

the skull, and forming there a crest of considerable size on the right side only.

Unfortunately I have not access to all the necessary works of reference to inquire if this question, as to the causes, growth, and uses of asymmetry in the Toothed Whales, has already been treated by naturalists in the northern hemisphere; but it is evident, from an examination of the drawings representing the three views of the foetal Cachalot (*Catodon*) in the Museum of the Royal College of Surgeons, that the remarkable asymmetry exists already in that early stage of existence.

On the other hand I may ask, why should the *Balænidæ* have a symmetrical skull, breathing, as they do, exactly in the same manner as the Toothed Whales? Eschricht, who has described the important changes which the skulls of the *Balænidæ* undergo, has shown that they are in the foetal state quite symmetrical, although later on slight inequalities in the maxillæ are sometimes discernible.

As far as I am aware, no cognizable reason can be given to account for this asymmetry in the skull of the Toothed Whales, and we are therefore almost led to assume that some of their remote ancestors were deformed by some accident and that thus this asymmetry of the skull was inherited by their progeny to a more or less extent, because it is difficult to believe that in the struggle for existence, in the adaptation to altered circumstances and a different mode of life, this strange asymmetry could be of any vital importance.

The study of the ontogeny of this species and of the phylogeny of the family to which it belongs, and of its extinct ancestors is therefore of the highest importance in considering the question of the origin of species, because every step in that direction is a clear gain to science.

It may be possible that this point has already been treated at length by some naturalists; but I am not aware that this is the case; and my wish to draw the attention of my brother naturalists in New Zealand, and other countries where an opportunity is offered by acquiring specimens of Toothed Whales in all stages of growth to study this striking fact in osteology, has been my only motive for alluding here more fully to it than I should otherwise have done.

3. List of Diurnal Lepidoptera collected in Cashmere Territory by Capt. R. B. Reed, 12th Regt., with Descriptions of new Species. By FREDERIC MOORE, India Museum, London.

[Received March 27, 1874.]

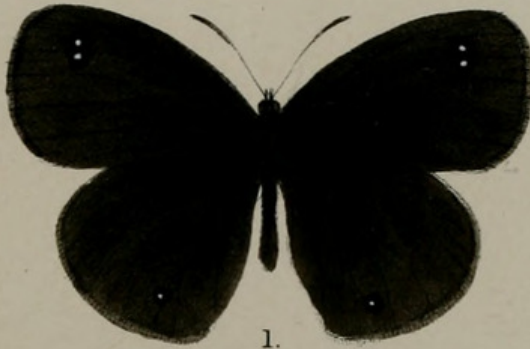
(Plate XLIII.)

The only notices hitherto published of the species of Lepidoptera known to inhabit Cashmere are those by Kollar in Hügel's 'Kashmir,' and recently by Capt. Lang of a small collection made at Goolmurg by the late Dr. Jerdon.





4.



1.



5.



6.



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7.



3.



9.

8.





Capt. Reed says, *in litt.* :—"I was on the whole much disappointed with Cashmere as a field for the entomologist; by Cashmere I mean the valley itself, where the only butterflies seen are of the commonest species. My best hunting-grounds were the ranges of hills crossed *en route* from the plains to the valley, viz. the Pir Punjal range (11400 feet), the Ruttun Pir (8200 ft.); and Soonamurg, a beautiful plateau on the Ladak road, and some 7000 feet high, afforded good sport."

Fam. NYMPHALIDÆ.

Subfam. DANAINÆ.

1. DANAIS AGLEA, Cram. Pap. Exot. t. 377. f. E.
2. DANAIS LIMNIACÆ, Cram. *l. c.* t. 377. f. C, D.
3. DANAIS CHRYSIPPUS, Linn.; Cram. *l. c.* t. 118. f. B, C.
4. DANAIS PLEXIPPUS, Linn.; Cram. *l. c.* t. 206. f. C, D.
5. EUPLCÆA CORE, Cram. *l. c.* t. 266. f. E, F.

Subfam. SATYRINÆ.

6. LETHE DYRTA, Feld. Reise Novara, Lep. iii. p. 497.
7. AMECERA SCHAKRA, Kollar, Hügel's Kasch. iv. p. 446, t. 15. f. 3, 4.
8. EPINEPHILE MAIZA, Lang, Ent. Monthly Mag. 1868, p. 36, ♀. (Plate XLIII. fig. 6, ♂).

*Male.* Upperside dark brown: fore wing with a small, scarcely perceptible ocellus. Underside ferruginous brown: fore wing with the discal portion clear ferruginous, traversed by the dark veins and crossed by an angular discal band; a small subapical ocellus, distinct, iris yellow, white-pupilled: hind wing with a small subbasal ferruginous patch, and an irregular transverse discal series of yellowish spots.

*Female* differs only in having two small distinct ocelli on upperside of fore wing, each with bright yellow iris, but without white pupil.

Exp.  $1\frac{1}{2}$  inch.

*Hab.* Goolmurg; common.

9. EPINEPHILE NEOZA, Lang, *l. c.* p. 35.

*Hab.* Goolmurg.

10. PARARGE CASHMIRENSIS, n. sp. (Plate XLIII. fig. 3.)

*Male.* Upperside ochreous yellow, brownish at the base; cilia yellowish white, spotted with black: fore wing with a black dentate discocellular streak and a dark ochreous-black exterior border, the inner margin of which commences one third before the apex and curves half round a subapical white-pupilled black spot, and thence attenuates to posterior angle: hind wing with a broad ochreous



brown exterior border with waved inner margin, contiguous to which are three black spots, each with a white pupil, the middle spot being the largest and the anterior the smallest.

*Female* differs in having two subapical spots and a broad discocellular patch on fore wing, and a fourth smaller anterior spot on hind wing.

*Underside*: fore wing paler ochreous, markings as in upperside, but greyish brown and with three narrow brown transverse streaks within the cell, and an irregular streak beyond it; two bright white-pupilled subapical spots, the upper one small, beneath which is a white dot, all being encompassed by a brownish line: hind wing with greyish-brown base and exterior border, the disk being whitish grey, the division marked by a dark brown irregular zigzag inner line and a wavy outer line; within this discal portion is a series of six round bright black spots, each having a white pupil (the basal two) and encircled by a yellow and a narrow brown outer ring, the second and third anterior spots being small, the others of equal size.

Exp. ♂ 2, ♀  $2\frac{2}{10}$  inches.

*Hab.* Goolmurg, Cashmere.

*Note.* The nearest ally to this species is *P. evermanni* from Central Asia, figured in the Moscow Bulletin for 1847.

#### 11. CALLEREBIA DAKSHA, n. sp. (Plate XLIII. fig. 1.)

*Male and female.* Upperside dark brown: fore wing with a small subapical black-bipupilled ocellus: hind wing with a smaller subanal black spot, having a single white pupil; a white dot beyond it on the middle of the disk, some specimens showing also an intermediate dot.

*Underside* slightly paler, but uniform brown: fore wing with a pale ferruginous ring encircling the subapical ocellus, beneath which is a minute white dot: hind wing with a pale ferruginous ring encircling the subanal black spot; a minute anal and a transverse discal series of five prominent white dots, which in some specimens appear on a black spot with a ferruginous ring.

Exp. ♂  $1\frac{6}{8}$ , ♀  $1\frac{7}{8}$  inch.

*Hab.* Goolmurg, Cashmere.

This is the smallest species of the genus yet described, and may be distinguished on the upperside by the absence of the ferruginous ring round the ocellus, on the underside by being of a uniform colour and without mottlings on hind wings.

#### 12. AULOCERA SWAHA, Kollar, Hügel's Kasch. iv. pl. 14. f. 1, 2.

These are brighter-coloured than specimens from Simla, and have the maculated band on fore wing clear chrome-yellow.

#### 13. AULOCERA SARASWATI, Kollar, Hügel's Kasch. iv. pl. 14. f. 3, 4.

#### 14. AULOCERA WERANGA, Lang, Ent. Monthly Mag. 1868, p. 247.

The smallest species of the genus.



15. *MELANITIS ISMENE*, Cram. Pap. Exot. i. pl. 26. f. A, B.

16. *MELANITIS BELA*, Moore, Catal. Lep. Mus. E. I. C. i. p. 223.

This is a very distinct species, and is confined to the N.W. Himalayas.

Subfam. *ACRÆINÆ*.

17. *PAREBA VESTA*, Fabr. ; Donovan. Ins. t. 30. f. 1.

*Acræa anomala*, Kollar, Hügel's Kasch. iv. pl. 3. f. 3, 4.

Subfam. *NYMPHALINÆ*.

18. *ATELLA PHALANTA*, Drury, Ill. Exot. Ins. i. t. 21. f. 1, 2.

19. *ARGYNNIS CHILDRENI*, Gray, Lep. Nepal, t. 11.

20. *ARGYNNIS KAMALA*, Moore, Catal. Lep. E. I. C. i. p. 156.

21. *ARGYNNIS JAINADEVA*, Moore, P. Z. S. 1865, t. 30. f. 1.

22. *ARGYNNIS RUDRA*, Moore, Catal. E. I. C. i. p. 157.

23. *ARGYNNIS NIPHE*, Linn. ; Cram. Pap. Exot. t. 14. f. B-E.

24. *ARGYNNIS ISSÆA*, Gray, Lep. Ins. Nepal, p. 11.

25. *ARGYNNIS CASHMIRENSIS*, n. sp. (Plate XLIII. fig. 4.)

*Male and female.* Upperside bright ferruginous, markings black and very prominent: fore wing with the costa, base, and hind margin brown; three lunular marks within and an outward curved streak closing the cell; a dentate lunule below the cell; a transverse discal confluent zigzag series of spots; a suffused subapical patch; a submarginal recurved row of broad oval spots; a marginal row of dentate spots, and narrow exterior line which is angled on the veins: hind wing with the base brown, indistinctly streaked with black, and bordered by a distinct black zigzag lunular band; the outer portion marked as in fore wing; cilia alternate white and black.

Underside: fore wing fulvous, apex and exterior border streaked with yellow; markings narrower and less defined; anterior spots in submarginal and marginal rows with white dots; a black patch at base of hind margin: hind wing dark ferruginous; disk clouded with yellow; two small pearly-white streaks at base of wing, one above the other below the cell; a small black narrow streak at base and a white-bordered black spot within the cell; a curved median transverse band with irregular black angulated borders, composed of three pearly-white portions and yellow intervening spaces, the former disposed thus—(1) between the costal and subcostal, (2) at end of the cell and divided by the discocellular, (3) between the first and second median, the first and third being much constricted; a submarginal series of six white-centred black spots; a marginal row of pearly-white quadrate spots, each well separated by a dark ferruginous streak, and bordered interiorly with a narrow blackish dentate lunule. Body above blackish brown, beneath and legs dark yellow.



Exp. ♂  $1\frac{3}{8}$ , ♀  $1\frac{5}{8}$  inch.

*Hab.* Soonamurg, N.E. of Cashmere valley.

This species belongs to the "*Selene*" group, and is allied to *A. jerdoni*, Lang, from Goolmurg, on S.W. side of the valley.

26. *MELITÆA BALBITA*, n. sp. (Plate XLIII. fig. 5.)

*Male.* Upperside bright fulvous; markings prominent; cilia pale yellow, alternating with black; costal edge and veins black; base of wings and hind margins fuliginous black; both wings with a broad exterior marginal black band, traversed by prominent fulvous dentiform lunules: fore wing with a black constricted mark within the cell, a streak at the end, a short longitudinal streak below it from base of wing, and two transverse discal series of spots (the inner row being the largest): hind wing with black subbasal irregular transverse series of lunular marks.

Underside paler: fore wing with the veins fulvous; costa and exterior margin yellow; markings not prominent; cilia as above: hind wing with black veins; a basal band, a prominent discocellular spot, a broad curved discal band, and a marginal series of broad lunules yellow, all bordered by a black line; the discal band traversed by a blackish irregular line, the interbasal space bright fulvous, and the interdiscal space yellow, with bright fulvous spots; extreme outer margin and cilia yellow.

*Female.* Upperside dull, clouded fulvous; cilia paler; markings broader, confluent, the base of the wings more broadly dusky black, the interdiscal space somewhat yellow, and the marginal dentiform lunules more or less yellow. Underside as in male, excepting that the exterior marginal lunules of fore wing, and the basal, discal, and marginal band of lunules, as well as the discocellular spot of the hind wing is glossy yellow or dull silvery white.

Exp. ♂  $1\frac{4}{8}$ , ♀  $1\frac{6}{8}$  inch.

*Hab.* Soonamurg, N.E. Cashmere.

The nearest European ally of this species is *M. athalia*.

27. *SYMBRENTHIA HYPOCLA*, Cram. Pap. Exot. iii. t. 220. f. C, D.

28. *SYMBRENTHIA HYSUDRA*, n. sp. (Plate XLIII. fig. 8.)

*Male.* Differs from *S. hypselis* (figured by Boisduval and Doubleday) in being smaller, the hind wings more rounded exteriorly and shorter hindward. On the upperside the bands are of an orange-yellow, much broader and with irregular sinuous margins, the band from the hind margin of fore wing being joined to the subapical and extending thence inwards to the costa, from which a small streak ascends to near the apex; on the hind wing the submarginal band is narrower, has an even outer edge, and extends to very near the anterior angle; a narrow marginal line runs from anal to anterior angle. On the underside the tessellations are different but prominent; the submarginal band on hind wing is formed of short black transverse streaks, the second and third spaces only tinged with



metallic greyish blue; a short black anal spot and two greyish-blue-streaked black-bordered lunules from caudal angle.

Exp.  $1\frac{7}{8}$  inch.

Hab. Cashmere.

29. SYMBRENTHIA ASTHALA, n. sp. (Plate XLIII. fig. 9.)

*Male.* Differs from *S. hypselis* in being much smaller. On the upperside the bands are of the same orange-red colour, but of a different shape and broader, the oblique subapical streak of fore wing being lengthened and extending nearly across the apex. On the underside the colour is nearly uniform orange-yellow, the tessellations somewhat different and the submarginal band composed of imperfectly formed conical lunules, partly dashed with metallic green; lunules from anal angle to tail similar to those in *S. hypselis*.

Exp.  $1\frac{6}{8}$  inch.

Hab. Cashmere.

30. VANESSA CASHMIRENSIS, Kollar, Hügel's Kasch. iv. p. 442, t. 11. f. 3, 4.

31. VANESSA XANTHOMELAS, Denis, W. V. p. 175.

32. VANESSA CHARONIA, Drury, Ill. Exot. Ent. i. t. 15. f. 1, 2.

33. GRAPTA C-ALBUM, Linn. S. N. i. p. 778.

34. PYRAMEIS CARDUI, Linn.; Esp. Schmett. i. t. 10. f. 3.

35. PYRAMEIS INDICA, Herbst, Nat. Schmett. vii. t. 180. f. 1, 2 (*callirhoë*, Hübn.).

36. JUNONIA LEMONIAS, Linn.; Cram. Pap. Exot. i. pl. 35. f. D-F.

37. JUNONIA ÆNONE, Linn.; Cram. l. c. i. t. 35. f. A-C.

38. JUNONIA ORITHYIA, Linn.; Cram. l. c. i. t. 19. f. C, D, t. 32. f. E, F.

39. JUNONIA ASTERIE, Linn.; Cram. l. c. i. t. 58. f. D, E.

40. JUNONIA ALMANA, Linn.; Cram. l. c. i. t. 58. f. F, G.

41. PRECIS IPHITA, Cram. l. c. iii. t. 209. f. C, D.

42. PRECIS WEDAH, Kollar, Hügel's Kasch. iv. p. 437.

*Precis hara*, Moore, Catal. E. I. C. t. 3a. f. 1.

43. KALLIMA INACHIS, Boisd.; Cuv. Règ. Anim., Ins. ii. t. 139. f. 3.

*Kallima hügelii*, Kollar, Hügel's Kasch. iv. t. 9.

44. CYRESTIS THYODAMUS, Boisd.; Cuv. Règ. Anim., Ins. ii. t. 138. f. 4.

*Cyrestis ganescha*, Kollar, Hügel's Kasch. iv. t. 7. f. 3, 4.



45. *DIADEMA BOLINA*, Linn. Mus. Ulr. p. 295 (1764); Clerck, Icon. t. 21. f. 2.

46. *DIADEMA JACINTHA*, Drury, Ill. Exot. Ent. ii. pl. 21. f. 1, 2 (1773), ♀.

*Diadema avia*, Fabr. Ent. Syst. iii. 1. p. 111 (1793).

47. *HESTINA NAMA*, Doubleday, Gen. D. Lep. t. 39. f. 2.

48. *EURIPUS CONSIMILIS*, Westw. Gen. D. Lep. p. 281, ♀.

*Euripus hallirothius*, Westw. l. c. p. 293, ♂.

49. *LIMENITIS HYDASPES*, n. sp. (Plate XLIII. fig. 2.)

*Male and female.* Upperside dark rufous brown; both wings with a transverse discal series of small oval white spots, and two submarginal rows of prominent dentate ochrey red spots, which are parallelly joined together by an intermediate row of dentate black spots, the outer row being also bordered by a black lunule; a narrow black and a white streak within, and a ochrey red streak closing the cell; two ochrey white spots before the apex. Underside bright ochrey yellow, the discal maculated band and streak in cell, as above, black-bordered; middle of the wings, outside the discal band, and a marginal series of lunules ochrey red; two black lunules near posterior angle of fore wing.

Exp. ♂  $2\frac{2}{8}$ , ♀  $2\frac{3}{8}$  inches.

*Hab.* Common about Cashmere.

NOTE. *L. ligyes* (Hewits.) may be distinguished from this species in being of a dark or somewhat greenish-brown colour, the discal maculated band being formed of larger spots, the submarginal series of black dentate spots being bordered outwardly by a whitish (sometimes slightly fulvous white) dentate spot, and outer or marginal hardly apparent blackish lunules; the underside is paler, and has more black diffused along the borders of the discal bands.

*L. trivena* (Moore) may also be known by its much paler brown colour, and the very broad discal transverse band, which occupies nearly one third of the wing, the underside being also of a very pale yellow. *L. ligyes* is apparently confined to the Kumaon district, and *L. trivena* to the Simla district of the N. W. Himalaya.

49\*. *LIMENITIS DANAVA*, Moore, Catal. Lep. E. I. C. i. p. 180, t. 6 a. f. 2.

50. *NEPTIS ANANTA*, Moore, Catal. Lep. E. I. C. p. 166, t. 4 a. f. 3, ♂.

*Hab.* Ruttun Pir.

The male only of this species was hitherto known; the female in no way differs from the male, except in being larger.

51. *NEPTIS AMBA*, Moore, P. Z. S. 1858, p. 7, t. 49. f. 4.

*Hab.* Ruttun Pir.

52. *NEPTIS ASTOLA*, Moore, P. Z. S. 1872, p. 560.



53. *ATHYMA LEUCOTHÖE*, Linn.; Cram. Pap. Exot. iii. t. 203. f. E, F.

54. *ATHYMA OPALINA*, Kollar, Hügel's Kaschm. iv. p. 427; Moore Catal. Lep. E. I. C. i. t. 5 a. f. 2.

55. *APATURA NAMOUNA*, Doubleday, Ann. Nat. Hist. 1845, xvi. p. 178.

*Apatura ambica*, Kollar, l. c. t. 8. f. 3, 4.

56. *DILIPA MORGIANA*, Westw.; Moore, Catal. Lep. E. I. C. i. t. 6 a. f. 5.

57. *CASTALIA DICHROA*, Kollar, Hügel's Kaschm. iv. t. 8. f. 1, 2.

58. *CHARAXES ATHAMAS*, Drury, Ill. i. t. 2. f. 4.

Fam. ERYCINIDÆ.

Subfam. LIBYTHÆINÆ.

59. *LIBYTHEA LEPITA*, Moore, Catal. Lep. E. I. C. p. 240.

Subfam. NEMEOBIINÆ.

60. *DODONA DURGA*, Kollar, Hügel's Kasch. iv. t. 13. f. 3, 4.

Fam. LYCÆNIDÆ.

61. *CHRYSOPHANUS PHLÆAS*, Linn.

*Chrysophanus chinensis*, Feld. Verh. zool.-bot. Ges. xii. p. 488.

62. *CHRYSOPHANUS PAVANA*, Kollar, Hügel's Kasch. iv. t. 5. f. 5, 6.

63. *CHRYSOPHANUS KASYAPA*, Moore, P. Z. S. 1865, p. 506, t. 31. f. 10.

64. *CHRYSOPHANUS ZARIASPA*, n. sp.

*Male*. Allied to *C. kasyapa*, but is a smaller insect and differs on the upperside in having the black spots smaller and the marginal borders broader, the latter being suffused inwardly with purplish blue, this colour in certain lights pervading the entire wings. On the hind wing the spots are preceded by bluish-black streaks pointing inwards. On the underside the spots are also smaller, and the coppery red bordering the three spots at the posterior angle is much brighter.

Exp.  $1\frac{1}{8}$  inch.

*Hab*. Soonamurg, N.E. Cashmere.

65. *POLYOMMATUS ARIANA*, Moore, P. Z. S. 1865, t. 31. f. 2.

66. *POLYOMMATUS GALATHEA*, Blanch. Jacq. Voy. Inde. iv. t. 1. f. 5, 6.

*Hab*. Soonamurg.

67. *POLYOMMATUS KASMIRA*, Moore, P. Z. S. 1865, t. 31. f. 1.



68. *POLYOMMATUS CHANDALA*, Moore, P. Z. S. 1865, p. 504, t. 31. f. 5.

69. *SCOLITANTIDES CASHMIRENSIS*, n. sp.

*Male*. Upperside pale greyish blue, slightly glossed with purple; veins blackish; both wings with a black discocellular lunule and a blackish exterior margin, the latter bordered inwardly by whitish lunules, which are most prominent on margin of hind wing, where they encircle a series of black spots; cilia alternate white and black. Underside pale cream-colour: fore wing with a pale black exterior marginal series of narrow spots, a decreasing submarginal series of darker spots, an irregular discal series of quadrate black spots, a discocellular spot, two spots within the cell and a small spot below it, disposed in a triangle: hind wing with a marginal double row of black spots, which are joined together by an intervening parallel series of bright orange spots; a curved discal series of seven rounded black spots, three spots on anterior margin, a discocellular lunule, and two small subbasal spots.

*Female*. Upperside dark fuliginous black, with a purplish gloss and blue scales scattered from the base.

Exp. ♂  $1\frac{1}{12}$ , ♀  $1\frac{1}{8}$  inch.

*Hab*. Soonamurg, N.E. Cashmere.

Allied to *S. hylas* and *S. vicrama*.

70. *THECLA DERIA*, Moore, P. Z. S. 1865, t. 31. f. 11.

71. *DIPSAS ODATA*, Hewits. Ill. D. Lep. p. 66, t. 30. f. 13, 14.

72. *APHNÆUS ICTIS*, Hewits. *l. c.* t. 25. f. 8, 9.

73. *LYCÆNA BÆTICA*, Linn. S. N. ii. p. 789.

74. *LYCÆNA DIPORA*, Moore, P. Z. S. 1865, p. 506, t. 31. f. 8.

75. *LYCÆNA NARA*, Kollar, Hügel's Kasch. iv. p. 421.

76. *DEUDORIX SELIRA*, n. sp.

*Male and female*. Upperside blackish brown, suffused with bluish purple; cilia dull yellow: fore wing with a large quadrate orange-red discal patch: hind wing with a broad orange-red exterior marginal band crossed by the dark veins. Underside pale fawn-colour; both wings crossed by a brown discal narrow band with white outer border: hind wing with a white marginal line, a small subanal black spot bordered with red, and a large black anal spot bordered with white.

Exp. ♂  $1\frac{3}{12}$ , ♀  $1\frac{4}{12}$  inch.

*Hab*. Cashmere.

Allied to *D. nissa*, Kollar, and figured as its female in Hewits. Ill. D. Lep. pl. 10. f. 44.

77. *DEUDORIX EPIJARBAS*, Moore, Catal. E. I. C. i. p. 32; Hewits. Ill. D. Lep. t. 7. f. 16-18.

78. *AMBLYPODIA RAMA*, Kollar, Hügel's Kaschm. iv. t. 4. f. 1, 2.





Moore, Frederic. 1874. "List of Diurnal Lepidoptera collected in Cashmere Territory by Capt. R. B. Reed, 12th Regt., with Descriptions of new Species." *Proceedings of the Zoological Society of London* 1874, 264–274.

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