Haut umgeben, bei der Bildung des Blastoderms von einigen Zellen umgeben wird, die durch Teilung des Keimbläschens entstanden sind; endlich, dass dieser Zellhaufe mit den Zellen, die ihn umgeben, in den aufeinander folgenden Phasen der Entwicklung von den andern, in Bildung begriffenen Organen scharf gesondert bleibt. Er verlagert sich zuerst gegen die Rückenseite des Embryo, bleibt aber immer im hintern Teil des Abdomens und spaltet sich dann bei der Bildung des Proctodaums in 2 Hälften, die sich seitlich dem Enddarm anlegen, ganz nahe der Anlage der Dorsoventralmuskeln. In der Folge verlängern sich die beiden Körper längs des Darmes nach vorne und werden von der dorsoventralen Muskulatur segmentweise stark geschnürt. Schliesslich bilden sie die gelblichen, dem Fettgewebe so ähnlichen Körper, die man beim ausgewachsenen Tier vorfindet. Die Körperchen, welche diese Masse erfüllen, sind also dieselben, die die Masse am vegetativen Eipol bilden. Während der Embryonalentwicklung machen sie 3 oder 4 Vervielfältigungsstadien durch, wobei sich ihr tonnen- oder ellipsoidförmiger Körper verlängert und in der Mitte hantelförmig einschnürt, um sich hierauf zu teilen.

Die Vermehrungsperioden dieser Zellen fallen mit ganz bestimmten Entwicklungsstadien des Keimes zusammen.

Die Art und Weise, wie sich diese Körperchen verhalten, ihre ganze Lebensweise, ihr Auswandern aus dem Organ beim Erwachsenen, ihr Eindringen ins Ei und ihre Entwicklung im Embryo zwischen den Zellen, die den sogenannten Fettkörper bilden, besonders aber ihr Bau und ihre Art der Vermehrung brachten mich auf die Vermutung, dass es sich möglicherweise um pflanzliche Mikroorganismen handeln könnte. Bestärkt wurde ich in dieser Meinung durch die Tatsache, dass sich Kulturen von niedern Pilzen (Blastomyceten) aus dem Inhalt der betreffenden Zellen ziehen lassen. In gewissen Entwicklungsphasen erzeugen die Kulturen die gleichen kugeligen oder eiförmigen Gestalten, wie sie in den gelblichen Körpern und am Eipol auftreten. Diese Tatsachen und experimentellen Beweise haben mich zur Annahme geführt, dass es sich wahrscheinlich um erbliche Symbiose zwischen diesen pflanzlichen Organismen und bestimmten Geweben von *Icerya* handelt.

Die Anwesenheit von niedern Pilzen im Körper der Cocciden wurde schon von Conte, Faucheron, Augusto Berlese und einigen andern mit Hilfe von Kulturen festgestellt; aber der von mir untersuchte Fall ist um so interessanter, weil er den Wert einer morphologischen und physiologischen Tatsache erlangt hat, da ja die Körperchen ein ganz bestimmtes Schicksal haben und da ich sie unter so vielen Hunderten von Eiern und Embryonen, die ich untersuchte, niemals vermisst habe; endlich auch, weil meine Beobachtungen mit der Uebertragung ihr stetiges Vorhandensein erklären und ferner die Auffassung der Blochmann'schen Körperchen als echte Bakterien unterstützen helfen. Sie sind geeignet, zur Lösung des Rätsels beizutragen, das Balbiani mit der Beschreibung des Zellhaufens am vegetativen Eipol der Aphiden gestellt hat, der sich in einer Weise entwickelt, die sehr an jene bei *Icerya* erinnert; ferner zur Lösung der übrigen, in gleicher Weise der Lösung noch harrenden Fragen, wie des ovalen Körpers bei *Dactylopius* und ferner noch des Polkörpers der Embryonen von *Cicada septemdecim*. Mir scheint es, dass diese letzte Frage, von Heymons durch die Untersuchung über die Embryonalentwicklung dieser Homopteren-Art aufgeworfen, in meinen Ergebnissen eine kaum mehr zweifelhafte Deutung finde, wegen der grossen Uebereinstimmung, die zwischen den wenigen Angaben jenes Autors über das Verhalten des Polkörpers und einigen Beobachtungen besteht, die von mir in dieser Mitteilung veröffentlicht worden sind.

Ich kann mich jetzt noch nicht über die Bedeutung aussprechen, die diesen Blastomyceten im Organismus zukommt, bevor ich die geeigneten mikrochemischen Reaktionen ausgeführt habe. Aber die Tatsache ist hervorzuheben, dass sowohl die Cocciden, als auch die Aphiden und Cicadinen infolge ihrer Lebensweise gezwungen sind, grosse Mengen von Zucker aufzunehmen, die sie nachher entweder durch den Darm oder durch andere Organe wieder ausscheiden müssen. Es ist daher wohl möglich, dass die genannten Pilze die Ausscheidung des Zuckers beschleunigen, dadurch, dass sie seine Zersetzung herbeiführen oder ihn in anderer Weise umwandeln, was gerade die Aufgabe vieler Saccharomyceten ist.

Zum Schlusse möchte ich darauf hinweisen, dass in dem Vorstehenden auch eine Probe für die Uebertragung von Mikroorganismen gegeben ist; ein Gegenstück dazu wäre die Uebertragung und gleichzeitige Entwicklung von pathogenen Organismen, die ja in den letzten Jahren bei der Untersuchung einiger Krankheiten von Mensch und Vieh eine so grosse Bedeutung erlangt haben.

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The Revieran Races of Agriades coridon, Poda

by *J. W. Tutt*, I. E. S.

By this time, my revision of the variation of this species, published in A Natural History of the British Butterflies and their world wide variation, by Friedländer & Sohn, Berlin, will be in the hands of most of our advanced European lepidopterists, and there is no need to repeat the facts and corrections of our local races obtained in Spain and Asia Minor respectively, but it appears advisable to publish separately our conclusions as to the race (or races) inhabiting the French and Italian Riviera, as information is still wanted and some modification of our conclusions may yet be necessary. It is, therefore, on account of this I forward the following for publication in the Societas entomologica, trusting that lepidopterists who are so happily situated as to advance our knowledge will do so. (Further details of the subject can be obtained in our recently published A. Nat. Hist. Brit. Butts., vol. IV., pp. 1—4).

Along the French and Italian Riviera, *A. coridon* appears to be double-brooded. It occurs in some spots in mid-April, apparently continuously for several weeks. It is reported as occurring again later in the year, and Chapman practically proved this point by obtaining eggs at Ste. Maxime, which produced larvae in a short time that fed up to maturity during the summer, whilst, in almost all other parts of its range, the eggs laid do not hatch till the following spring, and the insect is single-brooded. We first met with this early Rivieran brood in April, 1903, near Hyères, then again in April, 1905, near Hyères, and at Draguignan and Nîmes during the first week of May, 1905, but only in few specimens. In April and May, 1904 and 1906, Chapman found it in some numbers at Ste. Maxime. The examples that we captured stood in our collection as *meridionalis*, but were undescribed. In 1904, Bartel described a form from the Italian Riviera as *rezniceki*, but his description, although agreeing in some particulars

with the specimens in our possession, suggested marked differences which a careful examination of Chapman's material intensified, whilst his comparisons with other forms (for almost all of which he apparently used erroneous names), left one with no clear idea as to what he was describing. Whilst we were recently at work on the subject, we received from Reverdin the MS. of a description of a form that he called *constanti*. The three forms thus known to us appeared to present several broad characters in common, and to differ merely in detail, although these details might be considered important. We were unable to refer the specimens in the long series of *meridionalis* in our collection *en bloc* to either *rezniceki* or *constanti*, indeed, our examples appeared to cover the different ground claimed by each, and to exhibit considerable and marked variation *inter se*. We are, at present, very dissatisfied with our knowledge of the specialisation and localisation of these forms, and suspect that, when the same collector in the same season gets lengthy series from Hyères, Draguignan, Ste. Maxime, Pardigon, Nice, Monte Carlo, Bordighera, and Rapallo, and institutes a careful comparison, a good deal of overlapping will be found to occur; for what appear to be serious differences in colour, in spotting, etc., when the comparison of specimens from any one of these places is made with utterly different races of the species from far-away countries, may quickly disappear when the allied races are brought in series into juxtaposition. Bartel's comparison of *rezniceki* with the specialised races from Spain and Asia Minor, with which they have nothing in common, is futile; almost equally so is the comparison of these forms with Swiss examples. To determine their value as local races, they want comparing with one another, and with the *A. coridon* of other parts of Southern France and mid-Italy, where under approximately similar conditions, similar forms are more likely to be found. Both Bartel and Reverdin make much of the specialisation of the upperside ♂ colour of the forms they describe, yet this appears to be almost, or quite, identical with that of our *meridionalis*, and these latter again, are hardly distinguishable in this respect from the ♂ s from Digne, Grésy-sur-Aix, the Verdon Valley, etc. We therefore give the descriptions of these forms, and leave it to the future to discover how far they are racial and why. We may add that as a result of a lengthy correspondence Reverdin suggests that the the general racial form *meridionalis* breaks up into two sections locally that may be recognised as — var. *meridionalis*, (*a*) forma *rezniceki* (pale underside, etc.); (*b*) forma *constanti* (dark underside, etc.).

a. var. *meridionalis* (*-vernalis*), Tutt, „Ent. Rec.", xxi. p. 299 (1909); „Proc. Ent. Soc. Lond.", p. lxxx (1909). *Corydon*, Tutt, „Ent. Rec.", xvii., p. 215 (1905). — ♂. Rather smooth, delicate, but dull, silvery-blue in colour; margin of forewings variable. ♀ with deep grey-brown underside. The spring form of the Riviera race (from Hyères, Draguignan, Ste Maxime, etc.) ,(Tutt, Ent. Rec., xxi., p. 299). Of a pale silvery-blue colour, the ground tint quite indistinguishable from that of a very long series of examples taken at Grèsy-sur-Aix and other localities in Southern France (in July and August), varying somewhat in glossiness, but apparently never of the bright blue tint not uncommon in specimens found in Britain, the Swiss valleys (Val d'Hérens, etc.), the French Pyrenees, Fontainebleau Forest, and most other Central European localities; the somewhat dull appearance in some examples due to a thinness of scaling on the outer discal area of the wings, a feature further intensified when the specimens are a little worn; a darkening of the discoidal lunule in the forewings is marked in 42 ♂ s, against 18 ♂ s that do not show it, but in some of the 42 it is so faint as to be hardly discernible. The dark margin of the forewings is on the whole wide, but varies from the almost linear (*angusti-margo*) form to the extreme wide (*marginata*) form, in which it extends over the outer third of the wing and along the costa to the discoidal lunule; the *punctata* form is rare; the *divisa* form the most common, a pale grey or whitish dividing line (representing the outer margin of the obsoletely developed internecural ocellated spots) passing though the wide marginal band from the costa to the inner margin; on the hindwings the marginal band may consist merely of a row of well-developed, clearly-defined, pale-cinctured, black spots, whilst, in others, they are contained in a wide black margin that extends some distance towards the disc of the wing, and on its inner edge forms a series of dark united lunules. The colour of the underside of the ♂ s is somewhat variable, that of the forewings usually dark grey (reminding one of that of *A. thetis*), that of the hindwings with a slight tinge of brown in addition; the black spots (including the discoidal of forewing) well-developed, the margins pure white, the marginal ocellations strongly developed, surmounted by strong blackish-grey chevrons on the forewings, and by weak fulvous ones on the hindwings; in other examples the grey ground is suffused with whitish over the discal area of the forewings, leaving it, however, sufficiently grey for the white rings of the ocellated spots to show well, whilst on the hindwings the marginal chevrons are surmounted by white, giving a somewhat mottled appearance; the fulvous crescents, too, are somewhat brighter; in others, again, the ground colour of the forewings is almost blackish grey, the hindwings with a considerable amount of brown in the ground tint; a few are paler grey, and both in tint and spotting very like typical Central European *A. coridon*; only some 6 ♂ s out of 60 ♂ s are of the whitish, mottled form described above, although others are near enough to be difficult to determine as to whether they should be placed here or not. The spotting of the underside comprises examples of *cinnus*, Gerh., *juncta* (via *addenda*), *semiarcuata*, etc. The ♀ s are deep fuscous brown in colour, resembling in their brownness ♀ s from Susa (Piedmont), the ♀ s of var. *hispana*, and being decidedly less blackish-fuscous than the usual Central European ♀ forms; they vary much in the development of the marginal lunules, and include the forms *subaurantia*, *peraurantia*, and *aurantia*. The short black discoidal of the forewings is well-marked, there is not one noticeable on the hindwings, and there is no blue scaling. The underside of the ♀ s is very dark grey-brown, the hindwings scarcely, if any, browner than the forewings; the spots well-developed and clearly ringed with white; one exhibits well the characters of ab. *extensa*, the 2nd-4th submedian spots elongated, the lower half of the discoidal and the upper basal lengthened, whilst the lower basal and the 7th and 8th submedian spots unite into the *biarcuata* form; two others are of the *parisiensis* form, four of the ab. *addenda* in varying degrees, one being well towards the *antico-juncta* form; it is to be further noted that occasionally they bear the complete row of eight submedian spots on the forewings; the marginal ocellations are well-developed, the orange lunules bright on the hindwings, weak on the forewings, in which, however, the grey chevrons are sometimes very strongly developed. The metallic scaling on the underside is well-developed at the base of the hindwings, blue in the ♂ s and golden in the ♀ s.

It appears that our *meridionalis* comprises examples that are referable to *rezniceki* and others to *constanti*, whilst others seem to fall quite outside either. Most of the specimens from Ste. Maxime and Draguignan agree with those described by Reverdin, but both these places also give examples that correspond with *rezniceki* in the particular pale ground colour of the underside, which forms the essential distinction between the latter form and *constanti* (*teste* Reverdin); in addition *meridionalis* includes ♂ s which have the underside ground colour much darker, and the hindwings much browner than that mentioned in either of the other descriptions. Whether, therefore, these various Rivieran forms are really racial or overlap, is a matter for future enquiry. Our remarks on *meridionalis* are based on a series of 60 ♂ s and 17 ♀ s taken at Ste. Maxime, Draguignan, and Hyères. In no way does Bartel's colour-description of ♂ *rezniceki* agree with that of var. *meridionalis*, which is pale silvery blue in tint, nor is his reference to var. *apennina* understandable, as there is no special

Apennine race of *A. coridon* (see Nat. Hist. Brit. Butts., vol. IV., pp. 22—23): the forms agree on the whole in having a broad marginal border, but *meridionalis* by no means has this in every case, that of some specimens being very narrow; nor is it, in the latter, bounded by a conspicuous row of whitish arcuate spots as described in *rezniceki*; these frequently, when present at all, divide the broad margin lengthwise, whilst in others they are quite absent. The darkening of the discoidals is far from universal in *meridionalis*, and even when marked are often very inconspicuous. The marginal spots on the hindwings are large in *meridionalis*, but not so amazingly so as Bartel's description suggests in *rezniceki*. The underside of the ♂ s of *meridionalis* is very variable, the colour is occasionally as light as described by Bartel for *rezniceki*, more often like that noted by Reverdin for *constanti*, but frequently much darker than in the latter; the forms agree in the strong development of the metallic blue scaling at the base of the hindwings, and by the spots being large, although not larger than those from certain Piedmont and French localities; they also agree in the strong development of the marginal lunules, but those of the forewings have no orange chevrons in *meridionalis*, and only very weak ones on the hindwings, whilst they are described as an almost unbroken row of red wedge-shaped spots in *rezniceki*. The ♀ s appear to be alike in their brown ground colour, but there is no distinct discoidal lunule on the hindwing in *meridionalis*, nor are the discoidals of either wings edged with pale as described in *rezniceki*; nor in *meridionalis* is there an uniform type in the development of the marginal band of orange lunules on the upperside, the normal variation in this respect being shown in a fair series of examples, whilst in none are the marginal spots edged with white as described in *rezniceki*. The ♀ forms agree again in the strongly-developed spotting of the underside, but the red lunules in *meridionalis* do not appear to be so uniformly strongly developed and brightly coloured as Bartel notes for *rezniceki*; nor do we trace any close similarity between the colouring of these and the Engadine specimens where they appear to vary a good deal locally. In size our *meridionalis* vary from—♂ s 34 mm.—41 mm., ♀ s 31 mm.—37 mm. Bartel gives those of *rezniceki*—♂ s 29 mm.—30 mm., ♀ s 29 mm.—31 mm. a difference that can hardly be due to a different mode of measurement (we measure the size of the insect from the apex to centre of thorax × 2). Rowland-Brown notes (in litt.) that he has the var. *meridionalis* from Brantes, Vaucluse, laken in May, 1907.

β. var. *rezniceki*, Bartel. „Ent. Zeits. Gub.", xviii., p. 117, (1904); Seitz, „Gross-Schmett.", i., p. 315 (1909;) Rebel, „Berge's Schmett.", 9th ed.. p. 72 (1909). — The ♂ above lighter than var. *apennina*, pale greenish-blue (greenish-silver); a fine black discoidal line on the forewing; the marginal border of the latter very broad, blackish-grey, lighter than in typical Engadine specimens, not sharply defined inwardly, but bounded by a conspicuous row of whitish arcuate spots; in some examples there appear behind these latter a row of fairly conspicuous blackish spots, which seem to be very finely edged externally with whitish. The hindwings are also very strikingly distinct, in that, in front of the black border a row of black spots is placed, which are three times as large as usual, and have a fairly broad whitish border, in consequence of which they stand out very strongly. In front of this row of spots a blackish-grey clouding, in the form of a narrow stripe, is visible; the central spots are not rarely bordered with red as occurs in ordinary *coridon* ab. *suavis*. The underside fairly light, whitish on the forewing, light grey on the hindwing, the latter with the blue-green much more extended along the inner margin and the base, and more strongly marked than in other forms. The underside is, however, more specially distinguished by the exceedingly strong spotting which gives the insect a very different facies, approaching that of *A. bellargus*; the size of the marginal row of spots is specially striking, but the lunules are also greatly increased in size; the submarginal row of red wedge-shaped spots is also very pronounced, almost unbroken. The white bordering of the spots of the hindwings, which is also fairly broad on the forewings, gives the insect a very light appearance on the underside. ♀. The characters less markedly pronounced, which is the case with other local races of *A. coridon* in this sex. but still the form is distinguishable, being lighter on the upperside than are ♀s from the Engadine, leaning strongly towards brown; the discoidal spot of both fore- and hindwings is noticeable, very slightly bordered with light; an obsolescent marginal band of red spots, edged on both sides with very faint black lunules; hindwings with strong black-bordered red spots edged on both sides with strong black-bordered red spots; the marginal spots also edged with white.

(to be continued.)

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Literaturbericht.

Im Verlag von Julius Springer in Berlin ist in 3. Auflage erschienen: Julius Gerhardt, Verzeichnis der Käfer Schlesiens (preussisch und österreichisch), geordnet nach dem Catalogus coleopterorum Europae, vom Jahre 1906, 8°, XVI, 432 pp., Mk. 10.— broschiert.

Wie der bekannte schlesische Coleopterologe in seiner Vorrede sagt, wird eine Neubearbeitung dieses Verzeichnisses nicht nur dadurch gerechtfertigt, dass seit 1891 (Zeit des Erscheinens des Schlussheftes der Käfer Schlesiens) eine Anzahl neuer schlesischer Käfer, sowie neue Fundorte schon bekannter publiziert worden sind, sondern dadurch, dass manche Fehler berichtigt und die Nomenklatur vielfach durch das Prioritätsgesetz bedingte Verbesserungen erfuhr. Auch verlangte die systematische Ordnung des neuesten 1906 erschienenen Käferkatalogs besondere Berücksichtigung. So hat sich der Verfasser zu einer 3. Auflage entschlossen, aus der wir ersehen, dass Schlesien sich zur Zeit 4457 selbständiger Käferarten erfreut. Besonders reich sind die Familien der Curculioniden und Carabiden vertreten, erstere mit 623, letztere mit 383 Spezies, sodann die Chrysomeliden mit 381 Arten, während die Staphyliniden die höchste Vertretung mit 939 aufweisen. Neben den Fundortsangaben finden sich soweit das möglich war, Notizen über die Biologie. Das Verzeichnis kann mit Recht den Coleopterologen empfohlen werden.

Beiträge zur Insekten-Fauna Böhmens. VII. Die Federmotten Böhmens (Pterophoridae und Orneodidae) von Regierungsrat Dr. Ottokar Nickerl. Herausgegeben von der Gesellschaft für Physiokratie in Prag.

Mit diesem Verzeichnis schliessen die in den Beiträgen mitgeteilten Kleinschmetterlinge. Die Pterophoriden zählen in 8 Gattungen 30 Arten, die Orneodiden in 1 Gattung 5 Arten. Auch diese Arbeit enthält neben Fundortsangaben, Notizen über Futterpflanzen, Zeit des Vorkommens etc. Sie schliesst sich den vorangegangenen bezüglich sorgfältiger Bearbeitung an.

Hétérocères nouveaux de l'Amérique du Sud par Paul Dognin.

Als selbständige Publikation erscheinend. Fasc. I bereits vorliegend, enthält eine grössere Anzahl Neubeschreibungen.

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