VII consists of 2 setae on the 7th, 8th, and 9th abdominal segments . . . . . Eupoecilia

6 (5) On the 1st and 2nd abdominal segments, group VII consists of 2 or only of 1 seta, if of 3 setae then on the 8th abdominal segment setae IV and V are vertically or horizontally arranged, or on the 9th abdominal segment setae II stand on separate pinaculi.

7 (12) On the 8th abdominal segment setae IV and V are diagonally situated and setae II are not farther apart than setae I. The spiracles of the 2nd abdominal segment are mostly larger than the insertion place of seta III.

8 (11) Circles of hooks of the parapodia elliptical and with 22-38 hooklets.

9 (10) On the 8th abdominal segment seta group VII consists of 1 seta, parapodia with 22-25 hooklets which are arranged in a very even ellipse Commophila

10 (9) On the 8th abdominal segment seta group VII consists of 2 setae, parapodia with 35-40(38) hooklets Agapeta

11 (8) Circles of hooks of the parapodia round with 12-20 hooklets Stenodes

12 (7) On the 8th abdominal segment setae IV and V are horizontally or vertically arranged, if diagonally then setae II on the 8th abdominal segment are farther apart than setae I, or the spiracles on the 2nd abdominal segment are not larger than the insertion place of seta III.

13 (14) On the 1st, 2nd, and 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 2 setae. On the mesothorax seta VIII stands on the margin of the coxa Chlidonia

14 (13) On abdominal segments 1, 2, 7, 8, and 9 group VII does not consist of the number of setae given in no. 13, or the seta VIII on the mesothorax is distinctly set off from the coxa.

15 (24) On the 8th abdominal segment setae IV and V are horizontally or diagonally placed and on the cervical shield II is ventrad or ventrocraniad from I. On the 7th abdominal segment group VII always consists of 2 setae.

16 (17) On the 8th abdominal segment seta III is dorsocraniad from the spiracle Falseuncaria

17 (16) On the 8th abdominal segment seta III lies on the same level with the spiracle.

18 (19) On the 8th abdominal segment setae IV and V are diagonally arranged, group VII on the 8th abdominal segment consists of 1 seta Cochylichroa

19 (18) On the 8th abdominal segment setae IV and V are horizontally arranged, if diagonally, then group VII on the 8th abdominal segment consists of 2 setae.

20 (21) 2nd ocellus closer to the 3rd than to the 1st, group VII on the 8th abdominal segment consists of 2 setae, if of one then the distance between setae II on the 8th abdominal segment is less than that between setae I — Cochylidia

21 (20) 2nd ocellus equidistant from the 1st and the 3rd, or group VII on the 8th abdominal segment consists of 1 seta and the distance between setae II is greater than that between setae I.

22 (23) 2nd ocellus closer to the 3rd than to the 1st, or the parapodia have 20 hooklets — Phalonidia

23 (22) 2nd ocellus equidistant from the 1st and 3rd, parapodia with 12-18(15) hooklets — Cochylis

24 (15) On the 8th abdominal segment setae IV and V are vertically placed if horizontally then on the cervical shield seta II is ventrocaudad from I. On the 7th abdominal segment group VII consists of 3, 2, or 1 seta.

25 (28) On the 7th and 8th abdominal segments group VII consists of 2, on the 9th of 1 seta, on the 8th abdominal segment setae II are farther apart than setae I, III is situated on the same level with the spiracle.

26 (27) On the 1st and 2nd abdominal segments group VII counts 3 setae. — Brevisociaria

27 (26) On the 1st and 2nd abdominal segments group VII counts 2 setae — Acornutia

28 (25) On the 7th abdominal segment group VII consists of 3 or on the 8th abdominal segment of 1 seta, or on the 8th abdominal segment setae II are closer together than setae I, or III is found on the 8th abdominal segment to be not on the same level as the spiracle.

The genus Hysterosia Stephens 1852.

Diagnosis: On the 1st, 2nd, and 7th abdominal segments group VII consists of 3, on the 8th of 2 setae, the spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On the 8th abdominal segment the latter is found on the same level as the spiracle, or the circles of hooks of the parapodia are sectionally biserial, or seta VI is present on the 9th abdominal segment.

Obraztsov combined in this genus the spp. of the former genera Hysterosia and Phtecochroa or Commophila which are frequently confused with each other and reversed, and differentiated 2 subgenera. In the 2nd he places the two spp. fulvicinctana Constant and purana Guenee whose present position also seems to be larvo-systematically justified. Imagino-systematically it is still to be determined whether pulvillana should not be placed in the 1st subgenus of Hysterosia since the caterpillars of this species agree with Hysterosia inopiana in the conspicuously elliptical circles of hooks. The species rugosana - differing from Obraztsov - I am leaving in the genus Hysterosia since seta VI shows up on the 9th abdominal segment it being absent in all other genera except Hysterosia.

Species of Hysterosia

1 (2) Circles of hooks of the parapodia elliptical, on the 8th abdominal segment III is craniad from the spiracle — sg. Hysterosia — inopiana

2 (1) Circles of hooks of the parapodia round, if elliptical then seta III on the 8th abdominal segment is dorsad from the spiracle — sg. Propira

3 (4) Circles of hooks of the parapodia elliptical, on the 8th abdominal segment III is dorsad from the spiracle. — pulvillana

4 (3) Circles of hooks of the parapodia round, or III on the 8th abdominal segment is not dorsad from the spiracle.

5 (6) Circles of hooks of the parapodia biserial on the posterior margin — solaaliana

6 (5) Circles of hooks of parapodia entirely uniserial.

7 (8) Seta VI present on the 9th abdominal segment, the circles of hooks on the parapodia considerably larger on the side turned toward the ventral Mediana than laterally [or than toward the lateral Mediana?] — v-albana

8 (7) Seta VI is lacking on the 9th abdominal segment, the hooklets of the parapodia are uniformly developed.

9 (10) On the 8th abdominal segment setae IV and V are diagonally arranged, the distances between setae II and setae I are the same — schreiberiana

10 (9) On the 8th abdominal segment setae IV and V are horizontally arranged. The distance between setae II is greater than that between setae I.

11 (12) Setae IV and V are vertically situated on the 1st abdominal segment. Head, cervical shield, Anal shield, and thoracic legs brown, the caterpillar is reddish with 2 dorsal and 2 lateral yellow longitudinal stripes — fulvicinctana

12 (11) Setae IV and V on the 1st abdominal segment are diagonally situated, head light brown, cervical shield, anal shield yellow, the caterpillar is dorsally reddish without light longitudinal stripes, ventrally yellowish — purana

The subgenus Hysterosia Stephens 1852.

Diagnosis: The circles of hooks of the parapodia are uniserial and elliptical, on the 8th abdominal segment seta III is dorsocraniad from the spiracle, on the 9th abdominal segment seta VI is present.

Hysterosia (Hyst.)inopiana (Haworth 1811)(1839).

Caterpillar yellowish white and granulated. Head, cervical shield brown, the adfrontalia do not reach onto the posterior margin of the head. The 2nd ocellus is somewhat closer to the 1st than to the 3rd. On the cervical shield IIIa is closer to III than to IX, the prespiracular shield is only weakly indicated and IV stands ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocaudad from III, seta VIII is distinctly set off from the coxa. The spiracles are very small. Setae IV and V are diagonally arranged on all abdominal segments, whereby V is distinctly shorter than IV. On the 7th abdominal segment setae II stand closer together than setae I, and on the 8th abdominal segment the pinaculi of setae II are contiguous, III is situated craniad from the spiracle. Setae II, also I and III, as well as IV and V stand on a common pinaculum on the 9th abdominal segment, VI on a pinaculum of its own. Group VII on the 1st, 2nd, and 7th abdominal segments counts 2 setae, 1 on the 8th and 9th. The circles of hooks of the parapodia are uniserial and consist of about 34 hooklets, the caudal disks are provided with 12 hooklets.

The caterpillar lives from fall until May in a webby tube on the roots of Artemisia campestris.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on April 18, 1883 near Speyer in a webby tube on the root of A.campestris.

The subgenus Propira Durrant 1914.

Diagnosis: Circles of hooks of the parapodia round, if elliptical then III is dorsad from the spiracle on the 8th abdominal segment.

Hysterosia (Prop.) pulvillana (Herrich-Schäffer 1851)(1834).

Caterpillar yellowish white and granulated, head light brown, cervical shield yellowish. The 2nd ocellus is closer to the 1st than to the 3rd, the 3rd, 4th, and 6th ocelli are more strongly pigmented than the others. On the cervical shield IIIa is closer to III than to IX, II somewhat ventrocaudad from I. The prespiracular shield is not distinctly developed, IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocraniad from III, VIII distinctly set off from the coxa. The spiracles are round and the same size on all abdominal segments, on the 2nd they are not larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is smaller than that between setae I, III is dorsad from the spiracle, IV dorsocaudad from V (fig. 228). On the 9th abdominal segment setae II stand on separate pinaculi, the pinaculi of setae I and III are contiguous, setae IV, V, and VI stand on separate pinaculi. Seta VI occasionally fails to show up. On the 1st abdominal segment group VII counts 1 seta, on the 2nd ß/ß/ß/ß/ß/ß/ß to the 6th, 3 setae on the 7th, 8th, and 9th 1 seta. Since I had only 1 caterpillar of this species at my disposal for the investigation, I can say nothing on the constancy of this somewhat peculiar numerical relation. The uniserial elliptical circles of hooks of the parapodia consist of about 26, those of the caudal disk of about 10 hooklets.

Aug. to Apr. in the roots and stems of Asparagus officinalis.
The caterpillars from the Bavarian State Collection that were examined were found on Oct. 9, 1896 by Hinneberg near Potsdam in the root of A.officinalis.

H.(P.)soldaliana (Haworth 1811)(1833).

Caterpillar red, greenish on the segment boundaries, with light pinaculi. Body strongly granulated. Head light brown, cervical shield darker, on the posterior margin dark punctate [or dotted] (fig. 229). The 2nd ocellus is equidistant from the 1st and 3rd, the 3rd, 4th, and 6th ocelli are not larger than the others. On the cervical shield IIIa is somewhat closer to III than to IX, on the weakly developed prespiracular shield IV is ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III. VIII distinctly set off from the margin of coxa. On the 2nd abdominal segment IIIa lies beside pinaculum III. On all abdominal segments the distance between setae II is greater than that between setae I. On the 8th abdominal segment III is found on the same level as the spiracle, IV and V are horizontally situated. On the other abdominal segments setae IV and V are diagonally placed and IV is considerably longer than V. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th of 2, on the 9th of 1 seta. The round circles of hooks of the parapodia are anteriorly uniserial, posteriorly biserial and they count about 28 hooklets, caudal disk with 25 hooklets.

July, Aug. between spun-up berries of Rhamnus carthartica [sic!] and frangula.
The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Aug. 4, 1892 near Potsdam between spun-up berries on R.frangula.

H.(P.)v-albana (Donovan 1806)(1829).
syn. rugosana Hübner 1822 (1829).

Caterpillar dirty light-green, before pupation rose-red, body granulated, head brown. The 2nd ocellus is equidistant from the 1st and 3rd. On the cervical shield IIIa is closer to III, II is ventrocaudad from I. The prespiracular shield is only weakly developed, IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocaudad from III. The small spiracles are rounded, on the 2nd abdominal segment they are somewhat larger than the insertion place of seta III. On the

abdominal segments IV and V are diagonally situated, V substantially shorter than IV. On all abdominal segments setae II are farther apart than setae I. On the 8th abdominal segment III is somewhat ventrocraniad from the spiracle, on the 9th setae II, also I and III, as well as IV, V, and VI stand on common pinaculi. Seta VI is sometimes lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. Group VI on the 1st, 2nd, 7th, and 8th abdominal segments consists of 2, on the 9th mostly of 1 seta. The round uniserial circles of hooks of the parapodia count 16 to 18 hooklets those on the side turned toward the ventral Mediana are larger than laterally. Caudal disk with 12-15 hooklets.

The caterpillar lives in July, Aug. between spun-up leaves, flowers, and berries on Bryonia dioica. The end of Aug. it is found in a hollowed out cavity in the stem ~~xxxxxxx~~ covered over by a dry leaf or in rotted wood. It then overwinters in the ground. Pupation in the following spring.

The caterpillars from the Collection that were examined had been found by Disque on July 26 between spun-up berries of Bryonia dioica.

Hysterosia (Prop.) schreiberiana (Frölich 1828)(1838).

Caterpillar brownish-white or yellow, head light brown, cervical shield in the middle and on the posterior margin dark punctate [or dotted] (fig. 230). The ocelli stand at the same distances apart. On the cervical shield IIIa is cloer to III than to IX, II is ventrocaudad from I. In this species also, the prespiracular shield is only weakly developed, Iv is situated in the middle and ventrad from V and VI. On the mesothorax IIIa stands above III. The small round spiracles are not larger than the insertion place of seta III. On the 8th abdominal segment setae II and setae I are the same distance apart, III stands on the same level with the spiracle, and IV and V are diagonally arranged. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. The distance between setae VIII on the 9th abdominal segment is larger than on the 8th. On the 1st, 2nd, and 7th abdominal segments group VII consists of 3 setae, on the 8th of 2, and on the 9th of 1. The round uniserial circles of hooks of the parapodia consist of about 25, those of the caudal disk of about 10 hooklets.

The caterpillar lives from May to Sept., at first between spun-up leaves, later in leaf-stalks or young shoots of Prunus padus, Populus, and Ulmus. In Sept. it goes into chinks in the bark for pupation.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 8, 1908 near Neustadt/Weinstrasse in the bark of Ulmus.

H.(P.)fulvicinctana (Constant 1893).
syn. fulvifasciana Rebell 1901 (1702) lapsus calami according to Obraztsov.

Caterpillar reddish with 2 dorsal and 2 subdorsal light longitudinal stripes. Body strongly granulated, head, cervical and anal shields, and thoracic legs brown. The 2nd ocellus is closer to the 3rd than to the 1st. On the cervical shield IIIa is closer to III than to IX, II ventrad from I. The prespiracular shield is not to be distinctly recognized, IV stands in the middle, ventrad from V and VI. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. Setae IV and V are vertically situated on the 1st abdominal segment, horizontally on the 8th, and diagonally on the others, in which connection V is distinctly shorter than IV. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III on the same level as the spiracle. On the 9th abdominal segment setae II, also I and III as well as IV, V, and VI stand on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th of 2 setae, on the 9th of 1. The uniserial round circles of hooks of the parapodia count about 18, those of the caudal disk about 9 hooklets.

From fall the caterpillar lives on Statice limonium. This species does not occur in Germany, it was only reported from south France.

The caterpillars from the Bavarian State Sollection that were examined had been found by Constant, the discoverer of this species, on Feb. 21, 1895, at the Gulf of Juan Spain, on Statice limonium.

Hysterosia (Prop.) purana (Guenee 1845)(1700).

Caterpillar yellowish and reddish saddled, head light brown, cervical and anal shield yellowish, the latter dark punctate [or dotted]. On the cervical shield II is ventrocaudad from I. On the 1st abdominal segment the setae IV and V are vertically arranged. The round uniserial circles of hooks of the parapodia consist of about 20, those of the caudal disk of about10 hooklets. In all other characters this species agrees with the foregoing.

The caterpillar occurs on Scabiosa leucantha. The adult flies in July. In Germany this species has not yet been found, it was reported only from south France, Hungary, and Dalmatia.

The caterpillars from the Bavarian State Collection that were examined had been found by Chretien in Sept. 1898 in France on Scabiosa leucantha.

The genus Lozopera Stephens 1829.

Diagnosis: The circles of hooks of the parapodia are uniserial, on the 9th abdominal segment seta VI is lacking. On the 1st to the 7th abdominal segments inclusive group VII consists of 3 setae, on the 8th and 9th of 1 seta.

This genus is well characterized larvo-morphologically by the above characters. The individual spp. are very close to each other.

Spp. of Lozopera.

1	(2)	2nd ocellus closer to the 1st than to the 3rd, pinaculi distinctly developed	francillana
2	(1)	2nd ocellus closer to the 3rd than to the 1st, or equidistant from both, pinaculi only weakly developed.	
3	(6)	Setae IV and V are horizontally situated on the 8th abdominal segment, the anal shield only dark punctate [or dotted] (figs. 234 and 239).	
4	(5)	Seta III on the 8th abdominal segment is ventrocraniad from the spiracle, anal shield dark punctate only on the anterior margin (fig. 234)	flagellana
5	(4)	Seta III on the 8th abdominal segment is dorsocraniad from the spiracle, the whole anal shield is dark punctate	deaurana
6	(3)	On the 8th abdominal segment setae IV and V are diagonally situated, on the anal shield the anterior half is dark punctate, the posterior uniformly brown (fig. 241)	bilbaensis

Lozopera francillana (Fabricius 1794)(1646).

Caterpillar yellowish white and granulated, head brown, cervical shield yellowish, dark bordered on the posterior margin (fig. 231). Anal shield dark punctate [or dotted] (fig. 232). Pinaculi raised. The 2nd ocellus is closer to the 1st than to the 3rd, on the cervical shield IIIa is somewhat closer to III than to IX, II is ventrocaudad from I. On the prespiracular shield IV stands in the middle, ventrad from V and VI. Spiracles round, setae IV and V on all abdominal segments diagonally situated, in which connection V is much smaller than IV. On the 8th abdominal segment the distance between setae II is less than that between setae I, III is somewhat ventrocraniad from the spiracle. On the

9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st to the 7th abdominal segments group VII consists of 3 setae, on the 8th and 9th of 1 seta. The uniserial round circles of hooks of the parapodia count 20-25, those of the caudal disk about 10 hooklets.

The caterpillar lives from Sept. to April between the spun-up flowers and seeds of Eryngium campestre, Daucus, Pastinaca, and Peucedanum, later it bores into thestem and pupates after overwintering, in April.

The caterpillers from the Bavarian State Collection that were examined had been found by Stange on Feb. 14, 1902 near Friedland in the stem of Eryngium.

Lozopera flagellana (Duponchel 1836)(1652).

Caterpillar brownish white and strongly granulated, head dark brown, cervical shield lightbrown, posteriorly dark edged (fig. 233), dark punctate [or dotted] before setae I and II. The brownish anal shield is dark punctate [or dotted] on the anterior margin (fig. 234). The adfrontalia are strongly widened and the frontolateral suture is indented (fig. 235). The 2nd ocellus equidistant from the 1st to the 3rd or closer to the 3rd. The prespiracular shield is only weakly indicated (fig. 236). On the 8th abdominal segment setae IV and V are horizontally, on the others diagonally, situated. Circles of hooks of the parapodia consisting of about 24, those of the caudal disk of about 10 hooklets. In addition to these all additional characters given for francillana apply (fig. 237).

Sept., Oct., Nov. in flower heads of Eryngium, then overwinters in the stem and pupates in April.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on March 4, 1901 near Speyer in the stem of Eryngium.

Lozopera deaurana (Peyerimhoff 1877)(1848).

I could not find a description of the caterpillar in the literature, the following data were taken from the caterpillars of the Bavarian State Collection that were examined.

Caterpillar yellow-brownish, strongly granulated by small spinules. Head dark brown, cervical shield brownish, on the posterior margin as well as near setae II and IIIa dark punctate [or dotted] (fig. 238), anal shield brownish and with punctures [or dots] sprinkled over the whole anal shield (fig. 239). 2nd ocellus somewhat closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is closer to III than to IX, II is ventrocaudad from I. The prespiracular shield is not distinctly developed, IV stands in the middle, ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. The spiracles are round. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found dorsocraniad from the spiracle and IV and V are horizontally situated while on the other abdominal segments they are diagonally arranged. The setae II, also I and III, as well as IV and V are found - on the 9th abdominal segment - on common pinaculi, VI is lacking. The distance between setae VIII is greater than on the 8th abdominal segment. On the 1st to the 7th abdominal segments inclusive group VII counts 3 setae, on the 8th and 9th 1. The uniserial round circles of hooks of the parapodia count about 27, those of the caudal disk about 12 hooklets.

The caterpillar lives on Smyrnium olusatum; it does not occur in Germany and has been known only from south France. The caterpillars from the Bavarian State Collection that were examined had been found by Chretien on Feb. 14, 1904 near Nizza on Smyrnium olusatum.

I could not find a description of the larva of this species in the literature. The following was taken from the caterpillars from the Bavarian State Collection that were examined.

Caterpillar yellowish and strongly granulated by small spinules. Head dark brown, cervical shield brownish or yellowish, darker bordered or punctate [or dotted] on the posterior margin (fig. 240). Anal shield in the anterior half dark punctate [or dotted] the posterior half is uniformly brown (fig. 241). 2nd ocellus equidistant from the 1st and 3rd, the 4th equidistant from the 3rd and 6th. Setae IV and V on all abdominal segments diagonally situated. On the 8th abdominal segment III is somewhat ventrocraniad from the spiracle. The circles of hooks of the parapodia consist of 26-30, those of the caudal disk of 9-12 hooklets. In addition to these characters all additional characters given for deaurana apply.

This species does not occur in Germany, it was confirmed in Spain, France, Corsica, Sardinia, and Dalmatia. The caterpillars from the Bavarian State Collection that were examined had been found by de Joanis on April 4, 1914 in Portugal in the stem of Crithmum maritimum.

The genus Eupoecilia Stephens 1829.

Diagnosis: Group VII on the 1st and 2nd abdominal segments consists of 3 setae, on the 8th of 2. Setae IV and V on the 8th abdominal segment are diagonally placed, if horizontally then on the 9th abdominal segment setae II are found on common pinaculi and group VII on the 7th, 8th, and 9th abdominal segments counts 2 setae.

This genus can be larvo-sytematically separated from the others also. The transfer of cebrana and fasciella can also be larvo-morphologically defended. The species ambiguella stands close to sanguisorbana.

Spp. of Eupoecilia

1 (2) On the prespiracular shield setae V, IV, and VI are situated in one line, in which V is situated the lowest down; the brown pinaculi are strikingly large and are reniform on the 8th abdominal segment (fig. 242) ambiguella

2 (1) On the prespiracular shield IV is ventrad from V and VI, the pinaculum of seta III on the 8th abdominal segment is not developed in a kidney shape.

3 (4) The central seta of group VII on the base of the parapodia is the longest, on the 9th abdominal segment the group consists of 2 setae sanguisorbana

4 (3) The central seta of group VII on the base of the parapodia is the shortest, on the 9th abdominal segment the group consists of only one seta.

5 (6) Setae II on the 9th abdominal segment are found on a common pinaculum, the anal shield is small and dark-brown fasciella

6 (5) Setae II on the 9th abdominal segment stand on separate pinaculi, the anal shield is yellowish like the body cebrana

E. ambiguella (Hübner 1796)(1706).

Caterpillar brownish white, granulated, head, cervical shield, and thoracic legs black brown, anal shield and the large pinaculi brown. The head is sometimes also lighter and only the thoracic pinaculi brown. The ocelli stand at the same distances from each other, on the cervical shield IIIa is farther from III than from IX, II is ventrocaudad from I. On the diagonally placed prespiracular shield setae V, IV, and VI

stand in one line, V the lowest down. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. Setae IV and V on the 1st abdominal segment are vertically, on the 8th horizontally, on the others diagonally situated. On the 1st and 2nd abdominal segments IIIa is distinctly separated off from pinaculum III. On the 8th abdominal segment the distance between setae II and that between setae I is the same, III is on a reniform pinaculum, somewhat ventrocraniad from the spiracle (fig. 242). Setae II, also I and III, as well as IV and V stand on common pinaculi on the 9th abdominal segment, VI is lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th, on the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. The uniserial round circles of hooks of the parapodia count 25-30 hooklets, those of the caudal disk about 15. Anal comb with 6 spines.

The caterpillar shows up in 2 generations from June to Oct. Very injurious to grape vines. The caterpillar of the 1st generation spins up the flowers and flower buds of the grape and is called "Heuworm" [i.e., hay-worm], that of the 2nd generation lives in the grapes and is called "Sauerwurm" [i.e., sour-worm]. The caterpillars have been found also on Hedera helix, Cornus mascula, Syringa persica, Viburnum, Acer campestris, Rhamnus frangula, Ligustrum, and Lonicera racemosa.

Caterpillars from the Senckenberg-Museum, from the Bavarian State Collection and from the Landesanstalt for Wein-, Obst-, and Gargen-bau of Neustadt/Weinstrasse were at my disposal for investigation.

Eupoecilia sanguisorbana (Herrich-Schäffer 1851)(1705)

Caterpillar red-brownish and granulated, head, cervical thield, thoracic legs, and anal shield dark brown. On the cervical shield IIIa is closer to III than to IX, on the prespiracular shield IV is ventrad from V and VI. Setae IV and V on the 8th abdominal segment are horizontally situated, vertically on the others. The pinaculum of seta III is only weakly developed on the 8th abdominal segment. On the parapodia, the central seta of group VII is the longest. Anal comb with 4 spines. The uniserial round circles of hooks of the parapodia consist of 19-25, those of the caudal disk of 10-12 hooklets. Besides these all additional characters given for ambiguella apply.

Aug. and Sept. in the flower- and seed-heads of Sanguisorba officinalis.
Locality: Erlangen-Spardorf on Sept. 8, 1952 on S.officinalis.

E.fasciella (Donovan 1808)
syn. angustana Hübner 1822 (1827).

Caterpillar yellow-brownish, strongly granulated, head and cervical shield black-brown, anal shield and prespiracular shield brown. 2nd ocellus closer to the 3rd than to the 1st. On the cervical shield IIIa is closer to III than to IX, II is ventrocaudad from I. Seta IV on the prespiracular shield is ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII is distinctly set off from the coxa. Spiracles very small. On the 1st abdominal segment setae IV and V are vertically, on the others diagonally, situated. Setae II on the 8th abdominal segment are not farther apart than setae I. Setae II, also I and III as well as IV, V stand on common pinaculi on the 9th abdominal segment, VI is lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th and 8th of 2 setae, on the 9th of 1 (on the 7th also sometimes of 3 setae). The central setae of group VII on the base of the parapodia is the smallest. The uniserial circles of hooks of the parapodia consist of about 18, those of the caudal disk of about 12 hooklets.

Sept., Oct. between spun-up flowers and seeds on Achillea, Origanum, Solidago, Plantago, Calluna, and Thymus. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 28, 1900 near Speyer between spun-up flowers and seeds of Calluna.

tally, on the others diagonally. On the 1st and 2nd abdominal segments seta IIIa is distinctly set off from pinaculum III. On the 8th abdominal segment however IIIa stands on the margin of the reniform pinaculum of III. The distance between setae II on the 8th abdominal segment is not greater than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV and V are found on common pinaculi, VI is lacking. Setae VIII on the 9th abdominal segment are farther apart than on the 8th. On the 1st to the 7th abdominal segment inclusive group VII consists of 3 setae, on the 8th and 9th of 2 setae. The uniserial elliptical circles of hooks of the parapodia count about 32, those of the caudal disk about 12 hooklets.

Sept. to April and June in the root stock of Scabiosa ochroleucana and Succisa.

The caterpillars from the Bavarian State Collection that were examined had been found by Stange on Sept. 2, 1892 near Friedland in roots of Scabiosa.

The genus Falseuncaria Obraztsov and Swatschek 1958.

For the imagino-systematic diagnosis of this new genus Obraztsov wrote: "Thorax with a posterior tuft [or crest]. Forewing evenly squamose, in the ♂ without costal covering; 12 veins separated from each other; R-1 rises behind the middle of the discoidal cell; R-2 closer to R-3 than to R-1; upper "Teilungsader" [?dividing vein?] of the discoidal cell originating between R-1 and R-2 or absent; R-4 and R-5 approaching each other at the base, leading to costa; M-3 and Cu-1 more or less approaching each other. Hind wing with R and M-1 stalked; M-3 and Cu-1 separated from each other. ♂ Genitalia with a broad valva; sacculus weakly developed; tegumen very long, somewhat widened like an Uncus at the apex; no socii and no real uncus; sometimes a tongue-like scaphium is present; fultura superior well developed, double pointed in the middle; aedoeagus with a long distal process; cornuti like a bundle of many prickles [or spinules] which rise from a common base. ♀ Genitalia forming an elongate ovipositor; anal papillae small; bursa copulatrix membranous, punctate [or dotted]; ductus bursae short; ostium bursae with a weak lamella antevaginalis.

Type: Tortrix ruficiliana Haworth 1811. The 2nd sp. belonging to this genus is degreyana McLachl."

I can confirm this new genus larvo-systematically but am also referring the sp. austriana to it since it stands strikingly close to ruficiliana in all characters.

Diagnosis: On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1 seta. On the 8th abdominal segment III is dorsocraniad from the spiracle. Setae IV and V are horizontally placed. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III.

Spp. of Falseuncaria.

1 (2) The 2nd ocellus is equidistant from the 1st and 3rd, on the cervical shield IIIa is closer to III than to IX, head dark-brown or black — ruficiliana

2 (1) The 2nd ocellus is closer to the 3rd than to the 1st, on the cervical shield IIIa is equidistant from III and IX, head light brown — austriana

Falseuncaria ruficiliana (Haworth 1811).
syn. ciliella Hübner 1822 (1781) according to Obraztsov.

Caterpillar yellowish white and strongly granulated, head brown or black. The ocelli are placed at uniform distances apart. On the cervical shield IIIa is closer to III than to IX, II is ventrocranial from I. On the weakly developed prespiracular shield IV stands in the middle ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III. VIII is distinctly set off from the coxa. Setae IV and V are diagonally situated on the 1st to the 7th abdominal segments, horizontally on the 8th. The distance between setae II on the 8th abdominal segment is greater than that of setae I, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2, on the 8th and 9th of 1 seta. The spiracles are very small, on the 2nd abdominal segment they are not larger than the insertion place of seta III. The uniserial circles of hooks of the parapodia count about 20, those of the caudal disk about 10 hooklets.

Sept. to April and in June, July in the fruit capsules or seeds of Inula officinalia, Linum vulgaris, Chrysocoma, Primula vernalis, and farinosa, Bellis, Antirrhinum, and Gentiana.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 4, 1897 near Speyer in fruit nodes, later in the seeds of Primula.

Falseuncaria austriana (Chretien 1902).

I could not find a description of the larva in the literature. The following data were taken from caterpillars of the Bavarian State Collection that were examined which came from Chretien the discoverer of this species himself.

Caterpillar whitish and granulated, head brown. The 2nd ocellus is closer to the 3r than to the 1st. On the cervical shield IIIa is approximately equidistant from III and IX. Seta V on the abdominal segments is so small that it can hardly be recognized. On the prespiracular shield IV stands in the middle, ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII is distinctly set off from the coxa. Setae IV and V are diagonally placed on abdominal segments 1 to 7, horizontally on the 8th. Besides these characters all additional characters of the foregoing sp. apply.

This species does not occur in Germany, it was known only from France.

The caterpillars from the Bavarian State Collection that were examined had been found by Chretien on Aug. 6, 1902, near Ville-france in a stem swelling under the flower of Santolina rosmarinifolia.

The genus Cochylichroa Obraztsov and Swatschek 1958.

For the imaginal systematic diagnosis of this new genus Obraztsov wrote: "Similar to Agapeta Hübner except for the following: In the forewing the vein R-1 rises behind the middle of the discoidal cell: R-2 equidistant from R-1 and R-3; discoidal cell without vena dividens; R-5 leads to the apex. ♂ Genitalia with a strongly pubescent sacculus; no harpe present; uncus rudimentary; cornuti short, numerous.
Type: Eupoecilia atricapitana Stephens 1851."

This new genus can also be readily separated larvo-morphologically, but also shows great kindred relations to the foregoing.

Diagnosis: On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1. Setae IV and V on the 8th abdominal segment are diagonally placed, therefore on the same level as the spiracle.

Cochylichroa atricapitana (Stephens 1851)(1663).

Caterpillar pale yellow, dorsally sometimes light reddish, strongly granulated, head light brown, cervical shield brownish, dark punctate [or dotted] on the posterior margin, anal shield brownish, everywhere dark punctate [or dotted]. 2nd ocellus equidistant from the 1st and 3rd, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is somewhat closer to III than to IX, II is ventrocraniad from I. The prespiracular shield is only indicated, IV stands in the middle, ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. The spiracles are small, not larger on the 2nd abdominal segment than the insertion place of seta III. Setae IV and V are diagonally situated. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is situated on the same level as the spiracle. Setae II, also I and III, as well as IV and V stand on common pinaculi on the 9th abdominal segment, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1. The uniserial round circles of hooks consist of about 15, those of the caudal disk of 7-8 hooklets [sic!].

Aug. to Apr. and June in flowers, stem, and root of Senecio jacobaea, Hieracium, and Hypericum. The caterpillars from the Bavarian State Collection that were examined had been found by Stange on Nov. 10, 1910 near Friedland in the stem of S.jacobaea.

The genus Cochylidia Obraztsov 1956.

Diagnosis: The 2nd ocellus is closer to the 1st than to the 3rd, on the 1st, 2nd, 7th, and 8th abdominal segments, broup VII consists of 2 setae, on the 9th of 1. If group VII consists of 1 seta on the 8th abdominal segment then the distance between setae II on the 8th abdominal segment is less than that between setae I. Setae IV and V are horizontally placed on the 8th abdominal segment.

This genus was erected as new by Obraztsov (1956). I can separate this genus larvomorphologically by the above characters but otherwise it stands rather close to the two foregoing genera.

Spp. of Cochylidia

1 (4) On the 8th abdominal segment group VII consists of 2 setae.
2 (3) Spiracle of the 2nd abdominal segment distinctly larger than the insertion place of seta III, the posterior margin of the cervical shield is not darker — richteriana
3 (2) Spiracle of the 2nd abdominal segment not larger than the insertion place of seta III, the cervical shield is dark bordered on the posterior margin — implicitana
4 (1) On the 8th abdominal segment group VII consists of 1 seta — rupicola

Cochylidia richteriana (Fischer 1837)(1765).

Caterpillar yellowish-white and strongly granulated by small spinules, head light brown. 2nd ocellus closer to the 3rd than to the 1st, the 5th is smaller than the rest. On the cervical shield IIIa is approximately equidistant from III and IX, II ventrad from I. The prespiracular shield is not developed, IV stands in the middle ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, seta VIII distinctly set off from the coxa. Spiracles elliptical, on the 2nd abdominal segment they are larger than the insertion place of seta III. Setae IV and V on the 7th and 8th abdominal segments

are horizontally, on the others diagonally, placed. On the 8th abdominal segment the distance between setae II is greater than that between setae I, III is situated on the same level as the spiracle. Setae II, also I and III, as well as IV and V are found on common pinaculi on the 9th abdominal segment. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. Anal comb with 4 spines. The uniserial round circles of hooks of the parapodia count 15-18, those of the caudal disk about 8 hooklets.

The caterpillar lives from fall until spring in the root and rootneck of Artemisia campestris.

The caterpillars from the Bavarian State Collection that were examined had been found by Hinneberg on Nov. 11, 1892 near Potsdam in the root of A.campestris.

Cochylidia implicitana (Wocke 1856)(1771).

Catepillar pale yellowish, strongly granulated, head light brown, cervical shield yellowish, with 2 black spots on the posterior margin or dark bordered (fig. 246). 2nd ocellus closer to the 3rd, the 5th is not smaller than the others. Spiracles round, on the 2nd abdominal segment they are not larger than the insertion place of seta III. The circles of hooks of the parapodia consist of about 12, those of the caudal disk of about 8 hooklets. Besides these all other characters given for richteriana apply.

The caterpillar lives from Oct. until spring and again in Aug. in the flower- and seed-heads or stem of Matricaria, Anthemis, Solidago, Achillea, Chrysocoma, Gnaphalium, and Tanacetum.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 17, 1902 near Speyer in flowers of Solidago.

C.rupicola (Curtius 1826)(1674).

Caterpillar yellowish white, strongly granulated by small spinules. Head light brown, cervical shield yellowish. On the cervical shield IIIa is closer to III than to IX, the spiracles are very small. On the 8th abdominal segment the distance between setae II is less than that between setae I. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1 seta. The uniserial round circles of hooks of the parapodia count about 20, those of the caudal disk about 10 hooklets. In other characters this species agrees with richteriana.

Sept. to Apr. in receptacle and stem of Eupatorium cannabinum and Chrysocoma linosyris and Lycopus europaeus.

The caterpillars that were examined from the Bavarian State Collection had been found by Disque on March 31, 1902 and March 8, 1903 near Speyer in the stem of Eupatorium cannabinum.

The genus Phalonidia Le March 1933.

Diagnosis: On the cervical shield IIIa is closer to III than to IX. On the 8th abdominal segment group VII consists of 1 seta or on the 7th, 8th, and 9th of 2 setae.

This genus can also be larvo-morphologically separated from the others, yet it still seems to me to be heterogeneous in its species composition. The 2 spp. albipalpana and affinitana differ in the number of setae of group VII on the 1st and 2nd abdominal segments, substantially from the others. They would fit better into the genus Eupoecilia according to these characters. The species reversana cannot be generically separated from permixtana.

Spp. of Phalonidia.

1	(4)	On the 1st and 2nd abdominal segments group VII consists of 3 setae.	
2	(3)	On the 8th abdominal segment group VII counts 2 setae	affinitana
3	(2)	On the 8th abdominal segment group VII counts 1 seta	albipalpana
4	(1)	On the 1st and 2nd abdominal segments group VII consists of 2 setae.	
5	(6)	2nd ocellus equidistant from the 1st and 3rd, parapodia with 20, caudal disk with 10 hooklets	udana
6	(5)	The 2nd ocellus is closer to the 3rd than to the 1st, parapodia with about 15, caudal disk with 5-8 (7) hooklets.	
7	(8)	Head and thorax yellow, cervical shield not dark punctate [or dotted]	permixtana
8	(7)	Head and thorax dark brown, cervical shield dark punctate [or dotted] (fig. 137).	reversana

Phalonidia affinitana (Douglas 1846)(1684).

Caterpillar whitish, somewhat reddish before pupation, body strongly granulated, head brown. The ocelli placed at the same distances apart. On the cervical shield IIIa is closer to III than to IX. The prespiracular shield is not distinctly developed, IV stands in the middle, ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. Setae IV and V on the 8th abdominal segment are horizontally, on the others diagonally situated. On the 8th abdominal segment setae II are farther apart than setae I, III lies on the same level as the spiracle. Setae II on the 9th abdominal segment stand on separate pinaculi, before which are found 2 dark punctures [or dots] each (fig. 247), setae I and III, ~~xxxxxxxxxxxx~~ as well as IV and V stand on common pinaculi, VI is lacking. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th, 8th, and 9th of 2 setae. Anal comb present. The uniserial round circles of hooks of the parapodia count 20, those of the caudal disk 12 to 15 hooklets.

Aug. to Apr. and June, July in flower heads or stems of Aster tripolium.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 12, 1903 near Nordhausen in flower heads of A.tripolium.

P.albipalpana (Zeller 1847)(1751).

Caterpillar yellowish-white and granulated, head light brown, cervical shield yellowish. 2nd ocellus closer to the 3rd than to the 1st. On the 8th abdominal segment setae II and setae I are equally far apart. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, VI is lacking. On the 1st and 2nd abdominal segment group VII consists of 3, on the 7th and 9th of 2 setae, on the 8th of 1 seta. The uniserial circles of hooks of the parapodia count about 18, those of the caudal disk about 10 hooklets. In all other larvo-morphological characters this species agrees with the foregoing.

The caterpillar lives from Oct. on, overwintering on Statice limonium. This species does not occur in Germany, it was known from south France, North Italy, Corsica, Sicily, and south Russia.
The caterpillars from the Bavarian State Collection that were examined had been found by Constant on Sept. 23, 1895 at the Gulf of Juan, Sapin, on S.limonium.

P.udana (Guenee 1845)(1679).

Kennel wrote (1908) that according to Snellen the caterpillar is dirty-greenish-white and is provided with 5 confluent pale red longitudinal stripes on the dorsum.

Head, cervical and anal shields pale brown. He further wrote that according to Meyrick the caterpillar is dirty-yellowish-red or reddish-brown, head and cervical shield black brown. Since I have collected this caterpillar in the Dechsendorf Weiher region very often and at different times, I can add to this that both authors are right for the coloring depends on the time of bringing them in, probably also on the temperature. Setae II on the 9th abdominal segment are on a common pinaculum which is drawn out somewhat forward. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2, on the 8th and 9th of 1 seta. Anal comb with 6 spines. The uniserial round circles of hooks of the parapodia count 15-20, those of the caudal disk 7-10 hooklets. Besides these characters all additional characters given for affinitana apply.

Sept. until April in the pith of the stem of Alisma plantago. The caterpillars are easiest to find in Oct. in the dry main stems in which several are to be found for the most part.

Locality: Dechsendorf Weiher on Oct. 31, 1953 in the main stem of A.plantago.

Phalonidia permixtana (Schiffermiller 1776).
syn. muscehliana Treitschke 1835 (1677) according to Obraztsov.

Caterpillar dirty-yellowishwhite, strongly granulated by small spinules. Head light brown, cervical shield yellowish. 2nd ocellus closer to the 3rd than to the 1st. On the cervical shield IIIa is closer to III than to IX, II ventrocraniad from I. Setae II on the 9th abdominal segment stand on a common pinaculum. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1. The circles of hooks of the parapodia count about 15 hooklets. In all other characters this species also agrees with affinitana.

Sept. until April and June,July in the flowers, seeds, or in the stem of Butomus umbellatus, Pedicularis, Alisma plantago, Gentiana lutea, Euphrasia, and Rhinantus.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on June 26, 1893 near Speyer in flowers of Rhinantus.

P.reversana (Staudinger 1820)(1762).

I could not find a description of the caterpillar in the literature. The following data were taken from the caterpillars from the Bavarian State Collection that were examined.

Caterpillar whitish and strongly granulate, head and thoracic legs dark-brown, cervical shield brown punctate [or dotted] (fig. 248). 2nd ocellus closer to the 3rd than to the 1st. On th cervical shield IIIa is closer to III than to IX, II is ventrocraniad from I. The prespiracular shield is only weakly developed, IV is found in the middle ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. The spiracles are very small, on the 2nd abdominal segment they are not larger than the insertion place of seta III. Setae IV and V on the 8th abdominal segment are horizontally, on the others diagonally placed. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV, V, and VI are on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2, on the 8th and 9th of 1 seta. The uniserial round circles of hooks of the parapodia count about 14, those of the caudal disk about 7 hooklets.

Nothing is known of the biology of this species. This species has been found only in Spain. The caterpillars from the Bavarian State Collection that were examined had been found by Chretien on June 6, 1902 in Spain on Helichrysum.

The genus Cochylis Treitschke 1829.

Diagnosis: 2nd ocellus equidistant from the 1st and 3rd, parapodia with 12-18 hooklets. On the 7th abdominal segment group VI consists of 2 setae [sic:]. The circles of hooks of the parapodia are round.

The spp. of this genus had been split off from the species-rich genus Phalonia, by Obraztsov. These spp. can be uniformly separated from the other genera larvo-morphologically but it must be emphasized that they stand very close to these.

Spp. of Cochylis.

1 (4) On the 8th abdominal segment seta group VII consists of 2 setae.
2 (3) Caudal disk with 4-6 hooklets, on the 8th abdominal segment setae IV and V are diagonally placed, on the 9th they stand on separate pinaculi — hybridella
3 (2) Caudal disk with 10-12(11) hooklets, on the 8th abdominal segment setae IV and V are horizontally placed, on the 9th they stand on a common pinaculum — posterana
4 (1) On the 8th abdominal segment group VII consists of 1 seta.
5 (6) 4th ocellus equidistant from the 3rd and 6th, setae IV and V vertically placed on the 1st abdominal segment. Cervical shield posteriorly dark edged (fig. 235), anal shield dark punctate [or dotted] (fig. 255) — dubitana
6 (5) 4th ocellus closer to the 3rd than to the 6th, setae IV and V diagonally placed on the 1st abdominal segment. Cervical shield not dark bordered, anal shield not dark punctate — roseana

Cochylis hybridella (Hübner 1822)(1669).

Caterpillar yellowish and reddish saddled, head light brown, cervical shield yellowish, posteriorly dark bordered, mostly the border is dissolved into 2 dark spots (fig. 249). The ocelli are at uniform distances apart. On the cervical shield IIIa is closer to III than to IX. The prespiracular shield is only indicated, IV stands in the middle, ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII is distinctly set off from the coxa. Setae IV and V on the 8th abdominal segment are vertically placed, on the other segments diagonally. The distance between setae II is greater even on the 8th abdominal segment than that between setae I, III is situated at the same level as the spiracle. On the 9th abdominal segment, setae II stand on a common pinaculum, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. Anal comb with 4 spines. The uniserial circles of hooks of the parapodia count 14-15, those of the caudal disk 4-6 hooklets.

Aug., Sept. in flower heads of Picris hieracioides and Crepis.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 1, 1902 near Speyer in heads of Picris hieracioides.

C. posterana (Zeller 1847)(1661).

Caterpillar brownish-white, sometimes faint reddish, strongly granulated by small spinules. Head dark brown, cervical shield brown, black edged and along the median line dark punctate [or dotted] (fig. 250). Sometimes the head and the cervical shield are lighter. Anal shield brownish and dark punctate [or dotted](fig. 251). 4th ocellus somewhat closer to the 3rd than to the 6th. Seta IV is horizontally placed with V on the 8th abdominal segment, on the others diagonally. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi. On the 1st and 2nd

abdominal segments group VII consists of 3 setae, on the 7th and 8th of 2, on the 9th of 1 seta. The uniserial circles of hooks of the parapodia count 16-18, those of the caudal disk about 11 hooklets. In the other characters this species agrees with the foregoing.

Sept. to March and June, July in seed- or flower-heads of Carduus nutans, acanthoides, Centaurea jacea, Cirsium lanceolatum, Lappa tomentosa.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 24, and Oct. 9, 1907 near Speyer in heads of C.lanceolatum.

Locality: Knetzgau am Main on July 25, 1953 in heads of C.lanceolatum.

Cochylis dubitana (Hübner 1822)(1658).

Caterpillar brownish white or white, head brown, cervical shield light brown, dark edged (fig. 252), anal shield dark punctate [or dotted] (fig. 253). The 4th ocellus is equidistant from the 3rd and 6th. On the 1st abdominal segment setae IV and V are vertically, on the 8th horizontally, on the others diagonally, placed. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2, on the 8th and 9th of 1 seta. The uniserial circles of hooks of the parapodia count about 13, those of the caudad disk about 8 hooklets. In other characters this species agrees with the foregoing.

June and Aug., Oct. in flower- and seedheads of Lappa, Cirsium lanceolatum, Carduus acanthoides, Centaurea jacea, Senecio, Picris, and Hieracium.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Aug. 6, 1901 near Speyer in flower heads of Circium lanceolatum.

C.roseana (Haworth 1811)(1773).

Kennel (1908) wrote that according to Meyrick the caterpillar is pale green, head and cervical shield black. According to the caterpillars from the Disque Collection that were examined, the caterpillar is dirty-brown with a brown head. 4th ocellus closer to the 3rd than to the 6th. On the cervical shield IIIa is approximately equidistant from III and IX. The prespiracular shield is only weakly developed. On the mesothorax IIIa is dorsocraniad from III, VIII distinctly set off from the coxa. Spiracles very small, setae IV and V on the 8th abdominal segment horizontally set, diagonally placed on the others. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II, I and III, as well as IV and V stand on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, and 7th abdominal segments group VII counts 2, on the 8th and 9th, 1 seta. The uniserial circles of hooks of the parapodia consist of 12-15, those of the caudal disk of 6-8 hooklets.

Nov. to the first of May in seed heads of Dipsacus sylvestris, flowers of Chrysocoma, and seed capsules of Antirrhinum.

The caterpillars from the Bavarian State Collection that were examined had been found by Hofmann on Oct. 7, 1885 near Stuttgart in seed heads of Dipsacus.

The genus Brevisociaria Obraztsov 1943.

Diagnosis: On the 1st and 2nd abdominal segments group VII consists of 3, on the 7th and 8th of 2, on the 9th of 1 seta. Setae IV and V on the 8th abdominal segment are horizontally placed. The distance between setae II on the 8th abdominal segment is greater than that between setae I.

This genus, of which I could examine only the one species curvistrigana, can also be readily separated larvo-morphologically.

Brevisociaria curvistrigana (Stainton 1859)(1672).
Syn. curvistrigana Wilkinson 1859 (1672) according to Obraztsov.

Caterpillar pale brown, somewhat reddish and strongly granulated by small spinules. Head brown, cervical shield, anal shield lighter and dark punctate [or dotted] (fig.254 and 255). 2nd ocellus somewhat closer to the 3rd than to the 1st. On the cervical shield IIIa is closer to III than to IX. The prespiracular shield is only weakly indicated, IV is found in the middle ventrad from V and VI. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. Spiracles very small, the size of the insertion place of seta III on the 2nd abdominal segment. Setae IV and V on the 8th abdominal segment are horizontally, on the others diagonally placed. Also on the 8th abdominal segment the distance between setae II is greater than that between setae I, III is found on the same level as the spiracle. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 7th and 8th of 2, on the 9th of 1. The uniserial round circles of hooks of the parapodia count 18-22, those of the caudal disk about 12 hooklets.

Aug., Sept. in seed heads of Solidago virgaurea. A 2nd generation is supposed to show up in July.
The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 18, 1902 near Speyer in seed-heads of Solidago virgaurea.

The genus Acornutia Obraztsov 1943.

Diagnosis: On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2, on the 9th of 1 seta. 2nd ocellus closer to the 3rd than to the 1st. On the cervical shield II is ventrocaudad from I.

This genus erected by Obraztsov can also be larvo-morphologically separated from the others.

Acornutia nana (Haworth 1811)(1671).

Caterpillar dirty-yellowish white, strongly granulated by small spinules. Head brown cervical shield brownish, posteriorly dark punctate [or dotted](fig. 256). 2nd ocellus closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. On the cervical shield IIIa is somewhat closer to III than to IX. The prespiracular shield is only weakly developed, IV is ventrad from V and VI, equidistant from both. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. Spiracles very small, on the 2nd abdominal segment they are the size of insertion place of seta III. On the 8th abdominal segment setae IV and V are horizontally, on the other segments diagonally placed. The distance between setae II on the 8th abdominal segment is greater than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV and V are on common pinaculi, the distance between setae VIII is greater than on the 8th abdominal segment. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. The uniserial circles of hooks of the parapodia count about 14, those of the caudal disk of about 9 hooklets.

The adult flies from May to Aug., the caterpillars were found from March to May in catkins of Betula.
The caterpillars from the Bavarian State Collection that were examined had been found by de Crombrügghe on March 7, 1903 near Brussels in catkins of Betula.

The genus Aethes Billb. 1820.

Diagnosis: On the 8th abdominal segment setae IV and V are vertically placed, if horizontally then setae II are ventrocaudad from I on the cervical shield.

This genus is not homogeneous larvo-morphologically. The combining of its spp., therefore, causes difficulties. The differences are distinctly shown in the key.

Spp. of Aethes.

1	(12)	On the 8th abdominal segment setae IV and V are vertically placed, seta III is dorsocraniad from the spiracle.	
2	(7)	The spiracles are so large that they can be recognized already with the unaided eye, with that the margin of the spiracles is unusually strongly widened (fig. 258 and 259).	
3	(6)	On the 1st, 2nd, and 7th abdominal segments group VII consists of 3 setae.	
4	(5)	Parapodia with 24, caudal disk with 9-10 hooklets, on the cervical shield II is ventrocaudad from I	williana
5	(4)	Parapodia with 28, caudal disk with 12 hooklets, on the cervical shield II is ventrocraniad from I	maritimana
6	(3)	On the 1st, 2nd, and 7th abdominal segments seta group VII consists of 2 setae	sanguinana
7	(2)	Spiracles normally developed, the margin not especially strengthened.	
8	(11)	On the 7th abdominal segment group VII consists of 2 setae, on the prespiracular shield setae V, IV, and VI are placed in one line.	
9	(10)	On the 8th abdominal segment seta group VII consists of 1 seta	margaritana
10	(9)	On the 8th abdominal segment group VII consists of 2 setae.	kindermanniana
11	(8)	On the 7th abdominal segment group VII consists of 1 seta, on the prespiracular shield IV is ventrad from V and VI	smeathmanniana
12	(1)	On the 8th abdominal segment setae IV and V are horizontally placed, III is found ventrocraniad from the spiracle or on the same level as it is.	
13	(14)	On the 1st and 2nd abdominal segments group VII consists of 3 setae	tesserana
14	(13)	On the 1st and 2nd abdominal segments group VII consists of 2 setae.	
15	(16)	On the 8th abdominal segment group VII consists of 1 seta	cnicana
16	(15)	On the 8th abdominal segment group VII consists of 2 setae.	
17	(18)	On the 8th abdominal segment setae II are farther apart than setae I	badiana
18	(17)	On the 8th abdominal segment setae II are closer together than setae I	rutilana

Aethes williana (Brahm 1791).
syn. zephyrana Treitschke 1830(1732) according to Obraztsov.

Caterpillar yellow and strongly granulated by small spinules. Head light brown, sometimes even darker, cervical shield yellowish, anal shield dark punctate [or dotted] (fig. 257). 4th ocellus closer to the 3rd than to the 6hh. Prespiracular shield only weakly developed, IV stands in the middle ventrad from V and VI. On the cervical shield IIIa is approximately equidistnat from III and IX, II is ventrocaudad from I. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. Spiracles recognizable as large dark dots with the unaided eye, since the spiracular margin is unusually strongly widened (fig. 258 and 259). The pinaculum of III, on which IIIa also stands, partly embraces the spiracle from above. On the 8th abdominal segment IIIa is dorsocraniad from the spiracle (fig. 259), the distance between setae II is greater

than that between setae I. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, the surroundings of pinaculi II and (I+III) are mostly so strongly chitinized that these do not stand out distinctly. The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st, 2nd, and 7th abdominal segments group VII consists of 3 setae, on the 8th of 2, on the 9th of 1. The uniserial circles of hooks of the parapodia count 24, those of the caudal disk 9-10 hooklets.

Sept. to March and June in root and stem of Eryngium campestre, Gnaphalium arenarium, Daucus carota.

The caterpillars from the Bavarian State Collection that were examined had been found by Krone on July 10, 1903 near Vienna in the stem of Eryngium campestre.

Aethes maritimana (Guenee 1845)(1733).

According to Rebel (1901) maritimana is a good species, in Kennel (1908) it is a variety of zephyrana Treitschke (=williana Brahm). In 1951 Obraztsov in Ent.Ztschr.61 explained these relationships on the basis of investigation of the genitalia. He differentiated 2 spp. with several aberrations. He called the first williana Brahm (=zephyrana), the 2nd margarotana Duponchel. maritimana belongs to the latter. This is at first confusing, since margarotana was cited by Rebel in 1901 as an aberration of zephyrana Treitschke. Since according to Obraztsov exact determination of the adult is possible only on the basis of the genitalia and since I do not know how the adults of the caterpillars investigated by me were determined, I am citing this species as I found it in the Collection, as maritimana Guenee. According to Obraztsov it should be called margarotana Duponchel (1936) and set over against williana Brahm as a good species. The larvo-morphogical differences, as is evident from the description, are so trifling that it could be considered a species. In this case the decision must beleft to imagino-systematics.

Caterpillar yellow and strongly granulated, head light brown, cervical shield yellow, anal shield dark punctate [or dotted](fig.260). Spiracles likewise as strikingly large as in williana (see fig. 258 and 259). On the cervical shield II is ventrocraniad from I, on the 9th abdominal segment group VII consists of 1 or 2 setae. The circles of hooks of the parapodia count about 28, those of the caudal disk about 12 hooklets. Besides these characters all other characters given for williana apply.

Sept. to March and July in root and stem of Eryngium maritimum.

The caterpillars from the Bavarian State Collection that were examined had been found by de Crombrügghe on July 22, 1900 in France on Eryngium maritimum.

A.sanguinana (Treitschke 1830)(1758).

Caterpillar dirty yellow, head, cervical shield and thoracic legs black, the large spiracles, which can be recognized with the unaided eye, black, pinaculi blackish and provided with black setae. The ocelli are situated at uniform distances apart. The prespiracular shield is crescent-shaped and goes caudad underneath the spiracle with one tip (fig. 262). For the mesothmax see fig 261. The 9th abdominal segment is dorsally chitinized, so that the setae II, I, and III stand on a chitin plate. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1 seta. Anal comb with 6 spines. The uniserial circles of hooks of the parapodia count about 29, those of the caudal disk about 13 hooklets. In all other characters the caterpillar of this species agrees with that of williana. The most distinct difference appears in the number of setae of group VII on the abdominal segments.

Sept. to March and July in the stem of Eryngium campestre. This species was reported from Hungary, the environment of Vienna, Dalmatia, Italy, and France, but not from Ger-

many. The caterpillars from the Bavarian State Collection that were examined hadbeen found by Krone on July 2, 1902 near Vienna in the stem of E.campestre.

Aethes margaritana (Haworth 1811)
syn. dipoltella Hübner 1822 (1728) according to Obraztsov.

Caterpillar dirty greenish gray and granulated, head, cervical shield yellow-gray and the latter dark punctate [or dotted] (fig. 263). 2nd ocellus closer to the 3rd than to the 1st, with these at a right angle. On the certical shield IIIa is closer to III than to IV. Seta IV stands with V and VI in one line on the prespiracular shield. On the mesothorax IIIa is dorsocaudad from III, VIII distinctly set off from the coxa. On all abdominal segment setae IV and V are vertically placed. The spiracles are very small, not larger on the 2nd abdominal segment than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not larger than that between setae I. Setae II, also I and III, as well as IV and V stand on common pinaculi on the 9th abdominal segment, VI is lacking (fig. 264). The distance between setae VIII on the 9th abdominal segment is greater than on the 8th. On the 1st, 2nd, and 7th abdominal segments group VII consists of 2 setae, on the 8th and 9th of 1 seta. Anal comb with 4 spines. The uniserial round circles of hooks of the parapodia count 18-20, those of the caudal disk 13-15 hooklets.

Sept. to April in the flower- or seed-heads of Tanacetum, Matricaria chamomilla, and in spun-up umbels of Achillea.

Locality: Erlangen on Oct. 14, 1953 between spun-up umbels of Achillea.

Aethes kindermanniana (Treitschke 1830)(1753).

Caterpillar dirty-gray, dorsally reddish-brown, body strongly granulated by small spinules. Head black-brown, cervical shield brownish, dark punctate [or dotted] and posteriorly dark edged (fig. 265). Anal shield brownish. 2nd ocellus closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. On the 8th abdominal segment setae IV and V are vertically, on all the rest diagonally, placed. The distance between setae II on the 8th abdominal segment is greater than that between setae I, III is found dorsocraniad from the spiracle. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. The uniserial circles of hooks of the parapodia count 13-14, those of the caudal disk 10-11 hooklets. In all other characters this species agrees with the foregoing.

Sept. to May in the 2nd generation June, July in the end shoots or between spun-up flowers of Artemisia campestris, Pyrethrum corymbosum and Chrysanthemum. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct.7, 1907 near Neustadt/Weinstrasse between spun-up flowers and ent shoots on A.campestris.

A.smeathmanniana (Fabricius 1781)(1760).

Caterpillar brownish-gray and granulated, head black-brown, cervical and anal shields brown and dark punctate [or dotted](fig.266 and 267). On the 1st and 2nd abdominal segments group VII consists of 2, on the 7th, 8th, and 9th of one seta. Anal comb with 6 spinules. The uniserial round circles of hooks of the parapodia count about 14-16, those of the caudal disk about 11-15 hooklets. In other characters this species agrees with margaritana.

Sept. to April and the 2nd generation in June, July between spun-up flowers and seeds of Achillea millefolium, Anthemis, Cotula, Centaurea nigra, Lactuca sativa, etc.
Locality: Erlangen on Oct. 8, 1953 between spun-up umbels of A.millefolium.

Aethes tesserana (Schiffermiller 1776)
sym. aleella Schulze 1776 (1743) according to Obraztsov.

Caterpillar brownish white and granulated, head brownish yellow, cervical shield yellow, the 3rd, 4th, and 6th ocellus more strongly pigmented than the others, the 2nd closer to the1st than to the 3rd. Seta O-2 stands under the 1st ocellus; on the prothorax IV stands in the middle, ventrad from V and VI. Spiracles very small but somewhat larger than the insertion place of seta III. On the 8th abdominal segment the distance between setae II is not greater than that between setae I, III is found on the same level as the spiracle. Setae IV and V are horizontally placed on the 8th abdominal segment, diagonally so on the others. On the 9th abdominal segment setae II, also I and III, as well as IV and V stand on common pinaculi, the distance between setae VIII is not larger than on the 8th abdominal segment. On the 1st, 2nd, and 7th abdominal segments group VII consists of 3, on the 8th and 9th of 2 setae. The uniserial round circles of hooks of the parapodia count 20-27, those of the caudal disk 10-15 hooklets.

Sept. to April in the root stock of Picris hieracioides, Hieracium, according to Kennel (1908) also on Crepis and Conyza.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Oct. 22, 1893 near Speyer in the rootstock of Picris.

Aethes cnicana (Westwood 1845)(1750).

Caterpillar brownish white and granulated. The somewhat darker brownish gray pinaculi on the 9th abdominal segment are to be more distinctly recognized than on the other segments. Head pale brown, cervical shield brownish, posteriorly dark edged (fig. 268), anal shield not punctate (fig. 269). 2nd ocellus equidistant from the 1st and 3rd, the 4th is closer to the 3rd than to the 6th. Seta O-2 is ventrocaudad from the 1st ocellus. Spiracles very small, not substantially larger on the 2nd abdominal segment than the insertion place of seta III. Group VII on the 1st, 2nd, 7th, and 8th abdominal segments consists of 2 setae on the 9th of 1. Anal comb with 4 spines. The uniserial circles of hooks of the parapodia count about 15, those of the caudal disk about 8 hooklets. In the other characters the caterpillar of this species agrees with the foregoing.

Sept. to April in the stem and root of Carduus, according to Disque also in flower heads of Cirsium oleraceum.

The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 8, 1891 near Speyer in flower heads of C.oleraceum.

Aethes badiana Hübner 1822 (1749).
sym. rubigana Treitschke 1830 according to Obraztsov.

Caterpillar dirty yellowish-white, somewhat reddish in the last instars, body strongly granulated by small spinules. Head, cervical and anal shields brown, cervical shield somewhat lighter, dark punctate [or dotted] on the posterior margin and near seta III (fig. 270). 2nd ocellus closer to the 3rd than to the 1st, the 4th closer to the 3rd than to the 6th. Seta O-2 stands below the 1st ocellus. On the 8th abdominal segment the distance between setae II is greater than that between setae I, on the 9th abdominal segment group VII consists of 2 setae sometimes of only 1 seta. Anal comb with 3 spines. The uniserial circles of hooks of the parapodia count about 13, those of the caudal disk about 11 hooklets. In all further characters this species agrees with cnicana.

Sept. to April in [illegible]ot and stem of Arctium lappa and Cirsium oleraceum. The 2nd generation lives in June, July in flower and seed heads. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on Sept. 9, 1916, near Speyer in the head of Arctium lappa.

Aethes rutilana (Hübner 1822)(1740).

Caterpillar yellowish or brownish-white and granulated, head light brown, cervical shield brownish and dark punctate [or dotted] (fig. 271), anal shield brown-gray; the ocelli stand at uniform distances apart, seta O-2 is ventrocaudad from the 1st ocellus. The spiracles of the 2nd abdominal segment are not larger than the insertion place of seta III. On the 1st abdominal segment setae IV and V are vertically, on the 8th horizontally, on the others diagonally placed. The distance between setae II on the 8th abdominal segment is not greater than that between setae I. On the 1st, 2nd, 7th, and 8th abdominal segments group VII consists of 2 setae, on the 9th of 1. The uniserial round circles of hooks of the parapodia count about 24, those of the caudal disk about 14 hooklets.

The caterpillar lives from fall until May in a short curved web covered with excrement, right between the needles of Juniperus communis. The caterpillars from the Bavarian State Collection that were examined had been found by Disque on May 26, 1905 near Speyer on J.communis.

The Family Carposinidae.

Diagnosis: Only the 2 setae V and IV are present on the prespiracular shield, VI is lacking. On the parapodia group VII consists of 4 setae, seta III is dorsocraniad from the spiracle on the 8th abdominal segment. On the 9th abdominal segment seta I is closer to II than to III, setae IV and VI are lacking (fig. 275 and 276). The circles of hooks are uniserial. The aafrontalia do not reach to the posterior margin of the head (fig. 272).

This family embraces predominantly tropical spp. In the palearctic region occurs only one genus with 3 spp., of which only the next two spp. are represented in Germany. Kennel (1908), Spuler (1910), and Eckstein (1933) still cited this genus as a genus of the Phaloniinae. On the other hand Meyrick (1910) and Obraztsov (i.lit.) conceived of it as a separate family. This has been proved right by the larvo-morphological investigations, and conspicuously so. The chaetotaxy is a very different one from that of the Tortricids. The Carposinidae can be readily separated from them very distinctly by a constant character, namely the absence of seta VI on the prespiracular shield. The thereby conceivable relation to the Pyralidae, however, is distinctly a convergence phenomenon by reason of the further characters. With reference to other characters, any relations to the Gelechiidae can be read off* But the Gelechiidae still demand a larvo-morphological investigation before more exact statements can be made on that. [*The German term used here can also mean gathered, etc.].

The genus Carposina Herrich-Schäffer 1853.

Diagnosis: Prespiracular shield with 2 setae (fig. 274), on the parapodia group VII consists of 4 setae, on the 9th abdominal segment IV and VI are lacking (fig. 275). The circles of hooks of the parapodia are uniserial.

Spp. of Carposina

1 (2) The uniserial circles of hooks of the parapodia and caudal disk consist of 12 hooklets. On the 9th abdominal segment setae II do not stand on a common pinaculum (fig. 275) scirrhosella

2 (1) The uniserial circles of hooks of the parapodia consist of 15, those of the caudal disk of 8 hooklets. On the 9th abdominal segment setae II stand on a common pinaculum (fig. 276) berberidella

Carposina scirrhosella Herrich-Schäffer 1853 (1840).

Caterpillar orange-reddish and strongly granulated by small spinules. Head, cervical shield and anal shield brown. The adfrontalis do not reach up to the posterior margin of the head (fig. 272). The 3rd, 4th, and 6th ocellus are larger than the others, the 2nd is closer to the 1st than to the 3rd (fig. 273). On the cervical shield IIIa is closer to III than to IM, II ventrocaudad from I. On the prespiracular shield only setae V and IV are kept, VI is lacking (fig. 274). Seta IIIa on the mesothorax is dorsocaudad from III, VIII distinctly set off from the coxa. Spiracles very small and round. On all abdominal segments setae IV and V are vertically or nearly vertically placed. On the 7th abdominal segment setae II and setae I are equally far apart, on the 8th the distance between setae II is smaller and their pinaculi are contiguous, III is dorsocraniad from the spiracle. On the 9th abdominal segment setae II stand on separate pinaculi which touch the pinaculi of setae I. Seta III, on the other hand, is distinctly separated off. The lack of IV and VI on the 9th abdominal segment (fig. 275) is striking, the long seta V has been retained. On the 1st and 2nd abdominal segments group VII consists of 3 setae, on the 3rd, 4th, 5th, and 6th of 4 setae, on the 7th of 3, on the 8th and 9th of 1. The uniserial circles of hooks of the parapodia and caudal disk count 12 hooklets.

Aug., Sept., Oct. in fruits of Rosa.
Occurrence: South Germany, vicinity of Vienna, Hungary, Moravia, Galicia, and Asia Minor.
The caterpillars from the Bavarian State Collection that were examined had been found by Krone on Oct. 14, 1896 near Vienna in fruits of Rosa.

C. berberidella (Herrich-Schäffer 1853)(1841).

I could not find a description of the larva in the literature. The following is based on the research material of the Bavarian State Collection.

Caterpillar reddish and strongly granulated, head yellow, cervical and anal shields brown, pinaculi gray. On the 7th abdominal segment the distance between setae II is greater than that between setae I, on the 8th it is less. On the 9th abdominal segment setae II stand on a common pinaculum, with which the pinaculi of setae I are fused (fig. 276). Seta III is distinctly separated off. On the 7th abdominal segment group VII consists of 3 setae, sometimes even of only 2. The circles of hooks of the parapodia count 15, those of the caudal disk 8 hooklets. In all additional characters this species agrees with scirrhosella.

Aug. and Sept. in ripe fruits of Berberis.

Occurrence: South Germany, Tyrol, Steiermark, Carinthia, Dalmatia, Galicia.
The caterpillars from the Bavarian State Collection that were examined had been found by Krone on Oct. 13, 1903 near Vienna in fruits of Berberis.

III. Comparison of larval and imaginal systematics.

The purpose of this paper is not only to make possible determination of the caterpillars but also to show the extent to which the present-day state of imaginal systematics can be defended from larval systematics. Since imaginal systematics can only be considered complete when it agrees with larvo-morphological research results, I would like to treat this comparison here as a survey. In this paper the older, but particularly the more recent systems by Meyrick (1927) and Obraztsov (i.lit.) were considered. The latter has not yet published his monograph of the Tortricidae but he communicated the systematic classification of his work to me so that I could draw upon it for comparison.

By investigation of the genitalia he was able to split up large genera, to undertake species transfers, and to re-examine the justification for spp. According to my own investigation results it is the best system. I would like to discuss in the following the extent to which it agrees or deviates from them.

In Kennel's Monograph (1908) the family of Tortricidae is divided into 8 subfamilies; Meyrick (1927) and Obraztsov (1950) raised the subfamily Phaloniinae to family and expressed the relation to the Tortricidae by one subfamily. Although the Phaloniinae can be separated from the Olethreutinae better than the Tortricinae, I have retained the subfamily since the larvo-morphological family characters also apply to them. The primary motive for that was the transition forms. It is not surprising that Phaloniinae spp. belong to the genus Hysterosia, their larvae agree in one character or another with the Olethreutinae. Thus, for instance in the case of Hysterosia inopiana and in that of Propira pulvillana seta VI shows up on the 9th abdominal segment, in P.sodaliana the circles of hooks of the parapodia are biserial. These characters do not occur anywhere else in any genus of Phaloniinae., but on the other hand they do occur for the most part in the other subfamilies. Meyrick (1910) and Obraztsov (1950) split off the genus Carposina, of which only 8 spp. occur in the palearctic region, only 2 of them in Germany, from the Phaloniinae and raised it to a family of its own, the Carposinidae. This was proved correct by larvo-morphological investigations. Differing from all Tortricidae these two spp. have only the two setae V and IV on the prespiracular shield, setae IV and VI are lacking from the 9th abdominal segment, and group VII on the base of the parapodia consists of 4 setae. This is reason enough to justify the separation. Closer relations can be established to the Gelechiidae than to the Tortricidae, in that seta I on the 9th abdominal segment is closer to II and setae III are found on separate pinaculi. Still it seems to me that the independent position is better since only 2 setae are present on the prespiracular shield and group VII on the base of the parapodia consists of 4 setae.

The separation of the Trotricinae from the Olethreutinae is larvo-morphologically difficult since there are genera which show a transition character. It was possible only because I could draw upon several characters for the separation and make the separation according to tribes. With that it turned out that the subfamily Tortricinae and the subfamily Olethreutinae stand very close together.

Obraztsov (1946) split off the subfamily of Sparganothinae from the Tortricinae; it consists of only one monotypical genus. This separation is not larvo-morphologically possible, wherefore I kept to the older systemsin this case. Sparganothis pilleriana shows the greatest relationships to the genus Archips, wherefore I referred it to the Archipsini.

The division of extensive subfamilies into tribes seems to me to have been a very great service by Obraztsov. He subdivided the Tortricinae into 3 tribes, Archipsini, Cnephasiini, and Tortricini. As is evident from the keys and the diagnoses, they can also be readily separated larvo-morphologically. The tribe of the Archipsini, according to Obraztsov, contains 22 small genera which can also be separated larvo-systematically except for the following:

The genus Archips embraces the typical spp. of the former genus Cacoecia. Obraztsov divided the latter up into several small ones which all stand very close together larvo-morphologically but can differ by the shape and size of the spiracles. The genera Cormicacoecia (1 species) and Archips (6 spp. examined) cannot be separated sensu Obraztsov. For this reason I am again placing lafauryana in the genus Archips. The genus Aphelia was divided into 2 subgenera by Obraztsov, which cannot be separated morphologically, but only from the coloring of the head. On the other hand the subgenera of the genus Clepsis could be larvo-morphologically separated which is not surprising since their spp. formerly stood in different genera.

The genus Ptycholoma, of which only 1 species occurs in Germany, is differentiated by the possession of 2 setae in group VII on the 1st, 2nd, and 7th abdominal segment, strongly deviating from other Archipsini. Here we should investigate from the imagino-systematic side, whether there are not closer relations to the Tortricini since in these too group VII on the 7th abdominal segment consists of 2 setae.

In the genus Philedone were previously found the 3 spp., geringiana, prodromana, and joannisiana, besides the others. Obraztsov cited a genus of its own for each of these 3 species which he called Philedone, Philedonides, and Hastula Since the first 2 genera cannot be larvo-morphologically separated, I am again referring their spp. to the one genus Philedone. On the other hand the genus Hastula seems to be to be justified.

The monotypical genus Pseudargyrotoza with the species conwagana dsected by Obraztsov is so differentiated larvo-morphologically from other Tortricinae that this genus is justified without any doubt. It is very clearly separated by the uniserial circles of hooks, by the short coronal suture, by the absence of seta VI on the 9th abd. segmt. from all other Tortricini which Obraztsov probably wanted to point out by the fact that he cited this genus as the last of the Archipsini. By reason of the above named characters this species has so much in common with the Phaloniinae that I would unhesitatingly place it in this subfamily if Obraztsov had not informed me that there is no imagino-morphological basis for that. Accordingly it must be an extraordinary case of convergence.

The tribe of the Cnephasiini is not so uniform larvo-morphologically as the ones discussed. 3 generic groups can be differentiated:

1. Tortricodes,
2. Cnephasia, Cnephasiella, and Neosphaleroptera,
3. Doloploca, Exapate, Olindia, Eulia, Eana, Trachysmia.

But since the next tribe is so much more uniformly delimited by the combination of the different genera, it seems to me the erection of this tribe is very timely. The long existing monotypical genus Tortricodes occupies a special position in this tribe. No other species of the Trotricidae has, like Tortricodes tortricella, 2 setae in group VII above the thoracic legs on meso- and meta-thorax (fig. 60), as is known to me of the Psychidae. In all other characters, however, it is a typical tortricid caterpillar so that this is only a case of convergence. According to this character this species could be considered as original [or primitive].

The following genus Cnephasia stands next to the genera Cnephasiella and Neosphaleroptera, but can be readily separated from them larvo-systematically.

Whether Cnephasia wahlbomiana is a very variable species or a species complex could not be decided by me, since I did not have enough definitely determined material at my disposal. All additional genera, as Obraztsov erected them, can be larvo-morphologically separated also.

The tribe of the Tortricini is the most uniform of the Tortricinae. In all spp. belonging to it group VII on the 2nd abdominal segment consists of 3 setae, on the 7th abdominal segment of 2 setae, and on the 9th abdominal segment seta VI is always present. By these characters it differs from all genera of the Archipsini and Cnephasiini. It is certainly no accident that Obraztsov - on the basis of his imagino-systematic investigations - combined in this tribe all former spp. of Tortrix and Acalla whose caterpillars show 2 setae in group VII on the 7th abdominal segment. Of all the former Tortrix species occurring in Germany - according to Obraztsov - only viridana can be referred to the genus Tortrix. It has likewise been proved by larvo-morphological investigations that former Tortrix spp. which now belong in the Archipsini in no case belong to this genus since their caterpillars have 3 setae in group VII on the 7th abdominal

segment. The monotypical genera Aleimma and Spatalistis as well as Croesia stand considerably closer to the genus Tortrix. However, since I can separate these also larvo-morphologically I consider them as good genera. I cannot agree with Obraztsov in one point only. He combines all former Acalla spp., except holmiana, in the genus Acleris. This genus is also so uniform larvo-morphologically that its spp. are hard to separate. On the other hand he placed the species holmiana in the genus Croesia. Since I cannot separate holmiana from the genus Acleris and this [species] is separated from the two spp. of the genus Croesia by the development of the circles of hooks, I am referring this species back to the genus Acleris.

From the larvo-systematic point of view the subfamily of the Olethreutinae embraces the same species as sensu Obraztsov. The fact that this subfamily cannot be separated off from the Tortricinae by 1 constant character was already cited at the beginning of the discussion.

Obraztsov divided the Olethreutinae also into 3 tribes (1946); it was previously designated as Epibleminae and Conchylinae. As is evident from the key and diagnoses, this subfamily can also be readily separated larvo-morphologically except for 2 exceptional cases. Obraztsov placed the one species woeberiana, which formerly belonged to the genus Grapholitha, in the Eucosmini. This transver is considered correct larvo-morphologically also since on the 9th abdominal segment group VII consists of 2 setae. On the other hand, he left albersana, which can only be separated with difficulty from woeberiana and which stood beside it in the same genus, in the Laspeyresiini. He placed it in the monotypical genus Eucosmomorpha. As indicated by the name, relations with the Eusosmini already exist in this species. In reply to my questions, Obraztsov informed me that albersana and woeberiana occupy an intermediate position between the Laspeyresiini and the Eucosmini, in which albersana is closer to the Laspeyresiini and woeberiana to the Eucosmini. Since the two spp. can hardly be separated larvo-morphologically and fit the Eucosmini better than they do the Laspeyresiini, because group VII on the 9th abdominal segment consists of 2 setae, I am placing albersana with woeberiana in the genus Enarmonia. Formerly the two stood side by side in 1 genus.

I also came to somewhat different results in the delimitation of the Eucosmini and Olethreutini than did Obraztsov. He cited the genus Ancylis as the last of the Eucosmini. Since this larvo-morphologically very uniform genus differs from the latter by the fact that setae IV and V on the abdominal segments are approximately equally long, setae I and III stand on separate pinaculi on the 9th abdominal segment, and agrees in these characters with the genus Olethreutes, I am referring the genus Ancylis to the Olethreutini. Also Obraztsov informed me on this that Ancylis does show a transitional character.

I was strengthened in my viewpoint by the transfer of achatana, profundana, and obtusana whose caterpillars are equipped with the same characters as the genus Ancylis. In Rebel's catalog (1901) Achatana still stands in the genus Olethreutes and was later as proved correct larvo-morphologically placed in the genus Ancylis. Just so was obtusana transferred from the genus Epinotia into this genus. Meyrick (1927) referred profundana to the genus Olethreutes. These cases distinctly show the close relationship of the genera Ancylis and Olethreutes and moreover they show that the value thought of for them actually belongs to the larvo-morphological characters too.

The genera of the Laspeyresiini Dichrorampha, Laspeyresia, Pammene, and Lathronympha can also be larvo-morphologically separated, just as well as the subgenera of the genus Dichrorampha, as erected by Obraztsov (1953).

Obraztsov combined the genera Carpocapsa, Grapholitha, and Corbylophora into the genus Laspeyresia, which I also consider correct; for it was not possible for me to separate them from the larvo-morphological point of view.

The tribe of the Eucosmini is the richest in spp. of the Tortricidae. For reasons already set forth, I am referring the species albersana also to the genus Enarmonia.

The 6 genera Rhyacionia, Clavigesta, Barbara, Petrova, Coccyx, and Pseudococcyx arose through the dividing up of the earlier genus Evetria. On the one hand characters in common speak for retention of the one genus. But since the 6 genera can also be larvo-morphologically separated, I am joining in with the division, as Obraztsvo carried it out. As is to be learned from the key and the diagnoses, the morphological differences are very considerable.

The genus Spilotana can also be larvo-morphologically separated from the others. Obraztsov conceived of lariciana, which was earlier cited as a variety of ocellana, as a good species. The caterpillars differ only in the shape of the spiracles on the prothorax. In this case only imagino-systematics can decide whether this is really a separate species.

The genus Thiodia, of which only one species occurs in central Europe, can be well characterized larvo-morphologically. The same applies to the genus Foveifera.

Within the former genera Eucosma or Epiblema, Epinotia, and Semasia, Obraztsov recently made important transfers which also proved to be correct larvo-morphologically. Spp. were brought into the earlier genus Eucosma or Epiblema whose larvae show uniserial and biserial circles of hooks, just as in the genera Epinotia and Semasia. Now on one hand Obraztsov had placed the spp. of the genera Eucosma and Epiblema whose caterpillars have biserial circles of hooks, in the genus Epinotia; and on the other hand he placed the spp. of the genera Epinotia and Semasia, whose caterpillars were provided with uniserial circles of hooks in the genera Eucosma, Epiblema, or in new genera. So that now in the genera Eucosma and Epiblema - save for a few exceptions - are found spp. whose caterpillars have uniserial circles of hooks and in the genus Epinotia are found those which are provided with biserial circles of hooks. But these exceptions are evidence that Obraztsov had not carried out these changes completely enough. As for the genus Eucosma, trisignana with biserial circles of hooks must come with the reversed Epiblema spp. into the genus Epinotia; on the other hand the biserial Epinotia species pauperana must remain in the genus Epinotia. By this means only spp. whose caterpillars have uniserial circles of hooks are found in the genus Eucosma.

Obraztsov separated the subgenera Eucosma and Phaneta in the genus Eucosma. The first contains only spp. which already have always been in this genus, the second however contains spp. which formerly were almost exclusively found in the genera Semasia and Epinotia. Both subgenera I can also keep well apart from each other larvo-morphologically

The caterpillars of the genus Epiblema, which is very close to the genus Eucosma, and formerly made up a genus with it, are provided with uniserial circles of hooks except for grandaevana. It is striking that Obraztsov cited this species at the close of the genus. Since Lederer (1863) placed it in a genus of its own and it deviates larvo-morphologically from all other spp., even in the conspicuous size of 30 mm, I am joining Lederer in this case and again placing it in the monotypical genus Cacochroa Lederer.

Obraztsov (1946) separated the genus Pseudeucosma off from the former genus Eucosma Meyrick (1927); it can also be readily separated larvo-morphologically since on the 8th abdominal segment III is dorsocraniad from the spiracle. I am also referring Eucosma kochiana to this genus, in several characters it agrees with this genus. This species cannot be larvo-morphologically referred to the genus Epinotia, as Obraztsov did, since its caterpillars have uniserial circles of hooks and come closer in other characters to the genus Pseudocosma than to Eucosma in which it was before.

Meyrick (1927) had already divided the former species-rich genus Epinotia into several genera. Obraztsov largely followed him but separated a few more smaller genera off and moreover differentiated several subgenera in the genus Epinotia. In these subgenera he kept the former Eucosma or Epiblema spp. apart from the foremer Epinotia spp., which also proved correct larvo-morphologically. By reason of these changes are now-in Epinotia, spp. whose caterpillars predominantly have biserial circles of hooks or caterpillars whose spiracles on the 2nd abdominal segment are not larger than the insertion place of seta III. The former species Epinotia ustumaculana Obraztsov placed in the genus Rhopobota which also proved correct by reason of the larvo-morphological investigations, since the biserial circles of hooks of the parapodia are uniserial on the side.

Also according to Obraztsov the genus Gypsonoma Meyrick (1927) persists, yet he still refers the species nitidulana to it. The spp. which Meyrick combined in this genus are also very uniform larvo-morphologically, but nitidulana is very close to ustumaculana which belongs in the genus Rhopobota according to Obraztsov. It should be again imagino-systematically tested whether nitidulana must be transferred or not.

Obraztsov referred the species profundana, which has been so frequently transferred, in the genus Eudemis. In this case, I cannot follow him but rather I follow only Meyrick (1927) who placed this species in the genus Olethreutes (=Argyroploce). The kindred relations in this case are especially readily recognized from the caterpillar. While in all Epinotia relatives setae I and III on the 9th abdominal segment are found on a common pinaculum, in most Olethreutes spp. they stand on separate pinaculi.

As for the specific composition of the genera Pardia, Notocelia, Gypsonomoides, Gibberifera, Zeiraphera, Griselda, and Acroclita I came through larvo-morphological investigations to the same results as Obraztsov reached on the imagino-systematic side. I was able to separate the genera readily. The former monotypical genus Asthenia was conceived by him as a subgenus of Epinotia. The kindred relations can also be distinctly recognized larvo-morphologically, yet this monotypical genus could just as well be permitted to stand. since group VII on the 7th abdominal segment counts 3 setae instead of 2. However I have followed Obraztsov's division.

The tribe of the Olethreutini was erected by Obraztsov (1946). It can also be separated larvo-morphologically from the Laspeyresiini and Eucosmini. Differing from Obraztsov I am referring the genus Ancylis from the Eucosmini to the Olethreutini for the reasons already stated.

The larvo-morphological division of the genera runs parallel with the imagino-systematics of Meyrick (1927). The new results by Obraztsov I could not always follow as I would like to discuss thoroughly hereafter. Differing from Meyrick (1927) Obraztsov (1946) combined the genera Polychrosis and Lobesia. In this case I am following Meyrick since in Lobesia group VII on the 7th abdominal segment consists of 2 setae, of 3 in the case of Polychrosis. The long existing genera Bactra and Cymolomia can be well characterized larvo-morphologically.

The foremer species-rich genus Olethreutes (=Argyploce) was divided into the genus Endothenia and to Argyroploce by Meyrick, on the other hand Obraztsov divided it into 15 genera according to a list sent to me. I cannot follow this strong dividing up larvo-morphologically. I can detect 2 groups of spp. in the former Olethreutes spp., sensu Rebel (1901). The caterpillars of the 1st group have uniserial, those of the 2nd group biserial circles of hooks. To the 1st group belong all spp. of the genus Endothenia and a few others which, according to Obraztsov, are distributed over 6 more genera. As larvae of these genera are not uniform in development of the circles of hooks I cannot defend this classification.

On comparison of the systems it is very clear that in Rebel (1901) and Spuler (1910) all spp. whose larvae have uniserial circles of hooks are cited after one another although

they were not designated by a name of their own. This is evidence that even imaginally this close relation can be detected from a given point of view. Unfortunately Meyrick (1927) only took account of spp. occurring in England in his system so that I can only make an insufficient comparison. But I could establish the one thing, that he also referred the species fuligana whose caterpillar has uniserial circles of hooks to the genus Endothenia and not, as did Obraztsov, to the genus Olethreutes. For these reasons I am joining in the division of the genera of the Olethreutini sensu Meyrick and hope that my arrangement of German spp. in Meyrick's system will still be re-tested by imaginal systematics.

Transfer of the spp. achatana and obtusana from the genera Olethreutes and Epinotia to the genus Ancylis has proved convincingly correct by larvo-morphological investigations. From these 2 cases it can be very clearly seen that larval systematics can supply hints to imaginal systematics.

The spp. biarcuana, inornatana, and diminutana belonging to the genus Ancylis were conceived of by Obraztsov as one species. But since I can separate them even morphologically, which is otherwise very difficult in this genus, these are spp. which can be distinctly separated larvo-morphologically. In the case of inornatana group VII on the 9th abdominal segment consists of 1 seta, the cervical shield is yellow and provided with a typical black marking. Diminutana differs from this species by the fact that group VII on the 9th abdominal segment consists of 2 setae and the cervical shield is uniformly dark brown and strongly chitinized. Differing from these two spp., in biarcuana the spiracles are found on large black spots (fig. 204).

At the beginning of the larvo-imagino-systematic comparison and in the systematic part I have already given the reasons why I did not raise the Phaloniinae to a family as did Obraztsov in 1950 and Meyrick in 1927. A further reason for this is the fact that I cannot separate the subfamilies of the Phaloniidae erected by Obraztsov (1950). At the beginning of this Section I have also already stated that the genus Carposina can be referred neither to the Phaloniinae nor to the Trotricidae since only 2 setae are present on the prespiracular shield and group VII on the base of the parapodia consists of 4 setae.

The former genera Lozopera, Hysterosia, Phalonia or Cochylis, Euxanthis and Chlidonia can be readily separated larvo-morphologically. In his new revision Obraztsov had divided the large genera Phalonia and Euxanthis into several small ones. I could also separate them larvo-morphologically but only with the help of several characters. This is a sign that the genera produced by splitting up the genera Phalonia or Euxanthis stand very close to each other. Since I am assuming that the differentiation continues in case of further development to the adults I have followed Obraztsov's imaginal division so far as possible. Differing from his system I am leaving v-albana in the genus Hysterosia since seta VI on the 9th abdominal segment is present. It might still be investigated from the imaginal side whether pulvillana should not also be transferred from the subgenus Propira into the subgenus Hysterosia since they agree in the development of the elliptical circles of hooks.

I retained the monotypical genus Chlidonia since on the mesothorax seta VIII stands on the margin of coxa and group VII on abdominal segments 1 to 7 consists of 3 setae, and on the 8th and 9th of 2 setae. The position of seta VIII on the mesothorax is a special case in the Phaloniinae which justifies this monotypical genus. Obraztsov erected the 3 new genera Falseuncaria, Cochylichroa, and Cochylidia on the basis of his imagino-systematic investigations. His research results correspond to larval systematics. Data on the two genera Falseuncaria and Cochylichroa is published herewith for the first time, after consultation with Obraztsov. It may be emphasized that these 3 genera are very close larvo-morphologically.

The genus Phalonidia can also be larvo-morphologically separated still it seems to me the differences of the individual spp. are larvo-morphologically too great for one genus. Two species groups could be differentiated. The first would include affinitana and albipalpana, the 2nd udana, permixtana, and reversana. The species reversana cannot be generically separated from permixtana wherefore - differ-ing from Obraztsov - I am referring it to this genus.

In all other cases I came to the same division (as did Obraztsov) by way of larvo-morphological investigations.

It is evident from this comparison of the larval and imaginal systematics that the imagino-systematic revision of the Tortricidae undertaken by Obraztsov was not only necessary but that it can be defended with relatively trifling exceptions, larvo-systematically. The dividing of the great subfamilies into tribes, as well as of thelarge genera into smaller ones, seems to me to be particularly important.
The extent
^ to which I could not follow his system and had to join Meyrick or others has been precisely underlined by me in the special part and summarily in the larvo-imagino-systematic comparison, in order to give proof of imaginal systematics. The investigations have distinctly showed that larval systematics can do just that.

A system can only be considered correct when it can be defended by imagino- and larvo-systematics investigations.

Summary.

1. For this work, 356 caterpillars of tortricids were examined for morphological characters. Of these 329 occur in Germany, the other 27 in west and south Europe. With that 82 percent of the 400 German species were included in the larval systematics. The spp. that were not examined occur rarely or only in certain regions, or their caterpillars are not yet known.

2. Morphological descriptions were given for all the caterpillars for the first time. Hitherto they were only described from the coloring.

3. Of the next 18 spp., I could find descriptions nowhere in the literature. They were described from research material as new. Eana argentana, Acleris permutana, Acleris literana, Laspeyresia malcolmiae, L.perlepidana, Pammene costipunctana, Pseudococcyx tessulatana, Thiodia citrana, Olethreutes siderana, Philedone prodromana, Dichroramphodes agilana, Polychrosis cinerariae, Lozopera deaurana, L.bilbaensis, Agapeta zoegana, Phalonia austriana, P.reversana, and Carposina berberidella.

4. By rearing caterpillars and evaluating Disque's great Collection I could broaden knowledge of the biology in many cases, and also correct confusions and describe the habits of many caterpillarsfor the first time.

5. I was able to set up keys for determination of caterpillars of the families of the Tortricidae and Carposinidae as well as of the subfamilies tribes, genera, and spp., by larvo-morphological investigations.

6. Caterpillars of the most diverse families were examined in order to establish the larvo-morphological family characters of the Tortricidae and Carposinidae. With that I was able to find characters by which the existing keys by Gerasimov (1935 and 1952) for determination of caterpillars to families were improved. This is especially true for the larvo-morphological separation of Tortricidae and Gelechiidae which are very close.

7. A larval systematics for Tortricidae and Carposinidae was founded, with the results of investigation, which extensively corresponded to the most recent imaginal systematics by Obraztsov (i.lit.). Meyrick's (1927) system also, as well as all previous ones, was considered in that.

8. Lack of agreement between the imaginal and larval systematics was pointed out in the larvo-imaginal-systematic comparison and proposals made for solution of the problems.

9. The larvo-morphological investigations have shown that the genus Carposina cannot be placed in the family of the Tortricidae, but rather is to be conceived of as the separate family of the Carposinidae.

10. I was able to establish in the investigation of Ancylis biarcuana, A.inornatana, and A.diminutana that the caterpillars are morphologically well differentiated so that here it is not a matter of one species, as Obraztsov thought.

Tr.:R.Ericson
1960.