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No 11

PEOPLES COLLEGE
No 656
NORWICH.

James Thomson
Paris, 25 Mai, 1860

Contents.

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by John Reinhold Forster. - 1770.
2. Nova species Insectorum,
Centuria I. à J. R. Forstero. - 1771.
3. The English Lepidoptera: &
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4. Instructions for collecting &
preserving Insects. (Carter.) - 1771.
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Companion . . . (D. Lelforne) 1772.

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Bibliothèque
d'Histoire Naturelle
du Dr Maurice ROYER

M No 253

(A)

CATALOGUE
OF
BRITISH
INSECTS.

By JOHN REINHOLD FORSTER, F.A.S.

WARRINGTON:

PRINTED by WILLIAM EYRES.

MDCCLXX.

1770

THE author of this catalogue intends to publish a *Fauna of British Insects*; and as he thinks not to set out upon it, till he can offer to the public a work, as little imperfect as possible, and to give no other descriptions than from ocular inspection: he presents his most respectful compliments to all ladies and gentlemen who collect insects, and begs them to favour him, if possible, with specimens of such insects, as they can spare, and which he is not possessed of: for this purpose he has made this catalogue, and put no mark to the insects in his possession; those which he has so plentifully as to be enabled to give some of them to other collectors, are marked with a (*d*); those which he has not, are marked either *Berk.* signifying *Dr. Berkenhout's Outlines of the Natural History of Great Britain*; or *B.* signifying a manuscript catalogue of *British Insects* communicated to the author; or *B. B.* which signifies *Berkenhout*, together with the manuscript catalogue. *N S.* is put to such insects as have not yet been described by *Dr. Linnæus*, and are *new species* with new specific names. If therefore the author should be so happy as to be favoured with specimens, he will acknowledge the favour publicly, and give in return to any collector who desires to exchange, such insects as he can spare. This catalogue contains 1000 insects; the *Swedes* have near 1700, it would therefore be an honour to this country, to scrutinize carefully into the various branches of *Natural History*, and to give the public as perfect and extensive catalogues of *British Animals* as possible. The four first classes, containing *Quadrupeds*, *Birds*, *Reptiles* and *Fish*, have been so well and perfectly described by *Thomas Pennant Esq*; that it would be a disparagement, if the insects should be described defectively. But as *Mr. Pennant* has given up this branch to the author, he will do his utmost to give his work all the perfection which lies in his power. Therefore he takes this opportunity to shew the ladies and gentlemen collectors, how far he is gone by three years assiduous collecting in the neighbourhood of *Warrington*, and to enable at the same time the spirited and patriotic promoters of knowledge, and especially of *Natural History* in *Great Britain*, to contribute towards perfecting the *Natural History* of their own country.

DRAWINGS and scientific descriptions of such insects as are not yet described by *Linnæus* will be still more acceptable, and engage the publisher's thanks and acknowledgments.

WARRINGTON,
August the 1st.
1770.

MDCCXX

CATALOGUE

O F

BRITISH INSECTS.

I. COLEOPTERA.

1. SCARABÆUS.

24 24 Nobilis. Berkenh.

1 1 TYPHÆUS.

25 25 Rufipes.

2 2 Lunaris. B. B.

2. LUCANUS.

3 3 Cylindricus. d.

26 1 Cervus. B. B.

4 4 Nuchicornis.

27 2 Parallelepipedus.

5 5 Vacca. B.

28 3 Caraboides. Berkenh.

6 6 Erraticus. B.

7 7 Fossor.

3. DERMESTES.

8 8 Fimetarius. d.

29 1 Lardarius.

9 9 Hæmorrhoidalis. B.

30 2 Undatus. B.

10 10 Conspurcatus.

31 3 Pellio.

11 11 Stercorarius. d.

12 12 Vernalis. Berkenh.

32 4 Violaceus. B.

13 13 Ovatus. B.

33 5 Feneſtralis.

14 14 Sabulosus.

34 6 Melanocephalus. B.

15 15 Fullo. B.

35 7 Domesticus. Berkenh.

16 16 Horticola. d.

36 8 Scarabæoides. d.

17 17 Melolontha. d.

37 9 Murinus. B.

18 18 Solstitialis. B. B.

38 10 Fumatus.

19 19 Occidentalis. B.

39 11 Pulicarius. Berkenh.

20 20 Hemipterus. Berkenh.

40 12 Psyllius. B.

21 21 Brunnus.

41 13 Scanicus. B.

22 22 Auratus. B. B.

42 14 Colon.

23 23 Quisquilius.

A 2

4. HISTER.

4. HISTER.

- 43 1 Unicolor.
 44 2 Pygmæus.
 45 3 Bimaculatus.
 46 4 *Striatus*. N S.

- 74 2 *Murræa*. B.
 d. 75 3 *Nebulosa*. B. B.
 76 4 *Nobilis*. B. B.
 77 5 *Maculata*. B. B.
 78 6 *Pallida*. N S.

5. CISTELA.

A Genus not in *Linnaeus*, and
 only taken from *Geoffroy*.

- 47 1 *Fasciata*. N S. Geoff. 1. d.
 48 2 *Pustulata*. N S. Geoff. 2.
 49 3 *Nigra*. N S. Geoff. 3.
 50 4 *Striata*. N S.
 51 5 *Sericea*. N S.

6. BYRRHUS.

- 52 1 *Scrophulariæ*. Berk.
 53 2 *Verbasci*.

7. GYRINUS.

- 54 1 *Natator*.

8. SILPHA.

- 55 1 *Germanica*.
 56 2 *Vespillo*.
 57 3 *Bipustulata*. B. B.
 58 4 4-*Pustulata*. B. B.
 59 5 *Littoralis*.
 60 6 *Atrata*.
 61 7 *Thoracica*.
 62 8 4-*Punctata*.
 63 9 *Opaca*.
 64 10 *Rugosa*.
 65 11 *Sabulosa*. B. B.
 66 12 *Obscura*.
 67 13 *Rufipes*.
 68 14 *Aquatica*.
 69 15 *Colon*. B.
 70 16 *Grisea*. B.
 71 17 *Pulicaria*. Berkenh.
 72 18 *Pedicularia*. B.

9. CASSIDA.

- 73 1 *Viridis*.

10. CURCULIO.

- 79 1 *Alliariæ*.
 80 2 *Cyaneus*. B. B.
 81 3 *Badensis*.
 82 4 *Aterrimus*.
 83 5 *Cerasi*.
 84 6 *Pruni*. Berkenh.
 d. 85 7 *Acridulus*. B. B.
 86 8 *Purpureus*. B. B.
 87 9 *Fumentarius*.
 88 10 *Granarius*. Berkenh.
 89 11 *Dorsalis*. Berkenh.
 90 12 *Pini*. Berkenh.
 91 13 *Lapathi*.
 d. 92 14 *Scaber*.
 93 15 *Quercus*. Berkenh.
 94 16 *Vincariæ*. Berkenh.
 95 17 *Ulicis*. N S.
 d. 96 18 5-*Maculatus*. B. B.
 97 19 *Pericarpus*. Berk.
 98 20 *Anguinus*.
 99 21 *Bacchus*.
 100 22 *Betulæ*.
 d. 101 23 *Populi*.
 d. 102 24 *Alni*. B. B.
 103 25 *Rufulus*. N S.
 104 26 *Salicis*.
 105 27 *Fagi*. B. B.
 d. 106 28 *Beccabungæ*. Berk.
 107 29 *Obscurus*. N S.
 d. 108 30 *Pemorum*.
 109 31 *Germanus*. B.
 110 32 *Nucum*. B. B.
 111 33 *Rumicis*.
 112 34 *Scrophulariæ*. d.
 113 35 *Similis*. N S. d.
 114 36 *Dissimilis*. N S. d.
 115 37 4-*Guttatus*. N S. d.

116	38	<i>Pollinarius</i> . N S.	148	6	9-Punctata.
117	39	<i>Longimanus</i> . N S.	149	7	11-Punctata.
118	40	<i>Druparum</i> .	150	8	12-Punctata. B.
119	41	<i>Violaceus</i> . B.	151	9	13-Punctata.
120	42	<i>Tortrix</i> . Berk.	152	10	13-Maculata. N S. d.
121	43	<i>Lineatus</i> .	153	11	14-Punctata.
122	44	<i>Incanus</i> .	154	12	16-Punctata. Berk.
123	45	<i>Melanogrammus</i> . N S.	155	13	19-Punctata. d.
124	46	<i>Nebulosus</i> . Berkenh.	156	14	22-Punctata.
125	47	<i>Exfoletus</i> . N S. d.	157	15	25-Punctata.
126	48	<i>Ligustici</i> .	158	16	Conglobata. Berkenh.
127	49	<i>Ovatus</i> .	159	17	14-Guttata. d.
128	50	<i>Cervinus</i> .	160	18	2-Pustulata.
129	51	<i>Oblongus</i> .	161	19	4-Pustulata. d.
130	52	<i>Pyri</i> .	162	20	6-Pustulata.
131	53	<i>Argentatus</i> .	163	21	10-Pustulata. d.
			164	22	<i>Pantherina</i> . B.

11. ATTELABUS.

132	1	<i>Coryli</i> . Berkenh.
133	2	<i>Avellanæ</i> . d.
134	3	<i>Curculionoides</i> .
135	4	<i>Betulæ</i> . d.

12. CLERUS

Of *Geoffroy*; with *Linnaeus* they are species of *Atelabi*.

136	1	<i>Apiarius</i> . B. B.
137	2	<i>Formicarius</i> . B. B.
138	3	<i>Mollis</i> . B.
139	4	<i>Pilosus</i> . N S.
140	5	<i>Cylindricus</i> . N S.

13. ANTHRIBUS,

A genus not in *Linnaeus*, and in *Geoffroy* only.

141	1	<i>Fasciatus</i> . N S. Geoff. 1.
142	2	<i>Nebulosus</i> . N S. Geoff. 2.

14. COCCINELLA.

143	1	<i>Unipunctata</i> . B.
144	2	<i>Bipunctata</i> . d.
145	3	5-Punctata. B. B.
146	4	6-Punctata. B.
147	5	7-Punctata. d.

15. PTINUS.

165	1	<i>Pectinicornis</i> . B. B.
166	2	<i>Pertinax</i> . Berk.
167	3	<i>Mollis</i> . Berk.
168	4	<i>Imperialis</i> . B.
169	5	<i>Fur</i> . d.

16. BRUCHUS.

170	1	<i>Granarius</i> . B.
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17. CHRYSOMELA.

171	1	<i>Tanaceti</i> .
172	2	<i>Hæmorrhoidalis</i> . B.
173	3	<i>Graminis</i> . B. B.
174	4	<i>Ænea</i> . B.
175	5	<i>Alni</i> . d.
176	6	<i>Betulæ</i> . d.
177	7	<i>Hæmoptera</i> .
178	8	<i>Cerasi</i> .
179	9	<i>Padi</i> .
180	10	<i>Armoraciæ</i> . B.
181	11	<i>Cerealis</i> . Berkenh.
182	12	<i>Fastuosa</i> .
183	13	<i>Vitellinæ</i> . d.
184	14	<i>Polygoni</i> . B. B.
185	15	<i>Pallida</i> .

- 186 16 *Staphylea*. *d.* 228 5 *Flava*.
 187 17 *Polita*. *d.* 229 6 *Tessacea*. N S.
 188 18 *Hyperici*. N S. *d.* 230 7 *Melanopa*. N S.
 189 19 *Populi*. 231 8 *Fasciata*. N S.
 190 20 10-Punctata. *B.* 232 9 *Clavicornis*. N S.
 191 21 *Boleti*. *B.*
 192 22 *Sanguinolenta*. *B. B.* 19. CANTHARIS.
 193 23 *Olivacea*. N S. *d.* (Meloë of Linnæus.)
 194 24 *Marginata*. *d.* 233 1 *Proscarabæus*.
 195 25 *Marginella*. *d.* 234 2 *Veficatoria*. *B.*
 196 26 4-Punctata. *B. B.* 235 3 *Floralis*. *B.*
 197 27 2-Punctata. *Berk.*
 198 28 *Sericea*. *d.* 20. TENEBRIO.
 199 29 *Merdigera*. *B.* 236 1 *Molitor*. *B. B.*
 200 30 *Cratægi*. N S. 237 2 *Culinaris*.
 201 31 *Capræ*. 238 3 *Fossor*.
 202 32 *Nymphææ*. *d.* 239 4 *Pallens*.
 203 33 *Cyanella*. 240 5 *Mortifagus*. *B. B.*
 204 34 *Melanopa*. 241 6 *Cæruleus*.
 205 35 *Flavipes*. 242 7 *Violaceus*. N S.
 206 36 12-Punctata. *Berk.* 243 8 *Rostratus*.
 207 37 *Phellandrii*. *B. B.*
 208 38 *Asparagi*. *B. B.* 21. DYTISCUS.
 209 39 *Ceramboides*. *B.* 244 1 *Latissimus*. *Berk.*
 210 40 *Hirta*. 245 2 *Marginalis*.
 211 41 *Elongata*. *B.* 246 3 *Semistriatus*.
 212 42 *Oleracea*. 247 4 *Striatus*.
 213 43 *Chrysocephala*. 248 5 *Cinereus*.
 214 44 *Hyoscyami*. 249 6 *Sulcatus*.
 215 45 *Atricilla*. 250 7 *Maculatus*.
 216 46 *Erythrocephala*. 251 8 *Bipustulatus*.
 217 47 *Helxines*. 252 9 *Uliginosus*.
 218 48 *Exfoleta*. 253 10 *Granularis*.
 219 49 *Nitidula*. *d.* 254 11 *Minutus*. *B.*
 220 50 *Nemorum*. 255 12 *Piceus*. *B. B.*
 221 51 *Fuscicornis*. *B.* 256 13 *Caraboides*. *B. B.*
 222 52 *Xanthogona*. N S. 257 14 *Scarabæoides*. *B.*
 223 53 *Thoracica*. N S. 258 15 *Fuscipes*. *Berkenh.*

18. MORDELLA.

- 224 1 *Aculeata*. *B. B.*
 225 2 *Humeralis*.
 226 3 *Frontalis*.
 227 4 *Thoracica*.

22. CARABUS.

- 259 1 *Coriaceus*.
 260 2 *Granulatus*.
 261 3 *Hortenfis*.

- 262 4 Leucophthalmus.
 263 5 Clatratus.
 264 6 Violaceus. B B.
 265 7 Sycophanta. B
 266 8 Crepitans. B B.
 267 9 Cyanocephalus.
 268 10 Melanocephalus.
 269 11 Ferrugineus.
 270 12 Germanus.
 271 13 Vulgaris.
 272 14 Cupreus.
 273 15 Piceus.
 274 16 Velox.
 275 17 Cærulefcens.
 276 18 Ustulatus.
 277 19 Crux minor.
 278 20 Sexpunctatus. Berk.

23. CICINDELA.

- 279 1 Campestris.
 280 2 Hybrida. B.
 281 3 Riparia.
 282 4 Flavipes.
 283 5 Aquatica.

24. BUPRESTIS.

- 284 1 Chrysostigma. Berk.
 285 2 Ruflica.
 286 3 Minuta. B.
 287 4 Viridis. B.
 288 5 Granularis. Berk.
 289 6 Fuliginosa. N S.

25. ELATER.

- 290 1 Bipustulatus.
 291 2 Brunneus.
 292 3 Ruficollis. Berk.
 293 4 Mesomelus.
 294 5 Castaneus.
 295 6 Livens. B.
 296 7 Sangiuneus. Berk.
 297 8 Balteatus. B B.
 298 9 Sputator. B.
 299 10 Obscurus.
 300 11 Murinus.

- 301 12 Testellatus.
 302 13 Æneus.
 303 14 Pectinicornis.
 304 15 Niger.
 305 16 Linearis.

26. LAMPYRIS.

- 306 1 Noctiluca.
 N. B. The author has not got the males of this species.
 307 2 Coccinea. d.

27. MALACOPTERYX.

(Cantharis of Linnæus)

- 308 1 Fuscus. d.
 309 2 Lividus. d.
 310 3 Obscurus. d.
 311 4 Æneus. d.
 312 5 Bipustulatus. d.
 313 6 Rufus.
 314 7 Fasciatus. Berkenh.
 315 8 Biguttatus. Berkenh.
 316 9 Minimus.
 317 10 Testaceus. B.
 318 11 Cæruleus. B.
 319 12 Melanurus. d.
 320 13 Navalis.

28. LEPTURA.

- 321 1 Aquatica. d.
 322 2 Melanura. d.
 323 3 Rubra.
 324 4 Testacea.
 325 5 Virens. Berkenh.
 326 6 Sexmaculata. B.
 327 7 4-Fasciata. B.
 328 8 Attenuata. d.
 329 9 Mystica.
 330 10 Arcuata. B.
 331 11 Præusta. B. B.
 332 12 Arietis. d.

29. CERAMBYX.

- 333 1 Coriarius. B. B.

- 334 2 Nebulosus.
 335 3 Hispidus.
 336 4 Moschatus.
 337 5 *Ædilis*. B.
 338 6 Lamed B.
 339 7 Inquisitor.
 340 8 Fuliginator.
 341 9 Sclaris.
 342 10 Populneus. B.
 343 11 Rusticus. Berkenh.
 344 12 Violaceus. B.
 345 13 Bajulus. B.
 346 14 Sanguineus. Berk.

30. STAPHYLINUS.

- 347 1 Murinus.

- 348 2 Erythropterus.
 349 3 Maxillofus.
 350 4 Politus.
 351 5 Rufus. *Berkenh.*
 352 6 Riparius. *Berkenh.*
d. 353 7 Chrysomelinus. *Berk.*
d. 354 8 Fuscipes.
 355 9 Rufipes.

31. NECYDALIS.

- 356 1 Cærulea.
 357 2 *Ceramboides*. N S.

32. FORFICULA.

- 358 1 Auricularia. B. B.
 359 2 Minor.

II. H E M I P T E R A.

I. BLATTA.

- 360 1 Orientalis. Berk.
 361 2 Germanica.

2. GRYLLUS.

- 362 1 Bipunctatus. Berk.
 363 2 Subulatus.
 364 3 Gryllotalpa. Berk.
 365 4 Domesticus.
 366 5 Campestris. Berk.
 367 6 Verrucivorus. Berk.
 368 7 Grossus.

3. CICADA.

- 369 1 Cornuta.
 370 2 Spumaria.
 371 3 Nervosa.
 372 4 Albifrons.
 373 5 Leucocephala. Berk.
 374 6 Lateralis. Berk.

- 375 7 Striata. B. B.
 376 8 Lineata.
 377 9 Interrupta.
 378 10 Lanio.
 379 11 Marginata.
 380 12 Viridis.
 381 13 Flava.
 382 14 Aurata.
 383 15 Ulmi. Berkenh.
 384 16 Rosæ. Berkenh.

4. NOTONECTA.

- 385 1 Glauca. *d.*
 386 2 Striata. *d.*
d. 387 3 Minutissima. Berk.

5. NEPA.

- 388 1 Cinerea.
 389 2 Cimicoides.
 390 3 Linearis.

6. CIMEX.

6. CIME X.

- 391 1 Lestularius.
 392 2 Scarabæoides. Berk.
 393 3 Clavicornis. Berk.
 394 4 Corticalis. Berk.
 395 5 Betulæ. Berk.
 396 6 Filicis. Berkenh.
 397 7 Rufipes.
 398 8 Marginatus. Berkenh.
 399 9 Grifeus.
 400 10 Baccarum. Berkenh.
 401 11 Juniperinus. Berk.
 402 12 Prasinus.
 403 13 Cæruleus. Berkenh.
 404 14 Oleraceus. Berkenh.
 405 15 Bicolor. Berkenh.
 406 16 Acuminatus. Berk.
 407 17 Perfonatus. Berk.
 408 18 Ater.
 409 19 Hyofcyami. Berk.
 410 20 Equestris. Berkenh.
 411 21 Apteris. Berkenh.
 412 22 Pabulinus.
 413 23 Pratenfis. Berkenh.
 414 24 Campestris.
 415 25 Umbratilis. Berk.
 416 26 Nemorum.
 417 27 Dolabratus.
 418 28 Striatus. Berkenh.
 419 29 Populi.
 420 30 Ulmi. Berkenh.
 421 31 Sylvestris.
 422 32 Abietis. Berkenh.
 423 33 Lacustris.
 424 34 Stagnorum.
 425 35 Vagabundus. Berk.

7. A P H I S.

- 426 1 Ribis. }
 427 2 Ulmi. } Berkenh.
 428 3 Sambuci. }

- 429 4 Rumicis.
 430 5 Acetofæ.
 431 6 Lychnidis.
 432 7 Rosæ.
 433 8 Tiliæ.
 434 9 Brassicæ.
 435 10 Craccæ.
 436 11 Sonchi.
 437 12 Cardui.
 438 13 Tanaceti.
 439 14 Absinthii.
 440 15 Jaceæ.
 441 16 Betulæ.
 442 17 Fagi.
 443 18 Quercus.
 444 19 Salicis.
 445 20 Populi.
 446 21 Aceris.
 447 22 Atriplicis }

Berkenh.

8. C H E R M E S.

- 448 1 Graminis.
 449 2 Pyri.
 450 3 Sorbi.
 451 4 Urticæ.
 452 5 Alni.
 453 6 Quercus.
 454 7 Abietis.
 455 8 Fraxini.

Berkenh.

9. C O C C U S.

- 456 1 Hesperidum.
 457 2 Phalaridis.
 458 3 Betulæ. } Berkenh.

10. T H R I P S.

- 459 1 Minutissima.
 460 2 Physapus.
 461 3 Juniperina.
 462 4 Fasciata. } Berkenh.

III. LEPIDOPTERA.

I. PAPILIO.

463	1	Machaon.	} Berk.	503	41	Phlæas.	Berkenh.	
464	2	Podalirius.		504	42	Virgaureæ.		d.
465	3	Cratægi.		505	43	Comma.		d.
466	4	Brassicæ.		506	44	Malvæ.		
467	5	Rapæ.		507	45	Tages.		d.
468	6	Napi.				2. SPHINX.		
469	7	Sinapis.		508	1	Ocellata.	Berkenh.	
470	8	Cardamines.		509	2	Populi.		
471	9	Hyale.	Berkenh.	510	3	Tiliæ.	B. B.	
472	10	Rhamni.		511	4	Convolvuli.	B. B.	
473	11	Hyperantus.		512	5	Ligustri.	B. B.	
474	12	Io.		513	6	Atropos.	B. B.	
475	13	Mæra.		514	7	Elpenor.	B. B.	
476	14	Mægæra.		515	8	Porcellus.	B. B.	
477	15	Ægeria.		516	9	Stellatarum.	B. B.	
478	16	Galathea.		517	10	Fuciformis.		
479	17	Semele.		518	11	Apiformis.	B.	
480	18	Jurtina.		519	12	Culiciformis.	B.	
481	19	Janira.		520	13	Vespiformis.	B.	
482	20	Cardui.	B. B.	521	14	Tipuliformis.		
483	21	Iris.	B. B.	522	15	Filipendulæ.		d.
484	22	Antiopa.	B. B.	523	16	Statices.		
485	23	Polychloros.				3. PHALÆNA.		
486	24	Urticæ.		524	1	Pavonia.	Berk.	
487	25	C. Album.		525	2	Quercifolia.	B. B.	
488	26	Atalanta.		526	3	Rubi.	B. B.	
489	27	Lucina.	Berkenh.	527	4	Potatoria.	B. B.	
490	28	Maturna.		528	5	Pini.	B. B.	
491	29	Cinxia.	Berkenh.	529	6	Quercus.	B. B.	
492	30	Paphia.		530	7	Lanestris.	B. B.	
493	31	Aglaia.		531	8	Vinula.		
494	32	Adippe.		532	9	Bucephala.	B. B.	
495	33	Lathonia.	Berkenh.	533	10	Versicolora.	B. B.	
496	34	Euphrofyne.		534	11	Populi.	Berkenh.	
497	35	Betulæ.		535	12	Neuftria.	Berkenh.	
498	36	Quercus.		536	13	Caja.		
499	37	Argus.		537	14	Villica.	B. B.	
500	38	Argiolus.		538	15	Plantaginis.		
501	39	Rubi.		539	16	Monacha.	B. B.	
502	40	Pamphilus.		540	17	Dispar.	B. B.	

541	18	Chrysothoea.	d.	587	64	Oxyacanthæ. B. B.	
542	19	Salicis. B. B.		588	65	Polyodon.	
543	20	Coryli. Berkenh.		589	66	Oleracea.	
544	21	Pudibunda.		590	67	Pifi. B. B.	
545	22	Fascelina.		591	68	Atriplicis. B. B.	
546	23	Antiqua.		592	69	Triplacia.	
547	24	Gonostigma. B. B.		593	70	Pyramidæa.	
548	25	Cæruleocephala. B. B.		594	71	Typica.	
549	26	Ziczac. B. B.		595	72	Delphinii. B. B.	
550	27	Coffus. B. B.		596	73	Citrago. B. B.	
551	28	Aulica? B.		597	74	Lactearia.	
552	29	Lubricipeda.	d.	598	75	Putataria.	
553	30	Russula. Berkenh.		599	76	Vibicaria.	
554	31	Libatrix.		600	77	Thymiararia.	
555	32	Oo. B. B.		601	78	Punctaria.	
556	33	Humuli.		602	79	Amataria. B. B.	
557	34	Dominula. B. B.		603	80	Lacertinaria. Berk.	
558	35	Fuliginosa.		604	81	Sambucaria.	
559	36	Glyphica.	d.	605	82	Syringaria.	
560	37	Mi.		606	83	Prunaria. B. B.	
561	38	Jacobææ.	d.	607	84	Elinguaria.	
562	39	Rubricollis.	d.	608	85	Pulveraria.	
563	40	Quadra. B. B.		609	86	Betularia.	
564	41	Complana.		610	87	Wavaria.	
565	42	Nupta. B. B.		611	88	Pufaria.	
566	43	Pacta. B. B.		612	89	Papilionaria. B. B.	
567	44	Pronuba.	d.	613	90	Defoliaria. Albin. t. 91. fig. G. H. I.	
568	45	Maura.		614	91	Viridata.	
569	46	Fraxini. B. B.		615	92	Chærophyllata.	d.
570	47	Chryfitis.		616	93	Grossulariata.	d.
571	48	Gamma.	d.	617	94	Cratægata.	d.
572	49	Interrogationis.		618	95	Miniata. N S.	
573	50	Jota?		619	96	Fulvata. N S.	
574	51	Festucæ. B. B.		620	97	Populata.	
575	52	Meticulosa		621	98	Bilineata.	d.
576	53	Pfi.		622	99	Chenopodiata.	
577	54	Chi.		623	100	Plagiata.	
578	55	Aceris. B. B.		624	101	Prunata.	
579	56	Nictitans.		625	102	Fluctuata.	
580	57	Perficaria.		626	103	Remutata.	
581	58	Exfoleta. B. B.		627	104	Alchemillata.	
582	59	Verbasci.		628	105	Marginata.	
583	60	Plecta.		629	106	Urticata.	
584	61	Derafa.		630	107	Nymphæata.	
585	62	Brassicæ.		631	108	Potamogata.	
586	63	Rumicis.					

632	109	Stratitotata.	649	126	Padella.
633	110	Lemnata.	650	127	Culmella. Berk.
634	111	Brumata. Berkenh.	651	128	Salicella. Berkenh.
635	112	Prasinana.	652	129	Tapetzella. Berkenh.
636	113	Viridana.	653	130	Sarcitella. Berkenh.
637	114	Clorana. M B.	654	131	Granella. Berkenh.
638	115	Hamana.	655	132	Serratella.
639	116	Oporana.	656	133	Pomonella. B. B.
640	117	Bergmanniana.	657	134	Calthella.
641	118	Uddmanniana.	658	135	Swammerdamella.
642	119	Brunnichana.	659	136	Geoffrella.
643	120	Proboscidalis.	660	137	Frifschella. d.
644	121	Roftralis. Berk.	661	138	Rajella.
645	122	Forficalis.	662	139	Didactyla. Berkenh.
646	123	Verticalis.	663	140	Pentadactyla. Berk.
647	124	Pinguinalis.	664	141	Tridactyla.
648	125	Evonymella.	665	142	Hexadactyla.

IV. NEUROPTERA.

1. LIBELLULA.

666	1	4-Maculata.
667	2	Flaveola.
668	3	Depressa.
669	4	Vulgatissima. Berk.
670	5	Cancellata.
671	6	Ænea.
672	7	Grandis. Berkenh.
673	8	Forcipata.
674	9	Virgo.
675	10	Puella.

2. RAPHIDIA,

676	1	Ophiopsis. B.
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3. EPHEMERA.

677	1	Vulgata.
678	2	Marginata.
679	3	Vespertina. Berk.
680	4	Bioculata.
681	5	Fuscata. B.
682	6	Culiciformis. Berk.
683	7	Horaria. Berk.

684	8	Striata. Berk.
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685	9	Diptera.
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4. PHRYGANEÆ.

686	1	Bicaudata.
687	2	Nebulosa. Berkenh.
688	3	Striata. Berkenh.
689	4	Grisea. B.
690	5	Grandis. B.
691	6	Rhombica.
692	7	Flavilatera. Berk.
693	8	Nigra. Berk.
694	9	Ciliaris.
695	10	Longicornis.

5. HEMEROBIUS.

696	1	Pectinicornis. Berkenh.
697	2	Perla.
698	3	Chrylops.
699	4	Albus.
700	5	Hirtus.
701	6	Speciosus.
702	7	Sexpunctatus.

703 8 Humuli.

704 9 Lutarius.

6. PANORPA.

705 1 Communis.

7. MYRMELLON.

706 1 Formicarium. *Berk.*

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1. APIS.

707 1 Humulorum.

708 2 Centuncularis. *Berk.*

709 3 Rufa.

710 4 Bicornis.

711 5 Florifomis.

712 6 Helvola.

713 7 Succincta.

714 8 Cærulescens.

715 9 Mellifica.

716 10 Cunicularia.

717 11 Manicata. *Berk.*

718 12 4-Dentata.

719 13 Conica.

720 14 Vernalis. N S.

721 15 Lamii. N S.

722 16 Ruficornis.

723 17 Ferruginata.

724 18 Terrestris.

725 19 Hortorum.

726 20 Pratorum.

727 21 Lapidaria.

728 22 Muscorum.

729 23 Acervorum.

730 24 Subterranea. *Berkenb.*

731 25 Pennipes. N S.

2. FORMICA.

732 1 Herculeana.

733 2 Rufa.

734 3 Nigra.

735 4 Rubra.

736 5 Fusca.

Berkenb.

3. VESPA.

737 1 Crabro.

738 2 Vulgaris.

739 3 Parietum.

740 4 Muraria.

741 5 Spinipes.

742 6 Coarctata. *Berkenb.*

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744 2 Aurata.

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746 2 Juvenus.

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748 2 Ustulata.

749 3 Cyanocrocea. N S.

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751 5 Femorata. *Berkenb.*752 6 Lutea. *Berkenb.*

753 7 Nitens.

754 8 Arcuata. N S.

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756 10 Scrophulariæ.

757 11 Abietis.

758 12 Padi.

759 13 Salicis.

760 14 Atra.

761 15 Viridis.

762 16 Ovata.

763 17 Rosæ.

764 18 Bicornis.

765 19 Cineta.

766 20 Livida.

767 21 Nigra.

- 768 22 *Nassata*,
 769 23 *Cynobati*.
 770 24 *Caprææ*.
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 772 2 *Quercus baccarum*.
 773 3 *Quercus folii*.
 774 4 *Quercus petioli*. *Berk.*
 775 5 *Quercus gemmæ*. *Berk.*
 776 6 *Bedeguaris*.
 777 7 *Sericeus*. N S. (Geoff. 12)
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 779 2 *Viatica*.
 780 3 *Fusca*.
 781 4 *Cribraria*.
 782 5 *Fossoria*.
 783 6 *Leucostoma*.
 784 7 *Pectinipes*.
 785 8 *Xanthocephala*. N S.
 786 9 *Spinosa*. N S.
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 787 1 *Luteus*.
 788 2 *Ramidulus*.
 789 3 *Luftatorius*.
 790 4 *Perfuatorius*. *Berkenb.*
 791 5 *Fossorius*.
 792 6 *Manifestator*.
 793 7 *Titillator*.
 794 8 *Inculcator*. *Berkenb.*
 795 9 *Pugillator*.
 796 10 *Ruspator*. *Berkenb.*
 797 11 *Corruscator*.
 798 12 *Jaculator*. *Berkenb.*
 799 13 *Prærogator*.
 800 14 *Primatorius*. N S.
 801 15 *Xanthorius*. N S.
 802 16 *Armatorius*. N S.
 803 17 *Polyzonias*. N S.
 804 18 *Sugillatorius*.
 805 19 *Sarcitorius*.
 806 20 *Extensorius*.
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 808 22 *Peregrinator*. *Berk.*
 809 23 *Incubitor*.
 810 24 *Atrator*. N S.
 811 25 *Aterrimus*. N S.
 812 26 *Puparum*. *Berkenb.*
 813 27 *Aphidum*. *Berkenb.*
 814 28 *Ovulorum*.
 815 29 *Glomeratus*.
 816 30 *Globatus*. *Berkenb.*
 817 31 *Pectinicornis*. *Berk.*

VI. DIPTERA.

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 818 1 *Pectinicornis*.
 819 2 *Rivosa*.
 820 3 *Crocata*.
 821 4 *Oleracea*.
 822 5 *Hortorum*.
 823 6 *Variegata*.
 824 7 *Contaminata*.
 825 8 *Lunata*. *Berkenb.*
 826 9 *Cornicina*. *Berkenb.*
 827 10 *Atrata*.
 828 11 *Arundineti*.
 829 12 *Plumosa*. *Berkenb.*
 830 13 *Littoralis*.
 831 14 *Motitatrix*. *Berkenb.*
 832 15 *Monilis*. *Berkenb.*
 833 16 *Thomæ*.
 834 17 *Johannis*.
 835 18 *Brevicornis*.
 836 19 *Febrilis*.
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 840 2 *Bifurcatus*.
 841 3 *Pulicaris*.
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 843 2 *Livida*.
 844 3 *Stercorea*.

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- 845 1 *Crabroniformis*. *Berk.*
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 847 3 *Forcipatus*.
 848 4 *Oelandicus*.
 849 5 *Tipuloides*. *Berk.*
 850 6 *Morio*.

5. CONOPS.

- 851 1 *Rolstratus*.
 852 2 *Calcitrans*.
 853 3 *Irritans*.
 854 4 *Vesicularis*.
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- 856 1 *Major*.
 857 2 *Medius*.
 858 3 *Minor*. *Berkenb.*

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 862 2 *Hydroleon*. *Berkenb.*
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 868 8 *Scolopacea*.
 869 9 *Tringaria*.
 870 10 *Bombylans*.
 871 11 *Lappona*.
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Tabanus Pellitus)

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 874 14 *Pendula*.
 875 15 *Florea*.
 876 16 *Arbustorum*.
 877 17 *Nectarea*.
 878 18 *Nemorum*.
 879 19 *Intricaria*.
 880 20 *Tenax*.
 881 21 *Lucorum*.
 882 22 *Sylvarum*.
 883 23 *Bicineta*.
 884 24 *Mutabilis*.
 885 25 *Ichneumonea*.
 886 26 *Arcuata*.

- 887 27 *Clavicornis*. N S.

- 888 28 *Glaucia*.
 889 29 *Noctiluca*.
 890 30 *Ribesii*.
 891 31 *Pyrastris*.
 892 32 *Scripta*.
 893 33 *Mellina*.
 894 34 *Menthastri*.
 895 35 *Pipiens*.
 896 36 *Granditarfa*. N S.
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 898 38 *Saltatrix*.
 899 39 *Inanis*. *Berkenb.*
 900 40 *Pellucens*.
 901 41 *Meridiana*.
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 911 51 *Putris*. *Berkenb.*
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 913 53 *Cupraria*.
 914 54 *Nobilitata*.
 915 55 *Pennipes*. N S. (Scopoli)
 916 56 *Stercoraria*.
 917 57 *Scybalaria*.
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 919 59 *Vibrans*.
 920 60 *Cynipsea*.
 921 61 *Flava*.
 922 62 *Germinationis*.
 923 63 *Heracii*.
 924 64 *Frondefcentiæ*.
 925 65 *Solstitialis*.

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- 926 1 *Bovinus*.
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 928 3 *Pluvialis*.
 929 4 *Cæcutiens*.

10. OESTRUS.

- 930 1 *Bovis*.
 931 2 *Hæmorrhoidalis*. } *Berk.*
 932 3 *Ovis*.

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933 1 Saccharina. *Berk.*

2. PODURA.

934 1 Viridis,
 935 2 Plumbea,
 936 3 Villosa,
 937 4 Aquatica. } *Berk.*

3. TERMES.

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 940 2 Pubis,
 941 3 Bovis,
 942 4 Vituli,
 943 5 Cervi,
 944 6 Gallinæ,
 945 7 Columbæ,
 946 8 Sturni, N S. } *Berkenb.*

5. PULEX.

947 1 Irritans.
 948 2 Penetrans? A.

6. ACARUS.

949 1 Reduvius. *Berkenb.*
 950 2 Ricinus.
 951 3 Passerinus. *Berkenb.*
 952 4 Telarius. *Berkenb.*
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 959 3 Balænarum.

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 961 2 Cucurbitina.
 962 3 Domestica.
 963 4 Labyrinthica.
 964 5 Redimita.
 965 6 Montana.
 966 7 Extensa. } *Berk.*

967 8 Holofericea.
 968 9 Senoculata.
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 994 2 Entomon. }
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 1000 2 Forficata. } *Berk.*
 1001 3 Electrica. }
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 1004 2 Sabulosus.

NOVÆ SPECIES
INSECTORUM.
CENTURIA I.

AUCTORE

JOANNE REINOLDO FORSTERO, S. A. S.

Nam mihi contuenti se persuasit rerum natura, nihil incredibile
existimare de ea. Plin. lib. xi. c. 2.

L O N D I N I,

Veneunt apud T. DAVIES, in Russel-street; et B. WHITE,
in Fleet-street.

MDCCLXXI,

VIRO GENEROSISSIMO

JOSEPHO BANKS,

ARMIGERO,

JOANNES REINOLDUS FORSTER.

S. P. D.

ABSOLUTO ingenti & laborioso itinere, quo totum quem incolimus globum ambitu complexus es ; id præsertim effectum est ut nostra Anglia in posterum futuris naturæ consultis, ditiores thesauros rerum ad rem herbariam & Zoologiam spectantium, perlustrandos offerre poterit, quam universa reliqua Europa. Hæc TUA ingentia in studium rerum naturalium merita, posteritas sera grato animo deprædicabit. Patere quæso, ut Tuo potissimum nomini, hancce *Novorum Insectorum* centuriam, inscribam. Etiam si enim hac opella, paucula tantum describantur, eaque minuta Insecta, sunt tamen eadem nova, ideoque rerum naturalium particulam quandam illustratum iri hisce pagellis confido. Idque mihi spem facit, fore ut pro ingenti quo historiam naturalem complecteris amore, hanc Insectorum centuriam serena fronte accipere digneris, & uti monumentum, quo publice

declarem, quam ego lubenti pronoque animo, nomen meum profitear inter eos qui TE diligunt, honorant, admirantur; quantoque id mihi honori ducam, TIBI reique publicæ literariæ felicem auspicatumque reditum TUUM ex altero orbe publice congratulari. Quamque paratus sim TIBI animi & corporis vires integerrimas, ad sustinendos labores novi quod meditaris itineris; & omnia fausta prosperaque, reditumque felicem ornatum spoliis novis maris & orbis oppositi, non tantum apprecari, verum & ipse si numini id placuerit, eadem pericula TECUM adire, easdem voluptates ex naturæ studio sub novo cœlo TECUM participare. Vale.

Dabam Londini, VII. ante
kalendas Octobris,

P R Æ F A T I O.

ANTE hos duo vel tres annos, quum primum viderem, quam multis novis insectorum speciebus Anglia nostra abundet, & quantæ copiae quotannis in varia Gazophylacia Naturæ consultorum Britanniae e transmarinis undique confluant regionibus; consilium cepi, omnes novas species a me visas & quas illustris LINNÆUS non inseruit postremæ editioni systematis sui, proprio Marte describere. Hoc opus ultra centuriam brevi accrevit, & adhuc tanta novorum insectorum copia in variis optimatum & amicorum Gazis a me est examinata, ut facile inde secundam centuriam, novorum insectorum colligere possem. Ideo hac centuria speciminis loco & experiundi gratia in publicum emissâ experiar, num hæc mea opella, publico placeat, nec ne.

Si arriserit pluribus, volens lubensque & quantocyus potero secundam centuriam publici juris faciam; sin secus acciderit in hac sola centuria subsistere animus est.

Tabulas nunc ad hanc opellam addere supervacaneum censui, quia descriptiones tanta cura diligentiaque sunt exaratæ, ut tabulæ minus sint necessariae: præterea est mihi animus quasdam tabulas huc spectantes operi inferere, quo philosophiam entomologicam & genera insectorum lingua Anglica olim tractare statui. Latina lingua ideo

præcipue hæc scripsi, quod per omnem Europam eruditis communis ejus linguæ sit usus & quod in hisce oris nobilissimæ plures & clarissimæ feminæ eandem probe intelligant.

Insecta a nobis descripta partim sunt Angliæ indigena partim ab exteris oris advecta, quædam ab India Chinaque allata, alia Americæ septentrionalis propria, alia a freto Gaditano importata.

Si quando auctores eorum insectorum meminere, quæ a nobis sunt descriptæ, ubicunque potui, eos adduxi, ne quid diligentia nostræ deesse videatur.

Id præterea mei credo esse officii, publice gratias agere amicis, qui non solum Gazas amplissimas mihi aperuere, ut inde multa nova describerem insecta; verum etiam plurima mihi dono dedere, ut curatius examinata descriptaque publicare possem.

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NOVÆ SPECIES INSECTORUM.

CENTURIA I.

I. COLEOPTERA.

SCARABÆUS.

1. SCARABÆUS EXCAVATUS.

Scutellatus, thorace inermi, retuso-excavato, capitis cornu incurvato compresso, elytris obsolete punctato-striatis.

Habitat ad fretum Gaditanum.

MAGNITUDO et statura fere ad SCAR. *nasicornem* accedit. Corpus totum supra obscurum, ferrugineo-piceum; subtus pallidius, villis subfulvis hirtum.

ANTENNÆ piceæ.

CAPITIS labium bifidum; clypeus sinuatus desinens in Cornu breve, acutum, basi latius, compressum, thoracem versus flexum.

THORAX valde convexus, marginatus, adspersus punctis minutissimis, antice retusus, profunde excavatus, tuberculo utrinque ad cavitatis marginem.

SCUTELLUM triangulare, obtusum.

ELYTRA, lævia, marginata, obsolete punctata; punctis per strias numerosas dispositis; adest tamen stria punctorum, magis conspicua, utrinque ad futuram.

PEDES picei, primi paris nudi, postici pilis rarerer adspersi. *Tibiæ* anticæ tri-dentatæ, cum spina ad apicem; posteriores truncatæ, apice bispinosæ. *Tarsi* biunguiculati; primi paris; ungue altero valido.

2. SCARABÆUS CHINENSIS.

Scutellatus muticus, viridi-sericeus, glaber, sub-
tus viridi-inauratus, elytris obtusis, submucro-
natis.

Habitat in China.

CORPUS magnitudine SCAR. *Rhinocerotis*, totum smarag-
dino auratoque colore splendidissimum, depressum.

ANTENNÆ nigræ, triphyllæ; lamellæ, fere capitis longi-
tudine.

CLYPEUS Capitis antrorsum angustatus, lateribus margi-
natus, apice præmorsus.

THORAX marginatus, postice sinuatus, versus scutellum
productus.

SCUTELLUM minutum, acutangulum.

ELYTRA glaberrima, apice rotundata, obtusa & ad futu-
ræ apicem mucrone brevissimo.

PECTUS, Abdomen & Pedes ferrugineo-cuprei, at in non-
nullis viridi-inaurati ut latus superius corporis. Pectus
antice in mucronem obtusum productum.

TIBIÆ secundi & tertii paris, apice spinis quatuor seu
quinque armatæ.

TARSI nigri, in aliis virides.

ALÆ fuscæ.

INSECTUM totum glaberrimum splendens, pilis non nisi
rarenter sub capite & in femoribus prioribus adspersum.

3. SCARABÆUS HUDSONIAS.

Exscutellatus, muticus, ater, thorace convexo lunato, clypeo rotundato, emarginato, elytris postice emarginatis, femoribus posticis elongatis.

Drury. illustr. t. 35. f. 7.

Habitat in Americæ Septentrionalis provinciis Nov. Eboracensi & Marilandîâ.

MAGNITUDO ad Sc. *Typhoeum* accedit.

ANTENNÆ piceæ, capitulis tryphyllis.

CLYPEUS capitis rotundatus emarginatus.

THORAX valde convexus, lunatus.

ELYTRA postice gibba, obtusissima, vel potius emarginata; in singulo striæ octo maxime obsoletæ.

LAMINA magna triquetra pone elytra, ad anum, quæ cum elytris, thorace & clypeo, punctis minutissimis elevatis confita.

TIBIÆ anticæ spina ad apicem & dentibus tribus majoribus armatæ; inter & pone hos dentes adsunt alii plures minimi. Tibiæ reliquæ subcompressæ, prismaticæ, ad angulos dentatæ, ciliatæ.

FEMORA & tibiæ posticæ elongatæ. Dens ad basin femorum duorum posteriorum parium.

SIMILIS Sc. *Schæfferi*, sed duplo major.

4. SCARABÆUS FLEXILIS.

Scutellatus, muticus, apterus? capite thorace elytrisque fusco-lividis, lævissimis, elytris coriaceis, flexilibus obtusis, ciliatis.

Habitat in Hispaniâ ad fretum Gaditanum.

CORPUS magnitudine & habitu Sc. *sepicolæ*, apterum?

LABIUM quasi futurâ a capite distinctum marginatum.

ANTENNÆ ferrugineæ triphyllæ.

THORAX convexus, suborbiculatus, lævis, glaber, ad margines pilis testaceis ciliatus.

SCUTELLUM semi-orbiculatum.

ELYTRA obtusa, paululum abbreviata, coriacea, flexilia glaberrima, apice pilis tenuissimis ciliata.

PECTUS, Abdomen subtus, femoraque pallide livida, pilis concoloribus in pectore & femoribus densioribus, at in abdomine rarioribus adspersa.

FEMORA postica clavata.

TIBIÆ posticæ obconicæ compressiusculæ, apice ciliatæ.

TARSI fusco-ferruginei.

5. SCARABÆUS PICEUS.

Scutellatus muticus, totus piceus, pectore piloso, elytris striatis punctis impressis.

Habitat in America Septentrionali.

CORPUS magnitudine inferius SCAR. *Stercorario*; sed idem habitu; totum piceum.

ANTENNÆ parvæ, capitulis triphyllis.

CAPUT breve, lunatum, a labio futurâ distinctum.

THORAX valde convexus, retusus, antice tuberculo brevi ad nucham; postice truncatus, piceus punctis impressis sparsis.

ELYTRA picea, striis circiter tredecim ex punctis impressis.

PECTUS & Epigastrium pilis rufis confita.

PEDES piceo-ferruginei, posteriores valde remoti:

TIBIÆ omnes dentatæ, primi paris spina porrectâ.

6. SCARABÆUS GAGATES.

Scutellatus, muticus, totus ater, glaber, nitens,
 alis fuscis.

Habitat ad Sierra Leon Africæ.

CORPUS magnitudine SCAR. nitidi, totum aterrimum,
 vel colore Gagatis, nitidum, politum.

ANTENNÆ nigræ, pilosæ capitulis triphyllis.

CLYPEUS capitis quadrangularis marginatus.

THORAX ater, politus.

SCUTELLUM triangulare, acutangulum.

ELYTRA atra polita, absque striis aut punctis ullis.

STERNUM in mucronem obtusum, brevem productum.

PEDES nigri, pilis nigris sparsis.

TIBIÆ dentato-spinosæ.

7. SCARABÆUS DELTA.

Scutellatus, muticus, flavus, thorace atro, triangulo flavo, elytris testaceo-rufis, nigro trimaculatis.

Habitat————

CORPUS magnitudine SCAR. *Horticolæ*, vel paulo minus, subtus totum lana flava tectum.

ANTENNÆ piceæ, triphyllæ.

CAPUT nigrum, lineâ transversali inter oculos flavâ; ore maxillisque ferrugineis.

THORAX ater, flavo marginatus; in medio lineæ flavæ tres, una margini antico parallela, duæ alteræ versus scutellum fere coeuntes, triangulum subæquilaterum, areâ nigrâ, constituunt.

SCUTELLUM atrum, medio macula cordata flava, sæpius fere totum Scutellum tegente.

ELYTRA lutea, vel e fulvo testacea, futurâ nigra in qua post Scutellum, lineolæ binæ flavæ; dein maculæ parvæ, oblongæ, nigræ duæ in singulo elytro versus apicem; cum puncto minori, in medio vel potius versus basin. Elytra apice obtusissima.

LAMINA supra anum oblonga, inflexa, flava, lineolâ nigrâ. Abdomen & Pectus flava.

PEDES ferruginei, tarsis omnibus, tibiisque posticis nigris; pedes postici elongati, femoribus crassissimis.

D E R M E S T E S.

8. DERMESTES FASCIATUS.

Ovatus ater, capite, thoracisque lateribus utrinque macula ferruginea; elytris fasciis duabus, tibiis tarsisque ferrugineis.

Habitat in Americæ Septentrionalis provincia Nov-Eboracensi.

MAGNITUDO fere DERM. *Scarabæoidis*.

CORPUS ovale, atrum, omnino facie Coccinellæ, sed abdomen subtus non adeo planum.

CAPUT receptum sub thorace, macula rufa versus thoracem.

ANTENNÆ breves ferrugineæ, undecim articulorum, articulis tribus extimis crassioribus.

PALPI ferruginei.

THORAX antice emarginatus, utrinque ad latera macula magna ferruginea.

ELYTRA atra, glabra, fasciâ in medio, & altera ad apicem ferruginea, utrâque nec futuram nec marginem attingente.

FEMORA nigra.

TIBIÆ ferrugineæ, anticæ dentatæ.

TARSI ferruginei, articulis tribus.

9. ANTHRI-

ANTHRIBUS. Geoffr. inf. I. p. 306.

Antennæ clavatæ.

Caput exsertum.

Thorax latus, marginatus.

Elytra lata, brevia.

Tarsus quatuor articulorum.

9. ANTHRIBUS FASCIATUS.

Obovatus, niger, elytris rufis, striis elevatis nigris, cano-interruptis.

Geoffr. inf. I. p. 306. t. 5. f. 3. *Anthribus ovatus, niger, elytris striatis rubro nigroque marmoratis.*

Habitat in Anglia.

MAGNITUDO Hist. pygmæi.

THORAX & *Caput* nigra, pilis aliquot sparsis cinereis.

ELYTRA rufa; in singulo striæ quatuor vel quinque elevatæ, e maculis nigris cinereisque, alternatim positis.

ABDOMEN supra, (i. e. sub elytris) & anus, rubra.

10. ANTHRIBUS NEBULOSUS *.

Ovatus fuscus, antennis ferrugineis, elytris nebulosis.

Habitat in Anglia.

MAGNITUDO Byrrhi Verbasci *Linn.* totus pallide fuscus, pilis densis confusus.

ANTENNÆ ferrugineæ, capitulo ovato, trium articulorum.

CAPUT retractile.

ELYTRA maculis ferrugineo-fuscis sparsis.

PEDES pilosi.

* Genus ANTHRIBI ob antennis plane diversas ab antennis *Dermestis* et ob corporis singularem habitum a *Dermestibus* separavi: *Dermestis* genus plane confiteor esse maxime intricatum; ideoque optimum duxi, ab eodem unum hoc genus *Anthrubi* segregare.

H I S T E R.

II. HISTER STRIATUS.

Ater, thorace elytrisq̃ue striis elevatis.

Habitat in Anglia.

CORPUS Hist. Pygmæo dimidio minus, totum atrum.

THORAX latus marginatus, striis elevatis in medio quatuor, ad utraque latera duabus.

ELYTRA abbreviata, striis elevatis in utroque novem, punctisque impressis inter strias.

ABDOMEN & Pectus punctis crebris impressis.

TIBIÆ omnes glabræ.

CISTELA. Geoffr. inf. I. p. 115.

Antennæ extrorsum crassiores, & perforatæ.

Thorax conicus, marginatus.

Caput intra thoracem retractile, inflexum.

Corpus globoso-cylindricum.

Pedes compressi *, tarsis quinque articulorum.

12. CISTELA FASCIATA. †

Subvillosa fusca, fasciis longitudinalibus nigricantibus interruptis.

Geoffr. inf. I. p. 116. t. 1. f. 8. ♂ Schæff. ic. inf. Ratib. t. 95. f. 3.

Habitat in arena & campis arenosis Angliæ.

CORPUS obovatum, magnitudine Chrysom. politæ.

CAPUT retractile.

THORAX convexus, conicus, pectus ex parte ambiens; tectus pilis rufis aureum quasi splendorem efficientibus.

ELYTRA fusca, striis circiter quatuor longitudinalibus interruptis: pilis nigris erectiusculis nigram maculam constituentibus; pallidis appressis, pallidam.

ABDOMEN, Pedes, Antennæque nigræ.

* In Cistelis mortuis aut tactis, pedes intra foveolam abdominis plicati, adpressique, et tarsi in fossulam tibiarum recipiuntur.

† Male Andr. Jo. Bladh Cistelam fasciatam, cum *Byrrho pilula* Linn. committit. sunt enim prorsus diversa insecta; præsertim si celeb. Linnæi definitionem & descriptionem in Fauna Suec. n. 427. conferre volueris cum celeb. Geoffroyi & nostris descriptionibus.

13. CISTELA PUSTULATA.

Ovata nigra, maculâ elytrorum rufa, undata,
Geoffr. inf. I. p. 116. n. 2.

Habitat cum præcedente.

MAGNITUDO Chryf. fastuosæ.

CORPUS ovatum, undique nigrum.

THORAX maculis quibusdam e pilis rufis.

ELYTRA nigra, macula rufa, sesquiertia e pilis rufis
cincta in margine pilis albicantibus.

CISTELÆ antennis, thorace, pedibus, et tota corporis structura adeo differunt a reliquis insectis ejusdem classis & ordinis, ut non tam Geoffroyi divisionem, quam potius ipsam naturam sequutus sim in determinando hoc genere: licet *And. Jo. Bladh* in *Fundamentis Entomologicis* nuper Byrrhum Linnæi cum Cistela commiserit; id tamen re curatius examinata reperi, hæc duo genera toto cœlo esse diversa nec ullo modo, ad idem genus revocari posse & neque ipsum clariss. LINNÆUM judicem in hoc negotio recuso: si enim plures species hujus generis vidisset, utique credo, eum pro ingenti quo conspicuus est veritatis amore, id nobis daturum, nos recte hoc genus a reliquis sejunxisse.

14. CISTELA NIGRA.

Ovata, tota nigra, nitens glabra.

Geoffr. inf. l. p. 117. n. 3.

Habitat cum prioribus hujus generis.

CORPUS totum nigrum, antecedenti minus, nitens, glabrum.

ELYTRA striis oblitteratis, circiter decem in singulo elytro.

15. CISTELA striata.

Obovata nigra, elytris striatis.

Habitat in arenâ Angliæ.

CORPUS magnitudine & statura *Cistelæ fasciatæ*.

ELYTRA nigra, in singulo fasciæ quatuor vel quinque longitudinales concolores, sed nitentes, inclusæ striis oblitteratis.

16. CISTELA SERICEA *.

Ovata, fusco-viridis, elytrorum fasciis longitudinalibus interruptis.

Habitat cum præcedentibus.

MAGNITUDO Cist. nigræ.

CAPUT & thorax viridi-fusca, nitentia.

ELYTRA fasciis quinque vel sex longitudinalibus viridiferriceis, interruptis, maculis e pilis nigris erectiusculis. Intervalla fasciarum minus læte virentia.

S I L P H A.

17. SILPHA NOVEBORACENSIS.

Nigra, elytris piceis : lineis elevatis subternis, clypeo retuso, disco atro, margine rubro.

Habitat in Americæ Septentrionalis provincia Nov-
eboracensi.

CORPUS magnitudine SILPHÆ *atrata*, nigrum totum.

CLYPEUS thoracis antice retusus, margine rubro, disco nigro, punctis excavatis sparsis oblitus.

SCUTELLUM nigrum.

ELYTRA punctis excavatis sparsis piceis f. rubicundis, lineis elevatis, duabus futuræ proximis longitudine ely-
trorum, tertia exteriori abrupta.

C O C C I N E L L A.

18. COCCINELLA TREDECIM-MACULATA.

Coleoptris luteis, punctis nigris tredecim; thorace albo nigro-punctato.

Habitat in Pinis, Corylis, Plantisque variis Angliæ.

CORPUS magnitudine Cocc. 14 *punctatæ*, hemisphæricum nigrum.

ANTENNÆ rufæ.

CAPUT album, ore punctisque duobus ad thoracem contiguis nigris.

THORAX albus puncto nigro Scutello proximo, cincto maculis quatuor majoribus nigris; ad latera thoracis in plerisque punctum aliud nigrum.

ELYTRA fulva seu lutea, punctis in utroque elytro; primum uno, dein tribus, post duobus, denique unico communi ad basin futuræ.

PEDES pallidi, in quibusdam fusci; geniculis pallidis.

C H R Y S O M E L A.

19. CHRYSOMELA SAPPHIRINA.

Ovata, tota sapphirina, nitida, ore oculisque rubris antennis nigris.

Habitat————

CORPUS triplo majus Chrysomela *sanguinolentâ*, totum colore nitidissimo splendente viridi-sapphirino, vel cyaneo ornatum.

ANTENNÆ nigræ.

THORAX & ELYTRA punctis minutissimis ac vix perspicuis adspersa.

TARSI subtus fufci.

20. CHRYSOMELA HYPERICI.

Ovata, atro-cærulea, elytris nigro-æneis, striato-punctatis, alis rubris.

Habitat in *Hyperico perforato* Angliæ.

MAGNITUDO Chryf. fastuosæ.

ANTENNÆ fuscæ.

CAPUT & *Thorax* viridi ænei.

ELYTRA viridi-ænea, exarata punctis profunde excavatis per paria & glomeres, in strias longitudinales dispositis; striis in singulo elytro novem.

ABDOMEN & pectus viridi-cærulea, nitentia.

PEDES viridi-nigri.

21. CHRYSOMELA RHOD.

Ovata ferruginea, capite, thorace & striis aliquot elytrorum pallidis.

Habitat in RHOD *glabra* Linn. Americæ Septentrionalis. Anglis in America *the Sumach-bug* dicta.

CORPUS magnitudine chryf. *politæ*, feminæ.

ANTENNÆ basi ferrugineæ, cetera fuscæ.

OCULI nigri.

CAPUT & *Thorax* cum pectore pallida.

ELYTRA ferruginea, stria longitudinali ad marginem & aliquot in medio elytrorum pallidis; striæ punctorum profunde excavatorum decem vel undecim.

TARSI articulis tribus.

22. CHRYSOMELA LINEATO-PUNCTATA.

Ovata, thorace rufo, disco punctis nigris; elytris rufis, futura, punctis lineolisque nigris.

Habitat in Americæ septentrionalis provincia Nor-
eboracensi.

MAGNITUDO fere chryf. *polita*, habitus chryf. *populi*.

ANTENNÆ basi ferrugineæ, articulis quinque extimis
crassioribus fuscis.

CAPUT parvum ferrugineum versus thoracem nigrum.

OCULI nigri.

THORAX utrinque margine rufo crassiusculo; pars de-
pressa picea, maculis aliquot obscuris nigris.

SCUTELLUM nigrum.

ELYTRA pallide rufa, futura utrimque nigra; punctum
nigrum ad basin elytri, aliud prope apicem; ad mar-
ginem linea ex maculis tribus coadunatis nigris; in
medio lineæ duæ parallelæ nigræ; punctum minimum
nigrum ad basin elytri.

ABDOMEN infra nigrum nitidum.

ALÆ fuscæ.

PEDES ferruginei.

FEMORA medio nigra.

TARSI quatuor articulis.

23. CHRYSOMELA OLIVACEA.

Ovata, nigra, capite, thorace, elytris pedibusque olivaceis, elytris stria longitudinali & futura nigra.

Habitat in Anglia; lecta primo vere, in arena.

CORPUS magnitudine & habitu chryf. vitellinæ.

CAPUT olivaceum, ad thoracem collari nigro.

OCULI nigri.

ANTENNÆ fuscæ, basi pallidæ.

THORAX latus, convexus, punctatus, olivaceus.

ELYTRA olivacea, cum striis punctorum excavatorum; fascia longitudinalis nigra a basi ad apicem, in medio elytri, alia margini futuræ communis, itidem nigra.

ABDOMEN nigrum, punctatum.

PEDES olivacei; in quibusdam nigri, geniculis olivaceis.

VARIAT quoque capite, thorace, elytrisque colore fordide rubro, loco olivacei.

24. CHRYSOMELA FRONTALIS.

Ovata nigra, capite, antennarum basi, elytrorum margine, & pedibus ferrugineis.

Habitat in Americâ Septentrionali.

MAGNITUDO media.

CORPUS totum nigrum, oblongo-ovatum.

CAPUT ferrugineum.

OCULI nigri.

ANTENNÆ basi ferrugineæ, reliqua fuscæ.

THORAX fere orbiculatus, niger, nitens.

ELYTRA obscure striata, nigra margine ferrugineo.

ALÆ hyalino-fuscæ.

VENTER niger.

PEDES toti ferruginei.

25. CHRYSOMELA FIMBRIATA.

Saltatoria oblonga, capite, thorace quadripunctato, elytrisq̃ue pallide testaceis, linea nigra cinctis, femoribus rufis.

Habitat in America Septentrionali.

MAGNITUDO & statura prorsus chryf. caprææ.

ANTENNÆ longæ fuscæ, basi pallidæ.

CAPUT testaceum puncto inter antennas impresso fusco.

THORAX testaceus nitens, punctis quatuor & lineola longitudinali nigris.

ELYTRA pallide testacea; futura & linea prope marginem elytras ambiens nigra; ad apicem duo puncta minima nigra.

ALÆ fuscæ.

ABDOMEN subtus rufum.

PECTUS piceum.

FEMORA omnia rufa, ultimi paris saltatoria incrassata.

TIBIÆ fuscæ.

TARSI omnes quatuor articulorum fusci.

26. CHRYSOMELA HUDSONIAS.

Saltatoria, atra, oblongiuscula, antennarum basi ferrugineâ.

Habitat Noveboraci, in America Septentrionali.

CORPUS magnitudine CHRYS. *cyanellæ*, oblongiusculum, totum aterrimum, nitens.

ANTENNÆ fuscæ, basi ferrugineæ,

PLANTÆ Tibiæque fuscæ.

27. CHRYSOMELA LATICLAVIA.

Cylindrica nigra, capite thorace elytrisq̃ue rufis, futura & margine elytrorum nigro, antennis ferratis.

Habitat in Americâ Septentrionali.

MAGNITUDO Chryf. fericæ.

ANTENNÆ basi rufæ, articulis octo extimis nigris, ferratis.

CAPUT rufum.

OCULI nigri.

PALPI nigri.

THORAX rufus, glaber, postice margo lateralis lineâ nigra.

ELYTRA rufa lineis nigris *latis* ad utrumque marginem, adque futuram; apice tamen non nigro.

ALÆ fuscæ.

ABDOMEN subtus nigrum, pilis minutissimis cinerascens vestitum.

PEDES omnes nigri, postremi valde remoti.

FEMORA primi paris rufa, secundi picea.

TARSI quatuor articulis.

28. CHRYSOMELA CRATÆGI.

Oblonga rubra, elytris, linea longitudinali punctoque nigris.

Habitat in Anglia; lecta constanter in *Cratægo oxyacantha*, locis diffitis.

CORPUS habitu & magnitudine proximum Chryf. *nymphææ*, etiam valde affine Chryf. *merdigeræ*; fordide rubra sunt caput, thorax, elytra, tibiæ, anus: nigra vero antennæ, oculi, scutellum, pectus, abdomen, femora, tarsi.

CAPUT fordide rubrum, lineâ longitudinali nigrâ.

THORAX ruber, foveola impressa ad latus utrumque; & fascia transversalis nigra.

ELYTRA rubra, punctis minutissimis, excavatis fere contiguis confita: in singulo, linea longitudinalis nigra, quæ neque basin, neque apicem elytri attingit; suturam versus, post hanc lineam punctum oblongiusculum nigrum.

VARIETAS interdum reperitur pedibus totis rubris.

29. CHRYSOMELA TRIFURCATA.

Oblonga nigra, thorace elytrisque pallidis, elytris margine & futura, furca tridente, punctisque octo nigris notatis.

Habitat in Americâ Septentrionali.

MAGNITUDO & habitus Chryf. *flavipedis*.

ANTENNÆ pallidæ.

CAPUT nigrum.

THORAX angustatus pallidus.

ELYTRA pallida, notata furca tridente ad basin, cujus dens medius ad futuram brevior, reliqui laterales non marginem adtingunt; puncta utrinque tria nigra in una ferie disposita, unum utrinque ad cuspides laterales furcæ.

ABDOMEN subtus nigrum.

ALÆ fuscæ.

PEDES pallidi.

FEMORA tibiarumque posticorum ustulatæ.

TARSI omnis quatuor articulis.

30. CHRYSOMELA LEPTUROIDES.

Elongata, obscure ænea, antennis plantisque ferrugineis.

Habitat in provincia Noveboracensi Americæ Septentrionalis.

CORPUS elongatum, totum æneum, magnitudine LEPTUR. *melanuram* excedit.

ANTENNÆ & Palpi ferruginei.

THORAX ovatus.

ELYTRA elongata punctis rugosa, obscure ænea, margine læte virenti.

PEDES obscure ænei, tarsis ferrugineis.

C U R C U L I O.

31. CURCULIO ULICIS.

Longirostris femoribus simplicibus, cinereus, abdomine ovato, antennis, tarsis, tibiis omnibus & femoribus primi paris rufis.

Habitat in Anglia in floribus *Ulicis Europæi*, primo vere.

CORPUS ovatum, totum fuscum & villis cinereis oblitum, vix pediculi magnitudine.

ANTENNÆ rufæ, rostro subtus prope oculos insertæ.

RÖSTRUM atrum glaberrimum.

THORAX globosus cinereus.

ELYTRA fusca, striata, cinereis villis vestita, sine ulla macula nigra.

FEMORA concolora, grisea.

TIBIÆ & tarsi cum femoribus primi paris rufi.

32. CURCULIO LONGIMANUS.

Longirostris femoribus dentatis, manibus longissimis.

Habitat in Anglia.

CORPUS oblongum, magnitudinæ Curcul. *pomorum*, piceum pilis cinereis tomentosis nebulosum.

ANTENNÆ rufæ.

ROSTRUM cum thorace longitudinem elytrorum æquat.

MANUS seu pedes primi paris tertia parte ad minimum reliquos pedes superant.

ELYTRA cinerea punctis nigris sparsis.

TARSI rufi.

33. CURCULO POLLINARIUS.

Longirostris, femoribus omnibus dentatis, elytris depressis planis abbreviatis, ventre, elytrorum margine & pedibus polline aspersis.

Habitat in Angliæ plantis variis præsertim in *urtica dioica*.

CORPUS supra planum fuscum, subtus ventricosum polline griseo confutum.

ROSTRUM nigrum, retractile in foveolam pectoris inter pedes.

ANTENNÆ pedatæ, rufæ, insertæ rostro paululum ante apicem, articulo primo longissimo.

CAPUT retractile intra thoracem.

THORAX supra planus; linea longitudinalis in medio, ad latera puncta duo elevata seu spinæ.

ELYTRA supra plana, ad basin angulosa, apice obtusa abbreviata nigro fusca, uti caput & thorax.

VENTER, pedes & elytrorum margines aspersi polline griseo creberrimo; adeo ut supra sit fuscum, subtus griseum infectum; tactum rostrum pedesque contrahit ut vix a glebula terræ vel lapillo dignoscas.

34. CURCULIO IMPERIALIS.

Brevirostris ater, femoribus muticis, thoracis linea longitudinali, elytrorumque punctis perfticas dispositis viridi-inauratis.

Habitat ——— allatus in Angliam ex Olyffipone, quo forte ex Brafilia advectus erat.

MAGNITUDO Scarabæi Melolonthæ.

ARTENNÆ nigræ clavatæ.

ROSTRUM breve, crassum, striatum, striis duabus, villis viridi-sericeis repletis.

CAPUT striis tribus viridi pilosis, quarum duæ oculos includunt.

THORAX cylindricus, supra ater glaber, in medio linea longitudinali viridi-nitente exaratus; lateribus & in pectore viridi-inauratus, punctis elevatis glabris, atris rugosus, colore viridi prevalente.

SCUTELLUM minimum viride.

ELYTRA nigra convexa gibba; puncta numerosa excavata, viridi-sericea inaurataque, in fundo singuli puncti, puncto nigro, per strias decem in quolibet elytro disposita, punctis & striis versus futuram magis distantibus, at in lateribus confertis.

ABDOMEN totum uti pectus viridi-inauratum, punctis elevatis nigris, rugosum.

PEDES nigri pilis viridibus adspersi; tarsi dilatati subtus ferruginei.

35. CURCULIO NOVEBORACENSIS.

Brevirostris muticus, canus, elytris subfastigiatis, striis quinque albidis nigro punctatis, scutello flavicante.

Habitat in Americæ Septentrionalis provinciâ Nov-
eboracensi.

CORPUS totum fuscum, pilis canis undique aspersum ;
magnitudo e majoribus, vel $\frac{7}{16}$ unciaë pedis Anglicani
longum.

ROSTRUM incrassatum, medio linea longitudinali nigra.

OCULI fusci, rufis pilis cincti.

ANTENNÆ submoriciiformes, articulis extremis in capi-
tulum formatis.

THORAX canus, globoso-cylindricus.

SCUTELLUM flavicans.

ELYTRA convexa, oblonga, apice subfastigiata, striata
quasi punctis excavatis ; fasciæ inter strias circiter decem,
alternæ albidæ punctis nigris.

PECTUS, Abdomen & Pedes cana.

TIBIÆ bispinosæ.

TARSI quadri-articulati, subtus pilis albidis vestiti.

36. CURCULIO MELANOGRAMMUS.

Brevirostris, femoribus muticis, corpore cano, futurâ elytrorum antice nigra, nitida, rostro brevissimo.

Habitat in Angliâ.

CORPUS dimidio minus Curcul. *incano*, totum undique nigricans, tectum granulis vel squamulis numerosissimis canescentibus.

ROSTRUM vix ullum atrum nitens.

ANTENNÆ pedatæ, rufescentes.

CAPUT & Thorax cinerea granulata.

ELYTRA ovata, valde convexa, cano nebulosa, striis circiter decem longitudinalibus e punctis excavatis. Linea dorsalis cuneiformis atra nitida a basi, ad mediam fere futuram ducta, desinens in angulum acutum.

PEDES rufescentes.

C E R A M B Y X.

37. CERAMBYX BRUNNUS.

Thorace trispinoso, brunneus, elytris obtusis, striis duabus elevatis obscuris, antennis compressis brevioribus.

Drury illustr. t. 37. f. I.

Habitat in America Septentrionali.

CORPUS magnitudine excedit Ceramb. *moschatum*.

MAXILLÆ atræ, magnæ.

PALPI picei.

ANTENNÆ breviores, piceæ, compressæ, undecim articulorum.

OCULI grandes.

THORAX brevis, piceus, antice & postice ciliatus pilis fulvis; spinæ tres acutissimæ in utroque latere.

SCUTELLUM brunneum, femiorbiculatum.

ELYTRA longa, obtusa, punctata brunnea, striis elevatis duabus vel tribus obscuris.

STERNUM fulvo corcineum.

PECTUS & Epigastrium brunnea, vestita pilis fulvis.

ABDOMEN nitens brunneum, incisurarum marginibus fulvis.

PEDES compressi brunnei.

TIBIÆ bispinosæ.

TARSI quadri-articulati, subtus pilis densis fulvis vestiti.

38. *CERAMBYX INCANUS*.

Thorace spinoso, albus, elytrorum, fasciis duabus longitudinalibus fulvis, nigro-marginatis, antennis longioribus, subciliatis.

Habitat—————

MAGNITUDO *Cerambyx lineati*.

CORPUS totum nigrum, pilis albis minutissimis, confertissimis tectum.

ANTENNÆ, corpore longiores, nigræ, in medio singuli articuli canescentes; articulis tribus seu quatuor primis, (a basi) subtus pilis tenuissimis rarisque ciliatis.

FRONS alba, cum linea nigra inter antennis ducta & puncto nigro ad utrumque latus hujus lineæ.

THORAX subrotundus niger, spina valida utrinque armatus, lineisque duabus latis albis ornatus.

SCUTELLUM album.

ELYTRA alba, in quibus utrinque fasciæ seu lineæ latæ longitudinales fulvæ, nigro marginatæ; una ad marginem exteriorem, altera in medio singuli elytri; ambæ ante apicem desinentes.

ABDOMEN album linea longitudinali nigra.

PEDES canescentes, patellis a basi fulvis.

FEMORA subtus linea fulva.

PECTUS album, circa sternum fulvum.

39. CERAMBYX CHINENSIS.

Thorace spinoso, ater totus, elytris antice scabris punctis paucis albis sparsis, antennis longioribus, singulo articulo basi canescente.

Habitat in Chinâ.

CORPUS magnitudine & figurâ Ceramb. *Coriarii*, totum atrum.

ANTENNÆ nigræ, corpore longiores singulo articulo basi canescente.

THORAX rotundatus, utrinque spina recta valida armatus.

ELYTRA ad basin tantum punctis minutissimis subrotundis elevatis per strias dispositis, scabra. Puncta alba circiter decem sparsa in singulo elytro.

PEDES atri.

TIBIÆ medio canescentes.

TARSI supra canescentes, subtus fusci.

40. CERAMBYX PALLIATUS.

Thorace spinoso, violaceus, elytris subfastigiatis a basi ad medium fere testaceis, antennis brevibus, articulis quatuor clavatis.

Habitat in America Septentrionali.

CORPUS paullo minus *Ceramby. moschato*, pilis minutis confutum, coloris læte violacei, unde elegans animalculum.

CAPUT violaceum, punctatum, exsertum, canaliculo inter antennis notatum.

OCULI brunnei.

ANTENNÆ violacæ, articulis undecim; quorum primus crassus, secundus brevis globosus, tertius longiusculus clava magna, latera quasi rostrata, quartus, quintus & sextus clavati, reliqui atri, extimo oblongo.

THORAX conus oblongus, violaceus, punctatus ad elytrorum basin utrinque spina instructus.

ELYTRA sub-fastigiata, violacea, punctata, a basi ad medium fere pallio veluti testaceo cincta, inferius margine undulato.

VENTER & Pedes violacei.

TIBIÆ bispinosæ.

TARSI 4 articulati, infra pilis fuscis vestiti.

41. CERAMBYX TETROPTHALMUS.

Thorace mutico subcylindrico, corpore nigro-cinerascente, capite, thorace, & elytris rubris nigro punctatis, oculis quatuor, antennis brevibus.

Habitat in Americæ Septentrionalis provinciâ Novæboracensi.

MAGNITUDO fere Ceramb. *scalaris*.

CORPUS nigrum pilis albidis aspersum, unde cinerascens.

ANTENNÆ fusæ.

MAXILLÆ nigræ.

OCULI non ut in reliquis hujus generis lunati, sed duo distincti ad utramque antennam, uno inferiore paullo majore, altero superiore minore.

THORAX subcylindricus, ruber, punctis quatuor impressis nigris in medio orbiculum elevatum cingentibus: puncta duo elevata lateralia ad basin, & margo posticus nigræ.

SCUTELLUM pilosum, nigrum.

ELYTRA rubra punctis nigris octo: duobus ad basin elytrorum; quatuor in medio, horum exteriora majora; duobus versus apicem, in quibusdam etiam apex ipse niger, obtusus.

PEDES cinerascens, tarsis articulis quatuor.

42. CERAMBYX CLAVIPES.

Thorace globoso mutico, ferrugineo, corpore testaceo, capite nigro, femoribus clavatis, ustulatis, antennis hispidis mediocribus.

Habitat in Americâ Septentrionali.

MAGNITUDO *Lepturæ myficæ*.

CAPUT nigrum.

LABIUM & palpi ferruginei.

ANTENNÆ mediocres pilosæ, ferrugineæ, pilis longioribus in extremitate articulorum.

THORAX muticus, globosus, ferrugineus.

ELYTRA linearia, testacea.

ALÆ fuscæ.

EPIGASTRIUM nigrum.

ABDOMEN & pedes ferruginea.

FEMORA clavata, ustulata, postremi paris longitudine Abdominis.

TIBIÆ bispinosæ pilosæ.

L E P T U R A.

43. LEPTURA ROBINIÆ.

Thorace globoso fasciato, nigra, elytris fasciis sex flavis, tribus prioribus antrorsum arcuatis, posticis undulatis.

Drury ill. t. 41. f. 2.

Habitat in *Robinia Pseudacacia*, in provinciâ Nov-
eboracensi Americæ Septentrionalis.

MAGNITUDO *Lepturæ arcuatæ*.

CAPUT nigrum cinctum annulo flavo; macula flava inter
antennas, medio nigra.

ANTENNÆ fuscæ, elytrorum longitudine.

THORAX niger, annulis quatuor flavis.

ELYTRA nigra; fasciæ tres anteriores antrorsum arcuatæ
flavæ, posteriores duæ undulatæ; postrema ad apicem
elytrorum; elytra ad futuram complanata, depresso.

PEDES ferruginei.

44. LEPTURA PILOSA.

Elytris fastigiatis, tota nigra, pilis cinerascens confita.

Habitat in Hispaniâ ad Calpen freti Gaditani.

MAGNITUDO circiter Lept. *mystica*.

CORPUS totum nigrum, & undique pilis cinerascens crebris confitum.

ANTENNÆ articulis undecim.

OCULI brunnei.

THORAX globosus, dense pilosus, punctis excavatis confusus.

ELYTRA apice fastigiata, margine exteriori circa humeros seu basin picea.

ABDOMEN & pedes ob densiores pilos, magis cinerascens.

45. LEPTURA NITENS.

Thorace globofo, abdomineque nigris, flavescenti-tomentosis, nitentibus; elytris truncatis atris, fasciis quatuor, latis transversis flavis; pedibus ferrugineis.

Habitat in Americâ Septentrionali.

MAGNITUDO *Leptur. melanuræ*.

Os ferrugineum cum palpis.

ANTENNÆ ferrugineæ, basi fuscæ,

CAPUT cum thorace globofo, atque abdomine, nigra, adspersa pilis flavo-aureis.

ELYTRA truncata; fasciæ quatuor flavæ, latæ, transversæ, prima arcuata, circa marginem basin elytri attingit, circa futuram non; reliquæ transversæ; apex elytrorum niger.

ABDOMEN margine flavum.

PEDES omnes ferruginei.

N E C Y D A L I S.

46. NECYDALIS COLLARIS.

Elytris subulatis atra, thorace bipunctato testaceo ;
pedibus simplicibus.

Habitat in Americâ Septentrionali.

CORPUS magnitudine Necyd. *cæruleæ*, totum excepto
Thorace atrum. .

THORAX cylindricus, testaceus, punctis duobus nigris.

PEDES antici picei, reliqui atri.

47. NECYDALIS CERAMBOIDES.

Elytris subulatis, viridi-ænea, pedibus simplicibus.

Habitat in Angliâ, lecta in lucis, in floribus *Leontodontis*.

MAGNITUDO & habitus Necyd. *cæruleæ*, sed tota viridi-ænea.

ANTENNÆ nigræ.

THORAX subcylindricus, rugosus.

ELYTRA subulata; linea longitudinalis in medio singuli elytri, elevata, definens ante apicem, inter hanc lineam & futuræ partem tertiam à basi elytrorum, linea elevata altera.

ABDOMEN æneum politum.

PEDES nigri, femoribus simplicibus.

48. NECYDALIS MURALIS.

Elytris subulatis, fusca, humeris flavis, pedibus simplicibus.

Habitat in Angliâ frequens ad muros hortorum.

MAGNITUDO Lepturæ *melanuræ*.

THORAX subrotundus.

SCUTELLUM parvum fuscum.

ELYTRA subulata, abdomine breviora, basi flava, sive lutea.

PEDES fusci, femoribus simplicibus.

OBS. Hanc novam speciem debeo viro amicissimo *James Lee*.

L A M P Y R I S.

49. LAMPYRIS PILOSA.

Oblonga nigra, thorace fanguineo, lineis duabus longitudinalibus nigris, antennarum articulis tribus extimis pectinatis.

Habitat in America Septentrionali.

MAGNITUDO fere Lampyr. *noctiluca*.

CAPUT inflexum pilosum, nigrum.

ANTENNÆ fuscæ; articuli tres extimi pectinati.

THORAX pilosus, fanguineus, lineis binis longitudinalibus nigris; margo exterior ad caput flavus.

ELYTRA dense pilosa, atra.

ABDOMEN subtus glabrum, atrum.

PEDES concolores.

C A N T H A R I S.

50. CANTHARIS AMERICANA.

Thorace marginato flavo, macula nigra, elytris flavis versus apicem macula trientali oblonga nigra.

Habitat in Americæ Septentrionalis Noveboracensi.

MAGNITUDO Canthar. *fuscæ*.

CAPUT nigrum, margo oris rufescens, os acutum; palpi duo breviores, duo longiores.

ANTENNÆ fuscæ, longitudine elytrorum, filiformes, articulis undecim.

THORAX a tergo planus, subquadratus, flavus, macula disci nigra.

ELYTRA oblongo-linearia flava, flexilia; versus apicem macula oblonga, nigra, trientalis, i. e. occupans tertiam partem elytrorum.

ABDOMEN nigrum, marginibus segmentorum flavis.

FEMORA nigra.

TIBIÆ tarsique duorum primorum parium rufescentes, posteriorum nigræ.

B U P R E S T I S.

51. BUPRESTIS FULIGINOSA.

Elytris integerrimis, sublinearibus, glabris, pilosis; thorace deflexo, corpore fuliginoso.

Habitat in Angliâ; lecta in floribus *Cratægi Oxycanthæ*.

CORPUS magnitudine Canthar. *testaceæ*, totum fuliginosum, nitens, undique pilosum.

ANTENNÆ moniliformes, articulis undecim.

THORAX deflexus.

ELYTRA sublinearia, nec striata nec punctata.

TARSI articulis quatuor.

D Y T I S C U S.

52. DYTISCUS LIVIDUS.

Antennis perfoliatis, capite, thorace, elytris, & pedibus lividis, ventre nigro.

Geoffr. parif. I. p. 184. Hydrophilus 5.

Habitat in *Lemna* in aquis stagnantibus Angliæ, Galliæ.

MAGNITUDO Scarab. *conspurcati.*

ANTENNÆ perfoliatæ, clavatæ.

PALPI longissimi lividi.

CAPUT Thorax & Elytra livida.

ABDOMEN nigrum.

PEDES lividi, femoribus nigris.

TIBIÆ exterius ferratæ, spinis duabus terminalibus.

53 DYTISCUS DERMESTOIDES.

Antennis perfoliatis, hæmisphærico-ovatus, luridus, capite thoraceque nigris.

Habitat in Anglia inter *Lemnam* in aquis stagnantibus.

CORPUS fere Chrysom. *erythrocephalæ*, valde convexum, ovatum, totum luridum.

CAPUT atrum, nitidum.

THORAX ater, nitidus, margine pallido.

ELYTRA undique lurida, nullis punctis vel lineis nigris.

PEDES ferruginei, tibiis ferratis, apice bispinosi.

54. DYTISCUS ATER.

Antennis setaceis, totus ater, antennis pedibusque ferrugineis.

Habitat in Anglia, inter *Lémnam*, aquarum stagnantium.

CORPUS magnitudine Dytisc. *minuti*, vel Dytisc. *maculati* sed totum atrum.

ANTENNÆ filiformes, moniliformes, ferrugineæ ut et pedes.

55. DYTISCUS GLABER.

Antennis setaceis compressis, fuscus, elytris glabris, ventre pedibusque ferrugineis.

Habitat in Angliæ aquis stagnantibus.

MAGNITUDO DYTISCI *Striati*, cui admodum simile insectum ; tamen differt, ob characteres sequentes :

ANTENNÆ compressæ, ferrugineæ, nec nigræ.

ELYTRA glabra, nec transversim striata.

PEDES omnes ferruginei, nec postici nigri.

ABDOMEN ferrugineum, nec nigrum.

56. DYTISCUS NEBULOSUS.

Lividus nigro-nebulosus, antennis pedibusque ferrugineis, ventre atro, margine ferrugineo.

Habitat in Angliæ aquis stagnantibus.

MAGNITUDO Dytisci *uliginosi*.

ANTENNÆ fetaceæ.

ELYTRA livida, punctis minimis nigris nebulosa.

ABDOMEN atrum, margine laterali ferrugineo.

57. DYTISCUS EXSOLETUS.

Antennis fetaceis, lividus, antennis, capite, thorace, abdomine, pedibusque pallidis.

Habitat in Angliæ aqua stagnante inter *Lemnam*.

MAGNITUDO fere Cimicis, Dytisc. *maculatum* & *minutum* excedens.

CORPUS ovatum.

ELYTRA fusca, margine pallido.

C A R A B U S.

58. CARABUS SERICEUS.

Alatus ater, capite, thorace & elytris viridi-nigritentibus, antennis pedibusque rufis.

Habitat in America Septentrionali.

CORPUS magnitudine paullo Carab. *spinipedem*. superat.

CAPUT viridi-sericeum.

ANTENNÆ rufæ.

LABIUM superius & palpi ferruginei.

OCULI nigri.

THORAX obcordatus, viridi sericeus.

ELYTRA viridi-sericea, striis octo punctorum minutissimorum.

ALÆ albæ margine rufo.

ABDOMEN atrum.

PEDES omnes rufi.

TROCHANTERES seu appendices elongati ad femora postica, femoribus dimidio minores, rufi.

59. CARABUS LINEATUS.

Niger, thorace ferrugineo, elytris griseis, futuræ linea communi, alteraque in singuli elytri medio nigra, ante apicem desinente, pedibus griseis, tarsis nigris.

Habitat in Americâ Septentrionali.

MAGNITUDO Carab. *Crux minor*.

CORPUS nigrum.

PALPI ferruginei.

ANTENNÆ albidæ.

THORAX obcordatus, ferrugineus.

ELYTRA albida, seu grisea, striata; linea longitudinalis futuræ communis nigra; & in cujuslibet elytri medio, linea alia longitudinalis nigra, nec basin nec apicem adtingens.

ABDOMEN & epigastrium nigra.

PEDES albid; geniculis, tibiisque primi paris nigris.

TARSI omnes nigri.

T E N E B R I O.

60. TENEBRIO UNCINUS.

Apterus niger, thorace marginato, subæquali, elytris striato-punctatis, angulatisque, femoribus anticis clavatis, maximis, biuncinatis.

Habitat in Hispaniâ.

MAGNITUDO Teneb. *mortisagi*, sed corpus gracilius & elytra respectu corporis breviora.

CORPUS totum atrum obscurum.

ANTENNÆ longitudine thoracis, moniliformes.

CAPUT obovatum; inter oculos futura elevata retrorsum angulata.

THORAX antice, posticeque subtruncatus, marginatus, planiusculus, suborbiculatus, punctis minutissimis excavatis adpersus.

SCUTELLUM minimum.

ELYTRA abdomen lateribus includentia, angulis vel striis elevatis in singulo tribus, ante apicem in angulum acutum coëuntibus. Inter angulos, intervalla superiora tria in utroque elytro striis quatuor & punctis excavatis exarata, et lateralia striis sex.

FEMORA antica clavata, crassissima, ad latus interius pro recipiendis tibiis excavata canaliculo, cujus margo uterque unco valido armatus.

61. TENEBRIO BUPARIUS *.

Alatus ater, glaber, thorace lunato, maxillis validis, dentatis, longitudine capitis.

Habitat in Hispaniâ ad fretum Gaditanum.

CORPUS magnitudine & statura Lucani *interrupti*, & ad Lucanos referendum insectum, nisi antennæ filiformes essent. Habitus Tenebrionis *fossoris*.

CAPUT magnum, planum, quadratum, antice fulcis duobus.

MAXILLÆ porrectæ, incurvæ, conniventes, angulatæ, bidentatæ.

ANTENNÆ filiformes, undecim articulorum, quorum primus ad basin longior, crassior, antennam pedatam efficit; reliqui pilis testaceis minutissimis rarisque adpersi, ultimi ferruginei.

THORAX lunatus, marginatus, medio fossula exaratus ut in Lucan. *interrupto*.

ELYTRA longitudine dimidii corporis, apicem versus paullo latiora, rotundata, marginata, glaberrima, obsolete sexstriata.

PEDES primi paris in medio corporis positæ.

TIBIÆ antice dilatatæ, dentato-spinosæ; posteriores pilis ferrugineis ciliatæ.

TARSI articulis quinque.

* Nomen speciei, *buparius* derivatur a *βου* et *παρις*; quod *maxillifum* denotat.

M E L O E.

62. MELOE CINEREUS.

Alatus cinereus, antennis elytrisq̃ue atris, margine cinereis.

Habitat in Americâ Septentrionali.

CORPUS magnitudine ad Meloen *Schæfferi*, statura vero & habitu ad Mel. *vesicatorium* accedit.

CAPUT inflexum, nigrum, pilis cinereis.

ANTENNÆ atræ, infra pilis ciliatæ, moniliformes, articulis undecim.

THORAX subrotundus, cinereus; macula nigricans in medio, divisa linea cinerea.

ELYTRA flexilia, atra, margine undique & ad futuram cinerea.

FEMORA tibiæque cinereæ, geniculis nigris.

TIBIÆ apice spinosæ.

TARSI atrī in pedibus anterioribus quinque articulorum, in posterioribus quatuor.

VARIETATES minus cinereæ, et totæ nigræ, defectu pilorum cinerascantium e quibus color cinereus insecti ortus.

M O R D E L L A.

63. MORDELLA TESTACEA.

Testacea, capite nigro, thorace fusco.

Habitat in Angliâ; lecta in floribus *Cratægi Oxycanthæ*.

MAGNITUDO fere Mord. aculeatæ.

CAPUT nigrum.

ANTENNÆ testaceæ.

THORAX fuscus, vel magis obscure testaceus.

ELYTRA, Abdomen, & Pedes testacea.

64. MORDELLA MELANOPA.

Nigra, elytris, thorace, capite pedibusque testaceis.

Habitat cum precedente.

MAGNITUDO majoris pediculi.

CORPUS supra et artubus testaceum, subtus nigrum.

ANTENNÆ apice fuscæ.

OCULI atrii.

ELYTRA testacea; punctum fuscum in medio, & aliud ad basin futuræ, in singulo elytro.

PEDES testacei.

65. MORDELLA FASCIATA:

Atra, elytris testaceis, apice nigris, fasciaque nigra in medio.

Habitat in Angliâ; frequens in floribus *Gratægi*,
Rumicis & *Umbellatarum*.

MAGNITUDO præcedentis; vel paullo minor.

ANTENNÆ fuscæ, basi testaceæ.

THORAX niger, adpersus villis brevissimis, fusco-testaceis, non nisi oculo armato conspicuis.

ELYTRA testacea; in medio fascia transversa nigra, alia ad apicem.

ABDOMEN nigrum, pallidius versus apicem, & acutum, ut fere aculeatum.

PEDES fusci.

66. MORDELLA CLAVICORNIS.

Picea tota, antennis clavatis.

Habitat in Angliâ, cursitans in floribus *Rhei-Rhabarbari*.

CORPUS ovatum, magnitudine Mord. *thoracicæ*, vel paullo majus.

ANTENNÆ fuscæ, basi ferrugineæ clavatæ.

Os ferrugineum.

THORAX hemisphæricus, major quam in congeneribus, pilis minutissimis pallentibus confitus.

ELYTRA picea, æque pilosa; linea obscura longitudinalis ad futuram.

PEDES concolores.

II. H E M I P T E R A.

C I C A D A.

67. CICADA. CARINATA.

Thorace dilatato, carinato, connato, corpus totum
& elytras includente, alarum margine coriaceo.

Habitat in Americæ Septentrionalis provinciâ Nov-
eboracensi.

MAGNITUDO $\frac{1}{2}$ uncia f. pollicis Anglicani.

ANTENNÆ setaceæ, albæ, duorum articulorum, longitu-
dine capitis.

OCULI pallide fusci.

CLYPEUS capitis dilatatus ferrugineo-fuscus, adspersus
foveolis, in quorum fundo sunt globuli diaphani rubi-
cundi; foveolæ, globulique iidem adfunt in thorace &
in margine alarum.

THORAX dilatatus, gibbus, venosus, scaber, carinam effi-
cit acutissimam quasi ex elytris connatam, totum cor-
pus includentem; fascia transversa obliqua a dorso me-
dio, apicem versus descendit.

ELYTRA nulla.

ALÆ venosæ, hyalinæ, margine coriaceo.

ABDOMEN & Femora nigra.

TIBIÆ pallidæ, ut et Tarsi, triarticulati.

68. CICADA GUTTATA.

Saltatoria fusco-varia; capite, thorace, elytrisque ferrugineis punctis flavis albisque, tergo coccineo.

Habitat in Americâ Septentrionali.

MAGNITUDO Cicad. *Spumariæ*.

FRONS rubicunda, nigro-maculata.

ANTENNÆ fuscæ.

CAPUT & Thorax fusco-ferruginea, punctis crebris albidis.

ELYTRA fusco-ferruginea, punctis albidis adspersa, ad marginem punctis majoribus flavis.

ALÆ fuscæ.

TERGUM coccineum.

ABDOMEN albo fuscoque varium.

PEDES ferruginei.

69. CICADA COCCINEA.

Alis deflexis, flava; capite, thorace, scutello, tergo, elytrisq[ue] coccineis, elytris lineis duabus longitudinalibus obliquis virentibus.

Habitat in Americâ Septentrionali.

MAGNITUDO circiter Cicad. *flavæ*.

FRONS flava margine nigro.

ANTENNÆ fuscæ, basi flavæ.

CAPUT coccineo-rubellum.

THORAX coccineus margine & linea longitudinali viridi.

SCUTELLUM coccineum.

ELYTRA coccinea; undique margine viridi, lineisq[ue] duabus obliquis longitudinalibus, secunda interrupta, viridibus.

TERGUM coccineum.

ABDOMEN pedesq[ue] flava.

NOTONECTA.

70. NOTONECTA LINEATA.

Pallide flava, elytris concoloribus; maculis nebulosis fuscis tribus longitudinalibus.

Habitat in aquis provinciæ Noveboracensis in America Septentrionali.

MAGNITUDO $\frac{1}{2}$ pollicis s. uncia Anglicanæ.

ANTENNÆ parvæ sub capite, pone oculos, duorum articulorum, extimo clavato.

CAPUT obtusum, flavum.

OCULI brunnei.

THORAX flavus, lineis tribus transversis fuscis.

ELYTRA flexilia flava, punctis nebulosis fuscis, in lineas tres longitudinales digestis.

ALÆ inferiores albæ, pellucidæ.

ABDOMEN, Pedes, & Pectus pallide flava.

C I M E X.

71. CIMEX ATERRIMUS.

Ovatus, ater totus, elytris dimidiato-hyalinis.

Habitat in Hispaniâ ad fretum Gaditanum.

CORPUS magnitudine Cim. *ornati*, ovatum, totum aterrimum glabrum.

CLYPEUS capitis emarginatus.

ANTENNÆ apice fuscæ.

THORAX antice parum depressus, retusus.

SCUTELLUM triangulare acutum.

ELYTRA antice atra, a medio vero ad apicem flavescenti-hyalina; pars nigra ab hyalina margine undulato distincta, ut quasi præmorsa adpareant elytra.

ALÆ hyalinæ.

PEDES atri, pilis vel fetis brevibus, rigidis, atris, ciliati.

72. CIMEX CARINATUS.

Roſtro arcuato, antennis capillaribus, thorace compreſſo carinato, carina ferratâ.

Habitat————

CORPUS duplo majus Cim. *perſonato*, ſubtus nigrum.

ANTENNÆ quatuor articulorum, ruſæ.

ROSTRUM arcuatum, validum, ruſum, apice nigro.

CAPUT poſtice attenuatum, ſpinis duabus poſt anten-
& tuberculis totidem inter oculos.

THORAX rhombeus, lateribus dilatatus, medio ſurſum
compreſſus, carinatus; margine, apiceque carinæ fer-
ratis; ſpinæ duæ ad collum.

ELYTRA fuſca, apice fuſco-virentia.

PEDES ruſi.

FEMORA nigra, primi paris baſi rubra.

SPIRACULA rubra.

III. LEPIDOPTERA.

P A P I L I O.

73. PAPILIO NAIS.

N. P. alis dentatis, supra fulvis, primoribus fascia maculisque nigris, posticis punctis nigris sex.

Habitat in Bombay Indiæ orientalis.

CORPUS quartæ magnitudinis, fulvo-rubrum.

ANTENNÆ—

PALPI albi, rubicundi.

OCULI brunnei.

PEDES sex albi, quorum duo brevissimi, rubicundi.

ALÆ *primores* supra concolores fulvæ. Margo exterior niger, lunulis albis; supra hunc marginem fascia nigra, at marginem tenuiorem non attingens; ad crassio-rem duæ maculæ nigræ, quarum superior reniformis, maculis in ea rubris minimis. Alia macula nigra in medio disci.

— *subtus* fuscæ rubentes, maculis albis 4 ad apicem, & fascia fusca ad marginem exteriorem; ad crassio-rem, maculæ binæ nigræ, rubro maculatæ; in disco macula nigra.

— *inferiores* supra fulvæ margine nigro, punctis albis; puncta sex nigra supra hunc marginem: *subtus* fuscæ rubentes, fascia media transversa alba, punctis sex nigris ad marginem; puncta duo pulcre rubra ad basin nigro cincta.

P H A L Æ N A.

74. PHALÆNA MURALIS.

Noctua spirilinguis subcristata, alis supra albidis ; fascia undata, stigmate in medio alæ, macula & fascia altera ad basin virescentibus, nigro fimbriatis.

Habitat in Angliâ, larva victitat inter *Lichenem parietinum* & *saxatilem* & inde loculum pro chrysalide construit.

CORPUS facie Ph. *Aceris* sed minus, albidum, crista nigro-marginata.

ANTENNÆ fuscæ.

OCULI nigri.

PALPI erecti, incurvati albi, basi nigri.

ABDOMEN albidum, serie punctorum nigrorum a tergo.

ALÆ *superiores supra* albidæ, fascia virescente undata, nigro fimbriata ad basin, connexa maculæ concolori interruptæ, marginem anteriorem non tangente. *Stigma* vires in medio alæ, paululum a margine anteriore remotum. Ad marginem anteriorem fascia lata virescens undata, lituris nigris inclusa. Margo exterior nigro-punctatus, sic et inferior ciliis nigro punctatis.—*Subtus* fusco nebulosæ.

—— *inferiores supra* albidæ, fascia obscure fusca ad marginem anteriorem. *Subtus* concolores, cum puncto obscuro fusco in medio alæ.

PEDES albi, nigro annulati.

75. PHALÆNA MINIATA.

Geometra feticornis, alis rotundatis, omnibus pallide miniatis, anticis linea undata ad basin, characteribus in medio, & punctis versus marginem posticum nigris.

Harris inf. t. 30. f. p.

Habitat in quercetis Angliæ.

MAGNITUDO Ph. *marginatæ*.

ANTENNÆ pallide rubræ.

CORPUS pallide rubrum.

OCULI nigri.

ALÆ *superiores* pallide rubræ, vel miniatæ, linea undulata prope basin nigra; margo exterior usque ad hanc lineam itidem niger. Postice characteres confertissime & acute undulati, nigri; punctaque nigra sub singulo denticulo vel angulo hujus characteris. *Subtus* pallidiores, macula costali nigra, opposita parti nigræ marginis exterioris, in pagina superiore; versus apicem macula palmata nigra respondens maculæ undulatæ in pagina superiore.

— *inferiores* magis obscuræ rubræ: *subtus* fusco-rubræ.

ABDOMEN subtus nigrum.

PEDES pallide-rubri, geniculis nigris.

76. PHALÆNA FULVATA.

Geometra feticornis, alis rotundatis, anticis fulvis, fasciâ ad basin, aliaque in medio undato repanda, ferrugineo-rufâ.

Habitat in Angliæ *Cratægo oxyacantha*.

CORPUS magnitudine præcedentis.

ANTENNÆ albido-flavescentes.

OCULI fusci.

PALPI fulvi.

CAPUT & Thorax fulva.

ABDOMEN pallide flavum.

ALÆ superiores fulvæ; fascia ad basin & in medio ferruginea; macula trigona pallida versus apicem.
Subtus pallide flavæ.

— *posticæ* supra & infra ex albido flavescentes: *subtus* in medio puncto obscuro fusco.

PEDES pallide flavi.

IV. HYMENOPTERA.

C Y N I P S.

77. CYNIPS SERICEA.

Viridi-nitens, pedibus totis flavis antennis fuscis.

Geoffr. parif. I. p. 301. Cynips 12.

Habitat in gallis foliorum quercus deciduorum; mense

Januario lecta in principatu *Walliæ* in Angliâ.

1769 & 1770.

CORPUS Cynip. vel Ichneum. *Bedeguaris* minus, totum viridi sericeum.

ALÆ hyalinæ; costâ, lituraque minima costali, pallidis.

ABDOMEN oblongum, acutum ad anum.

FEMORA, tibiæ, plantæque pallide flava.

TENTHREDO.

78. TENTHREDO CYANO-CROCEA.

Antennis clavato-filiformibus, exarticulatis, capite thoraceque cyaneis, abdomine croceo.

Habitat in plantis umbellatis Angliæ.

MAGNITUDO Tenthred. *Salicis*.

ANTENNÆ exarticulatæ, prismaticæ, nigræ, sursum erectæ, plerisque ciliatæ.

CAPUT & *Thorax* cyanea nitida.

ALÆ hyalinæ, cum fascia fusca a puncto nigro.

ABDOMEN croceum.

FEMORA primi & secundi paris pedum violacea, tertii paris flava; patellâ & apice violaceis.

TIBIÆ Primi paris fuscæ; secundi & tertii paris luteæ; apicibus nigris.

TARSI fusci.

79. TENTHREDO ARCUATA.

Antennis subclavatis, abdomine nigro, arcubus quinque, fascia ad basin, lateribusque flavo-virentibus.

Habitat in Angliâ.

MAGNITUDO Tenthred. *bicinctæ*, vel paullo minor.

ANTENNÆ subclavatæ, atræ, septem articulis, quinque extimis majoribus; bases antennarum latere interiore flavæ.

LABIUM flavum.

THORAX ater, lineâ flavâ a capite ad basin alarum, in maculam flavam desinente.

PECTUS flavo-maculatum.

SCUTELLUM flavum & postice ad ejus latera puncta duo minima flava.

ALÆ hyalinæ, costâ fusca, punctoque costali ferrugineo.

ABDOMEN nigrum, lateribus flavo-virentibus: ad basin fascia flavo-virens; segmento uno interjecto, reliqua margine arcubus flavo-virentibus cincta, supra, infraque.

PEDES flavo-virentes.

FEMORA linea longitudinali ad latus exterius nigra.

TIBIÆ apice nigræ.

TARSI supra fusci.

80. TENTHREDO ATRATA.

Antennis subclavatis exarticulatis, corpore atro,
dorso cingulo & arcubus tribus flavescenti-vi-
rentibus.

Habitat in Angliâ.

MAGNITUDE paullulum superat Tenthred. *ustulatam*.

ANTENNÆ subclavatæ, subtus stria elevata longitudinali.

ALÆ ferrugineæ, macula fusca oblonga, secundum costam
usque ad apicem alarum protensa.

ABDOMEN sub scutello cingulo flavo-virenti; interjecto
uno segmento sequuntur tria arcubus marginum flavo-
virentibus.

FEMORA atra, geniculis flavis.

TIBIÆ & plantæ flavæ.

UNGUICULÆ fuscæ.

I C H N E U M O N.

81. ICHNEUMON PRIMATORIUS.

Niger, scutello flavicante, antennis albo-annulatis, thorace maculato, abdominis segmento secundo & tertio ferrugineo, reliquis nigris, ultimis albo-maculatis.

Habitat in Angliâ; unicum tantum specimen a me lectum ad sepas.

MAGNITUDO Ichneum. *Pisorii* vel major; simillimus Ichneum. *sarcitorio*, sed triplo major, absque linea transversa nigra, inter segmenta abdominis ferruginea.

CAPUT totum atrum.

ANTENNÆ nigrae, annulo albo.

THORAX niger, macula albida ante alas primores.

SCUTELLUM albidum.

ABDOMEN petiolo nigro; segmenta petiolo proxima ferruginea, reliqua nigra: puncta seu maculae albæ singulae in segmentis tribus ultimis.

ALÆ hyalinae, costa fuscâ.

PEDES ferruginei, sed femora nigra, quorum postica et media macula alba ad basin ornata.

82. ICHNEUMON ARMATORIUS.

Niger, scutello flavo, antennis nigris, subtus rufis; thorace utrinque spinâ armato; abdomine nigro cingulis binis, anoque flavis.

Habitat in Angliâ.

MAGNITUDO Ichn. *luctatorii*.

CAPUT nigrum, fronte labioque flavis.

ANTENNÆ nigræ, fere totum corpus longitudine æquant; subtus rufæ, basi vel infimo articulo subtus flavæ.

THORAX niger, punctis duobus vel tribus ad basin alarum flavis; spina ad utrumque latus thoracis postice, abdomen spectans.

SCUTELLUM flavum.

ABDOMEN petiolatum, longum, compressum, segmento secundo tertioque antice dimidiato-flavis; subtus segmenta 2, 3, 4, flava, sed quartum puncto utrinque nigro.

ANUS flavus.

PEDES primi & secundi paris toti lutei, at in femoribus maculæ longitudinales nigræ.

FEMORA postica nigra, basi flava.

TIBIÆ posticæ flavæ, apice nigræ.

PLANTÆ posticæ ferruginæ.

ALÆ rufæ, venis rufis.

83 ICHNEUMON XANTHORUS.

Niger, scutello flavo, antennis annulo flavo cinctis; thorace maculato, abdomine petiolato flavo-annulato, pedibus flavis, femoribus nigris.

Habitat in Angliâ.

MAGNITUDO Ichn. *extensorii* vel paullo major.

CAPUT nigrum, lineola flava ante oculos.

PALPI ferruginei.

ANTENNÆ basi flavæ, dein rufæ, medio flavicantes apice nigræ.

THORAX niger, collo flavo ante, et altero pone alas primores.

SCUTELLUM flavum.

ALÆ rufescentes; costa primorum, punctoque luteis.

ABDOMEN petiolo nigro, apice flavo; segmenta nigra, sed margines fasciis latis flavis ornati.

FEMORA primi & secundi paris pedum nigra, exceptis genibus flavis; postica tota nigra, puncto majore flavo ad basin.

TIBIÆ flavæ, posticæ apice nigræ.

TARSI flavi.

84. ICHNEUMON ATRATOR.

Niger totus, scutello concolore, antennis nigris albo cinctis; pedibus rufis, plantis posticis apice albis.

Habitat in Angliâ.

CORPUS magnitudine Ichn. *extensorii*, nigrum totum, moschum redolens.

ANTENNÆ annulo albo cinctæ.

ALÆ fuscescentes.

ABDOMEN falcatum, atrum aculeo brevissimo.

PEDES ferruginei, postici plantis apice albis.

PATELLÆ, (five bases elevatæ mobiles, quibus femora infident,) in pedibus posticis maximæ, atræ.

85. ICHNEUMON POLYZONIAS.

Ater, antennis luteis, capite, thorace, pectore-
que flavo maculatis; scutello flavo, abdomine
atro, marginibus segmentorum flavis.

Habitat in Angliâ.

MAGNITUDO Ichneum. *extensorii*.

ANTENNÆ ferrugineæ seu luteæ, basi & apice fuscescen-
tes; basis antennarum subtus flava.

CAPUT nigrum; linea circum oculos, macula frontis, &
labium flava.

THORAX ater; maculæ ante alas, sub alis & supra pedes
secundi paris flavæ.

SCUTELLUM flavum.

ALÆ hyalino-ferrugineæ, macula costali pallida.

ABDOMEN subtus compressum & carinatum, marginibus
segmentorum supra infraque flavis.

PEDES ferruginei; tibiæ anticæ, femorumque apices
flava.

PATELLÆ femorum posticorum ovatæ, nigræ.

S P H E X.

86. SPHEX XANTHOCEPHALA.

Nigra, fronte flavâ, abdomine fufciffili, pedibusque flavo maculatis.

Habitat in Angliâ.

MAGNITUDO Sphegis *cribrariæ*.

CAPUT nigrum, fronte macula magna flava, posticetrifida.

ANTENNÆ longitudine thoracis nigræ, articulo infimo flavo.

THORAX niger, puncto flavo ante alas.

ALÆ hyalinæ, apice fufcefcentes.

ABDOMEN nigrum; margines segmentorum 2, 3, 4, 5, 6, fasciis flavis cincti, subtus puncta flava utrinque duo.

PEDES flavi, genubus nigris, tarsis fuscis.

87. SPHEX SPINOSA.

Atra, abdomine subseffili, thorace postice utrinque spina instructo, labio pectoreque argenteis.

Habitat in Angliâ.

MAGNITUDO Apis *rufipedis*.

CORPUS atrum, absque pilis.

ANTENNÆ nigræ.

CAPUT nigrum, ore seu labio argenteo.

THORAX niger rugosus, postice utrinque spina brevī armatus; antice lineola flava ornatus.

PECTUS, inter pedes primi & secundi paris, fascia argenteo-plumbea cinctum.

ALÆ hyalinæ.

ABDOMEN nigrum subseffile, gleberrimum, supra fasciis tribus flavis, prima interrupta, a reliquis remota.

PEDES rufi, femoribus ad exortum nigris.

C H R Y S I S.

88. CHRYSIS CYANOCHRYSÆ.

Glabra nitens, capite thoraceque cyaneis, reliquis viridi-aureis, ano quadridentato.

Habitat in Hispaniâ ad Calpen freti Gaditani.

MAGNITUDO parum inferior Chrysid. *ignita*.

CAPUT cyaneum.

LABIUM superius & regio inter oculos vestita pilis raris griseis.

ANTENNÆ fuscæ, articulis duobus ultimis, ad basin cyaneis.

THORAX scabriusculus punctatus cyaneus, sub alis versus abdomen utrimque dentes singuli.

ALÆ fuscæ, costa venisque nigris.

ABDOMEN viridi-aureum, ano quadridentato.

VENTER concavus nitens, coloris beryllini.

PEDES femoribus cyaneis, tibiis beryllinis, tarsis fuscis.

89. CHRYSIS CYANURA.

Glabra nitens, smaragdina, thorace bidentato, abdomine concolore, quadridentato.

Habitat in Hispaniâ ad Calpen freti Gaditani.

CORPUS magnitudine æquat maximas inter Chryfid. *ignitas*, totum nitens, colorem smaragdinum imitatur.

ANTENNÆ nigræ totis ultimis duobus articulis & quibusdam reliquorum supra nitentibus.

OCULI magni purpureo-fusci.

THORAX linea capiti parallela transversim divisus, dein medium thoracis divisum in areolas tres lineis longitudinalibus.

SCUTELLI loco, duo dentes; sub alis versus abdomen utrinque dentes singuli.

ABDOMEN undique nitens viride, duo extrema ad apicem segmenta cyanea; anus quadridentatus.

ALÆ fuscæ; costa alarum, venæque nigræ.

PEDES nitentes; tarsis fuscis.

V E S P A.

90. VESPA RUFICORNIS.

Nigra, thorace hirtio, antennis alisque rufescentibus; abdomine fasciis quinque interruptis flavis.

Habitat in Hispaniâ ad fretum Gaditanum

MAGNITUDO V. *vulgaris*.

CAPUT nigrum maxillis flavis, palpis ferrugineis, rostro vel linguâ nigra: *frons* flava, macula nigra versus antennas hastata; pone oculos lunula rufa.

ANTENNÆ ferruginæ, basi flavæ: ad stemma primum puncta duo flava, in quolibet latere unum.

THORAX niger, pilis flavis adspersus; antice macula vel linea sinuata flava cingitur; ad alarum basin punctum lineare flavum; ad horum punctorum extremitates macula transversa flava in thorace loco scutelli, ac pone hanc maculam sulci transversi bini.

ALÆ basi rufæ, apice fuscescentes, venis ferrugineis.

ABDOMEN glabrum, sessile, atrum, in quolibet segmento maculæ binæ oblongæ flavæ, anusque flavus: subtus segmenta tria vel quatuor ultima similiter maculis magnis (in singulo duabus) ornata.

FEMORA basi nigra apice flava.

TIBIÆ apice spinosæ, flavæ.

TARSI flavo-rufescentes, primi paris extrorsum ciliati.

A P I S.

91. APIS SERICEA.

Capite, thoraceque viridi-nitente; abdomine nigro, fasciis quinque, pedibusque flavis.

Habitat in Americâ Septentrionali.

MAGNITUDO & facies Chrysid. *ignita*.

LABIUM superius & maxillæ flavæ,

LINGUA nigra, longitudine capitis.

ANTENNÆ nodosæ, supra fuscæ, infra flavæ.

CAPUT viride nitens.

OCULI fusci.

THORAX viridi-aureus.

ABDOMEN ovatum, nigrum, fasciis quinque flavis.

PEDES omnes flavi.

FEMORA postica dente parvo.

ALÆ fuscæ hyalinæ.

92. APIS VESPIFORMIS.

Nigra, antennis, ore, maxillis, pedibus, & alis ferrugineis ; thorace punctis abdomine fasciis quinque flavis, primis interruptis.

Schæffer. ic. inf. ratib. t. 53. f. 11. & t. 81. f. 7.

Habitat in Americâ Septentrionali & Germaniâ.

CORPUS nigrum, magnitudine Apis mellificæ, facie vespæ.

MAXILLÆ ferruginæ apice fuscæ.

LINGUA ferruginea.

ANTENNÆ nodosæ ferruginæ.

THORAX puncto ferrugineo utrinque ad collum, ad calum alæ, sub ala, in scutello, & unico sub scutello.

ABDOMEN fasciis quinque flavis ; quarum duæ, proximæ thoraci, interruptæ.

ALÆ ferruginæ.

PEDES ferrugineo-flavi.

93. APIS NOVEBORACENSIS.

Atra, subvillosa, alis atro-cærulescentibus, abdominis segmento secundo & tertio fascia flava.

Habitat in Americæ Septentrionalis provinciâ Nov-eboracensi.

MAGNITUDO vespæ *vulgaris*, tota atra, subvillosa.

LINGUA brevis ferruginea.

ANTENNÆ atræ nodosæ.

ABDOMINIS segmentum secundum & tertium superiori parte fascia flava.

ALÆ atro-cæruleæ.

TARSI postici spinis ferrugineis.

TIBIÆ anticæ spina incurva ferruginea.

Drury illustr. t. 44. f. 5. videtur esse varietas fasciis quatuor flavis, & capite flavescente.

94. APIS ALBIFRONS.

Atra pubescens, fronte, thorace, tibiis, punctisque in abdomine albis.

Schæff. ic. t. 22. f. 14.

Habitat in Angliâ, ad fretum Gaditanum in Hispaniâ, & in Germaniâ.

MAGNITUDO Ap. *Tumulorum.*

FRONS truncata; circa basin antennarum pili albi.

ANTENNÆ crassiusculæ.

THORAX antice & lateribus pilis densis albis tectus; sub alis punctum album; in postica parte thoracis & inter alas pili nigri.

ABDOMEN segmento primo antice pilis albis tecto, latera segmentorum 2, 3, 4, punctis utrinque singulis albis.

TIBIÆ in superiori parte pilis albis adpersæ & in apice spinosæ.

ALÆ hyalino-fuscæ, venis nigris; margine exteriori punctis crebris nigris.

V. DIPTERA.

M U S C A.

95. MUSCA CHALYBATA.

Antennis filatis, clavatis, scutello sexdentato,
thorace chalybato, abdomine atro.

Habitat in Angliâ, lecta vere.

MAGNITUDO Musc. *clavipedis*.

ALÆ nigræ.

THORAX nitidus, cæruleo-ater.

SCUTELLUM dentibus sex, tribus utrinque, quorum duo
extimi minimi.

HALTERES nigri.

ABDOMEN atrum.

PEDES testacei, postici elongati, plantis nigris dilatato-
clavatis,

96. MUSCA VALLATA.

Antennis filatis, clavatis, scutello sexdentato, abdomine femoribusque flavis.

Habitat ad Sepes in Angliâ.

MAGNITUDO præcedentis, vel paullo major.

ALÆ subferrugineæ, incumbentes, planæ, puncto fusco in medio costæ.

THORAX nitidus ater.

SCUTELLUM dentibus sex.

HALTERES flavi.

TIBIÆ apicem versus fuscæ.

TARSI fusci.

97. MUSCA SIMILIS.

Antennis filatis, clavatis, scutello viridi-cæruleo nitido, sexdentato, abdomine chalybato.

Habitat in Angliâ; circa solstitium lecta.

CORPUS magnitudine præcedentium.

ALÆ subferrugineæ, puncto fusco ad alas.

PEDES omnes nigri.

THORAX nitidus, viridi cæruleus.

ABDOMEN cæruleo-atrum.

SCUTELLUM sex dentibus.

HALTERES albi.

OBS. Hæ tres muscæ & *M. clavipes* Linnæi, valde similes & inter se affines; sed tamen sunt diversæ, nam 1. *M. CLAVIPES* habet *abdomen* flavum, alas nigras, *halteres* flavos *femora* flava, *tarforum* articulum primum elongatum clavatum; at nulla reliquarum eisdem omnes habet characteres. 2. *M. VALLATA* habet *abdomen* flavum; sed *alæ* subferrugineæ sunt, & *tarsi* simplices. 3. *M. CHALYBATA* habet quidem *alas* nigras & *tarfos* clavatos; sed *Thorax* est chalybatus & *abdomen* atrum ut et *halteres*. 4. *M. SIMILIS* habet *pedes* simplices, *alas* subferrugineas, *halteres* albos, *thoracem* viridi cæruleum, nitidum & *abdomen* chalybatum; adeo ut fatis sint ab invicem distinctæ.

98. MUSCA MELANOPYRRHA.

Antennis plumatis, tomentosa nigra, abdominis apice rufo.

Schæff. ic. inf. ratiss. t. 10. f. 6.

Habitat in Angliâ, & Germaniâ.

MAGNITUDO Musc. *pellucens*.

FRONS pallida.

OCULI approximati, nigri.

PILI pauci flavi, circa stemmata.

THORAX hirsutus niger.

ABDOMEN, hirsutum nigrum, apice hirsutum rubrum, subtus atrum.

SCUTELLUM olivaceum.

ALÆ basi nervis fulvis, in medio macula magna fusca.

99. MUSCA GRANDITARSA.

Antennis, setariis, glabra, thorace nigro-æneo, abdomine ferrugineo apice nigro.

Habitat ad fepes in Angliâ.

HABITUS & fere magnitudo Musc. *segnis* cui simillima.

THORAX nigro-æneo-virens.

ABDOMEN oblongum, ferrugineum; duo ultima segmenta nigra.

FEMORA omnia nigra, simplicia.

TIBIÆ ad basin & femora ad genua ferruginea in pedibus quatuor anterioribus.

TARSI nigri; articuli primi tarsi primi & secundi paris pedum, grandes, cum pollice; at articulus primus, tarsi pedum posticorum, grandis absque pollice.

ALÆ subfulvæ.

HALTERES albi.

T A B A N U S.

100. TABANUS AMERICANUS.

Oculis——, plumbeus, abdominis segmentis
versus latera albicantibus, alis hyalinis, costa
ferruginea, pedibus ferrugineo-fuscis.

Drury ill. t. 44. f. 2. 3.

Habitat in Virginiâ & provinciâ Noveboracensi, Ame-
ricæ septentrionalis.

MAGNITUDO e maximis congenerum, unciam unam
pedis Anglicani longitudine exæquat.

PROBOSCIS nigra, capitis longitudine, palpis ferrugineis.

FRONS & cetera capitis alba, pilosa.

ANTENNÆ lunatæ ferrugineæ.

OCULI———magni.

STEMMATA nulla conspicua nisi locum eorum occupat
punctum magnum nitidum excurrans in lineam niti-
dam angustam inter oculos.

THORAX plumbeus, vix pilosus; subtus pectus totum
confitum pilis albidis longioribus.

ABDOMEN utrimque coloris plumbei, segmentis septem,
quorum quinque ad margines vestita sunt pilis minutis
albicantibus, præsertim ad latera.

PEDES ferrugineo fusci.

TARSI fusci, absque spinis in secundo "pare pedum (qua-
rum mentionem facit *Drury*.)

ALÆ hyalinæ fuscae, costa ferruginea.

(N. B. Figura 3. apud *Drury* b. c. mihi videtur esse
varietas hujus Tabani).

M. Harris sc.

THE
ENGLISH LEPIDOPTERA:
OR, THE
AURELIAN'S POCKET COMPANION:

CONTAINING
A CATALOGUE OF UPWARD OF FOUR HUNDRED
MOTHS AND *BUTTERFLIES*,
THE FOOD OF THEIR RESPECTIVE CATERPILLARS,
THE TIME OF CHANGING INTO CHRYSALIS,
AND APPEARANCE IN THE WINGED STATE:

ALSO,
THE PLACES WHERE THEY FREQUENT AND
ARE USUALLY FOUND;
WITH A CONCISE DESCRIPTION OF EACH, AND
THEIR DIMENSIONS.

BY MOSES HARRIS.

AUTHOR OF THE AURELIAN, OR HISTORY OF ENGLISH INSECTS.

LONDON:

PRINTED FOR J. ROBSON, BOOKSELLER IN NEW
BOND STREET.

MDCCLXXV.

1775

THEORY OF THE EARTH

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T A B L E

O F

TERMS used in the DESCRIPTION of the various Parts of the BUTTERFLY, refering to the Plate, wherein they are accurately delineated.

H E A D.	<i>f</i> Lower Corners of the superior Wings.
<i>a</i> Eyes.	<i>t</i> Outer Corners of the inferior ditto.
<i>c</i> Palpi.	<i>u</i> Abdominal Edges.
<i>d</i> Knobs of the Antennae.	<i>w</i> Anus.
<i>e</i> Threads of the Antennae.	<i>x</i> Ocelli.
<i>f</i> Tongue.	<i>y</i> Bar, Band or Garter.
<i>g</i> Thorax.	
<i>h</i> Shoulders.	
<i>i</i> Scutulum or Escutcheon.	A Superior Wing angulated.
<i>k</i> Abdomen with its Anuli.	B Superior Wing, smooth or even edged.
<i>l</i> Tips or Apices.	C Inferior Wing scalloped.
<i>m</i> Sector Edge.	D Inferior Wing indented.
<i>n</i> Fringes.	
<i>o</i> Sector.	
<i>p</i> Abdominal Groove.	
<i>q</i> Tails.	
<i>r</i> Abdominal Corners.	

The

The Interior Parts of the Superior Wing described.

The Parts coloured *Green*, are the FAN-TENDONS and MEMBRANES, marked in Numerical Order; viz. 1st, 2d, 3d, &c.

PAPILIONES have only five of these MEMBRANES, and six TENDONS.

The Parts coloured with *Pale Crimson*, are the TABLES.

The *Pale Blue*, shews the SECTORS.

Shoulder MEMBRANE—*Yellow*.

Slip MEMBRANE—*Pale Orange*.

Long MEMBRANE—*Pale Indian Ink*.

The Parts coloured *Purple*, are the SECTOR TENDONS and MEMBRANES, and it is in this Part of the Wing only, wherein one GENUS differs from another.

The Grand Tendons are coloured deep Red, and are three in Number; viz.

7 Long Tendon,	} Grand Tendons.
8 Principal Tendon,	
9 Shoulder Tendon,	
10 Table Tendon.	
11 Slip Edge.	
12 Bar Tendon.	

Interior Parts of the Inferior Wing described.

Green, shews the FAN-TENDONS and MEMBRANES, which are the same in Number as in the Superior Wings.

Pale Crimson, shews the TABLE MEMBRANE.

Blue. The SECTOR.

Yellow.

A TABLE of TERMS.

Yellow. TABLE MEMBRANE, or BENT ditto.

Pale Indian Ink. LONG MEMBRANE.

Pale Orange. ACCUTE MEMBRANE.

Deep Red. GRAND TENDONS, three in Number; viz.

15 POSTERIOR TENDON,

16 TABLE TENDON,

17 BENT or FEMORAL
TENDON,

} Grand Tendons.

18 Spur; this Part answers to that little instrument in the Phalæna, called Spring.

13 Abdominal Tendon.

14 Long Tendon.

It is worthy to be remarked, that although the several Parts of the Inferior Wings greatly correspond with the respective Parts of the Superior, yet here are no Parts answerable to the Sector Tendons and Membranes, and which are distinguished with Purple in the Superior; but Providence seems to have supplied that Deficiency, if I may call it one, by adding another on the opposite Edge of the Wing, called THE ABDOMINAL MEMBRANE, and is coloured Purple.

The first part of the year was spent in the study of the history of the country, and the second part in the study of the history of the world. The third part of the year was spent in the study of the history of the United States, and the fourth part in the study of the history of the United States.

The first part of the year was spent in the study of the history of the country, and the second part in the study of the history of the world. The third part of the year was spent in the study of the history of the United States, and the fourth part in the study of the history of the United States.

P R E F A C E.

THE usefulness of the following little work will be obvious at first view, to any one who has the slightest acquaintance with this part of Natural History : The author found it so necessary, that he always carried a copy of it in his pocket ever since he began to collect the different species of the LEPIDOPTERA.

What is now offered to the Publick has been revised and properly arranged, so that it is truly a compendium and repository of every new discovery of the author's researches for almost these thirty years diligent application.

It is divided into eight columns :

The *First* contains a Catalogue of the English Names of MOTHS and BUTTERFLIES, which are ranged in alphabetical order for the more easy finding any subject enquired for.

The *Second* shews what the Insects feed upon in the Caterpillar state.

The

The *Third*, the times of the transformation into the Chrysalis.

The *Fourth*, the times when it appears in the winged state, and the length of time it has lain in Chrysalis.

In the *Fifth* is precisely set down how much the Fly measures, or expands, from the tip of one wing to the tip of the other, in inches and parts of an inch.

The *Sixth* points out the places where the insects frequent, or are commonly found, in the winged state.

The *seventh* is a short description of the upper side of the wings, intended to assist the memory of the reader, and that he may the better distinguish one from another: It is therefore hoped, the brevity of the descriptions will be excused, as the nature of this work could not admit of descriptions more particular and full, as it is only meant to give an idea of each, and in what they differ from one another.

In the *Eighth* column are the *Linnean* Names,
with

with the number annexed to each insect as it is numerically placed in that author, in his twelfth edition.

It is necessary to acquaint the reader, that where the particular day of the month is set down in the third and fourth columns, it is not there meant that the insect is exact to that particular day as to its transformation, or appearance in the winged state, but must be understood to be as near as possible about the time; and that the insect remains as long in the Chrysalis state as the difference between the days of the month set down in each column.—As for example; The *Admirable*, the second insect in the Catalogue, is mentioned as changing into Chrysalis the 10th of July, and coming forth in the flying state the 1st of August; this is to signify, that the beginning, or first part of July is about the time for the generality of that species to change into Chrysalis; and the Caterpillar, which happens to change on the 10th of July, will come forth in the winged state on the first of August, as they always remain three weeks in the Chrysalis state.

It must also be observed, that of some of the

Lepidoptera there are two or three broods in a Summer, consequently the separate times of the several broods must be noted, as well of their transformation into the Chrysalis, as their appearance in the winged state. Here I was under the necessity of setting down two or three different months in one column. For the better understanding of which, we will give the *Speckled wood*, 49, as an example: In the third column is placed *Mar. May, July*, and in the fourth *April, June, Aug.* here is meant, that the Caterpillars which change into Chrysalis in March appear in the fly in April; the Caterpillars from this brood change in May and appear in June; and again the Caterpillars proceeding from second brood, change into Chrysalis in July, and come forth in the flying state in August.

I have also given an alphabetical List of *Linnean* Names to as many of the English species as I could find in that author; or as many as I was certain agreed with those of the English insects, for there are a great number of which I was doubtful, and chose not to admit them for fear of making mistakes. This List refers to the English one, where the history of the insect inquired after may be found.

I had once determined to give necessary and full directions to the young beginner relative to the collecting, breeding, and managing the various species, in their several states ; but as that has been industriously treated on by others, I shall content myself with setting down some rules and remarks founded on my own experience, and which are very necessary to be known, as they will prevent accidents, and such as the collector would not perhaps know how to account for.

And *first*, Let not the boxes which are taken in the pocket for Caterpillars, nor the cages made for breeding insects be made of deal or fir, except they be well lined with paper ; for the effluvia of the turpentine, raised by the heat of the pocket, or that of the sun, is extremely prejudicial to them, and seldom fails to destroy the greatest part of the Caterpillars contained therein for any length of time. The cause of the deaths of the Caterpillars, found at the bottoms of cages, or pocket boxes, is generally attributed to bruises got in beating the trees for them at the time of collecting them, which is a great mistake, as those which happen to be injured in beating, seldom die till the time of changing their

their skin, or of their transformation, and will nevertheless eat heartily till either of these times approach. If the inside of the cages or boxes be well lined with paper, as aforesaid, and air holes made in the sides and tops, covered with crape, or canvass, &c. to admit the air, it will in a very great measure prevent the above ill effects.

2dly, It is needless to go out to collect insects if the weather is cool, or much wind stirring, as at such times almost all kinds of insects conceal themselves, dreading the wind as much as they dislike the cold. Many fruitless journies have been made even in the midst of summer on this account. A warm and damp air, such as generally comes after rain, is what almost all sorts of Insects are fond of, in every state; and it is mostly for this reason they fly so near the earth at such times, that they may enjoy the humidity which arise in steams from the ground. In hot and dry days it is common to observe the Butterflies settle in numbers on the mud in ditches; and I have often seen above twenty so close together as to be contained within the circumference of a small hoop; by which it is found that heat with moisture best agrees with their nature.

But

But the *Garden White* is as good a token for fine weather as may be ; when these flies are out in a morning, it seldom or ever happens but a fine day ensues. This fly is also called the *Tally* for the *Swallowtail*, which appears from the Chrysalis at the same times of the year, as may be seen by the Catalogue.

3^{dly}, In the preservation of the Chrysalides during the winter, be sure to keep them in cold and moist places, as in a cellar or out house, otherwise the greatest part of them will be killed, especially those whose nature it is to change in the earth, as they cannot bear to be kept warm and dry, which is apt to exhale the nutritive moisture from them, hardens their shell, and weakens the insects so much, that at the time when they should appear in their flying state, they have not strength left sufficient to burst open the Chrysalis and come forth of their confinement ; in this case the miserable animal must die, as many have done, occasioned entirely by this mismanagement of them.

4^{thly}, When any of the *Lepidoptera* are extended on the setting board beneath the card braces,

braces, let them remain in that situation, till not only the aqueous moisture be evaporated, but the oily and saline particles, which will in a great measure fly off also, otherways the consequence will be bad : viz. the wings will not only start from their natural position, but the bodies with the *antenna* will grow mouldy when in the cabinet, or repository ; and what is of worse consequence, they will breed millions of *Animalcule* which will infallibly destroy them, except some remedy is applied. I would therefore advise they may be kept in some dry place open to the air, and where they may be free from dust for a considerable length of time before they are placed in the cabinet.

5thly, If at any time the insects, in a cabinet or box where they are placed for preservation, should appear as if growing mouldy, or be infested with small *Animalcule*, which is known by a kind of dust seen beneath the abdomen ; in this case the smoke of tobacco is the only effectual remedy, which must be blown through the small end of a pipe admitted through a hole made for that purpose at the back part of the drawer or box, this not only corrects the putrid
and

and stagnant air, but destroys those formidable enemies which often destroy whole cabinets of Insects: this will preserve them for twelve-months, when it will be necessary to act the same part over again. It may be feared and objected that the smoke may in some measure damage the insects, but a little experience will plainly evince the contrary.

A TABLE

PAPILIO.

ENGLISH Names.

	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
1 A dmirable, white	-	-	June 20	2 $\frac{3}{4}$
2 Admirable	nettles	July 10	Aug. 1.	2 $\frac{1}{2}$
3 Blue, azure	grafs	-	May 10	1 $\frac{1}{4}$
4 Blue, common	grafs	May	June 1	1
5 Blue, argus	grafs	June	July 9	1 $\frac{1}{2}$
6 Blue, clifden	-	June 1	June 20	1 $\frac{1}{4}$
7 Blue, chalkhill	-	June 1	July 13	1 $\frac{1}{4}$
8 Blue, silverstudded	grafs	May	June 20	1
9 Brimstone	buckthorn	May	June 22	2 $\frac{3}{4}$
10 Brown, meadow	grafs	May 12	June 4	2 $\frac{1}{4}$
11 Bramble or green fly	bramble	July	May 1	1 $\frac{1}{4}$
12 Comma	hops, nettles	Jan. 18, Aug	June 30, Sept	2 $\frac{1}{4}$
13 Copper	grafs	-	June Aug	1
14 Emperor, purple	fallow	May 25	June 29	3

Usual haunts in the winged state	Upper side described	LINNEAN Names.
1 Woods -	Black, with white bars	Camilla 187
2 Lanes -	Black, with red bars	Attalanta 175
3 Woods -	Blue, tips black	Argiolus 234
4 Long grafs -	Blue, fringes white	
5 Long grafs -	Blue, mixt brown	
6 Commons near Clifden	Pale blue	
7 Commons near woods	Pale blue	
8 Commons -	Blue, fringes white	
9 Meadows -	Yellow, red spot in the middle	Rhamni 106
10 Meadows -	Brown, small ring near the tip	Jurtina 155
11 Woods -	Brown, green on the under side	Rubi 237
12 Meadows -	Orange, with black spots	C. album 168
13 Meadows -	Shining copper spotted with black	Virgaurea 253
14 Woods -	Purple with white bars	Iris 161

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
15 Fritillaria, silver wash	-	May 31	June 20	3
16 Fritillaria, high brown	violets	May 20	June 12	2 $\frac{3}{4}$
17 Fritillaria, dark green	-	May 20	June 10	2 $\frac{1}{4}$
18 Fritillaria, pearl border	-	April 30	May 11	2 $\frac{1}{4}$
19 Fritillaria, pearl border liknefs	-	June 4	June 18	2 $\frac{1}{4}$
20 Fritillaria, greafey	devils bitt	April 17	May 1	2 $\frac{1}{4}$
21 Fritillaria, Queen of Spain	-	April	May 10	2 $\frac{1}{2}$
22 Fritillaria, Glanville	long plantain	April 15	May 15	2 $\frac{1}{4}$
23 Fritillaria, duke of Burgundy	-	May 12	May 28	1
24 Fritillaria, small pearl border	heath	May 12	May 28	2
25 Grayline	grafs	June 30	July 20	2 $\frac{1}{2}$
26 Griftle	-	April	May 11	1
27 Keeper, large gate	grafs	June	July 12	2
28 Keeper, small gate	grafs	April 5	April 29	1

Haunts in the winged state	Upper side described	LINNEAN Names.
15 Woods -	Yellow brown streaked and spotted with black	Paphia 209
16 Woods -	Orange brown, with black spots	Adippe 212
17 Woods -	Orange brown spotted with black	Aglaza 211
18 Woods -	Orange spotted with black	Euphrosyne 241
19 Heaths near woods	Checker'd black and orange	Maturna 204
20 Woods and meadows	Orange and yellow checker'd with black	
21 Gamling Gay wood near Cambridge	Orange brown spotted with black	Lathonia 213
22 Meadows -	Orange brown spotted with black	Cinxia 205
23 Woods -	Brown spotted with black	Lucina 203
24 Woods -	Orange brown spotted with black	
25 Meadows and woods	Dark brown with small circle at tips	Semele 148
26 Woods -	Dark brown with spots of white	
27 Hedges -	Orange brown small ring on the tips	Megera 142
28 Meadows -	Yellow with ring on each tip	Pamphilus 239

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
29 Lady, painted	nettles, thistles & docks	July 20	Aug. 1.	2 $\frac{3}{4}$
30 Lady of the woods	wild cole	July 25	May 6	1 $\frac{3}{4}$
31 Peacock -	nettles	July 7	July 28	3
32 Ringlett -	grafs	June 1	June 20	2
33 Tortoiseshell, large	elm tree	June 21	July 12	3
34 Tortoiseshell, small	nettles	Aug. 16 June 3	Aug. 30 June 17	2
35 Skipper, large	-	May 5 June 5	May 25 July 25	1 $\frac{1}{2}$
36 Skipper, small	-	June 25	July 17	1
37 Skipper, dingey	-	April	May 6	1 $\frac{1}{4}$
38 Skipper, pearl	-	-	Aug. 25	1 $\frac{1}{2}$
39 Streak, brown hair	buckthorn	July 1	Aug. 1	1 $\frac{1}{2}$
40 Streak, purple hair	oak	June 6	July 17	1 $\frac{1}{4}$
41 Surprise, grand	willow	July 8	July 28	3 $\frac{1}{4}$
42 Streak, hair dark	-	-	Aug. 1	1 $\frac{1}{4}$

Haunts in the winged state,	Upper side described	LINNEAN Names.
29 Furzes and teazles	Orange and carnation cloud- ed with black, 5 white spots at each tip	Cardui 157
30 Hedge fides -	White, superior wings tip'd with orange	Cardamines 85
31 Lanes and hedge fides	Dark red brown, large eye like spot on each wing	Io 131
32 Woods and hedge fides	Brown small rings on each wing	Hyperantus 127
33 Lanes -	Orange brown, 3 large black spots on the sector edge	Polychloros 166
34 Banks -	Red orange, 3 black spots on sector edge of each wing	Urticæ 167
35 Woods -	Yellow orange spotted with brown	Comma 256
36 Woods -	Yellow orange with a streak of black in the middle	
37 Woods, heaths, and Meadows	Dark brown having a light- ish bar cross the superior wings	Tages 268
38 Swampy ground on briars, Hanwell heath near Ealing		
39 Hedges	Brown with an orange spot on each superior wing	Betulæ 220
40 Bushes [11]	Black with blue spot near the body	Quercus 222
41 Willows [11]	Dark brown with a broad yellow border	Antiopa 165
42 Hedges		

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inches
43 Tail, fswallow	wild fennel and carrots	Sep. 23 July 15	May 15 Aug. 10	3 $\frac{1}{4}$
44 White, large garden	cabbage	Sep. 23 July 15	May 15 Aug. 10	2 $\frac{3}{4}$
45 White, small garden	cabbage	Sep. 23 July 15	May 15 Aug. 10	1 $\frac{3}{4}$
46 White, black veined	white thorn	May 16	June 6	2 $\frac{1}{2}$
47 White, green veined	cabbage	Sep.	May 11	1 $\frac{3}{4}$
48 White, wood	-	Octob. July	May 6 Aug. 6	1 $\frac{1}{2}$
49 Wood, fpeckled	grafs	Mar. May July	April June Aug.	2
50 White, marbled	grafs	May	June 6	2
51 Wall -	grafs	May 2 July 2	June 2 Aug. 2	2 $\frac{1}{4}$
52 Yellow, clouded	-	July	Aug. 7	2 $\frac{1}{4}$
53 Yellow, pale clouded	-	July	Aug. 9	2 $\frac{1}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names
43 Meadows, Bristol and Weltram	Yellow spotted with black. Two tails.	Machaon 33
44 Gardens -	White, two black spots and black tips.	Brassicæ 75
45 Gardens -	White, with two round black spots on superior wing with black tips.	Rapæ, 76
46 Cornfields -	White, tendons black.	Crategi, 72
47 Gardens -	White, with two black spots and black tips.	Napi, 77.
48 Woods -	White, grey tips.	
49 Woods in lanes	Brown, spotted with cream colour.	Ægeria, 143
50 Meadows -	White, checker'd with black	Galathea, 147
51 Walls and banks	Clay colour, clouded with brown, a ring at the tip.	Mæra, 141
52 Meadows -	Yellow orange, bordered with black clouds.	Hyale. 100
53 Meadows -	Pale yellow, bordered with black clouds.	

P H A L Æ N A.

ENGLISH Names.

	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
54 A rchés, buff	oak & white thorn	June 29	July 29	$1\frac{3}{4}$
55 Arches black	oak	June 9.	July 9	3
56 Arches dark	cabbage	May	July	2
57 Arches red	oak	June 1.	July 1	$1\frac{1}{4}$
58 Anlér	-	-	-	-
59 Arches grey	-	May 15	June 15	1
60 Arrach wild	arrach	Aug. 28	Sep.	$1\frac{1}{4}$
61 Argus buff	white thorn	April	May	1
62 Apple-tree moth	apples	Sep.	May	$\frac{5}{8}$
63 Arratch, July	arrach	Sep. 12	July	$1\frac{1}{2}$
64 Argent and fable	white thorn	May 6	June 6	$1\frac{1}{2}$
65 Broad bar, shaded	heath	-	May	$1\frac{1}{8}$
66 Brown, light work	heath	-	July	1
67 Beauty, minor	fruit trees	June	July	1

Haunts in the winged state	Upper side described	LINNEAN Names,
54 Woods	Dark buff, with small arched markings.	Monicha 43
55 Woods	White, with strong black arch like markings, tail red.	
56 Gardens	Dark brown, with black arched markings.	
57 Woods	Orange red, with black arched lines.	Pomonilla 401
58		
59 Woods		
60 Fields	Buff colour waved with undulated bars	Antriplicis 173
61 Lanes	Buff colour, speckled with brown specks	
62 Orchards	Brown, marbled with black	Pomonilla 401
63 Fields	Pale orange, with undulated black and brown bars.	
64 Lanes	White, beautifully check-er'd and spotted with black.	
65 Heaths	Grey, having a broad dark bar.	
66 Heaths	Brown, prettily marbled with white.	
67 Orchards	Light brown, mottled with dark brown.	

ENGLISH Names.	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
68 Back, large diamond	-	April	May 18	$\frac{3}{4}$
69 Back, small diamond	-	April	May 18	$\frac{1}{2}$
70 Back diamond likeness	-	April	May	$\frac{3}{8}$
71 Barr, broad	oak	-	June	$\frac{1}{4}$
72 Barr, Oak	oak	May	June	1
73 Bar, scallap wing broad	oaks	-	Aug. 10	$1\frac{1}{4}$
74 Bar, tripple	oak	-	May 26	$1\frac{1}{2}$
75 Bar, purple	-	-	June 5	
76 Bar, dun	oak	May 27	Aug. 10	$1\frac{1}{4}$
77 Beauty, brindled	lime, and lalach	June 30	April 7	2
78 Beauty, oak	lime, oak, elm	May 26	Mar. 5	$2\frac{1}{2}$
79 Beauty, pale oak	oak	Octob.	May 7	2
80 Beauty, hornfey	black thorn	-	Aug. 20 June 2	$1\frac{1}{2}$
81 Beauty, mottled	black thorn	May 10	June 12	

Haunts in the winged state.	Upper side described	LINNEAN Names.
68 Gardens -	Dark brown, having two yellow spots and two bright silvery lines	
69 Gardens -	Black, with three yellow spots on each superior wing.	
70 Gardens -	Black, with one yellow spot, under wings yellow.	
71 Woods -	Brown, having a broad dark bar.	
72 Woods -	Brown, having three dark bars.	
73 Woods -	Wings much indented, and of a light brown, having a broad dark bar, with a round small ring in the centre of the wing.	
74 Woods -	Grey, having three double bars cross the wing	
75 -	-	
76 Woods -	Light brown, broad bar cross the middle, underwings black.	
77 Gardens against pales	Yellow brown, and brindled having bars crossing the wings.	
78 Woods -	White freckled with black, having two brown bars crossing each wing.	
79 Woods -	Pale brown, handsomely vein'd with dark brown.	
80 Lanes 131	Wings, having a succession of bars of grey, brown and orange.	
81 Lanes 131	Light brown, beautifully mottled with dark brown.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
82 Beauty, Clifden	white thorn	June	July	1 $\frac{1}{2}$
83 Beauty, willow	willow	June 10	Aug. 10	2
84 Beauty, Richmond	black and white thorn,	May 5	June 5	1 $\frac{1}{2}$
85 Bell,	elm	-	May 28	1
86 Bird, humming	ladies bed- f straw	Aug.	April May	2 $\frac{1}{4}$
87 Bird, clear winged humming sphinx	willowwood	-	May 1	2
88 Bird, small clear wing- ed humming sphinx	-	-	Aug. 22	1 $\frac{1}{2}$
89 Bird, least clear winged humming sphinx	currantbush stalks	-	May 29	1
90 Bishop	lime moss	-	-	1
91 Blossom, peach	raspberry leaves	June	July 16	1 $\frac{1}{2}$
92 Blossom, pease	-	June	July	1
93 Beauty, pale spotted	-	-	June	3 $\frac{1}{4}$
94 Blush, maiden	oak	-	May	1
95 Border, blue	white thorn	-	May	1 $\frac{1}{8}$

Usual haunts in the winged state	Upper side described	LINNEAN Names.
82 Lanes -	Silver white, a large brown cloud on the sector edge, the same edge hath a broad border of brown, with a white square spot in middle.	
83 On the barks of willows	Of a pale greenish brown, beautifully rabied with undulating bars.	
84 Hedges -	Wings angulated, of a pale yellow orange, and hath broad brown bars.	Syringaria 206
85 Barks of elms	Greyish brown, near the tips is tinged with red brown.	
86 Gardens on flowers	Wings superior brown, the inferior orange, the anus tufted.	Stellatarum Sphinx 27
87 Gardens on flowers	Wings transparent, with a broad brown border, and broad yellow ring round the abdomen.	Fuciformis Sphinx 28
88 Seen on a flower in Norwood	Wings transparent, anus tufted.	
89 On the leaves of the currant	Wings transparent, anus tufted.	Culiceformis 30
90 Against walls or sometimes trees	Lightish grey marbled with black.	
91 -	Dark brown, having five large rose colour'd spots.	
92 -	-	Delphinii 188
93 Woods -	Pale white, with pale clouds.	
94 Woods -	Buff, with a blush of pink in the middle of the wing.	
95 Lanes -	White, triangular spot in the middle, and a border of blue grey.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inches.
96 Border, clouded	oak	May 26	June 26	1 $\frac{1}{4}$
97 Border, laced	oak	-	May 12 July 6	1 $\frac{1}{4}$
98 Brafs, burnished	archangel	July 20 May 5	Aug. 1 June 6	1 $\frac{1}{2}$
99 Brafs burnished likenefs	-	-	June	2
100 Beauty, small brindled	oak	Aug.	April	1
101 Beauty, pale brindled	lime, elm	-	Feb. 21	
102 Bar, grey scallaped	heaths	-	May	1 $\frac{1}{4}$
103 Brindled	hastle, oak	June 14	April	1
104 Border, Essex broad	-	-	-	
105 Buff, clouded	grafs	-	June 5	2
106 Buff, waved	-	April	May	
107 Buff waved likenefs	-	-	-	
108 Burnet, sphinx	hay, grafs	May 11	June 2	1 $\frac{1}{2}$
109 Burnet, companion	grafs	April	May 20	1 $\frac{1}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names.
96 Woods	White, bordered with large black clouds.	
97 Woods	White, having a broad bar down the middle, border like lace.	
98 Meadows	Wings partly brown shining like polish'd brass.	Chrysitis 126
99 Meadows	Brown having a large square spot shining like brass	
100 Woods	Brown prettily brindled.	
101		
102 Heaths	Grey, with two occult bars or broken lines which cross them.	
103 Woods	Dirty buff freckled with brown.	
104		
105 Southgate warren	Golden yellow, red fringe and two large spots on wings.	Quadra 114
106 Hedges		
107 Lanes		
108 Meadows	Shining green, six spots of scarlet, inferiors scarlet.	Filipendulæ 34
109 Fields	Brown clouded, inferior yellow vein'd with brown.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
110 Bar, gray broad -	-	-	May	1 $\frac{1}{2}$
111 Brindled, pale -	-	-	Mar. 5	1 $\frac{3}{4}$
112 Betony, water -	water betony	July	April 20	1 $\frac{1}{4}$
113 Betony, water likness	cabbage	July	Aug	1 $\frac{1}{4}$
114 Beauty, boltons -	-	May	June	1 $\frac{1}{2}$
115 Blush, double bar'd	-	-	May	1 $\frac{1}{4}$
116 Buff-lined, beautiful	heath	-	May	1
117 Codling -	codling	July	June	$\frac{3}{4}$
118 Chivern'd, broad -	-	May	June	1 $\frac{1}{2}$
119 Carpet -	-	-	July 17	1 $\frac{1}{2}$
120 Carpet, Clifden -	-	-	July	1 $\frac{1}{4}$
121 Carpet, clouded -	white thorn	-	May	1 $\frac{1}{4}$
122 Carpet, cloaked -	black thorn	-	May	1 $\frac{1}{4}$
123 Carpet, green -	white thorn	-	May	

Haunts in the winged state.	Upper side described	LINNEAN Names
110 Heaths -	Grey, with a broad brownish bar; inferior pale.	
111 Woods -		
112 Bank sides -	Brown, with a dark streak of brown on slip edge.	Verbasci 152
113 Gardens -	Dark buff colour streaked with deep brown.	
114 Hedges -	Grey, full of neat undulated bars; one in middle broad.	
115 Hedges -		
116 Heaths in Yorkshire	Buff colour veined with neat bars of brown.	
117 Orchards -	Fine brown marbled with a darker colour.	
118 Lanes -	Pale brown, with broad chivern like bars of dark brown.	
119 Woods -	White, with broad bars of dark brown.	
120 Lanes -		
121 Lanes 111	White, with clouded bars of brown.	
122 Lanes 112	White, half the wing toward the thorax dark brown.	
123 c	Dark green bared with brown.	

ENGLISH Names:	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
124 Carpet, Hornsey -	oak	-	Aug.	$1\frac{1}{4}$
125 Character, Hebrew	elm	Sep. 20	Mar. 13	$1\frac{1}{2}$
126 Crimson and gold	nettles	-	May 12	$\frac{3}{4}$
127 Crown -	-	-	-	-
128 Cyper -	-	-	Feb. 18	$1\frac{1}{4}$
129 Carpet, bar'd -	-	-	-	$1\frac{1}{2}$
130 Dagger, dark -	willow	-	Aug.	$1\frac{1}{4}$
131 Dagger, March -	oak	Sept	Mar. 10	$1\frac{1}{4}$
132 Dagger, gray -	willow, and fruit trees	Sep.	May 27	$1\frac{1}{4}$
133 Dagger, gray liknefs	oak	May 26	June 26	$1\frac{1}{4}$
134 Da jour, marvel -	oak	May 26	July	$1\frac{3}{4}$
135 Da jour, marvel liknefs -	oak	-	-	1
136 Da jour, mavel companion -	oak	-	-	$1\frac{1}{4}$
137 Da jour, scarce marvel	birch	-	May	$1\frac{1}{2}$

Haunts in the winged state	Upper side described	LINNEAN Names.
124 Lanes near Hornsey	Bar'd with brown, between is orange colour.	
125 Near elms -	Dark brown, with a strong black mark in the middle of the wing, or crooked spot.	
126 About nettles	Crimson spotted with gold colour; inferior black with yellow bar.	
127 Lanes -		
128 Banks -		
129 Lanes -	White, having three broad bars of brown.	
130 Willow bark	Dark gray, with some marks in the wing like daggers.	
131 Bark of trees in woods	Light brown, full of short lines, which are all parallel with the front or sector edge.	
132 Bark of willows	Light gray, with strong marks on the wing resembling daggers.	Pfi 135
133 Woods -	This moth has a faint appearance of the above markings.	
134 Woods -	Of a light blue green, with marks of white, all over marked with crooked black marks.	
135 Woods -	This appears a little like the above.	
136 Woods -	Of an olive green, brindled with dark browns.	
137 Woods -	This is rather less than the Marvel da jour, but much stronger in the markings.	

ENGLISH Names,	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
138 Da jour, scarce mævel	white thorn	-	May 20	1 $\frac{1}{8}$
139 Ditto, dark -	elm	-	Ap. 15	1
140 Ditto, pale -	white thorn	April	May	1
141 Dock -	dock	-	-	1 $\frac{1}{2}$
142 Dot -	nettles	Sep. 4	May 30	1 $\frac{3}{4}$
143 December -	white thorn	Nov.	Dec.	1 $\frac{1}{8}$
144 Drinker -	grafs under hedges	May 27	June 27	3
145 Dismal -	willow bark	-	June	1 $\frac{1}{2}$
146 Dingy dot -	-	-	-	1
147 Eye, white line brown	marigolds	Aug. 14	May 20	1 $\frac{1}{4}$
148 Ear -	-	-	-	1 $\frac{1}{4}$
149 Egg, goose	white thorn	April	May	1
150 Egger, large -	white thorn	June 21	July 18	3
151 Egger, small -	black thorn	June 16	Mar. 23	1 $\frac{1}{2}$

Usual haunts in the winged state	Upper side described	LINNEAN Names.	
138 Hedges in lanes	White, broad dark bar cross the wing, a border of the same, and shoulder covered with brown.		
139 Gardens -	Like the above in its markings, but is less, and almost black.		
140 Grass in meadows	Marked as the above, but the bars are of a pale brown.		
141 Near rubbish mounds			
142 Bank sides -	Almost black, having a white dot in the middle of the wing.		
143 Hedge in lanes -	Dark brown, with very faint markings.	Populi	34
144 Lanes -	Female, of strong buff colour, with a white spot in the middle of the wing. Male almost red.	Potatoria	23
145 Willow bark -	Of a plain shining dark brown, inferior wings light.		
146 -	Of a dingy brown, having a black spot in middle of the superior wing.		
147 Gardens -	Brown, having an undulated white line near the fan edge.	Oleracea	171
148 Gardens -	Brown, having a strong mark in the middle like the human ear.		
149 Woods -	White, having some clouds in the middle of the wing as if scorched,		
150 Lanes near woods	Yellow buff colour, with a white spot in the middle.	Quercus	25
151 Lanes -	Nearly black, having two light bars; anus tufted.	Lanestrus	28

ENGLISH Names,	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inche ^s
152 Egger, liknefs -	nettles	-	June	1 $\frac{1}{4}$
153 Egger, snout liknefs	nettles	May 9	June 3	1 $\frac{1}{4}$
154 Egger, oak -	oak	Octob.	May 15	1
155 Egger, grafs -	trefoil	May 12	Aug. 20	2 $\frac{1}{2}$
156 Eight, figure of -	crabtree	June	Aug. 9	1 $\frac{1}{4}$
157 Elephant, large, sph.	ladies bed- fstraw	Aug. 2.	May 23	2 $\frac{1}{4}$
158 Elephant, small, sph.	-	Aug.	May 27	1 $\frac{1}{8}$
159 Elephant, spotted, sp.	meadows	Aug.	May 27	2 $\frac{1}{4}$
160 Ermine, large -	elder	Sept.	May 15	1 $\frac{3}{4}$
161 Emerald, large -	birch and broom	June 15	July 6	2 $\frac{1}{4}$
162 Emerald, small -	white thorn	-	-	1 $\frac{3}{4}$
163 Emperor, -	blackthorn, willow	July 8	Ap. 15	3 $\frac{1}{4}$
164 Ermine, small -	white thorn	June 10	July 10	7 $\frac{1}{8}$
165 Ermine, cream -	elder	Aug. 18	May 15	1 $\frac{3}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names
152 Lanes	Umber colour, having a broad brown bar crossing the middle.	
153 Hedges	Marked like the foregoing.	
154 Woods	Brown, with two bars cross the wing.	
155 Meadows	Yellow brown, two light bars cross the middle of the wing.	
156 Orchards	Dark brown, with a mark like a double figure of eight in the middle.	Cæruleoce- phala 59
157 Rotherhith marshes	Superior wings olive bordered with rose colour: inferiors rose colour.	Elpenor 17
158 Meadows——Ofterly wood near Brentford	This is marked like the above.	Porcellus 18
159 Meadows	Superior wings of a rose colour, with dark olive spots: the inferior are rose colour.	Euphorbia 19
160 Pales in gardens	Wings narrow, and white, and are full of small black spots.	
161 Woods	Pea-green, having a white bar near the end of the wing.	Papilionaria 225
162 Hedges	Pea green, with two bars cross the wing.	
163 Ofier grounds	Gray with red bars, having a large eye like spot in middle of each wing.	Pavonia 7
164 Whitethorn hedges	Gray, full of small black specks.	Padella 351
165 Garden pales	Cream colour, full of black specks.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands, inches
166 Ermine, thistle -	thistles	Aug.	May	$1\frac{1}{4}$
167 Ermine, seven spot	-	-	-	$1\frac{3}{4}$
168 Ermine, water -	ladies bed- straw	Aug.	May	$1\frac{3}{4}$
169 Ermine, distaff -	fruit trees	June 10	July 10	1
170 Eye, dark line brown	pot herbs	Aug.	May	$1\frac{1}{2}$
171 Ear, shaded -	-	-	July	$1\frac{1}{2}$
172 Fern -	fern	-	-	
173 Flyer, high -	fallow	-	-	$1\frac{1}{2}$
174 Flyer, July high	fallow	June 4	July 4	$1\frac{1}{4}$
175 Flyer, July high lik- nefs -	oak	Sept.	May	$1\frac{1}{2}$
176 Footed, fan -	black thorn	-	-	$1\frac{1}{4}$
177 Favourite, or broom moth -	chickweed	Sept.	May 28	$1\frac{1}{2}$
178 Fox -	bramble	April	May	$1\frac{1}{2}$
179 Fringe, dark -	-	-	June	$1\frac{1}{4}$

Usual haunts in the winged state	Upper side described	LINNEAN Names.
166 Banks of thistles -	White, full of black specks	
167 Yorkshire -	White, having seven black specks on each superior wing.	
168 Rotherhith or marshes	White, having two black specks.	
169 Orchards -	White, full of black specks	Evonymella 350
170 Gardens -	Brown, light brown spot in middle of wing, and a black line or bar near the outer edge.	
171 Gardens -	Brown, having a dark spot in the middle like a human ear.	
172 Heaths -		
173 Near woods -	Olive green, having a number of interrupted crooked bars crossing them.	
174 Near woods -	Fine brown, full of undulated bars, both broad and narrow, of chocolate colour.	
175 Lanes -	See the description of the July high flyer.	
176 Lanes -	Pale umber, having three lines crossing the wing, and two long feathers protruding from the breast.	
177 Meadows -	Red brown, with broken bars of a cream colour, particularly one near the fan edge.	Pifi 272
178 Near woods -	Male red brown, white spot in middle, and a light bar near the fan edge.	
179 Lanes -	Narrow wings of dark lead colour; fringes broad.	Rubi 27

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
180 Forrester, sphinx	forrel	May 3	May 27	$1\frac{1}{4}$
181 Fringe, gold -	oak	June 1	Aug.	$1\frac{1}{4}$
182 Furbelow -	gardens	-	Aug	$1\frac{1}{4}$
183 Furbelow, pale	-	-	-	$1\frac{1}{4}$
184 Footman	-	-	-	$1\frac{1}{4}$
185 Freckled -	pot herbs	Aug	Sep. 20	$1\frac{3}{4}$
186 Gentlewoman, old	cabbage	July 8	June 13	$1\frac{1}{2}$
187 Gentlewoman, small old -	herb mercury	June	Aug.	$1\frac{1}{4}$
188 Grey, dappled -	-	-	-	$1\frac{1}{4}$
189 Green, pea -	oak	May 29	June 20	$\frac{3}{4}$
190 Ghost -	roots of burdock	May 5	June 5	$2\frac{1}{2}$
191 Glory, Ealings -	white thorn	May 23	Sep.	$1\frac{3}{4}$
192 Glory, Kentish -	-	-	April	$2\frac{1}{2}$
193 Goat	willowwood	May 25	June 25	$3\frac{1}{2}$

Haunts in the winged state.	Upper side described	LINNEAN Names,
180 Meadows -	Intirely of green, shining like satin.	Statice 47.
181 Meadows -	Crimson, two gold spots on sector edge; fringe gold colour.	
182 -	Pale brown, with dashes of dark brown, all parallel to the sector edge.	
183 -	Like the foregoing, but paler.	
184 Lanes -	Dark lead colour, bordered round with cream colour.	
185 Gardens -	Grey freckled with brown.	
186 Gardens -	Brown freckled with black, a white mark like an ear in middle of wing, and a broken bar near the edge.	Brassicæ 163
187 Banks, ditches -	This is like the above, but less and paler.	
188 Gardens -	Gray dappled and freckled with brown, like the Freckled but much less.	
189 Oak trees -	Green; inferior: light brown.	Viridana 286
190 Church yards -	Male like white fatten: female golden yellow, with red marks and spots.	Humuli 84
191 Hedges at Ealing -	Brown, variegated with shades of green, with some marks like daggers.	Oxyacanthæ 165
192 Woods -	Light brown, with dark triangular spots.	Versicolora 32
193 Willow bark -	Gray, full of small black veins and streaks, like net work or any thing full of cracks.	Coffus 63

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
194 Grafs, fword -	fword grafs	Aug.	May	2 $\frac{1}{2}$
195 Gothic -	roots of net- tles	May 5	June 5	1 $\frac{1}{2}$
196 Gothic, dark -	water beto- ny	May 15	June 23	1 $\frac{3}{4}$
197 Grafs, knot -	knot grafs	Aug.	May	1 $\frac{1}{2}$
198 Green, cream border'd pea -	willow	May	June	$\frac{3}{4}$
199 Ground, filver -	white thorn	April	May 21	1 $\frac{1}{2}$
200 Gipsey -	fruit trees	July 11	July 31	2
201 Ground, beautiful chefnut -	-	June	July	1 $\frac{3}{4}$
202 Hawk, eyed, fphinx	willow and apple trees	July & Aug.	June 6	3 $\frac{1}{4}$
203 Hawk, privet, fphinx	privet hed- ges	Aug.	June 7	4 $\frac{1}{2}$
204 Hawk, poplar, fphinx	poplar and willow	Sep. 15	May 6	3 $\frac{1}{2}$
205 Hawk, unicorn, fph.	bindweed	June	Sept.	4 $\frac{3}{4}$
206 Hawk, bee tyger	jeffamine, potatoes, green elder	Sept.	July 22	5
207 Hawk, lime, fphinx	lime tree	Sept.	May 24	3

Haunts in the winged state	Upper side described	LINNEAN Names.
194 Marshes	Light brown, dashed with dark brown shades parallel to the sector edge, dark brown spots in middle.	Exsoleta 151
195 Banks	Dark brown, with a number of light lines crossing each other; some appear like arches.	
196 Banks	This is similar to the above but handfomer.	
197 Dunghills	Gray brown, brindled and variegated with a variety of brown shades.	
198 Willows	Green, bordered on the sector edge with yellow.	
199 Whitethorn hedges	White, having an irregular brown bar cross the middle, which is generally divided at bottom.	
200	Grayish brown, having arched black marks.	Dispar 44
201 Yorkshire	Dark or chocolate colour towards the thorax; rest a light brown; a yellow spot in the middle.	
202 Willows	Between buff and pink colour, with shades of fine brown: inferior rose colour, with spots like eyes.	Ocellata, sph. 1
203 Privet hedges	Superior brown, spot like a dagger in middle: inferior rose colour, with two bars of black.	Ligustri, sph. 8
204 Bark of poplar and willows	Olive tendons, light brown inferior, red next the abdomen.	Populi, sph. 2
205 Fields where bindweed grows	Like the Privet, but the inferior wings gray, two bars of black.	Convolvuli, sphinx, 6
206 Potatoe fields	Superior brown; inferior yellow bared with black.	Atropos, sph. 9
207 Lime tree bark	Superior brown; two triangular spots of olive; tips white.	Tiliæ, sph. 3

ENGLISH Names.	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
208 Heath, scarce -	heaths	May	June	1 $\frac{1}{4}$
209 Heart -	oak	Oct. 2	May	1 $\frac{1}{4}$
210 Heart and dart -	grafs	May	June	1 $\frac{3}{4}$
211 Heath, brown -	-	-	May	1 $\frac{1}{4}$
212 Heath, pale -	-	-	May 16	1 $\frac{1}{4}$
213 Herald -	willow, and fallow	Sep. 4	Oct. 2	2 $\frac{1}{4}$
214 Half mourner -	oak	May 26	Aug. 20	2 $\frac{1}{4}$
215 Horn, Jappan long	oak	-	April	$\frac{1}{4}$
216 Horn, golden long	oak	-	May 11	$\frac{1}{4}$
217 Hornet -	poplar wood	May 20	July 12	2
218 Honor, maid of	oak	May	June 2	1 $\frac{1}{4}$
219 Housewife, cross bar'd	-	-	-	1 $\frac{1}{2}$
220 Housewife, small green	white thorn	May 26	June 26	$\frac{3}{4}$
221 Housewife, large green	white thorn	May	June 26	1 $\frac{1}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names.
208 Heaths -	Yellow, full of black lines, which divide the wing into square white spots.	
209 Woods -	Pale buff, variegated with redish brown, having two round spots like rings in the middle.	Oo, sphinx 81
210 Delight to be about pales -	Dark brown, with a spot in the middle like a heart, having a black streak by it.	
211 Heaths -	Yellow, brindled all over with redish brown.	
212 Chalk pits by Charlton -	Like the former but paler.	
213 Dark parts of houses	Redish brown, with a neat double white bar cross the wing, and a white speck in the middle.	Libatrix, sph: 78
214 Woods -	Gray brown, having three double bars crossing them.	
215 Woods -	Black, shining like gold; the horns three inches long and white.	
216 Woods -	Yellow intire.	
217 Against the bodies of poplar -	Wings transparent and yellow; brown ring round the abdomen, which is yellow.	Apiformis, sphinx 29
218 Oak of honor by Peckham -	Green totally, with brown spots at the corners of the wings.	
219 Lanes -	Yellowish green.	
220 Lanes and hedges	Fine green, two white lines cross the superior wing.	Viridata 230
221 Hedges of whitethorn	This is like the above, but the fringes are spotted,	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged ft c.	Expands Inches
222 Housewife, small pale	white thorn and oak	April	May	$\frac{3}{4}$
223 Horn, green golden	oak	Sep.	Ap. 23	$\frac{1}{2}$
224 Inlaid -	-	-	May	$1\frac{1}{2}$
225 Jappan, large -	oak	-	May 12	$\frac{3}{4}$
226 Jappan, small -	oak	-	May 12	$\frac{1}{2}$
227 Ingrailed -	-	-	June	
228 Inlide, burnished -	-	-	June	
229 Knot, true lovers -	-	-	June	$1\frac{1}{4}$
230 Lace, Bruffels -	lime, mofs and oak	June 1	June 22	$1\frac{1}{2}$
231 Lady, Old -	-	July	Aug. 10	$2\frac{1}{4}$
232 Lackey -	black thorn, brier	July 1	Aug.	$1\frac{1}{4}$
233 Lackey, likenefs -	-	-	-	$1\frac{1}{4}$
234 Lappet -	white thorn, black thorn	May	July	3
235 Lappet, pine tree	pine tree	May	July	$2\frac{3}{4}$

Haunts in the winged state	Upper side described	LINNEAN Names.
222 Hedges in lanes -	Like the former, but smaller, and of a very pale green.	
223 Woods -	Of a greenish golden colour.	
224 Lanes near woods	Brown, edged round with yellow.	Complana 115
225 Woods -	Of a golden jappan colour; horns short.	
226 Woods -	Golden jappan colour; antenna short.	
227 Woods -		
228 Lanes -		
229 Gardens -	Brown, having a mark in the middle like what is termed a True Lover's Knot.	
230 Woods, on bark of trees -	Grayish, covered over with marks like lace work.	
231 Old houses, or under bridges -	Dark footy brown, mark like a grave brocade, the tendons appear of a light brown.	Maura 124
232 Lanes near woods	Fox colour, two cream coloured bars on the superior wing.	Neustria 35
233 -	Similar to the above, but more upon the olive.	
234 Lanes near woods	Dark red brown, wings broad and indented, having two indented bars like lines.	Quercifolia 18
235 -	Dark red brown, like the former, but less, and more upon the buff colour.	Pini 24

ENGLISH Names.	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands inches
236 Likeness, small sword grafs -	-	-	-	1
237 L. Moth -	gooseberry bush	May 21	June 9	1 $\frac{1}{4}$
238 Leopard wood -	within the bodies of ash in nurseries	May 28	June 28	2 $\frac{3}{4}$
239 Lines, silver -	-	-	-	1 $\frac{1}{4}$
240 Lines, triple -	oak	-	Aug	1 $\frac{1}{2}$
241 Lines, brown silver	white thorn	April 1	May 1	1 $\frac{1}{2}$
242 Lines, green silver	oak	Sep. 28	May 19	1 $\frac{1}{2}$
243 Lines, scarce silver	fallow	June 6	June 26	2
244 Line, brown bright	-	-	-	1 $\frac{3}{4}$
245 Magpie, clouded	elms	April	May	2
246 Magpie, large -	currant bush	June 19	July 25	2
247 Magpie, small -	nettles	May 15	June 2	1 $\frac{1}{4}$
248 Magpie, small likeness	nettles	June 26	July 10	1 $\frac{3}{4}$
249 Mark, China rush	rushes	-	-	1

Usual haunts in the winged state	Upper side described	LINNEAN Names.
236 Ditches near marshes	Of a grayish brown, with mark on the sector edge like the letter L.	
237 Gardens -	Of a grayish brown, having a mark on the middle of the wing like the letter L.	Wavaria 219
238 Woods -	White, full of round dark green spots like small shot	Æsculi 83
239 Woods -		
240 Woods -	Brown olive, having three black lines crossing the upper wing.	
241 Hedges -	Of a pale brown, having a whitish diagonal line on the superior wing.	
242 Woods -	Of a fine green, with three diagonal silverish bars in the superior wing.	Prasinana 285
243 Near woods -	Fine green, having two diagonal yellow lines on each superior wing.	
244 -		
245 Rows of elms -	White, and marked like the large Magpie, but very faintly, with two brown spots on the superior wing	
246 Gardens -	White, full of round black spots, which lay in double rows cross the wing, yellow between.	Grossulariata 242
247 Nettles -	Marked with rows of black spots, which join to each other, yellow between.	Urticata
248 Nettles -	Shining like pearl, of a yellowish colour, faintly marked like the former.	Virticalis
249 Near ponds -	White marked with buff, inferior white marked with black.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inches
250 Mark, brown China	elder	-	-	$1\frac{1}{4}$
251 Mark, small white China	duckweed	April July	May Aug. 1	$\frac{3}{4}$
252 Mark, small golden China	-	-	July	$\frac{3}{4}$
253 Mark, large golden China	-	-	June	1
254 Mark likenefs, dingy China	nettles	-	June	$1\frac{1}{4}$
255 Mottled cross bar	-	-	-	
256 Magpie, dingy likenefs	-	-	-	1
257 Network, shaded	-	-	-	
258 Network, yellow	-	-	July	
259 November	oak	Octob.	Nov.	2
260 November likenefs	white thorn	Sept.	May	$1\frac{1}{2}$
261 Nonpareil Clifden	-	-	July	$3\frac{1}{2}$
262 Orange bar'd	oak	-	-	2
263 Orange	oak	Sept.	May	2

Haunts in the winged state.	Upper side described	LINNEAN Names,
250 Gardens -	Black, or dark brown, with round spots of white.	Lemnata
251 Ponds and ditches	Male white, having a pretty spotted border to the inferior wings; female rusty coloured.	
252 Gardens -	Of a golden colour marbled with brown.	
253 Gardens -	Like the former, but larger and fainter marked.	
254 Pales -	White, faintly marked like the Brown China Mark.	
255 -		
256 -	Of a dark dingey colour, and very faintly marked like the Magpie Likeness.	
257 -		
258 -	Yellow marked with brown like network.	
259 Woods -	Buff colour, having two brown lines on each superior wing.	
260 Lanes near woods	Marked like the November, but darker.	
261 Taken at Clifden, very scarce -	Superior wings gray marbled brown; inferior black having a blue broad band cross the middle.	Fraxini 125
262 Woods -	Orange, having two lines cross the wing.	
263 Woods -	Orange sometimes clouded with brown.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
264 Orange companion	oak	Sept.	May	1 $\frac{1}{2}$
265 O Moth	oak	-	May	1 $\frac{3}{4}$
266 Orange, mottled	burdock stalks	July 15	Aug. 30	1 $\frac{1}{2}$
267 Owl	oak	Sept.	Octob.	
268 October	oak	Sept	Octob.	1 $\frac{3}{4}$
269 Panther	oak	-	-	
270 Parsnip, cow	cow parsnip	-	-	1 $\frac{1}{4}$
271 Pebble	birch, willows, oaks	July	Aug.	1 $\frac{3}{4}$
272 Pepper'd	elm, lime	Sept. 10	May 12	2 $\frac{1}{4}$
273 Phœnix	-	-	-	
274 Plumed, brown	grafs	-	Aug.	
275 Pinion, white spotted	elm, inclosed in leaves	June 25	July 5	1 $\frac{1}{4}$
276 Pinion, double spotted	-	-	May 8	1 $\frac{1}{4}$
277 Pit, chalk	-	-	July	1 $\frac{1}{4}$

Haunts in the winged state,	Upper side described	LINNEAN Names,
264 Woods -		
265 Woods -	Brown, having a broad bar and a small ring in the middle; wings dentated.	
266 Burdocks -	Orange colour, like gravel and a brown border,	
267 Woods -		
268 Woods -	Brown with two dark lines cross the superior wing.	
269 -		
270 Lanes -		
271 Willow bark -	Brown, having a large oval spot of darker brown, in the middle.	Zeczac 61
272 Barks of trees -	White, and covered with black freckles as if pepper'd.	Betularia 217
273 -		
274 Woods -	Narrow winged, and brown	Pentadactyla 459
275 On elm trees in hanging wood	Fine brown, having three triangular cream colour spots on the sector edge.	
276 -	Brown, having two white spots on the sector edge.	
277 In chalk pits -		

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
278 Plumed, white -	nettles	June 5	June 19	$1\frac{1}{2}$
279 Plumed, gray -	-	-	Sept.	$1\frac{1}{4}$
280 Plumed, twenty -	-	July Sept.	Aug. May	$1\frac{1}{2}$
281 Prominent -	-	Sept. 29	May	$1\frac{1}{2}$
282 Prominent, rusty -	willow	-	June	$1\frac{1}{2}$
283 Prominent, dark -	oak	-	June	$1\frac{1}{4}$
284 Prominent, pale -	-	Aug. 1	May 23	$1\frac{1}{4}$
285 Pufs, small, or Kitten	black thorn and willow	Aug.	May	$1\frac{1}{4}$
286 Pufs -	aspen and willow	Aug. 1	May 23	$3\frac{1}{4}$
287 Quaker -	garden stuff of various sorts	Aug.	Mar. 2	$1\frac{1}{4}$
288 Rose -	in the buds of roses	-	-	1
289 Red neck -	oak	-	June 10	$1\frac{1}{4}$
290 Renunculus -	renunculus	-	-	-
291 Sallow -	fallow	June	Sept.	$1\frac{1}{4}$

Haunts in the winged state	Upper side described	LINNEAN Names,
278 Among nettles -	White and narrow winged.	Didactyla 454
279 Garden pales -	Grey and narrow winged.	Tefferadactyla 456
280 House windows -	Brown and mottled, the wings like the sticks of a fan.	Hexadactyla 460
281 -	Hath a small peice project- ing, from the slip edge of inferior wing.	
282 Norwood -	Superior wings of a fox co- lour, inferior buff colour.	
283 Woods -	Dark brown, having some whitish markings.	Camelina 80
284 -	This is of a grey colour and pretty scarce.	
285 Lanes -	Marked like the puffs.	
286 Barks of trees -	White, having a great number of black lines in the form of gothic arches, as if tabbied.	Vinula 29
287 Garden pales -	Of a plain brown colour, having a small ring in the middle, and a whitish line near the edge.	
288 Gardens -		Salicella 367
289 Woods -	Black, having a red colour and the lower end of the abdomen yellow.	Rubricollis 113
290 Gardens -		
291 Sallows -	Yellow with red spots.	Citrago 189

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inches
292 Sattin -	willow	June 20	July 15	2
293 Scollop'd oak -	oak	-	-	1 $\frac{1}{2}$
294 Seraphim -	-	-	-	
295 Shades, angled -	nettles	Ap. 24 May 12	June 1 Sep. 15	2 $\frac{1}{4}$
296 Shades, angled likene ^s -	-	June 14	July 14	
297 Shades, small angled, or Chevalier	-	May 28	June 28	1 $\frac{1}{2}$
298 Shell, red -	oak	Sept.	March	
299 Shell, scollop'd -	oak	May	June 15	1 $\frac{1}{2}$
300 Shipton -	grafs	-	May 20	1 $\frac{1}{4}$
301 Shark -	-	May 25	June 25	2
302 Snout -	oak	-	June 12	1
303 Speck, lime -	African marigold	Aug. 20	June 20	1
304 Spot, white -	maple	April June	May 27 July 1	1
305 Spot, gold -	water grafs	July 20	Aug. 16	1 $\frac{1}{2}$

Usual haunts in the winged state	Upper side described	LINNEAN Names
292 Willow bark	White like fatten, legs speckled with black.	Salicis 46
293 Woods -		
294 -		
295 Nettles -	Brown, and large triangular olive spots.	Meticulosa 132
296 -	Something familiar to the above.	
297 Pales	Brown, with a dark triangular spot or bar which crosseth the middle of the wing.	
298 Under oaks -		
299 Woods sides -	Pale brown, full of fine lines close and parallel to each.	
300 Meadows near woods	Superior brown, with white markings, inferior black with yellow dotted bars.	
301 -	Grey having fine streaks along the wing parallel to each other.	
302 Woods -	Pale brown, having very long palpi.	
303 Gardens -	White, hath a broad border like lace, and a dark brown cloud in the middle of the wing.	
304 Woods -	Black having two white round spots in each wing.	
305 Ditches near marshes	Brown, having some marks on the wing like drops of gold.	Festuca 131

ENGLISH Names.	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
306 Spectacle -	mint	Ap. 20	June 20	1 $\frac{1}{2}$
307 Straw bar'd, scollop'd	-	-	-	
308 Sparkling, gray -	oak, elm	-	June	$\frac{3}{4}$
309 Sparling, orange -	oak, elm	-	June	$\frac{3}{4}$
310 Straw, clouded -	oak	-	-	$\frac{3}{4}$
311 Stone, mocha -	white thorn	April	May 1	1
312 Stone, pale mocha	white thorn	-	-	1
313 Streak -	-	-	Oct. 6	
314 Streamer -	white thorn	-	Ap. 21	1
315 Stripe, white -	-	-	May	
316 Stripe, shoullder -	white thorn	-	May	
317 Stripe, yellow shoullder	white thorn	April	May 18	1
318 Stripe, cream dot	elder, fun- flower, &c.	Aug. 18	May 15	1 $\frac{3}{4}$
319 Sweeper, large chim- ney	brambles	-	June 23	1

Haunts in the winged state.	Upper side described	LINNEAN Name.
306 Gardens -	The part next the shoulder and the outer or fan edge light greenish brown, the middle dark clouded.	
307 -		
308 Gardens on the bodies of trees	Superior gray, with a br. cloud near the shoulder; fan membranes covered with a dark brown spot striped with gold.	
309 Ditto -	Wings superior orange, striped with silver; large dark cloud in middle, streak'd with white lines.	
310 -	Straw colour having an angular brown bar in the fan edge.	
311 Lanes -	White, having a scolloped broad bar across and small ring in the middle of the wing.	
312 Lanes -	Like the former, but pale.	
313 Furs and broom in the evening		
314 Lanes and hedges	White moth, having a bar of brown near the thorax and another waving like a narrow flag near the tip.	
315 Woods -		
316 Woods -		
317 Hedges and lanes -	Yellow, full of waved stripes of dark yellow.	
318 Gardens -	Cream colour, having lines of black dots.	Lubricipeda 69
319 Woods -	Black, with white tips.	Chærophylla- ta 237

ENGLISH Names,	Food of the caterpillar	Change into chrysalis	Appears in the winged state,	Expands Inche,
320 Sweeper, small chimney	-	-	July	1 $\frac{1}{2}$
321 Swallow -	-	May	June	2
322 Swift, large evening	roots of grafs	May	June	2 $\frac{1}{2}$
323 Swift, common small	roots of grafs	May 1	May 10	1 $\frac{1}{4}$
324 Swift, golden -	roots of grafs	May	June	1 $\frac{1}{2}$
325 Sychamore -	fychamore	Sept	June 12	1 $\frac{1}{4}$
326 Sychamore liknefs	willow	May	June	1 $\frac{1}{4}$
327 Spider -	hazle, oak	Aug. 20	May 30	2
328 Tabby -	-	-	June	1 $\frac{1}{2}$
329 Tail, brown -	white thorn and oak	June 30	July 23	1 $\frac{3}{4}$
330 Tail, fringe -	-	-	-	-
331 Tail, yellow -	black thorn	June 10	July 20	1 $\frac{1}{4}$
332 Tail, fwallow -	white thorn,	May	June	2 $\frac{1}{2}$
333 Teazle -	teazle	May 20	June 6	3 $\frac{3}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names
320 Woods -	Black.	Aceris 137
321 Pales	Dead white, dashed with dark brown on the sector edge of the wing.	
322 Meadows	Brown, clouded with br. spots.	
323 Meadows	Brown, with whitish dots placed in stripes.	
324 Meadows	Orange brown, with dark spots; two bars meet in an angle at sector edge.	
325 Near sychamores	Gray prettily freckled with brown, with a mark like a dagger near the thorax.	Aceris 137
326 Willow bark	Gray, but no dagger like spot.	
327 Woods -	Brown, variegated with dark brown.	
328 Stables -	Brown, tinged with dark brown, and appears very glossy.	
329 Hedges and lanes -	White, having a tuft at the tail brown.	
330 -		Sambucaria 203
331 Hedges =	White, having a yellow tuft at the anus.	
332 Lanes -	Of a brimstone colour, having two bars thro' all the wings.	
333 Lanes =	Whitish brown, variegated with dark browne,	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands Inches
334 Tip, brafs hook	-	-	June	$1\frac{1}{3}$
335 Thorn -	white thorn	April	May	$1\frac{1}{2}$
336 Tipt, buff -	oak, ofiers	Sep. 15	May 31	$2\frac{3}{4}$
337 Tip, buft likenefs	-	-	June	$\frac{3}{4}$
338 Tip, broom buft	broom	-	-	
339 Tip, chocolate	birch	Sept. 24	Mar. 19	$1\frac{3}{4}$
340 Tip, bar'd hook	oak	Sept.	May	$\frac{3}{4}$
341 Tip, brown hook	oak	Sept 20	May	$1\frac{3}{4}$
342 Tip, orange hook	lalach	-	-	$\frac{3}{4}$
343 Tip, pibble hook	oak	-	June	$1\frac{3}{4}$
344 Tip, purple hook	lalach	May	June	$\frac{3}{4}$
345 Tip, scallap hook	oak	May	June	$1\frac{1}{2}$
346 Tip, scorched hook	lalach	June	Aug.	$\frac{3}{4}$
347 Tuffock, nut-tree	hazle	Sep. 15	April 5	$1\frac{9}{16}$

Haunts in the winged state.	Upper side described	LINNEAN Names.
334 Woods -	Yellow buff, having few markings.	
335 Lanes and hedges	Pale orange, bar'd with brown.	Prunaria 208
336 -	Grave silver colour dashed with brown; a large spot on each tip, buff colour.	Bucephala 31
337 Lanes and houses		
338 Heaths -	Brown, having a large buff colour spot at the tip.	
339 Woods -	Brown, having a large spot at the tip of a chocolate colour.	Curtula 52
340 Woods -	Yellow brown, with three broad brown bars.	
341 Woods -	Yellow brown, having two large brown bars.	Lacertinaria 204
342 Gardens -	Orange colour, the edge of the wing as if scorched.	
343 Belvidere -	Light brown, with a number of brown lines, and a black spot in the middle.	
344 Gardens -	Dark purple colour.	
345 Woods -		
346 Gardens -	Dark brown, the markings on the wings divided into small squares like brick work.	
347 Woods 101	Grayish brown, having a broad bar in the middle, wherein is a round ring.	Coryli 50

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
348 Triangle -	white thorn	April	May 2	$1\frac{1}{4}$
349 Tuffock, dark	white thorn	Sep. 26 May 20	May 7 July 20	2
350 Tuffock, grey	oak	-	July 20	
351 Tuffock, orange, or scarce vapourer	hazle	May 27 Male 16	June 10	$1\frac{1}{4}$
352 Tuffock, pale	oak	Sep. 12	Octob.	$2\frac{1}{2}$
353 Tiger, cream spot	Chickweed	Ap. 29	May 29	$2\frac{3}{4}$
354 Tiger, large	nettles	May 29	June 30	3
355 Tiger, ruby	ragwort	June	July	$1\frac{1}{4}$
356 Tiger, scarlet	hounstongue & nettles	May 13	June 10	$2\frac{1}{2}$
357 Tiger, small -	nettles, chickweed	Ap. 24	May 31	$1\frac{1}{4}$
358 Thorn, Yorkshire	-	-	May	1
359 Tip, small hook	oak	-	June	$\frac{1}{2}$
360 Tap, nettle -	nettles	May 20	May 12	$\frac{1}{2}$
361 Tiffue -	oak, elm	-	June	

Usual haunts in the winged state	Upper side described	LINNEAN Names.
348 Lanes -	White, having a triangular spot in the superior wing	
349 Lanes -	Dark gray, having two bars of orange mixed with bl.	Fasolina 55
350 Woods -		
351 Woods -	Dark orange; white spot in corner of wing, with black lead lines near the body.	Gonostigma 57
352 Woods -	Pale yellowish colour, with two feint bars cross the wing.	Pudibunda 54
353 Banks which face the rising sun	Superior black, large spots of a cream colour; Inferior yellow spotted with black.	Villica 41
354 Banks -	Superior of a cream colour clouded with dark brown; inferior scarlet with round spots of black.	Caja 38
355 Banks -	Superior wings red brown; inferior rose colour.	Fuliginosa 95
356 Charton in Kent	Superior wings green spotted with cream colour; inferior scarlet with black spots.	Dominula 90
357 Banks -	Cream colour clouded with black, inferior wings yellow spotted with black.	Plantaginis 42
358 -	Pale orange, with bars of brown.	
359 Woods -	Brown, having two dark bars.	
360 Banks -	Gray, mottled with brown.	
361 Woods -	Light brown, with feint markings, but very glossy.	

ENGLISH Names,	Food of the caterpillar	Change into the chrysalis	Appears in the winged state.	Expands Inches
362 Vein'd, blood	white thorn and oak	April	May	1
363 Vapourer, common	lime-tree	Aug. 13	<i>Female</i> Aug. 20	$1\frac{1}{4}$
364 Vanear -	brambles	May	June	1
365 Vanear, purple	-	-	-	1
366 Vanear, rufh	rufhes	May	July	
367 Vanear, filver	grafs	April	May	
368 Vanear, ftriped	grafs	May	June	
369 Vanear, yellow	grafs	May	June	
370 Vein'd, black	white thorn,	-	June 18	$1\frac{1}{2}$
371 Umber, waved	oak	-	April	$2\frac{1}{4}$
372 Umber, mottled	oak	June 26	Nov. 5	$2\frac{1}{4}$
373 Underwing, white	-	-	July	1
374 Underwing, large yellow	grafs roots	May	Aug.	$2\frac{1}{4}$
375 Underwing, beautiful yellow	heathbroom	cat. all winter	end of June	1

Haunts in the winged state	Upper side described	LINNEAN Names.
362 Lanes and woods	Lightish gray, having an oblique red bar cross the wings.	Antiqua 56
363 Lime trees -	Dark brown, with a white spot on the corner of the wing.	
364 Woods and lanes		
365 - -		
366 Ponds -		
367 Gardens -		Pronuba 121
368 Woods -		
369 Woods -	Wings yellow, striped with brown.	
370 Near woods -	White, all the tendons bl.	
371 Woods -	Yellow brown, with waved bars of dark brown.	
372 Woods -	Yellow, mottled or freckled with dark brown.	
373 Lanes -		
374 Gardens -	Superior brown, a mark like a human ear in the middle; inferior yellow bordered with black.	Pronuba 121
375 Belvidere wood near Earith	Superior wings red marbled with yellow.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands Inches
376 Underwing Aug. yellow.	grafs roots	July	Aug.	$1\frac{1}{2}$
377 Underwing third yellow	grafs roots	May	June	$1\frac{1}{4}$
378 Underwing, broad bordered yellow	grafs roots	May 15	June 26	$2\frac{1}{4}$
379 Underwing, least yellow	grafs	April	May 15	$\frac{3}{4}$
380 Underwing, yellow companion,	meadows	July	Aug.	
381 Underwing, blossom	nettles	Sept.	Mar.	
382 Underwing, crimson	high oaks	May 26	July 2	3
383 Underwing, copper	fallow, oak	June 2	July 12	$2\frac{1}{4}$
384 Underwing, copper, companion	-	-	-	$1\frac{1}{2}$
385 Underwing, orange	poplar	Octob.	April 1	$1\frac{1}{2}$
386 Underwing, orange companion	-	Octob.	April 1	
387 Underwing, pale white	-	-	July	
388 Underwing, pink	ragwort	Aug. 6	May 18	$1\frac{1}{4}$
389 Underwing, red	willow	July 10	Aug. 2	$3\frac{1}{4}$

Haunts in the winged state.	Upper side described	LINNEAN Names
376 Meadows -	Superior wings pale brown.	
377 Meadows -	Superior wings red brown.	
378 Meadows -	Broad black border on the inferior wings.	
379 Meadows -	Brown clouded with black and a black border very broad.	
380 Meadows -		
381 Lanes -	Superior wings brown, under wing pale purple.	
382 Burnt wood -	Superior brown, variegated with deep brown; inferior crimson, with two bl. bars.	Nupta 119
383 Woods -	Superior brown, inferior of a copper colour.	
384 -		
385 Woods, Hornsey	Superior wing brown, inferior orange with black spots.	
386 Woods -		
387 Woods -		
388 Commons -	Superior foot colour, with one streak and two spots of red; inferior wings pink.	Jacobææ 111
389 Willow bark -	Superior gray, dappled with brown; inferior red with two black bars.	Pacta 120

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state	Expands inches
390 Underwing, straw colour'd	-	-	May	
391 Upperwing, orange	oak	June 15	July 29	1 $\frac{1}{2}$
392 Usher, spring	oak	May 16	Feb. 28	1 $\frac{3}{4}$
393 Wing, black marked narrow wing	-	-	-	1 $\frac{1}{4}$
394 Weeper -	-	-	-	
395 Wainscott -	great fword grafs	May & June	Aug.	1 $\frac{1}{4}$
396 Wing, march clofe	oak	Sep.	Mar. 9	$\frac{3}{4}$
397 Waved beautiful	-	-	July 6	
398 Waved hornsey	-	-	Mar. 4	1 $\frac{1}{2}$
399 Wing, grafs clofe	grafs	May	June	1 $\frac{1}{4}$
400 Woolen, moth	woolen	April	May	
401 Waved, pale	white thorn	May 1	May 17	1 $\frac{1}{4}$
402 Way, milkey	-	-	July 8	
403 Wing, scorched	white thorn	May 27	June 16	1 $\frac{1}{2}$

Haunts in the winged state.	Upper side described	LINNEAN Names.
390 -		
391 Woods -	Superior orange, inferior pale buff.	
392 Woods -	Pale brown clouded with dark brown,	
393 -		
394 -		
395 Marshes -	Wainscott colour.	
396 Woods -	Superior wing half black, and the other half white.	
397 -		
398 Hornsey lane -	Whitish, prettily waved with brown.	
399 Meadows -	Pale brown, having some angular marks at the tips.	Culmella 361
400 -		Sarcitella 373
401 Hedges in lanes -	White, having some faint grayish bars.	Lactearia 194
402 Lanes		
403 Lanes	Yellow buff, dashed with brown, the edges of the wings as if scorched.	

ENGLISH Names.	Food of the caterpillar	Change into chrysalis	Appears in the winged state.	Expands inches
404 Wing, scorched like	-	-	-	$1\frac{1}{2}$
405 Wing, cross -	elm	Ap. 20	May 14	$1\frac{1}{4}$
406 Wing, waved cross	-	-	Mar. 19	$1\frac{1}{2}$
407 Waved white -	white thorn	May	June	1
408 Y moth -	nettles	-	Sep.	$1\frac{3}{4}$
409 Y golden -	-	-	June	$1\frac{3}{4}$
410 Y scarce silver	-	-	-	$1\frac{3}{4}$
411 White, double spotted	-	-	June	1
412 Yellow, small clouded	broom	May 26	June 26	1
413 Yellow, speckled	-	-	May 12	$1\frac{1}{4}$
414 Yellow, or brimstone	white thorn	Sep.	May 23	$1\frac{3}{4}$
415 Yellow, frosted	elms	Sep. July	May 7 Aug 12	$1\frac{1}{4}$

Haunts in the winged state	Upper side described	LINNEAN Names;
404 Lanes near woods	Similar to the above, but not so strongly marked.	
405 -	Buff colour, having a diagonal line from the tip, and a dark spot in the middle of the wing.	
406 Against pales -		
407 Hedges -	Whitish, with two brownish bars crossing each wing	
408 Grass in meadows	Brown, having a mark in the middle of the wing like the letter Y.	Interrogatio- nis 129
409 -	Red brown, having a golden Y in the middle of the wing.	Gamma 127
410 Yorkshire -	Purple, having the same mark in the middle as above.	
411 -	Brown, having two white spots on the edge of the wing.	
412 Commons -	Strong yellow, having a broad brown bar cross the wing.	
413 Woods -	Yellow, full of black spots.	
414 Lanes -	Yellow, with red triangular spots, and a white spot in the middle.	Cratægata 243
415 Hedges -	Yellow, having a broad black border, freckled on under side.	

A N

I N D E X

T O T H E

T R I V I A L N A M E S o f L I N N Œ U S o f t h e L E P I D O P T E R A :

R E F E R R I N G T O T H E E N G L I S H C A T A L O G U E .

A

Aceris	325	Antiqua	363
Adippe	16	Antriplicis	60
Ægeria	49	Apiformis	217
Æsculi	238	Argiolus	3
Aglaza	17	Atropos	206
Amataria	61	Attalanta	2
Antiopa	41		

B

Betulæ	39	Brassicæ, <i>Pbal.</i>	186
Betularia	272	Bucephala	336
Brassicæ, <i>Pap.</i>	44		

C

C. Album	12	Caja	354
Cæruleocephala	156	Camelina	283

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Cardui	29	Coryli	347
Chærophyllata	319	Coffus	193
Chryfitis	98	Crategata	414
Cinxia	22	Crategi	46
Citrago	291	Culiceformes	89
Comma	35	Culmella	399
Complana	224	Curtula	339

D

Delphinii	92	Dispar	200
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THE AURELIAN; or Natural History of
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INSTRUCTIONS
FOR
COLLECTING AND PRESERVING
INSECTS,
PARTICULARLY
MOTHS AND BUTTERFLIES.

Illustrated with a COPPER-PLATE,

On which the NETS, and other APPARATUS
necessary for that Purpose, are delineated.

— *quod alii Venationibus, Confabulationibus Tesseris,
Chartis, Lufibus, Compotationibus insumunt, illud ego Ani-
malculis indagandis, colendis, contemplandis impendo.*

RAY.

L O N D O N :

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M D C C L X X I .

1771

P R E F A C E.

THE following instructions were originally drawn up for a gentleman going to reside abroad, partly with a view of collecting the various productions of nature, particularly insects.

Most of the English as well as Foreign insects, in the collections which I have lately had opportunities of observing, have been either spoiled in the catching, or, for want of properly know-

knowing how to preserve them, rendered imperfect, and of little or no value.

I regretted that so much time and labour should be spent to so little purpose; and for that reason was induced to make these instructions, with some additions, more generally known; from which it is hoped that some advantage may result, not only to the young Aurelian and Entomologist, but that they may excite to a more general investigation of the insects of this country.

I N S T R U C T I O N S

F O R

COLLECTING AND PRESERVING

I N S E C T S.

Of Insects in General.

THIS little treatise being intended for those who are altogether unacquainted with insects, as well as for those who have made them their particular study, it may not be amiss to premise a short account of the nature of insects in general.

Almost every insect, from the largest beetle to the smallest mite, is originally

B pro-

produced from an egg; which the female, guided by unerring instinct, deposits in some place capable of affording it proper and sufficient nourishment in its future state: the places to which they are committed are many and various, and strikingly display the wisdom of an all-wise Providence.

Some deposit them on the various parts of plants, some commit them to the earth, and others to the waters; some deposit them on putrid flesh, others in the bodies of living animals, even of insects themselves.

After a period more or less short, the little Larvæ, Caterpillars, or Maggots, come forth; and feeding on their destined food till they are arrived at their full growth, change into the Chrysalis or Aurelia state. In this they
remain

remain some time longer ; during which they are for the most part inactive ; and lastly come forth in their perfect or fly state, when they propagate their species and die.

Butterflies and moths being not only one of the most numerous, but the most beautiful class of insects, whether we consider the variety or richness of their colours, and from the peculiar delicacy of their structure requiring more care to be used in catching as well as in preserving them, we chose first to speak of, and to be more particular in our directions concerning them.

There are two methods of collecting insects of this kind ; first, by breeding, 2dly, by catching them in their fly state. Of these the former is much to

be preferred ; as, besides the pleasure which arises from observing the gradual progress of the insect, from its egg or caterpillar to its perfect or fly state, we can kill them before they have in the least injured the farina or meal of their wings by flying,

The difficulty likewise of procuring the most beautiful and valuable insects of this class in their fly state, makes this method much the most eligible. Most of the Sphinges of Linnæus, or Hawk Moths as they are called, are very seldom seen in their fly state, and when seen on the wing generally elude the swiftest pursuit ; but in their caterpillar state they are often found, and easily taken. Thus the Sphinx * Atropos

* We have used on this occasion the names of the celebrated Sir Charles Linnæus ; a name dear to

pos (Jeffamine Hawk Moth) the largest and one of the most beautiful species of moth this country produces, is frequently found feeding on the Jeffamine and Potatoe ; the Sphinx Elpenor, or Elephant Hawk Moth, on the Galium Palustre, or White Ladies Bed Straw ; the Sphinx Ocellata, or Eyed Hawk, on the Willow ; Sphinx Tiliæ, or Lime Hawk Moth, on the Lime tree ; Sphinx Ligustri, or Privet Hawk Moth, on the Privet ; Phalæna Pavonia, or Emperor Moth, on the Briar, Blackthorn, &c. and so of a great number of others.

to every naturalist, and whose candour, genius and industry can never be too much admired. It were to be wished that our English names were in general equally expressive.

Method

Method of collecting them in their Caterpillar State.

Besides the method of collecting caterpillars by attentively examining the leaves and other parts of plants at different times of the year, there is another ; viz. by beating the boughs of trees, particularly the taller ones, with long poles, spreading a large sheet underneath to receive them.

By this means many very valuable caterpillars are often caught, which would with great difficulty be procured by any other means.

Caterpillars should be handled as little as possible ; the more hairy ones are in general the least hurt by it. It will be necessary to carry a box in the pocket,

pocket, partly filled with leaves, to put them in.

Method of rearing them.

The caterpillars being procured, our next endeavour is to rear them. For this purpose they are to be supplied with some of the plant they are found feeding on. Although many of them live on a variety of food, the greatest part are attached to some particular kind, deprived of which they would soon perish.

To save the unnecessary trouble of supplying them with fresh food every day, several sprigs of the tree or plant are to be put into a wide mouth'd glass filled with water, and the caterpillars placed on them. Most plants may in this manner be preserved fresh for
three

three or four days. The glass, together with the caterpillars and their food, is to be placed in the breeding box represented in the plate, and a constant supply of fresh food is to be given them as soon as the former appears in the least withered.

After they are arrived at their full growth, they will leave off eating, and either immediately or very soon change into chrysalis ; previous to which, Butterflies spin a little web, just sufficient to suspend themselves by ; many of the moths, like the silkworm, spin a large web, in which they enwrap themselves ; and a great number work themselves into the earth, where they spin themselves cases, or change without any spinning ; as do most of the Sphingæ or Hawk Moths. It will therefore be necessary to cover the bottom

tom of the box with fine mould to the depth of three or four inches, and keep it constantly moist.

It frequently happens that Caterpillars are what the Aurelians call stung; that is, have the eggs of the Ichneumon Fly deposited in them: in such case, the eggs are generally hatched before the caterpillar goes into chrysalis. The Larvæ or Maggots of the fly being arrived at their full growth, eat their way out of the body of the caterpillar, and, enwrapping themselves in little cases of their own spinning, change into chrysalis; and in this state have been considered as the Eggs of the caterpillar, by persons unacquainted with insects. The caterpillar, having afforded subsistence to its natural enemy, dies.

Caterpillars, previous to their going into chrysalis, generally lose the brilliancy of their colours, and many of them rove about for a considerable time.

After remaining in their chrysalis state till near the time of their coming forth, such as are inclosed in a hard case or spinning, as the *Phalæna*, *Vinula*, *Puss Moth*, *Phalæna Quercus*, &c. are to be carefully freed from it; as the aperture which the Insect naturally makes, is often too narrow for it to pass out without considerably injuring its plumage. The opening will be best made by cutting off the largest extremity of the case, taking care not to wound the inclosed Pupa or Chrysalis.

Method

Method of collecting them in their Chrysalis State.

Butterflies and Moths may often be found in chrysalis under the projections of garden walls, pales, outhouses, in summer-houses, &c. and frequently on their food.

A great variety of Moths in this state may with more certainty be found by digging in the winter months under the trees which they feed on, particularly under the Oak, Willow, Lime, and Elm Trees. When they are dug up in this manner, they are to be placed as soon as convenient in a box, such as is represented in the plate, and kept covered with moist earth till the ensuing spring, when they may be dug

up

C 2

up, and placed within a few inches of the surface of the mould, and in that manner left to come out of themselves.

It frequently happens, that if we are not so fortunate as to collect any Chrysalis's, we are amply recompensed by the variety of Beetles we thus dig up.

Method of collecting them in their Fly State.

The delicacy of the wings of these Insects will not admit of their being caught without injury but in Nets made of the finest materials.

The collector then should in the first place furnish himself with a net adapted to this purpose: that which is represented in the plate, has on
repeated

repeated trials been found to answer best. (Vide explanation of the plate.) The net should be made of fine gauze, having its stiffening taken off by being soaked a little while in warm water; or if dyed of a green colour, which is common, this will be unnecessary.

He is next to provide himself with two or three large oval boxes for the pockets, lined at top and bottom with thin cork; and a pin-cushion well stored with pins of various sizes.

Being thus furnished with proper instruments, we shall proceed to give him such instructions as may enable him to use them with success.

It is particularly to be observed,
that there is a continual succession of
Insects

Insects, as well as of Plants. Some appear with the early Primrose, others accompany the late flowering Ivy. So that in this respect, the Aurelian and Entomologist may regulate their excursions by those of the Botanist. The latter would in vain search for the Pilewort (*Ranunculus Ficaria*) in the month of July; and the former be equally disappointed in seeking after the Orange Tip (*Papilio Cardamines*) in the month of August.

Some of those insects continue longer in their fly state, and their plumage is less hurt by flying than others. Some continue a few days only; others several weeks. In general Moths and Butterflies, unless they are caught the first day of their coming out of Chrysalis, are worth little: hence arises the necessity of our
care-

carefully watching those particular times, and of making frequent excursions, to have them in the greatest perfection.

Butterflies are to be caught on the wing only when the sun shines warm. They inhabit a variety of places. The greatest number of them frequent woods, and may be taken in or near them; as the *Papilio Iris*, *Populi*, *Hyperantus*, and most if not all the *Fritillaries*. Some delight in meadows, as the *Papilio Justina*, *Galathæa*, *Phlæas*, *Comma*, &c. and others frequent gardens, clover fields, heaths, lanes, &c. Many of those which frequent woods are taken with much greater facility in the morning, a few hours after sun-rise; at which time they are found feeding on the flowers that grow by the sides of the woods:
after-

afterwards, when the sun shines with more strength, they fly high, and with such swiftness as to be taken with the utmost difficulty.

Moths fly chiefly in the evening, a little after sun-set. Like Butterflies, they inhabit a variety of places, and are to be met with in the greatest plenty near woods. They may also be taken in great numbers in the day-time by beating the hedges, &c. more particularly in the afternoon, as the least motion will then put them on the wing. They are likewise frequently met with in the day-time sticking to the bark of trees, on walls and pales that surround gardens, &c. and may be thus caught in great perfection. Some few, like the Butterflies, fly in the middle
of

of the day when the sun shines warm.

The ingenious naturalist, Geoffroy, informs us that Moths may be taken in great plenty by means of a Candle and Lanthorn carried into or near some wood towards dark; that the moths immediately fly to the light, and are caught with great facility.

We cannot recommend this method from our own experience; but, from the propensity we frequently observe in Moths to fly towards, and even into, lighted candles, we apprehend it to be a very eligible one.

An expertness in using the Net is attained by practice only.

D

Having

Having taken the Butterfly or Moth in the Net, we are to proceed with caution ; as on killing it properly, its beauty in a great measure depends. We are not to take hold of it indiscriminately in any part ; but are, by means of the net, to bring its wings, if possible, into an erect position, and then press the under part of the thorax or breast betwixt the thumb and forefinger sufficiently hard to kill it : by this means the wings are neither distorted, nor their plumage injured.

The net being then opened, the insect is to be laid hold of gently by one of the horns, and again placed betwixt the thumb and forefinger, in which situation it is to be held while a pin, proportioned to its size, is stuck through the upper part of the
thorax

thorax or back. The insect is then to be placed in the pocket box.

Method of managing them in their Fly State ; as Setting, Preserving them, &c.

Though the insects may by this means be caught uninjured, something further is necessary to make them appear to advantage. This is called setting them, and is done in the following manner :

The insect being stuck through with a pin of a proper size, is to be placed, before its wings are become stiff, on a piece of cork having a smooth surface, and covered with white paper. The body of the fly should not be made to touch the cork, when stuck into it, but to stand up

some little distance from it. (It being only the edges of both wings that are to fit close to the cork, not the wings to lie flat on it.) The wings are then to be expanded (Vide Plate) with a fine needle, or some sharp-pointed instrument.

The upper edge of the superior wings is to be placed in a line with the head of the insect; and they are to be kept in this situation by means of little braces, made of card paper, cut in the shape represented in the Plate. These must be proportioned to the size of the wings, and fitted to their shape, by being more or less bent. By these means, the spots, &c. on both wings are made conspicuous, and the insect appears to much greater advantage.

To

To set them well, however, requires considerable practice, and some ingenuity.

After remaining in this position four or five days, or till it is become thoroughly stiff, the braces may be taken off, and the insect removed into the store box; which should be so constructed, as effectually to seclude those little insects, which are so apt to infest and destroy collections of this kind. The shape of the store box is immaterial; that which is represented in the plate is simple, and answers every purpose. The inside of it should be lined with thin cork; and some slips of cloth glued to its edges to make it shut closer.

If, notwithstanding these precautions, insects should get among them
(which

(which the fine powder, that falls from and surrounds such insects as are attacked, quickly discovers) immersing them in rectified spirits of wine immediately kills them without injuring the fly. And if a little corrosive sublimate be dissolved in the spirit they are immersed in, it will prevent them from any future attacks.

Camphire kept in the boxes is also a good preventative.

The flies may be either kept in boxes of this kind, or in such cabinets as the collector may think proper. The bottom of the drawers, if in cabinets, should also be lined with thin cork, covered with white paper.

Me-

*Method of collecting Insects of the
Beetle Kind.*

§. I.

By insects of the Beetle kind, we mean all such as have thin membranous wings covered with hard cases or shells, and included in Linnæus's first class of insects, COLEOPTERA. These have generally been termed Scarabæi, or Beetles: some few of them have obtained distinct English names, as the Chafer, Lady-bird, Earwig, &c. and all have been divided by Linnæus into Genera and Species.

The insects of this, as well as of the preceding and following classes, may be found in their Caterpillar or Grub state, in which they are often extremely destructive to the roots of plants; and may in like manner be brought to their perfect or fly state, regard being had to their
their

their different manner of feeding. The time and care, however, required for this purpose, is probably more than can be spared by the generality of collectors: we would nevertheless wish the curious Entomologist, who has both leisure and abilities for this purpose, to engage in pursuits of this kind, as being the only means of establishing with certainty the different Genera of Insects.

The insects of this class are in general easily collected in their fly state. Some creep and fly in the day-time when the sun shines warm; others, like the moths, fly in the evening and night only.

Their habitations are exceedingly diversified. Some are found in the bodies of rotten trees, as the *Lucanus Cervus*,
Flying

Flying Stag, *Scarabæus Cylindricus*, and many of the *Cerambyces*: others among the dung of various animals, particularly of horses and cows, as the *Scarabæus Fimetarius*, &c. Some reside in the bodies of animals that are become putrid, as the *Silpha Vespillo*: great numbers are found on the leaves and stalks of plants, as the *Scarabæus Melolantha*, Chafer, *Coccinellæ*, Lady-birds, *Chrysomelæ Curculiones*, &c. others delight more particularly in the flowers of plants, as the *Scarabæus Auratus*: some reside altogether in woods, as many of the *Cerambyces*, and they are often found in great plenty under the bark of decayed trees: some are found swimming on the surface of standing waters, as the *Gyrinus Natator*: others in pools, ditches, ponds, &c. as the *Dytisci*: Some are discovered from the light which they emit, as the

Lampyris Noctiluca Glow-worm : and a vast quantity is found on dry banks, sand banks, sand pits, pathways, &c. particularly when the sun shines warm.

These insects, as soon as caught, may, with a pin of a proper size, be stuck through the body, close to the future that runs down the middle of the back, as represented in the plate (vide fig. 6) and then placed in the pocket box ; taking care that they do not injure one another from being placed too close together. Or if the collector be disposed to procure this class of insects, he will find it very convenient, and much less cruel, to carry a number of small pill boxes in his pockets, in which the insects may be readily secured and kept till he returns home, without suffering any pain. They are then to be immersed in

in boiling water, as being the most ready means of killing them, and afterwards stuck through in the manner above-mentioned ; being careful to make the pin pass a sufficient length through the body of the insect, and then placed on a piece of smooth cork. When they have remained in this situation two, three, or four days, according to the size of the insect, their legs, antennæ, &c. are to be extended with a pair of fine forceps or tweezers, and placed in a natural position ; in which they will, if proper care be taken of them, always afterwards remain. They are then to be placed in the store box.

§. II.

The next class of insects is the HEMIPTERA.

The Genera contained in this class are principally these ; viz. *Blatta*, Cockroach, *Mantis*, *Gryllus*, Locust, Grasshopper, Cricket ; *Fulgora*, *Cicada*, *Notonecta*, *Nepa*, and *Cimex*, or Bug.

The first of these, the *Blatta*, like the bed bug *, has been imported from abroad, where they are equally numerous and troublesome. † They are
found

* Bugs, according to Southall, were scarce observed in England till after the fire of London, in 1666. It is supposed that they were then imported with the timber which the new houses were built with.

† They are as troublesome as they are common in the island of Senegal. Though they are scarce
an

found in the greatest plenty here in bake-houses ; particularly in the night, their usual time of feeding.

All those of the next genus, Mantis, are foreign ; some of them are extremely remarkable and curious, and from their particular shape have been called Walking Leaves. They are found in the meadows, and on the leaves of plants and trees. The Grylli mostly reside in meadows and fields among the herbage. The mischief done by the Blattæ is nothing, compared with the ravages of some of those,
viz.

an inch thick, they do an incredible deal of mischief. They gnaw linen, sheets, wood, paper, books, and in short whatever comes in their way : they attack even the Aloes, the bitterness of which keeps off all the other insects.

Adanson's Voyage to Senegal, p. 296.

viz. the Locusts.* One species of this genus, the *Gryllus Domesticus*, resides in houses, particularly where there are ovens.

* In this voyage (says Adanson) I was witness myself, for the first time, to the mischief done by Locusts; that scourge so dreadful to hot climates! The third day after our arrival we were still in the road, when there suddenly arose over our heads, towards eight o'clock in the morning, a thick cloud, which darkened the air, and deprived us of the rays of the Sun. Every body was surpris'd at so sudden a change in the sky, which is seldom overcast in this season: but we soon found that it was owing to a cloud of Locusts, rais'd about twenty or thirty fathoms from the ground, and covering an extent of several leagues; upon which it poured a shower of those insects, which fell to devouring while they rested themselves, and then resumed their flight. This cloud was brought by a very strong East wind; it was all the morning in passing over the adjacent country; and we imagined that the same wind drove the Locusts into the sea. They spread desolation wherever they came; after devouring the herbage, with the fruits and leaves of trees,

ovens. Most of the Fulgoræ are discoverable from the light which they emit ; these, like the Mantes, are foreign, and many of them equally curious. The Cicadæ are found on trees and plants ; the Notonectæ and Nepæ reside in stagnating waters. There is scarce a person who has lived a while in any very populous place, but knows
where.

trees, they attacked even the buds and the very bark : they did not so much as spare the reeds with which the huts were thatched, notwithstanding that these were so dry : in short they did all the mischief that can be dreaded from so voracious an insect.

The inhabitants of Asia, as well as Europe, sometimes take the field against Locusts, with all the dreadful apparatus of war. The Bashaw of Tripoli in Syria some years ago raised 4000 soldiers against these insects, and ordered those to be hanged who refused to go.

Hasselquist's Voyage to the Levant, &c.

where to find one species of the next genus, the Cimex or Bug, to particularize the places where the remaining species of this very numerous genus reside, would be almost endless; they are in short to be met with almost everywhere.

These insects may be killed either with boiling water, or a few drops of spirit of turpentine. They are all of them to be stuck through the thorax or back betwixt the shoulders. The wings of the Grylli, and some of the others, are to be expanded, and kept so by means of the little braces; and their legs, antennæ, &c. are also to be placed in a natural situation.

§. III.

The insects contained in the next class, NEUROPTERA, are chiefly aquatic, residing in the waters in their caterpillar state, and flying about them in their perfect state. The principal genera are, the Libellula, Dragon Fly, Ephemera, May Fly, Phryganea, Hemerobius, and Panorpa. The Libellulæ are considered by the generality of people as containing in them something venomous, and from hence have derived their several names of Adder Spear, Adder Bolt, Horse-finger, &c. It must be confessed, that their shape, manner of flight, &c. is such as might readily raise such an idea: the collector, however, must not be misled by their appearance, and intimidated from catching them, they being perfectly harmless,

F

less,

less, indeed equally so with the Gnats they feed on.

The net used for catching Butterflies will be very convenient for catching the insects of this class, particularly the *Libellulæ*.

They are all of them readily killed, either by squeezing their thorax, or with a few drops of spirit of turpentine. The same means are to be used in setting them, &c. as in the Hemiptera.

§. IV.

The insects of the next class, HYMENOPTERA, are for the most part armed with stings, which are either venomous or harmless. The principal genera are the *Tenthredo*, *Ichneumon* ;
Sphex,

Sphex, Chrysis ; Vespa, *Wasp*, *Hornet* ; Apis, *Bee* ; Formica, *Ant*.

The Tenthredines are found on trees and flowers in their caterpillar state : they feed on the leaves of plants. The Ichneumones are found in the same manner : in their caterpillar state they live chiefly in the bodies of other insects, particularly of the caterpillars of Moths and Butterflies, in which they deposit their eggs. The Sphex resides principally in sand banks ; it is also caught on flowers, &c. This insect catches and kills others, which it buries in the sand, having previously deposited its eggs in them. The Chrysis, (many species of which are exceeding beautiful) is found flying about old walls, posts, sand banks, &c. in which it builds its nest. *Wasps*, *Bees*, and *Ants* are found on

flowers and fruits, and almost on every thing that is sweet.

These insects being armed many of them with poisonous stings, it will be necessary to use the forcep nets to catch them with (vide fig. 7.) When caught, a pin is to be stuck through them while in the net (i. e. through the thorax, as in fig. 8.) It is very difficult to kill these insects without injuring them in some respect; boiling water hurts their wing, and the fine hairs with which the bodies of many of them are covered; spirits of wine or turpentine proves immediately fatal to some, while others are scarce affected by it; and letting them remain transfixed till they are dead, will probably be thought too cruel.* We shall leave the collector

* The best method, as I have since been informed by an ingenious gentleman, is to stick them

tor to adopt either of these methods, or any other he pleases. When dead, their wings, &c. are to be expanded, and kept in as natural a position as possible.

§. V.

Insects with two wings only, form the next class, DIPTERA: it contains various kinds of *flies* and *gnats*. There is scarce any place in which some of the former are not to be met with; but they are found more particularly on all kinds of plants and flowers, especially on the umbelliferous ones. Some of them fly about cattle of various kind, in the skins of which they deposit their eggs, as the *Oestrus Bovis*, &c. The latter
 mostly

them through with a needle dipt in aqua-fortis. The *Sphinges*, and other large *Moths*, are likewise killed in this manner with the least injury.

mostly fly about waters and watery places.

These insects are easily killed by a few drops of spirit of turpentine : their wings are to be expanded so as that their bodies may become apparent ; and a little brace should be placed underneath them, to prevent their bodies from being too much incurvated in drying, which they are very apt to be.

§. VI.

The insects of the last class are such as have no wings at all, and are therefore called, *APTERA*. *Spiders, Scorpions, Centipes, and Crabs* of various kinds, make up the principal part of this class. These are so common, and the places they inhabit so generally known, that any information on the
means

means of collecting them would be superfluous.

Most of them require to be preserved in some kind of spirits, as spirits of wine, rum, brandy, &c. Such of them indeed as are inclosed in hard shells, may be preserved dry, in the same manner as the insects of the Beetle kind.

As the collector will have frequent occasion for the use of cork, both to line his boxes with, and to set his insects on, we shall inform him how to prepare it for use.

He may procure the cork in large pieces at any of the cork-cutters. These must be cut into smaller ones; and in order to make the cork flat, it is held before the fire till it becomes
hot

hot through ; it is then to be immediately placed betwixt two smooth boards, and a very heavy weight laid on it, where it must remain till cold. Thus flattened, it is to be rasped on both sides, with such a rasp as is used by the bakers ; afterwards with a finer one ; and lastly with a pumice stone, which makes it perfectly smooth. If the cork be thick, and the purpose of it to line boxes, it may be sawed through the middle, and rasped on both sides as before.

EXPLA-

J^o Fongeron & Co.

E X P L A N A T I O N
O F T H E
P L A T E.

Fig. 1. The breeding box. *a.* an opening in the front, covered with gauze; *b.* the door on the side.

N. B. The bottom of it should be covered with fine mould to the depth of four or five inches. The shape and structure of it need not be strictly adhered to.

2. Shews the manner in which the wings of the Butterflies and Moths

G are

are to be expanded, and how the braces are applied to keep them so.

3. The Net used for catching Moths, Butterflies, and other insects. *a.* the part made of fine gauze; *b.* the sticks; *c.* the binding which receives them.

N. B. The sticks, for the convenience of carrying them, are made to take to pieces, somewhat in the manner of fishing rods. They join to one another by means of hollow brass ferrils fixed to the end of each. There are three of them, each of which is about fourteen inches long.

4. Shews one of the sticks; *a.* the brass ferril; *b.* the end of the next stick, which goes tight into it.
To

To the upper end of the sticks is joined in like manner a piece of cane, about two foot long, bent of a proper shape, *c.* Instead of three pieces of wood here represented, the other stick may consist of one entire piece, and be used as a walking-stick. The gause must be edged with two pieces of binding sewed together to receive the sticks; and as the sticks are taper, so must be the cavity: at the upper part of it, where the sticks meet, it must be closed by a few stitches, that the net sticks may shut even together. The net may be about a yard broad when expanded, and the length of it a yard and a quarter. This size, however, may be varied at pleasure.

5. The Store Box.

6. Shews

6. Shews the manner in which the Beetles, &c. are stuck through one of the wings.

7. The Forcep Nets.

8. Shews a fly stuck through the thorax: and in the same manner all the different species of Bugs, Wasps, and Flies in Sect. II. III. IV. and V. are to be stuck.

F I N I S.

Speedily will be published,

A Translation of the FUNDAMENTA ENTOMOLOGICÆ of Linnæus; or, "An Introduction to the Knowledge of Insects."

1

2

3

THE
NATURALIST'S
AND
Traveller's Companion.

CONTAINING
Instructions for discovering and preserving
Objects of NATURAL HISTORY,

Under the following Heads :

I. The Method of catching and preserving Insects for Collections, illustrated with a Copper-plate.	V. Experiments for discovering the Contents of the Air.
II. The Method of preserving Birds and other Animals.	VI. Directions for collecting Fossils, including Earths, Stones, Salts, Inflammables, Minerals, and Metals.
III. Directions for bringing over Seeds and Plants from distant Countries.	VII. Directions for taking off Impressions or Casts from Medals and Coins.
IV. Method of analysing Medicinal or Mineral Waters.	

*Multa etenim sunt quæ esse audivimus, quæliæ autem sint ignoremus!
Quamque multa venientis ævi populus, ignota nobis, sciet!*

SENECA.

L O N D O N :

Printed for the AUTHOR, and sold by GEORGE PEARCE,
Cheapside.

MDCC LXXII.

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Lettsom (J.C.)

C. Bouch. 1772.

P R E F A C E.

THE experienced Naturalist must not expect to find much Information in this little Treatise. The Author had kept it by him for some Time in Manuscript, and occasionally given Copies to Sea-faring Persons, and such of his Acquaintance going Abroad, as were desirous of procuring the Natural Productions of different Countries. But this having necessarily confined it to a few Individuals, he has been induced to Publish it, that every Person might avail themselves of any Instruction it affords, his ultimate Design having been to promote a more general Knowledge of Natural History.

T H E
N A T U R A L I S T ' S
A N D
Traveller's Companion.

S E C T. I.

The Method of catching and preserving INSECTS *for Collections.*

INSECTS in general are known to most people, the systematic distinctions but to few; nor have we any English names for the greatest part of them. The general denomination of beetles, butterflies, moths, flies, bees, wasps, and a few other common names, are all that our language supplies. It would, therefore, be in vain to enumerate the immense variety of genera and species to any person unskilled in the science of entomology: we may,

B

however,

however, give directions under general names, where to find and how to catch each kind; and such as require more particular information upon this subject, may consult an ingenious treatise, which has appeared since the first publication of this, (a) under the title of *Instructions for collecting and preserving Insects*, by W. Curtis (b).

I. The first great class called beetles (c), are found in and under the dung (d) of animals, especially of cows, horses, and sheep; many of them make holes under the dung three or four inches deep; it will therefore be necessary to have an iron spade to dig them out, when in search of this tribe of insects.

Some (e) are found in rotten and half decayed wood, and under the decayed bark of trees; on the carcases (f) of animals that have been dead four or five days; on moist bones that have been gnawed by dogs or other animals; on flowers having a foetid smell; and on several kinds

(a) Gentleman's Magazine, vol. XLI. 1771, page 6. It may be necessary to observe, that the following classes and genera of insects are made after the Linnæan system.

(b) See also Chæffer *Elementa Entomologica*; Foister's catalogue of the animals of North America.

(c) COLEOPTERA. (d) Scarabæus, *chafer*. Dermestes, *leather-eater*. Hister, *mimick-beetle*. Staphylinus, *rove-beetle*. (e) Lucanus, *stag-beetle*. Cerambyx, *capricorn-beetle*. Dermestes. (f) Hister, Silpha, *carriion-beetle*. Staphylinus.

(g) Byrrhus,

kinds of fungous substances, particularly the rotten and most stinking: others (*g*) may be found in a morning about the bottoms of perpendicular rocks and sand banks, and also upon the flowers of trees and herbaceous plants.

Many kinds (*b*) may be caught in rivers, lakes, and standing pools, by means of a thread net, with small meshes, on a round wire hoop, fixed at the end of a long pole.

In the middle of the day, when the sun shines hot, some (*i*) are to be seen on plants and flowers, blighted trees and shrubs; others (*k*) in moist meadows are best discovered at night, by the shining light which they emit.

A great variety (*l*) fit close on the leaves of plants, particularly of the burdock, elecampane, coltsfoot, dock, thistle, and the like; or feed on different kinds of tender herbs (*m*).

Numbers (*n*) may be found in houses, dark cellars, damp pits, caves, and subterraneous passages, or on umbelliferous flowers (*o*), on the trunks

(*g*) *Byrrhus, curculio, weevil. Bruchus, seed-beetle. (b) Gyrimus, whirl-beetle. Dytiscus, water-beetle. (i) Coccinella, lady-fly. Buprestis, burn-cow. Chrysomela, golden-honey-beetle. Cantharis, soft-winged-beetle. Elater, spring-beetle. Necydalis, cleft-winged-beetle. (k) Lampyris, glow-worm. (l) Cassida, tortoise-beetle. (m) Meloë, blister-beetle. (n) Tenebrio, stinking-beetle. (o) Cerambyx, Pinus.*

trunks as well as the leaves of trees; in timber-yards, and in the holes of decayed wood.

Some (*p*) inhabit wild commons, the margins of pools, marshes, and rivulets; and are likewise seen creeping on flags, reeds, and all kinds of water-plants.

Multitudes (*q*) live under stones, moss, rubbish, and wrecks near the shores of lakes and rivers. These are found also in bogs, marshes, moist places, pits, and holes of the earth, on stems of trees; and in an evening they crawl plentifully along path-ways after a shower of rain.

Some (*r*) may be discovered in the hollow stems of decayed umbelliferous plants, and on many sorts of flowers and fruits.

II. Another class (*s*) of insects are found about (*t*) bake-houses, corn-mills, in ships, and in all places where meal is kept; on grass (*u*), and all kinds of field herbage. Some (*v*) of these frequent rivers, lakes, and standing-pools.

III. Butterflies and moths make another great

(*p*) *Leptura*, *wood-beetle*. *Cicindela*, *glossy-beetle*. (*q*) *Carabus*, *ground-beetle*. (*r*) *Forficula*, *earwig*.

(*s*) HEMIPTERA. (*t*) *Blatta*, *cock-roach*. (*u*) *Mantis*, *camel-cricket*. *Gryllus*, *locust*. *Fulgora*, *cicada*, *flea-locust*. *Cimex*, *bug*. (*v*) *Notonecta*, *boat-fly*. *Nepa*, *water-scorpion*.

division

division (*w*). In the day when the sun is warm, butterflies (*x*) are seen on many sorts of trees, shrubs, plants, and flowers. Moths (*y*) may be seen in the day time, sitting on walls, pales, trunks of trees, in shades, out-houses, dry holes, and crevices; on fine evenings they fly plentifully about the places they inhabit in the day time: some (*z*) are seen flying in the day time over the flowers of honey-suckles and other plants with tubular flowers. Insects of this species seldom sit to feed, but continue vibrating on the wing, while they thrust the tongue or proboscis into the flower.

IV. Insects of this class (*a*) are found in woods (*b*), hedges, meadows, sand-banks, walls, pales, fruits, and umbelliferous flowers; some (*c*) fly about lakes and rivers in the day.

V. The fifth division (*d*) including wasps (*e*), bees (*f*), &c. may be seen about hedges (*g*), shrubs, flowers, and fruits. Wasps and bees are the only winged insects that have any great degree

(*w*) LEPIDOPTERA. (*x*) *Papilio*, *butterfly*. (*y*) *Phalæna*, *moth*. (*z*) *Sphinx*, *hawk-moth*.

(*a*) NEUROPTERA. (*b*) *Myrmeleon*, *hemerobius*, *pearl-fly*. *Raphidia*, *camel-fly*. (*c*) *Libellula*, *dragon-fly*. *Ephemera*, *may-fly*. *Phryganea*, *spring-fly*.

(*d*) HYMENOPTERA. (*e*) *Vespa*, *wasp*. (*f*) *Apis*, *bee*. (*g*) *Tenthredo*, *saw-fly*. *Sirex*, *tailed-wasp*. *Ichneumon*, *ichneumon-fly*. *Sphex*, *ichneumon-wasp*. *Vespa*. *Apis*.

(*b*) *Mutilla*,

degree of poison in them, they should therefore be taken with a pair of forceps, and handled cautiously on account of their stings, which are dangerous. Some (*b*) of this division have stings, but no poison, and are to be found on the flowers of umbelliferous plants, when the sun shines hot in the middle of the day, at which time others (*i*) are seen on sand-banks, walls, and pales.

VI. Flies of various kinds constitute the next class (*k*); they fly about the tops of trees (*l*), little hills, horses, cows, sheep, ditches, dung-hills, and every offensive object. Some (*m*) are found on all sorts of flowers, particularly those of a foetid smell. Many (*n*) of these are most easily taken when they begin to feed; for in the middle of the day they are so quick and active, that it is almost impossible to catch them.

VII. The last great division (*o*) contains scorpions, spiders, crabs, lobsters, &c. It is necessary only to observe here, that all kinds of insects having no wings may be preserved in spirits, brandy or rum, except crabs, lobsters,

(*b*) *Mutilla*, *naked-bee*. (*i*) *Chrysis*.

(*k*) DIPTERA. (*l*) *Oestrus*, *gad-fly*. *Musca*, *fly*. *Tabanus*, *whame*. *Hippoboscæ*, *horse-fly*. (*m*) *Tipula*. *Conops*. *Afilus*, *wasp-fly*. (*n*) *Bombylius*, *flower-breeze*.

(*o*) APTEA.

and

and the like, which may conveniently be preserved dry.

I. The first class of insects, consisting of beetles (coleoptera) are hard winged. Many kinds fly about, in the day, others in the evening, some at night only. They may be caught with a gauze net, or a pair of forceps covered with gauze. When they are taken, stick a pin thro' the middle of one of the hard wings, and pass it through the body, as in plate, fig. 1. They may be killed instantly, by immersion in hot water, as well as in spirit of wine; then stick them on a piece of cork, and afterwards carefully place their legs in a creeping position, and let them continue exposed to the air until all the moisture is evaporated from their bodies. Beetles may also be preserved in spirit of wine, brandy, or rum, closely corked up.

II. Insects of the second class (hemiptera) may be killed in the same manner as beetles, and likewise by means of a drop of the etherial oil of turpentine applied to the head.

III. The division of butterflies and moths (lepidoptera) as well as all flies with thin membranaceous wings, should be caught with a gauze net, or a pair of gauze forceps: when taken in the forceps, run a pin through the thorax or shoulders, between the forewings, as in plate, fig. 3. After this is done, take the pin by the head, and remove the forceps, and with the other

other hand pinch the breast of the insect, and it will immediately die: the wings of butterflies should be expanded, and kept so, by the pressure of small slips of paper, for a day or two. Moths expand their wings when at rest, and they will naturally take that position.

The best method of having the most perfect butterflies is to find out, if possible, the larva or caterpillar of each, by examining the plants, shrubs, or trees they usually feed upon, or by beating the shrubs and trees with long poles, and thereby shaking the caterpillars into a sheet spread underneath to receive them; to put them into boxes covered with thin canvas, gauze, or cat-gut, and to feed them with the fresh leaves of the tree or herb, on which they are found; when they are full grown, they will go into the pupa, or chrysalis state, and require then no other care, till they come out a perfect butterfly, at which time they may be killed, as before directed. Sometimes these insects may be found hanging to walls, pales, and branches of trees, in the chrysalis state.

Moths might likewise be procured more perfect, by collecting the caterpillars, and breeding them in the same manner as butterflies. As the larvæ or caterpillars cannot be preserved dry, nor very well kept in spirit, it would be satisfactory if exact drawings could be made of them while they are alive and perfect. It may be
necessary

necessary to observe, that in breeding these kinds of insects, some earth should be put into the boxes, as likewise some rotten wood in the corners; because, when the caterpillars change into the pupa, or chrysalis state, some go into the earth, and continue under ground for many months before they come out into the moth state; and some cover themselves with a hard shell, made up of small pieces of rotten wood. Hence also, as many go into the earth, valuable insects may sometimes be found by digging after them a foot deep, about the roots of trees, shrubs, and plants.

IV. The fourth class of insects (neuroptera) may be killed with spirit, or with a drop of ætherial oil of turpentine.

V. Insects of the next class (hymenoptera) are best killed by oil of turpentine also. A pin may be run through one of their wing-shells and body, as represented in plate, fig. 2.

VI. Those of the sixth class (diptera) may be killed with spirit of wine.

VII. The last division (aptera) in general are subjects which should be kept in spirit.

When in search of insects, we should have a box suitable to carry in the pocket, lined with cork at the bottom and top to stick them upon, until they are brought home. If this box be strongly impregnated with camphor, the insects soon become stupefied, and are thereby prevented

from fluttering and injuring their plumage. Besides a gauze forceps, the collector should have a large muscheto gauze net, made in the shape of a bat fowling-net, and also a pin-cushion with three or four different sizes of pins, to suit the different sizes of insects.

In hot climates, insects of every kind, but particularly the larger, are liable to be eaten by ants and other small insects, especially before they are perfectly dry: to avoid this, the piece of cork on which our insects are stuck in order to be dried, should be suspended from the ceiling of a room, by means of a slender string or thread; besmear this thread with bird-lime, or some adhesive substance, to intercept the rapacious vermin of these climes in their passage along the thread.

After our insects are properly dried, they may be placed in the cabinet or boxes where they are to remain: these boxes should be kept dry, and also made to shut very close to prevent small insects from destroying them; the bottoms of the boxes should be covered with pitch, or green wax, over which paper may be laid; or, which is better, lined with cork, well impregnated with a solution of a quarter of an ounce of corrosive sublimate mercury, in half that quantity of æthereal oil of turpentine, and a pint of the camphorated spirit of wine.

The

The finest collections have been ruined by small insects, and it is impossible to have our cabinets too secure. Such insects as are thus attacked may be immersed in spirit of wine, without injuring their fine plumage or colours; and afterwards let them be sprinkled about their bodies and insertions of the wings with the solution above-mentioned. We may dissolve a much larger proportion of sublimate mercury, by means of a saturated solution of crude sal ammoniac in water: I find that an ounce of the sal ammoniac solution will dissolve twenty scruples of the sublimate.

These observations and directions respecting insects, may, perhaps, be the means of exciting the curiosity of some, whose enquiries after this part of natural history will be amply compensated by the frequent opportunities of enlarging their knowledge, as there is scarce any part of the surface of this globe, scarce a tree, a shrub, or a plant, an animal either living or dead, or even the excrements of animals, on which some kind of insect does not depend for its subsistence and propagation. An inquisitive traveller, as well as every other person, has it more or less in his power to add to the common stock of knowledge, with very little expence either of time or labour.

S E C T. II.

*Method of preserving BIRDS and
other Animals.*

THE general increase of knowledge of late in natural history, from the attention of individuals to various branches of it, must afford no small degree of pleasure to the sensible part of mankind. Whilst such different researches have given entertainment to different dispositions, enlarged the mind, and engaged and diverted it from unprofitable or dangerous pursuits, they have occasionally given rise to the most useful improvements in every department of life, and afforded means of joining utility with elegance.

To promote these purposes more effectually, a more general knowledge of a good antiseptic for animal substances has been much enquired after. Owing to a want of this, many curious animals, and birds particularly, come to our hands in a very imperfect state: some from foreign parts entirely miscarry, and others of the finest plumage are devoured by insects.

Many

Many subjects I have prepared myself with success; but since the first insertion of this account in the Gentleman's Magazine *, the methods used by the ingenious captain Davis, and T. S. Kuckahn, have been published in the Philosophical Transactions †, of which I shall also avail myself.

The former directs birds in perfect plumage, “ to be opened from the upper part of the
“ breast, to the vent, with a sharp knife or
“ pair of scissars, the feathers of the breast and
“ belly being first carefully laid aside by the fin-
“ gers, so as not to hinder the skin being easily
“ come at. The skin must then be carefully
“ loosened from all the fleshy parts of the breast,
“ body, thighs, and wings; after this, cut off
“ all the flesh from those parts, and take out
“ also the entrails and all the inside: then, hav-
“ ing got a composition of burnt alum, cam-
“ phor, and cinnamon, of each an equal quan-
“ tity, well powdered and mixt together, strew
“ some of this powder lightly over the whole
“ carcase; but salt is by no means to be used
“ with this composition, as it always will drop
“ and nasty the plumage in moist weather; pour
“ also into the body a small quantity of camphor

* Vol. XL. 1770, page 293.

† Vol. IX. anno 1770, page 184, and 302. From the specimens both these methods appear to succeed.

“ dissolved

“ dissolved in rectified spirits of wine; after
 “ that, fill up the cavity with fine cotton, or
 “ any soft woolly substance, pouring some of
 “ the aforesaid spirits into the cotton or stuffing.
 “ Open next the mouth, and with a pair of scif-
 “ fars take away the tongue, the roof of the
 “ mouth, eyes, brains, and inside of the head *;
 “ fill that also with the same composition; and
 “ having procured eyes as near the natural ones
 “ as possible, put them into the sockets by means
 “ of a small pair of nippers introduced at the
 “ mouth. The eyes will be best made by letting
 “ fall some drops of black sealing wax on a card
 “ of the size of the natural ones †; the card
 “ must be cut something larger than the wax,
 “ to prevent their falling out of the head. Fill
 “ the head quite full with cotton, pouring some
 “ of the spirits down the throat, with some of
 “ the powder; a small piece of brass wire, that
 “ has been heated in the fire to make it pliable,
 “ may be put down the throat, being passed

* Kuckahn directs the neck to be pulled within the skin,
 till the back of the skull is drawn in sight, out of which a
 small piece is to be cut, and the brains extracted; the
 cavity of the skull is then to be moistened with the varnish,
 sprinkled with the powder, and filled up with cotton, &c.
 and then the skin may be drawn back to its proper
 place.

† To answer this purpose, beads may be conveniently
 introduced, by means of a needle and thread, passing the
 needle through the mouth, and out at the eye.

“ through

“ through one of the nostrils, and fastened to
 “ the breast-bone, to place the head in any atti-
 “ tude you choose; next fill up the body, where
 “ the flesh has been taken away, with cotton
 “ and your composition; and, having a fine
 “ needle and silk, sew up the skin, beginning
 “ at the breast, observing, as you approach to-
 “ wards the vent, to stuff the skin as tight as it
 “ will bear. This will be easiest accomplished
 “ by means of a small piece of stick or ivory,
 “ like a skewer, till the whole is done: then lay
 “ your feathers of the breast and belly in their
 “ proper order, and your bird will be com-
 “ pleted. If you would chuse to put it into an
 “ attitude, by introducing a small piece of the
 “ wire above-mentioned through the sole of
 “ each foot up the leg, and into the pinion of
 “ each wing, it may be disposed of as you
 “ please.”

Instead of using the solution of camphor in
 spirit of wine, Kuckahn recommends a liquid
 varnish, made of two pounds of common or raw
 turpentine, one pound of camphor, and one
 pound of spirit of turpentine. The camphor is
 to be broke into very small pieces, and the whole
 is to be put into a glass vessel, open at top, which
 is to be placed in a sand heat, till the ingredients
 are perfectly dissolved *.

For

* The solution of corrosive sublimate, Sect. I. page 3,
 would

For the dry compound of cinnamon, burnt alum, and camphor, directed in the foregoing method, he substitutes the two following compositions.

Corrosive sublimate,	—	—	$\frac{1}{4}$ lb.
Saltpetre prepared or burnt,			$\frac{1}{2}$ lb.
Alum burnt,	—	—	$\frac{1}{4}$ lb.
Flowers of sulphur,	—	—	$\frac{1}{2}$ lb.
Musk *,	—	—	$\frac{1}{4}$ lb.
Black pepper,	—	—	1 lb.
Tobacco ground coarse.	—	—	1 lb.

Mix the whole together, and keep it in a glass vessel stopped close. Some of this is to be strewed upon the inside of the skin and cavity of the head, after they have been washed with the varnish.

The other dry composition is made of equal quantities of tansy, wormwood, hops, and tobacco, which are to be cut small and mixed together; with this the cavities of the craw and body are to be stuffed. He likewise directs an artificial breast to be made of soft wood, and

would probably prove more effectual against insects than this varnish, or the camphorated spirit.

* The musk renders this composition very expensive, for which the same quantity of camphor might be substituted with real advantage.

fitted to the proper place, after being moistened with the varnish *.

When these antiseptic powders before mentioned cannot be had, tobacco sand mixed with a small proportion of alum, black pepper, and camphor may be substituted. If the sublimate solution (Sect. II. page 16.) can be procured, the abdomen and throat of the animal may be first washed with it, and the tobacco, oakum, or tow, steeped also in the same liquor.

Small birds are well preserved in brandy, rum, arrack, or first runnings, the finest plumage not being injured by spirits.

Large sea-fowl have thick, strong skins, and such may be skinned; the tail, claws, head, and feet are carefully to be preserved, and the plumage stained as little as possible with blood. The inside of the skin may be moistened with the sublimate solution, and then stuffed with oakum, tow, or tobacco steeped in the same, and afterwards dried in an oven, not heated sufficiently to crisp the feathers. The eyes may be filled with white putty, which, when dry, may be painted

* I am informed that both Leman's and Grace's curious collections were preserved with cork breasts. I have found that this gives the subjects a plumpness, which cannot be equalled by tow, or any stuffing; though it must be admitted, that the specimen exhibited before the Royal Society by captain Davis, can be exceeded by nothing but life itself.

to resemble the natural eyes. “ Baking is not
 “ only useful in fresh preservations, but will also
 “ be of very great service to old ones, destroy-
 “ ing the eggs of insects; and it should be a
 “ constant practice once in two or three years,
 “ to bake them over again, and to have the
 “ cases fresh washed with camphorated spirit,
 “ or the sublimate solution, which would not
 “ only preserve collections from decay much
 “ longer, but also keep them sweet *.”

When the subject is to be kept some time in a hot climate, it should be secured in a box filled with tow, oakum, or tobacco, well sprinkled with the sublimate solution. The same preparations and precautions already described, are equally applicable to quadrupeds in general.

Small quadrupeds, all kinds of reptiles, as snakes, lizards, and frogs; fish of all sorts, and small tortoises, with sea eggs†, and sea stars, may be put into brandy, rum, arrack, or first runnings, with a little alum in it.

Shells constitute an extensive part of natural history, and may be collected in great plenty and variety on the shores of most islands and continents. Those which are found with the fish in

* See Philosophical Transactions, vol. LX. page 319.

† The echini, or sea eggs, may also be dried; but they are then so liable to be broken, that the safest method is to preserve them in spirit.

them,

them, are the most valuable for the brightness of colour, and smoothness of surface, as they lose that beauty and polish, when they have been long exposed to the sun. In bivalves, or those having double shells, as cockles, oysters, &c. both the shells should always be collected. It is sufficient in packing up shells, to prevent their rubbing against each other by means of paper, moss, sand, &c. some of the shell fish may be preserved in spirits, as this might prove an useful addition to the knowledge of this department of natural history.

The nests and eggs of birds, would likewise contribute to increase the knowledge of natural history, and prove also highly ornamental amongst collections in that branch of zoology.

S E C T. III.

*Directions for bringing over SEEDS
and PLANTS from distant Coun-
tries.*

EVERY part of the world has its peculiar productions, and in no objects of natural history is the variety more entertaining, than in the vegetable kingdom. The gardens of the curious have already been enriched with many valuable acquisitions from distant countries; but many attempts also to introduce several other plants equally rare, have been unsuccessfully made, owing to the bad state of the seeds or plants when first procured, or the method of disposing of them during long voyages, and the accidents which the utmost precaution cannot prevent. The ingenious J. Ellis, Esq; has favoured the world with the most judicious observations on the present subject, which may soon prove the means of many useful additions in horticulture to this kingdom. He directs sound ripe seeds to be chosen, which have been collected in dry weather, and kept dry without exposing

exposing them to sunshine; and internally they should be plump, white, and moist.

- a. They may be preserved by rolling each in a coat of yellow bees wax, about half an inch thick; and afterwards a number of these thus prepared, may be put into a chip box, which is to be filled with melted bees wax, not made too hot *: the outside of the box may then be washed with the sublimate solution, (Sect. II. page 16.) and kept during the passage in a cool airy place. In this manner tea seeds, the stones of mangoes, and all hard nuts and leguminous seeds in general, may be prepared.
- b. Instead of putting small seeds in bees wax, they may be inclosed in paper or cotton which has been first steeped in melted bees wax, and then placed in layers in a chip box, which is to be filled as before with melted bees wax. Pulpy

* Instead of melted bees wax, plaster of Paris, mixed with water, (Sect. VII.) and poured upon the nuts, seeds, &c. may be substituted. I shall not lay much stress at present upon this method, because I never knew it tried; but from analogy it appears to me preferable to any other for preserving such substances in a state fit for vegetation. The coat formed by plaster of Paris excludes air and moisture; and at the same time is sufficiently porous to absorb the exhalation from the vegetable included. Another advantage is, that it may be applied cold. It also remains of the same consistence in all climates, and under all degrees of heat of the air. I would therefore recommend a trial of this cheap body.

seeds,

feeds, as those of strawberries, mulberries, arbutuses, &c. may be squeezed together and dried, and then put into the cerate paper or cotton above-mentioned.

- c. The small feeds well dried may be mixed with dry sand, put into the cerate paper or cotton, and packed in glass bottles, which may be covered with a bladder or leather. These bottles may be put into a keg, box, or any other vessel, filled with four parts of common salt, two of saltpetre, and one part of sal armoniac, in order to keep the feeds cool, and preserve their vegetative power.
- d. Seeds and nuts in their pods, may be put, with alternate layers of silk paper, into half-pound canisters with double rim covers, made of tin and tutenague, and lined with the same paper: these should be well covered with paper at the top, and kept in an airy cool place.
- e. The feeds well dried may be put into a box, not made too close, upon alternate layers of moss, in such a manner as to admit the feeds to vegetate, or shoot their small tendrils into the moss. In the voyage, the box may be hung up at the roof of the cabin; and when arrived here, the feeds should be put into pots of mold, with a little of the moss also about them, on which they had lain.

Seeds preserved after this manner, and also in the preceding (d), which are procured in the East

East Indies, may be examined when the ship arrives at St. Helena; and some of them which appear in a state of vegetation, should be sown in cases or tubs of earth kept as secure as possible from sea water; some holes should be cut in these cases or tubs, and covered with bast-mats or sail-cloth, which will admit sufficient air.

More of the same seeds may be also sown after the ship has passed the tropic of Cancer, near the latitude of thirty degrees north. Plants or shrubs that are to be transported, must be taken out of the ground with a quantity of the soil covering the roots, which should be wrapped in wet moss, and surrounded with a bast-mat, or dry plantain leaves, and put into the cases or tubs, with the precautions above-mentioned.

When the naturalist is in search of vegetable productions, different soils and situations should be examined; as the sea, and its shore, deep running waters, dikes, marshes, moors, mountains, cultivated and barren fields, woods, rocks, &c. afford each their peculiar plants; and wherever any are collected, the particular soil and situation should be remarked. Sometimes it may prove inconvenient to convey the plants which may be discovered, when it would not be so to send them dried in the form of a *hortus-ficcus*. To do this in the best manner, and to make their stalks, leaves, &c. lie flat and smooth, they

they must be exposed betwixt papers to a free dry air, with considerable pressure upon them. The leaves and flowers should be carefully expanded, for on this the beauty and value of the specimen greatly depends. Those plants should also be gathered on a dry day, while they are in full bloom, and all their parts perfect and entire. When perfectly dry, they may be kept either loose in quires of paper, or fastened into a book, with glew made of fine isinglass dissolved in boiling water. Particular care is to be taken to avoid any injuries from moisture, or insects; to prevent any accident from the latter, let the paper and stalks of the plants be sprinkled with the sublimate solution. (Sect. II. page 16.)

The impressions of plants well taken off upon paper, look very little inferior to the best drawings, and may be done with very little trouble. For this purpose, some printer's ink *, and a pair of printer's bosses, such as are used for laying the ink on types, are necessary. After rubbing these bosses with a little of the ink, lay the plant betwixt them, and press it so as to give it sufficient colour; then take the plant and lay it carefully on a sheet of paper, and press it with the hand, to give the impression of the plant to the paper, which may be afterwards coloured accord-

* Where this cannot be procured, ivory, or lamp black, ground with boiled linseed oil, may be substituted.

ing to nature; a piece of blotting paper may be placed betwixt the plant and the hand, to prevent the latter from being dirtied by the ink.

But the most effectual method of sending a branch of any plant with the flowers, and parts of fructification entire and perfect, is to put them in bottles of brandy, rum, or arrack.

Corals, corallines, sponges, &c. inhabitants of the sea, are found in considerable variety near the coasts of islands and continents, particularly in hot climates. Some of these are very tender and brittle when dry, and should therefore be carefully packed up in sand, in order to keep them steady, or placed betwixt papers in the manner of an *hortus ficcus*.

In hot climates, the insects are very rapacious; and I have seen the finest fan-corals, and others of a soft texture when first taken out of the sea, almost devoured by ants, before they became dry and hard. To prevent injuries of this kind, a little powdered corrosive sublimate, or the sublimate solution (Sect. II. page 16.) may be sprinkled upon these productions. Some of the small, and branches of the large ones, might also be put into spirits, and the parts of them thereby preserved much more distinct, which

E

would

would serve greatly to illustrate their natural history *.

* Though the author agrees with the ingenious J. Ellis, Esq; in the propriety of ranking corals, corallines, &c. among the animal kingdom, he has placed them under this section, as they are usually thought to be vegetable productions.

S E C T. IV.

Method of analyzing MEDICINAL
WATERS.

AS many springs contain a volatile principle, soon liable to be dissipated, it is necessary to make our experiments on the spot, in order to discover the contents of such waters. Various as these contents may at first appear, the apparatus proper to detect all of them may be reduced into a very small compass.

When we purpose to examine any medicinal spring, the soil and face of the country should be considered, the stony or mineral appearance, and particularly whether there are any mineral veins; the degree of heat of the water should be ascertained by a thermometer, and its comparative weight to other springs in the neighbourhood also carefully observed; after which we may enter on our experiments.

I. AERIAL MATTERS.

I. MEPHITIC, FIXABLE, OR FIXED *air*, is heavier than common, or vital air, and frequently mixed with water; by which union, common water is capable of dissolving iron, and thereby forming a chalybeate spring, as in Pyrmont, Spa, and many other celebrated mineral waters.

This mephitic air is detected by lime-water, the former precipitating the calcareous earth of the latter in a white powder. To discover the quantity of this ærial matter, a bottle filled with the mineral water, should be tied over the mouth with a loose bladder: the bottle is then to be placed in boiling water, the heat whereof will extricate the mephitic air, which rising into the bladder, may be collected by tying the bladder close to the neck of the bottle, and afterwards measured by a proportionable bulk of water. (See Sect. V.)

II. SALINE BODIES.

I. AN ACID is sometimes found in the composition of mineral waters, which is always the vitriolic.

a. In

- a. In its fixed state, which is supposed to be separated from pyrites: this is however very rare, and probably never occurs, as it cannot remain long in this state, without being neutralized by earths, salts, or metals.

Many of those springs called acidulæ, received this name from the mephitic air we have already mentioned. If this acid be present, it may be discovered by an infusion or syrup of violets, or by an infusion of lacmus, or archil *, which are turned of a brighter or reddish colour by it. This acid may be detected also by a solution of lead in the nitrous acid; the solution should be fully saturated. The nitrous acid uniting with calcareous earth, or fossil alkali, falls in a white sediment, while the vitriolic acid combines with the lead.

- b. In its volatile sulphureous state. (See page 32.)

2. An ALKALI is also very seldom found in water in its proper state.

- a. When a *fossil alkali* is present, it is more nicely detected by the syrup of violets, or infusion of lacmus, than the former, these being turned green by the least portion of alkali. If a considerable quantity of alkali were combined with

* This is so nice a test, that even mephitic air is apt to give it rather a brighter colour.

the water, it might be precipitated by a solution of calcareous earth, or by acids.

- b. A *volatile alkali* may be distinguished by a solution of corrosive sublimate mercury in water, or in the nitrous acid; the alkali rendering the solution white; a precipitation of a white powder ensues, but no change is produced; when the alkali is the fixed or fossil; or if any; the mercury will be precipitated in an orange, brown, or reddish powder; where there is a considerable quantity of the volatile alkali, the water turns blue by the addition of copper. When this alkali is in a very small proportion, some of the water should be distilled over.

3. NEUTRAL SALTS are frequently found in medicinal waters.

- a. GLAUBER'S SALT, compounded of vitriolic acid, and fixed fossil alkali, spirit of wine added to a solution of this salt, precipitates it in a white powder; but no change is produced by the addition of any alkaline salt.
- b. EPSOM SALT, formed of the same acid, and the earth of magnesia, is often a composition in purging waters. Any alkaline salt, either fixed or volatile, turns this water milky or curdly; the alkaline salt uniting with the vitriolic acid, precipitates the earth of magnesia.
- c. NITRE, is composed of the nitrous acid, and fixed alkali. Water containing this salt should

be evaporated, and the nitre remaining may be known by deflagration, or by its making a crackling noise over the fire. When the nitrous acid is combined with calcareous earth instead of the fixed alkali, the earth may be precipitated by the addition of this alkali.

- d. COMMON SALT, consisting of the muriatic acid, and fossil alkaline salt. The acid of this salt is nicely detected by a solution of silver in the nitrous acid; the muriatic acid, having a nearer affinity with silver than the nitrous, unites with the silver, which falls down in a white sediment, while the nitrous acid joins with the alkali of the common salt. It is proper to have a redundancy of the nitrous acid in the solution of silver, lest the silver be precipitated by a calcareous earth, which may be in the water.

III. EARTHY SUBSTANCES.

- a. CALCAREOUS EARTH, or calcined LIME-STONE, is found in most wells and medicinal springs; the presence of which is best discovered by a solution of lead in the nitrous acid. This acid should be saturated with as much lead as it will dissolve, lest the superfluous acid should saturate the earth, and prevent the precipitation of the lead. If there be any calcareous earth in the water, this solution turns it milky, and after
some

some time a white powder is deposited, the calcareous earth precipitating the lead, by uniting with the nitrous acid.

- b. If calcareous earth be suspended in water by combination with the vitriolic acid, gypsum, or selenites is formed, which may be discovered by the addition of alkaline salt to this compound; the mixture should be warmed a little, to promote the precipitation of the selenitic earth.
- c. The same acid united with argillaceous earth, or earth of alum, produces an aluminous austere composition; and the earth may be precipitated also by alkaline salt, which uniting with the vitriolic acid, allows the earth to fall down in a sediment.

IV. SULPHUREOUS.

SULPHUR may be suspended in its proper form, though it is not soluble in this state; but when the principle of inflammability in sulphur is combined with calcareous earth, or any alkali, in the form of an *hepar sulphuris*, it readily dissolves; in which case the water smells disagreeably, like the scourings of a gun, or putrid eggs. It is distinguished also by a solution of *saccharum saturni* (sugar of lead) in the nitrous or vegetable acids; a little of this solution being
marked

marked in lines on paper, and the paper suspended over the water, the volatile sulphureous fumes rising from the water turn these lines of a brown or dark colour; the inflammable matter of the sulphur uniting with the lead in the solution of the saccharum saturni, partly revives the metal, and hence produces that dark colour. (See Sect. V. page 39, 40.)

V. BITUMINOUS BODIES,

BITUMEN frequently runs from amongst rocks; whence it is called petroleum; it is also common in the bowels of the earth, as hath been often fatally experienced from those bituminous vapours called fire-damps, which prove inflammable, and therefore different from mephitic air, the latter extinguishing fire. Whether this inflammable vapour is formed of the principle of inflammability of sulphur and the vitriolic acid in a volatile state, is not so well ascertained as the remarkable effects produced by these bituminous bodies in the mountains of *Ætna*, *Vesuvius*, and many others mentioned in history.

LIQUID BITUMEN, NAPHTHA, or PETROLEUM, is never found combined with water, but floats on its surface in a manner evident to the eye, and particularly may be distinguished by taste and smell.

VI. METALLIC SUBSTANCES.

- a. IRON is a common ingredient in mineral waters, whence they are called chalybeate. The general method of distinguishing this metal, is by an infusion or powder of galls, which turns water containing iron of a purple or black colour, deeper in proportion to the quantity of iron present.

But the most accurate method, is by means of the Prussian alkali*; fully saturated with the inflammable matter of the dried blood. This alkali mixed with a chalybeate water turns the latter immediately blue, and deposits the iron in a powder of the same colour.

- b. COPPER in water is precipitated in a red powder by the same alkali.
- c. ZINC is precipitated in a white powder by the Prussian alkali. Although this alkali precipitates all the metallic substances from acids, so that they may be distinguished from one another, it does not any of the earths.
- d. ARSENIC has been suspected in some mineral springs, but I am acquainted with no proof of

* The Prussian alkali is made of equal quantities of dried ox-blood, and fixed alkali. These are to be burnt together in a crucible, and the ashes dissolved in a sufficient quantity of water, when we enter on our experiments.

it. However, it may possibly happen that water running through arsenical veins, may carry off a quantity of arsenic. To discover this, the water should be evaporated, and the residuum may be placed on a hot bar of iron, and if there be any arsenic, it is known by emitting a strong garlick smell; or this residuum may be moistened with oil, and put between two bright plates of copper, which, when heated, are turned of a white colour, if any arsenic be present; but the smell generally affords a sufficient test.

S E C T. V.

*Experiments on the CONTENTS of
the AIR.*

NOTHING is more evident than that our atmosphere abounds with a great variety of substances, if we consider the various exhalations constantly taking place from all vegetables; in prodigious quantities from all animal bodies; and the great variety of fossil matters that are incessantly rising in the atmosphere.

To investigate the nature of all these is impossible; in very few cases can we find the exhalation of one kind only; and many of them are of little consequence; for if we consider the quantity that is constantly exhaling, and the powers many of them might have in acting upon the human body, we should expect the effects to appear every moment to a considerable degree, which we find very far from being the case: there are certainly some means by which they are obviated: these exhalations are no doubt more or less diffused into the higher regions of the air; and probably also, from their mixture with one another,

ther, the most active come to be neutral and innocent. It is in few instances that the exhalations are not exposed to the means of mixture; and it is but seldom, comparatively, that effects are produced upon human bodies, although in a particular manner immersed in this vitiated atmosphere.

There are, however, some impregnations in the atmosphere, which daily experience shews have considerable influence on our bodies; for though they may not sensibly affect the more robust and strong, they certainly do the weak and delicate. With a view to investigate them more particularly, the following experiments were made in the beginning of August, in the year 1769.

For some preceding weeks the air had been generally warm and dry, and mostly free from wind; the evening on which I began to condense the atmospherical moisture was calm, and clos'd a fine warm day; the place where this moisture was collected, was in a court about the centre of Gracechurch-street.

I procured a large glass globe perfectly clean on the outside, into which I put a quantity of ice and sal ammoniac powdered; the globe thus prepared, was suspended in the air about five yards from the surface of the ground; the cold produced by the ice and neutral salt congealed the moisture of the air on the external surface of the globe in
the

the form of ice. This condensed body was carefully scraped off with a silver spatula, and received into a wide-mouthed bottle well rinsed: when I had collected in this manner some ounces of condensed matter, I proceeded on the following experiments.

EXPERIMENT I.

TO know if it contained any fixable or mephitic air, I put one ounce of the condensed moisture into a vial, the cork of which was perforated through the whole length, to admit the extricated air to pass through: over the cork was tied a loose bladder free from any air; I then placed the vial thus prepared, in boiling water; the heat of the water extricating the fixable air from the condensed moisture, it escaped through the perforation of the cork into the bladder, where it was collected; the quantity of this air occupied a space, which of simple distilled water was equal in bulk to $1\frac{1}{2}$ drachm. The vial, upon weighing it after the separation of the air, was reduced a few grains lighter.

To be more certain that a great part of this extricated air was fixable, or mephitic, I applied it to lime-water; a precipitation of calcareous earth ensued, which convinced me of the presence of mephitic air. (See Sect. IV. page 28.)

EXPE-

E X P E R I M E N T II.

I TOOK a quantity of the condensed atmospheric moisture, which had not been exposed to heat; with this I mixed some syrup of violets diluted; the syrup evidently became of a greener colour; which persuaded me that no acid, but an alkali, predominated. (See Sect. IV. page 28.)

E X P E R I M E N T III.

BY mixing the condensed moisture with a solution of corrosive sublimate mercury, the mixture became of a pale white, which proved the alkali to be volatile; for with a fixed alkali, no change could have been produced; or, if any, the mercury would have been precipitated in a brown or reddish powder, called *mercurius precipitatus fuscus Wortzii*. (See Sect. IV. page 22, 23.)

E X P E R I M E N T IV.

A PIECE of paper marked with a solution of lead in distilled vinegar, was suspended over
a quantity

a quantity of the condensed moisture, while in a state of evaporation; but no change taking place in the lines marked on the paper, I concluded no sulphur or inflammable matter was detached. (See Sect. IV. page 30.)

EXPERIMENT V.

THE condensed moisture evaporated to dryness, yielded a brownish saline body, which from some experiments (see Sect. IV. and VI.) appeared to be chiefly a compound salt of the vitriolic acid and volatile alkali, forming sal vitriolatum ammoniacum; this I procured in the proportion of about $1\frac{1}{2}$ grain, in two ounces of the moisture.

From what appears to be the contents of the city air, as above related, many particulars obviously result, which afford some insight into the nature and cause of the different diseases in the city from those without. There is reason to presume, that putrid effluvia are noxious to animal bodies; they may very often introduce a ferment into a subject disposed to the putriferative fermentation, and hence have a tendency to promote diseases which arise from a putrid diathesis.

Probably the effluvia of perspiration, when accumulated in more confined places, as in goals, hospitals,

hospitals, and large cities, are liable to a further degree of putrifaction, and to be converted into peculiar miasmata, which we very well know produce diseases of this kind, as in cases of goal fevers.

There appears from Experiment I. another material circumstance, which, until very lately, we were unacquainted with; we find that in all fermentations, a mephitic air is detached, which has frequently proved a certain, and sometimes sudden poison to animals; it is therefore reasonable to suppose, if taken in very largely, without proving a poison, that it may produce diseases of very dangerous tendency, and particularly of a putrid kind. The same mephitic, or fixed air, arises from numberless and various sources; it is exhaled from the earth; it rises certainly from all breathing animals, probably from all burning bodies, and seemingly in a peculiar manner from the putriferous fermentation.

S E C T. VI.

Directions for collecting and distinguishing Fossil Substances, including Earths, Stones, Salts, Inflammables, Minerals, and Metals.

TO write particularly upon these objects of natural history, is not the present design: a few general instructions may be sufficient to direct a traveller in the choice of such fossil bodies as he may meet with. Wallerius, Woodward, Cronstadt, Linnæus, and Da Costa, may supply a more inquisitive enquirer with the most extensive information.

Many are discouraged from pursuing this part of natural history, owing to the great variety of objects it comprehends, and the numerous properties by which they are distinguished. But these when attended to, appear much less complicated, and capable of being reduced to a few simple heads; simple in their nature, and uniform in their composition; all new combinations producing chiefly a change only in form, colour, and consistence.

I. E A R T H S

I. EARTHS and CALCAREOUS STONES.

A. CLAYS are soft earths; mixed with a quantity of water they form a ductile paste; when burnt, they become hard and solid.

These are various in their consistence and colour, owing to their mixture with other bodies. Some, containing calcareous substances, effervesce with acids, which they do not when pure; and their variety in colour is owing to the addition of iron, or some inflammable matter, which may be separated by washing and by heat.

a. Pipe-clay is of a soft unctuous nature, not gritty to the teeth. Here may be included the porcelane clay of which China ware is composed.

b. Boles, Tripoli, Terra Sigillata, Lemnos, and brick clay, are all different kinds of clay, more or less pure, in proportion to the mixture of other bodies they contain.

B. CALCAREOUS BODIES effervesce with, and are dissolved by acids; by burning they are converted into lime.

a. They appear under many different forms, and are found in strata in the bowels of the earth, and frequently in large beds, as lime-stone,

marble, &c. When lime-stone is of a brighter colour, it is called marble, distinguished by authors into many varieties, some of the finest of which are met with in Greece, Egypt, and Italy.

b. Free-stone is generally calcareous, and cuts in all directions, of a concreted granulated structure; found in large beds in the bowels of the earth, as Portland stone, &c.

C. SPARS are calcareous bodies, found in mines, attendant on ores, &c. when pure, of a glassy appearance, and often crystalized into polygonal figures.

a. Found also in the rents or veins of rocky matter, under a variety of forms, called calcareous spar, having a rhomboidal figure, without any acute or right angles. In some veins this spar is found very transparent, and is then called Iceland-crystal. When these veins are not entirely filled up with spar, there are crystals found in them of a cubical, pyramidal, and columnar form.

b. In caverns under ground in a diversified form, sometimes resembling icicles, occasioned by water containing earthy and stony matters distilling down these caves, and depositing the earth, &c. in these forms. Incrustations likewise are included here; the stony substances
suspended

suspended by the water being deposited upon mosses, roots, and branches of plants.

D. GYPSA * are firm concretions, easily scraped with a knife, do not effervesce with acids, fall into a white powder in the fire, and concrete again with water into a mass, which soon hardens, called plaster, or stucco.

a. Sometimes disposed in little grains, resembling Epsom salt, or sugar crystals. When gypsa are of a fine texture, and indurated so as to bear a polish, they are called alabasters.

b. Of a fibrous texture, the fibres running parallel to one another, called fibraria.

c. Composed of thin clear transparent plates, easily to be split, and flexible, by some called glacies mariæ, and improperly Muscovy talc.

d. In the form of crystals; columnar, resembling nitre; rhomboidal, &c. called selenites.

e. Gypseous powder is also found suspended in some springs, whence the water is usually said to be hard: this is procured by evaporating the water. (See Sect. IV. page 32.)

* Gypseous bodies are not calcareous, though they are here placed under that head, after most writers. They are more properly neutrals, being neither vitrifiable nor refractory.

2. VITRI-

2. VITRIFIABLE BODIES.

THESE strike fire with steel, and scratch glass. They do not effervesce with acids: the file also makes no impression on them. By heat they vitrify, or become glassy.

A. FLINTY BODIES are found plentifully in strata of sand and chalk. The dark colour of black flints is owing to the inflammable matter they contain, for on burning they become white.

a. Stony strata of a quartzose basis, and the various kinds of granites belong to this head.

b. Whin-stone contains the quartzose basis mixed with iron. This kind of stone is now used for paving the streets of London. Sometimes it is found in a crystallized form, as in the Giant's Causeway in Ireland, and at Arthur's Seat near Edinburgh.

c. In gravel or pebbles, containing a proportion of sand, distinguished from the places where they are found, as the Egyptian, Scotch, &c. The finer sort of them are known by different names, as agate, chalcedony, onyx, catseye, &c.

d. Cornelians,

- d. Cornelians, and Mocha stones which are diversified in their surfaces like trees and mosses, are a purer kind of flinty substances. The jasper likewise is included amongst the flints.
- e. Porphyry, wherein the flinty matter is so diffused as to render this substance opaque, is variegated like marble, but does not effervesce with acids.

B. CRYSTALS are bodies of angular or polygonal figures, pellucid, bright, resembling glafs.

- a. Found in fissures of rocky strata, and in the centre of pebbles. These have a short column consisting of six sides, terminated with a pyramid.
- b. Cornish diamonds, Bristol stones, &c. are also crystals, which are more or less valuable, according to their hardness, clearness, brilliancy, &c.

C. GEMS are crystals of various colours, usually found in small bodies, hard, bright, and radiant, as the diamond, ruby, sapphire, topaz, beryl, emerald, garnet, hyacinth, chrysolite, amethyst, &c. Many of these are probably to be found in rocky strata, and in the broken sides of mountains both in England and Scotland, as well as in other parts of Europe.

3. APYRI, or REFRACTORY SUBSTANCES.

THESE do not strike with flint, or effervesce with acids; they are not changed by fire, nor are they soluble in water.

A. TALCS are bodies which cohere slightly together, slippery to the touch, and so soft as to be easily scraped with a knife.

a. They are seldom found in large strata, but are generally mixed with other bodies, as metallic ores, black lead, slate, whin-stone, &c.

b. Steatites, or soap-rock, feels like soap or tallow, is generally of a light, yellowish, or pale brown colour.

c. Serpentine stone differs from the preceding, in containing a quantity of iron in it, and is usually found in strata like marble.

B. MICÆ, or GLIMMERS, have a scaly texture, the plates mostly running horizontally parallel, easily separable. They are found of various colours.

a. Resembling the Moscow glass, or glacies mariæ

b. Sometimes found in thick masses, of a dark, red, or grey colour, resembling metallic substances.

C. ASBESTOS.

C. ASBESTOS and AMIANTHUS, are bodies like
 wife unaffected by the fire. The former is the
 most flexible, and may be wove with the addition
 of hemp or lint into cloth, capable of enduring
 the greatest heat; the lint is indeed consumed,
 but the asbestos remains unchanged. Formerly
 dead bodies were wrapped in this kind of cloth,
 when they were thrown upon funeral piles, to
 prevent their ashes mixing with the common
 ashes.

Amianthus is of a similar nature, and has the
 same property of resisting the force of the fire.
 These bodies are of various colours, white, green,
 yellow, brown, &c.

II. S A L T S.

SALTS are fusible or volatile in fire; soluble
 in water, and sapid.

I. The simple salts are either alkaline or
 acid*.

A. ALKALINE SALTS turn the syrup of violets, or
 an infusion of purple flowers of a green colour,
 and effervesce with acid salts.

* Some of these salts are not native productions; but as
 an acquaintance with these substances may prove an intro-
 duction to the knowledge of many useful chemical facts, a
 more general account is here given of them.

H

a. Fossil

- a. Fossil alkali, so called from its being found in the earth, in large strata, but in a compound state. It is also in sea salt, and may be procured from the ashes of sea weeds by burning. This salt is the *natrum* of the ancients.
- b. Vegetable alkali, procured chiefly from the ashes of land vegetables, whence are produced pearl ashes, pot ashes, &c.
- c. Volatile alkali is distinguished from the other two by its volatility, as it evaporates by heat before it becomes fluid. It is procured from putrid substances, particularly animal, and also from some subterraneous fires, the urine of animals, all horny and bony substances, and plentifully from foot.

B. MINERAL ACID SALTS turn the syrup of violets, or an infusion of purple flowers of a red colour; they effervesce with alkaline salts, and are only obtained in a fluid state.

- a. Vitriolic acid, or oil of vitriol, so called from vitriol or copperas, which contains this acid united with iron; is heavier than water, and colourless when pure. With the principle of inflammability it forms sulphur, from whence this acid is chiefly procured.
- b. Nitrous acid, or aqua fortis, is of an orange tawney colour. Exposed to the air, it emits fumes of a fiery colour.

c. Muriatic

c. Muriatic acid, or spirit of sea salt, is a colourless transparent fluid. Exposed to the air, its fumes are white.

C. Besides these, we may enumerate,

- a. Vinegar, or the acetous acid, which has the general properties of acid salts.
- b. Tartar is a dry saline substance, neither fusible nor volatile; suffers no change from heat under the boiling point, or 212° . It does not readily dissolve in water, nor does it affect the syrup of violets so much as the preceding acids.
- c. Sedative salt has the properties of salts in general. We are in great measure ignorant of its origin. It is chiefly procured from borax, a substance that is brought from the East-Indies. Sedative salt is generally got in a crystallized form, resembling snow, or bruised spermaceti.

2. COMPOUND SALTS, or such as consist of an acid united with an alkaline salt, having the properties of salts in general. There are eighteen of these salts, which are enumerated in the following table.

	Vitriolic acid.	Nitrous acid.	Muriatic acid.	Vinegar.	Tartar.	Sedative salt.
Fossil alkali.	Glauber's salt.	Cubic nitre.	Common salt.		Rochelle salt.	Borax.
Vegetable alkali.	Vitriolated tartar.	Nitre.	Digestive salt.	Regenerated tartar.	Tartarified tartar.	
Volatile alkali.	Vitriolated ammoniac.	Nitrous ammoniac.	Sal ammoniac.	Vegetable ammoniac.		

In this table the acids and alkalies point respectively to the salts which they compose. Thus the nitrous compound salts are placed in the second column, under the nitrous acid; and on the left side the particular alkali, with which each compound salt is combined, and so on of all the others.

These neutral or compound salts may be decomposed by the addition of an acid or alkaline salt; and their attractions are in proportion to the order set down in the table: thus if we want to separate a volatile alkali from an acid, either of the fixed alkalies will answer. There is no line drawn between the fossil and vegetable alkalies, because their powers of attraction are nearly the same. The acid salts are likewise placed in the same order of attraction; the first column or vitriolic acid, separates the second or nitrous acid;

acid; and this the third or muriatic acid, and so on of all the rest.

III. I N F L A M M A B L E S.

THESE are not malleable or ductile; soluble in oils; and flame.

A. SULPHUR is found in all ores, except those of tin, bismuth, and cobalt. It is plentiful in strata of coal, and is always discoverable from the smell it emits.

a. Mineralised with iron, it is called iron pyrites, marcasite, or copperas stone, of pale, grey, and yellow colours, and strikes fire with flint.

b. Mineralised with copper, the pyrites is of a sparkling green colour, or of various hues like a rainbow, and does not strike fire.

c. United with earths, clays, and stones, sometimes in regular crystallised figures; or in round or square masses.

B. BITUMENS are either fluid or solid. Liquid bitumen issues out from crevices in mines, and takes fire by a candle; from this property it is known to miners by the name of fire-damp.

c. NAPHTHA is a bituminous fluid, found floating on the surface of some waters, particularly in Persia, from whence it is chiefly procured.

b. PETROLEUM

- b. PETROLEUM is thicker than the former, ouzes out of the crevices of rocks, whence it receives its name. It is frequent in Bavaria, Sicily, and France.
- c. Pix judaica, or asphaltum, is of the same nature, but hard.
- d. Amber, and ambergris, are inflammable bodies, similar to the foregoing. The former is found principally in Prussia. Ambergris is met with in the greatest quantities in the East Indies, at Madagascar, Mauritius, Borneo, the Molucca islands, and on the Egyptian coast.
- e. Jet and fossil coal are nearly alike. The latter is sufficiently known.

IV. MINERALS.

THERE are fourteen metallic bodies at present known, gold, silver, copper, iron, tin, lead, quicksilver, platina, antimony, zinc, bismuth, arsenic, cobalt, and nickel. The six latter are brittle, distinguished by the name of semi-metals.

A. GOLD when pure is not sonorous, nineteen times heavier than water, soluble in aqua regia, but not in the nitrous acid.

a. It

- a. It is most frequently found pure, in its metallic state, in thin plates, solid, crystallised, or in a powder, called wash-gold, or gold dust.
- b. It is found in quartz, and sometimes in marcasite, and also mineralised with iron, quicksilver, and a mixture of zinc and iron.

The largest quantities of gold are brought from the Brazils and the Spanish West Indies. This metal is found also in Hungary, Transylvania, and in many other parts of Europe, in red, yellow, black, or iron-coloured sands. It is met with likewise in some rivers, as the Tagus, Ganges, Rhine, Saale, Niger, Danube, &c. called river, or wash-gold.

B. SILVER, when pure, is eleven times heavier than water, soluble in the nitrous acid, but not in aqua regia.

- a. It is often found native or pure, generally of about sixteen carats standard.
- b. *Minera argenti vitrea*, or glass silver ore, of a dark colour like lead ore, is ductile, and contains sulphur.
- c. *Minera argenti cornea*, resembling resin in colour, and containing arsenic.
- d. *Minera argenti rubra*, a brittle red-coloured ore, containing arsenic and sulphur.
- e. *Minera argenti alba*, combined with arsenic, and containing more copper than silver, of a
light

light grey colour, and of a dull steel-grained texture.

f. United with arsenic and regulus of cobalt, of different colours, brown and dark blue.

g. Mixed with lead ore, sometimes in a white crystallised form.

Silver is found in all countries, but most plentifully in America, particularly in Peru and Potosi.

C. COPPER, when pure, is near nine times heavier than water, the most sonorous of all metals, dissolves in all the acids. The least quantity of this metal in solution, turns blue by the addition of volatile alkali. The vitriol of copper is of a deep blue colour, called blue, or Roman vitriol.

a. Copper is found native in a solid or granulated state, but more frequently in the state of ore, of which there are various kinds, which may be included under the following heads:

b. Consisting of the pure calx of the metal, sometimes with a little iron, which comprehends the *minera cupri vitrea*, and the *minera cupri viridis*, of a green or blue colour.

c. Combined with arsenic or sulphur. This is softer, and more common than the former. It appears of a red, brown, dusky, or grey colour. Sometimes blended with quartz, flinty stone, &c. These (b and c) are rich ores of this metal.

d. Containing

d. Containing more iron than copper, yet sufficient of the latter to be wrought for it. This kind, called copper pyrites, is generally of a yellow colour resembling marcasite, or sulphur pyrites, but is of a richer yellow than the iron or sulphur pyrites. It is also softer, and does not strike fire with flint like the iron pyrites. When broke, it shews the rainbow colours.

Copper ores are found in most countries, particularly in Sweden, Hungary, and Transylvania. Japan also affords a fine sort of copper.

D. IRON is about eight times heavier than water, is attracted by one of its ores called the loadstone. Its solution is turned of a black or dark purple colour, by galls and vegetable astringents. The vitriol of this metal is green, called green vitriol, or copperas. (See Sect. IV. page 34.)

a. Iron is sometimes, though very rarely, found in its pure state. The ore of the metal is found all over the world, most generally of a dusky brown colour. The purer ores are generally pale and yellowish, with white sparkling appearances.

b. In most clays and ochres, and may be extracted from the ashes of most animal and vegetable substances, and collected by the magnet.

c. Indurated amongst some fossils, in the state of ruddle, blood-stone, &c. of blue, red, and brown colours. Emery is also an ore of this metal;

I

but

but one of the most remarkable of its ores is the load-stone.

- d. Iron is found in countries abounding with coal, called iron stone, in which state it is of a light brown colour, and on calcination becomes of a deep purple colour.
- e. The ores of some other metals contain iron; the copper ores usually contain more iron than copper.

E. TIN is a silver-coloured metal, seven times heavier than water, does not vitrify like lead, is malleable and unsonorous.

- a. Crystallised tin ore, or grain tin, found in crystalline masses, commonly of a polished surface, of a blackish brown colour.
- b. Crystalline concretions, resembling the foregoing, but of a lighter colour, and more unctuous on the surface; sometimes in a cubic form.
- c. Tin-stone, intermixed with a large proportion of stony and other mineral matters.
- d. Mineralised with iron; and also with sulphur and iron, called black-lead.

Tin is found in England, Bohemia, Saxony, and in Malacca in the East Indies.

F. LEAD is above eleven times heavier than water, unsonorous, malleable, and very fusible. It gives a sweet taste in solution.

a. Galena

- a. Galena plumbi, or potter's lead ore, is a rich ore of lead, composed of flat planes, with cubic angles.
- b. Steel-grained ore, is also a rich lead ore, containing silver.
- c. Antimoniated lead ore, containing antimony, and having irregular striæ, or radiated lines, like that semi-metal.
- d. Lead is often found mixed amongst calcareous earth; and likewise in some veins in the earth where cavities are formed, in white or yellow crystals.

G. QUICKSILVER, OR MERCURY, is a fluid metallic substance, fourteen times heavier than water, easily divisible, and evaporates in a heat below ignition, or before it becomes red hot.

- a. Sometimes it is found in a pure state, called virgin mercury, but this happens very rarely.
- b. It is chiefly procured in an ore united with sulphur, called cinnabar, of a red colour, and brittle.
- c. Combined with sulphur and copper, of a dark grey colour, and brittle glassy texture.

Cinnabar is found in Hungary, Transylvania, Carinthia, Bohemia, the Palatinate, France, Spain, Sweden, and probably in the East Indies and Japan.

H. PLATINA, PLATA SILVER, OR PLATINA DE PINTO, introduced into England in the year 1749. Is eighteen times heavier than water, difficult of fusion, and hardens most metals on mixture, resembles silver in colour. This metal is said to be found in the gold mines of the Spanish West Indies. [Vide Lewis's Philosophical Commerce of Arts.]

I. ANTIMONY is the metallic mineral, and the metal separated is called regulus of antimony, which is a semi-metal of a silver colour, consisting of brittle shining planes.

- a. Native, pure, or regulus of antimony.
- b. Mineralised with sulphur, arsenic, and most metals, generally of a radiated, crystallised, or steel-grained texture; silver-coloured, red, brown, or dusky.

It is found in Bohemia, Saxony, Transylvania, Hungary, France, and other parts of Europe.

K. ZINC, OR SPELTRE, is a white semi-metal, inclining a little to blueish, seven times heavier than water, bears the stroke of the hammer longer than any other semi-metal; soon evaporates by heat. United with copper, it forms prince's metal, pinchbeck, and brass. The vitriol of this metal is white, called white copperas, or white vitriol.

- a. Indurated

- a. Indurated in a crystallised solid form of a greyish colour. It is also frequently found half indurated with a martial ochre, called lapis calaminaris, of brown, yellow, and red colours.
- b. Mineralised of various colours, as mock-lead, black-jack, or mock-ore, &c. Sometimes it is met with in a scaly texture.

Zinc is found at Goslar in Germany, and at Holywell, and other places in England. It is also brought from the East Indies, in a pure state, called tutenague.

L. BISMUTH, OR TIN-GLASS, is a semi-metal, of a white yellowish colour, and laminated texture; above seven times heavier than water, and very fusible.

- a. It is found plentifully in Saxony, and in less quantities in England, but it is scattered in arsenical ores very generally,

M. ARSENIC, wherever it is found, may be known by evaporation over the fire, as it gives forth a strong garlick smell, very noxious in a large quantity. (See Sect. IV. page 35.)

- a. Sometimes found pure, loose, or indurated, of a pale or grey colour.
- b. Mineralised with sulphur, called yellow, or red orpiment. Sometimes it is united with silver, copper, or antimony. The richest silver ores abound with this semi-metal.

Arfenic

Arsenic is found principally in the Bohemian and Saxon mines; but the richest native orpiment is brought from Turkey and Natolia.

N. COBALT is a semi-metal of a whitish grey colour, fine grained texture, hard and brittle, about six times heavier than water; soluble in aqua regia, the vitriolic and nitrous acids, and the solution becomes red. After the dissipation of the arsenic from cobalt, and by calcination, the blue glass called smalt is procured.

a. Cobalt is found united with earths, arsenic, iron, and other metals of various colours, black, grey, violet, blue, or ash-coloured. Sometimes it looks like melted scoria, or glass of a blueish grey colour, called slag cobalt. Sometimes crystallised in cubical figures; frequently it is found in a loose friable ochre.

It is found most plentifully in Saxony, particularly in the district of Misnia; but it is also met with in many other parts of Europe.

O. NICKEL is a semi-metal, which was first discovered about the middle of the present century*; is about $8\frac{1}{2}$ times heavier than water,

* This metal was discovered by Cronstedt. See the Royal Academy of Sciences at Stockholm, for the years 1751 and 1754.

of a coppery colour. It is found united with iron, arsenic, sulphur, and particularly with cobalt and bismuth. Its solution in the nitrous and muriatic acids is green. The vitriolic acid has little or no effect upon it.

In the preceding observations on fossils, effervescence with acids, and striking fire with flint, have been often mentioned: it would be necessary, therefore, for a traveller in search of fossil substances, to have with him a bottle of aqua fortis, or the nitrous acid, and a steel, to discover thereby on the spot certain properties of such bodies as may be collected. A hammer also may be necessary to break stones, &c. that are too bulky to bring away.

A blow-pipe is likewise an useful article; by blowing long and forcibly through such an instrument, upon the flame of a candle, by which the point of the flame may be directed against the body to be examined, it will frequently discover, whether it is a calcareous, vitrifiable, or refractory substance; and for greater precision, experiments for the same end may be afterwards made at the fire-side, on a charcoal fire, &c.

The collector should also attend to as many of the following particulars as possible.

1. When any article is collected, mark it by a number, or some sign of distinction, referring to
a cata-

a catalogue, with all the particulars that may be known relative to it; as,

2. Where it was found.
3. In what quantity, whether scarce or abundant.
4. If on the surface of the earth, or at what depth.
5. In what position, whether horizontal, perpendicular, &c. And with what other fossil bodies it was found, as clay, stone, slate, mineral, &c.
6. Whether in strata, or in loose nodules.
7. The depth and thickness of the strata, how they incline, or to what points of the compass they tend; or if level or horizontal; whether they have perpendicular or horizontal fissures, and what fossil bodies are contained in these fissures.
8. All high mountains and hills, especially their sides, are to be searched; the shores also of the sea, with their banks, and the cliffs adjacent, and the falls of cascades, rivers, and great gullies.
9. The situation of mines, pits, and quarries, whether in a valley or hill; and the disposition of the strata, whether horizontal, inclining, &c. their thickness, and the depth they lie, and what other fossils are imbedded either in the strata, or in the neighbouring caverns, fissures, partings, &c.

10. The

10. The waters of mines should be examined, whether pure, tasteless, purgative, vitriolic, or chalybeate, &c.

11. The damps and steams of mines, and what are the consequences or effects of them; in what seasons and state of the air they are chiefly observed; and what temperature the air bears in different depths of such mines.

12. The account given by the natives, inhabitants, miners, workmen, &c. who may be acquainted with the subject.

S E C T. VII.

*Directions for taking off IMPRESSIONS
or CASTS from MEDALS and
COINS.*

C HIEFLY owing to the cost required for purchasing a cabinet of medals, it has happened that the study of them has hitherto been confined, comparatively, to a few individuals. Another principal impediment to the cultivation of an acquaintance with them, has arisen from the difficulty of understanding the inscriptions, for want of a sufficient knowledge of languages; on which account in particular, this study has been condemned by the illiterate as barren and useless; but such as are acquainted with the advantages which have already resulted from those *nummi memoriales*, cannot hesitate a moment to assist a promotion of a more general pursuit of the subject *.

* Though the study of medals does not properly belong to natural history, this short account of taking impressions from them, may prove acceptable to some travellers.

While Colossian statues, and the hardest marbles, with their deepest inscriptions, are destroyed by accidents, or by time, and paintings finished with the highest colours quickly fade, a medal shall survive innumerable accidents, and disclose historical facts a thousand years after statues are crumbled away; and when nothing but the names of an Apelles, or a Praxiteles remain. Does not a single medal, of which we are in possession, give us greater light into history, than the once famous libraries of Alexandria and Pergamus, which are now no more? From these, and many other considerations, I would willingly contribute my endeavours to render this study more general, and consequently more useful. I have tried a variety of methods to enable a young medalist to collect a cabinet, which may initiate him into the knowledge of medals and coins at a trifling expence.

The method of taking off plaster of Paris and sulphur impressions, is known to every body: the first is too soft to preserve them from injury, and the brittleness of sulphur is a greater objection.

I found by forming a coat or layer of thin metal over the plaster of Paris, it would be a considerable defence. Tin is the cheapest and most convenient metal for the purpose, as it is sufficiently flexible, and at the same time very

much resembles silver. The tin-foil I have tried, is of the same kind with that used for silvering looking-glasses. It should be laid over the medal or coin intended to be taken off, and then rubbed either with a brush, the point of a skewer, or a pin, till it has received perfectly the impression of the medal; the tin-foil should now be pared off round the edge of the medal, till it is brought to the same circumference: the medal must then be reversed, and the tin-foil will drop off into a chip box or mould ready to receive it, the concave side of the foil, or that which is laid on the face of the medal, being uppermost; upon this pour plaster of Paris made in the usual manner, and when dry, the figure may be taken out of the box or mould, with the tin-foil sticking on the plaster, the convex-side being now uppermost again, in which position it is to be kept in the cabinet, after it becomes dry. To have an impression very perfect, the thinnest tin-foil should be made use of*.

The impressions taken in the foregoing manner almost equal silver medals in beauty, and are very durable: if the box or mould † be rather

* This method does not in the least injure any medal or coin.

† Chip boxes, used by apothecaries, answer this purpose, and may be easily procured. A slip of paper wrapped round any circular body with a flat surface, is equally convenient.

larger than the impression of tin-foil, the plaster when poured on, runs round its edges, and forms a kind of white frame, or circular border round the foil, whence the new-made medal appears more neat and beautiful. If this tin-foil be gilt with gold-leaf, by means of thin isinglass glue, or boiled linseed oil, the medal will resemble gold.

F I N I S.