

lations: considering that by the above mentioned Experiment it appears, that in the production of the Ice made in the open Air, the very Air is mixed with the Water.

But of these and many other things the Author (saith the *Journalist*) intends to discourse in his *Natural Philosophy*; where he means to shew, that 'tis not necessary, there should be any vacuities in the Ice, and to teach, what is to be said of the place deserted by the *Mercury* whether it be void of all Body, or only of the Air, that was there.

*A Letter written to the Publisher from York, Jan: 10. 1670, concerning a kind of Fly that is Viviparous, together with a Set of curious Inquiries about Spiders, and a Table of the several sorts of them to be found in England, amounting to at least 33. By Mr. Martyn Lister.*

Sir,

I Return you thanks for your obliging Letter of the third of *January*, and have sent you the *Viviparous Fly* and the Set of Inquiries you desire of me. The *Fly* is one, if not the very biggest, of the harmless Tribe that I have met with in *England*; I call them *harmless*; because that they are without that hard Tongue or Sting in the mouth, with which the *æstrum*-kind, or Gad-flies, trouble and offend both man and beasts. This Fly is striped upon the shoulders grey and black, and as it were checkered on the tail with the same two colours: the *Female* may be known by a redness on the very point of the tail. The very latter end of *May* 1666, I opened several of them, and found two Baggs of live white worms of a long and round shape, with black heads; they moved both in my hand and in the un-opened Vescicles, backwards and forwards, as being all disposed in the Cells, length-ways the body of the femal, like a Sheaf.

Some such thing is hinted by *Aldrovandus* lib. 1. de *Insect*:



*Insect. p. 57. edit. Bonon. Tiro cùm essem (saies he) à grandioribus muscis unam albis pictam lineis, specie illectus, cepi; ea, in vola manus aliquandiu retenta, plusculos edidit Vermiculos candidos, mobilitate propria insignes.*

This is the only Fly I have observed with live and moving worms in the belly of it; yet I guess, we may venture to suspect all of this Tribe to be in some measure Viviparous.

With these Flyes I have sent you a paper of those odd-turned Snails \*, mentioned in my former Letter, which perhaps you may think will deserve a place in the Repository amongst the rarities of the R. Society.

\* See Numb.  
50. 1011.

*Some general Enquiries concerning Spiders.*

1. **W**Hat sorts of Spiders to be found with us in England, and what is the best method to distinguish them and to reduce them to *Classes*?

2. Whether Spiders come not of Spiders, that is, of creatures of their own kind? And whether of Spiders are bred Grasshoppers, *Cicadae*, &c. as *Interpreters* falsely make *Aristotle* to say, first *Aldrovandus*, and lately *Kircher* (*V. Arist. Hist. Nat. lib. 1. cap. 19. Confer Interpret. Tho. Gaxe, Scaliger, Aldrov.*)

3. Whether Spiders are not Male and Female; and whether Female Spiders growing bigger than the Male, be sufficient to distinguish Sexes.

4. Whether all kinds of Spiders be alike, as to the place and number of *Penis's*; and whether all the thread-yielding kinds, are not furnished with a double *penis*, that is, if the *Cornicula* or certain knobbed Horns, by which all Males are best distinguished, be not each a *penis*, and used in the *Coit* alternatively?

5. Whether the Eggs in Spiders be not formed, and very large before the time of the *Coit*?

6. What Spiders breed in Spring, and what in Autumn? What Spiders are content with one brood in the year, and



and to lay all their Eggs at a time? What seem to breed every Summer month, at least to have many subordinate broods; and whether the Eggs be accordingly distinguishable in several *Matrices* or Cells in the body of the Female?

7. Whether Spiders do not take their form and perfection in the Egg, and are not thence hatched necessarily at a stated and set time, that is, after a certain number of days, as 21, compleat Animals of its own kind? and whether the presence of the Femal be necessary in order to the hatching the Eggs, at least for three days, as the Ancients seem to affirm?

8. Whether the perfectly-round eggs of Spiders ought to be called and esteemed Worms, as *Aristotle* and *Pliny* will have them, that is, in *Swammerdam's* phrase and doctrine, Whether they be *Puppets* in the egg, and undergo all alterations accordingly, before they be thence hatched perfect Spiders?

9. What different colours observable in the Eggs of Spiders, as well of pulps as shell, as white, yellow, orange, purple, greenish? and what respective tinctures they will give, or be made to strike with the several families of Salts?

10. Whether there be not Eggs of some sorts of Spiders, which the Worms of certain slender Wasps (the kind in general being called by *Mouffet* *Musca tripiles*) delight to feed on? and whether the Fable of *Vespæ Ichneumones*, told us by the Ancients, be not to be made out by the same Observation, of these Wasp-worms feeding on the Eggs, and perfected into Wasps in the very webs of Spiders?

11. After what manner do Spiders feed; whether in sucking they devour not also part of their prey? How long can they live without food, since they store up nothing against Winter?

12. Whether Spiders feed only of their own kind of Creatures,



Creatures, as of Insects, that is, of Flyes, Beetles, Bees, Scolopendræ and even of one another? or whether they kill Snakes too, as the Ancients affirm, for food or delight?

13. Whether some of them choose not to feed on one sort of Fly or other Insect only; and what properties such have?

14. When, and how oft in the year they cast their Skins, and the manner of their casting it? What variety of colours immediately after the shifting the Hackle in one and the same species of Spider, that may, if not well heeded, make the history of them more confused?

15. What mean the Ancients by Spiders casting their threads, which *Aristotle* compares to a *Porcupins* darting her quills, or bark-starting from a Tree; and *Democritus* to Animals voiding of Excrements? *Arist Hist Nat. lib. 9. cap. 39.*

16. Whether the thread be formed in the Body of the Animal such as it comes from it; I mean, whether it be, as it were, unwound off of a stock or clew, as I may say, and which indeed to me seems to have been *Aristotles* meaning; or whether it be drawn off of a liquid mass, as in spinning of Glas or melted Wax, which seems to have been *Democritus's* sense, in saying, it was excrement corrupted or fluid at certain times?

17. Whether the Spiders thred being glutinous, every thing sticking to it upon the lightest touch, be not so much the reason of the Spiders taking his prey, as the Figure of the Net.

18. Whether a Web be not unflammable; and whether it can be dissolved, and in what Menstruum?

19. What difference 'twixt the thred of Spiders, and that of the Silk-worm or Caterpillars? What strength a Spiders thread is of, and what proportion it bears with the like twist of Silk? Whether there be not stronger thread from some sort of Spiders than from others, as there are threds from them of very different colours, as white, greenish,



greenish, blewish, dark hair-colour, &c? Whether the strength of the *Bermudo* nets to hold a Thrush, mentioned in one of the *Transactions* \*, consist in the thickness only, or much too in the nature of the thred?

20. Whether its being to be easily drawn out at any time and at what length one pleases, and many threds together in sight of the Animal, be not as advantageous to the working of it up and twisting, &c. as the unravelling the Cods of Silk-worms.

21. Whether either the viscous substance of their Bodies or Webs be healing to green-wounds, &c. as the Ancients have taught us, and we use vulgarly? and whether some one kind of them be not preferable, for this purpose, before others?

22. What use may be made of those Animals, which devour Spiders for their daily food, as *Wrens*, *Red-breast*, &c? Whether Spiders be a cure for sick Poultry, as the good Wives seem to experiment?

23. Whether the reason why Spiders fail not in the air until Autumn, be not because they are busily employed the Summer months in breeding, or what other reasons may be assigned?

The first article of Enquiry I have in part answered, by sending you enclosed a Scheme, which, after some years observation, I have corrected and enlarged to what it is: yet I must acquaint you, that such Draughts will be ever lyable to change and improvement, according to the measure of knowledge a continued Observation may bring us to. However it is the first, that I know of, that will be extant, on this subject, and it may be acceptable to the curious.



Tabulæ compendiarie Araneorum Angliæ; quibus accedunt eorum Tituli, è notis maximè discriminantibus atque insignibus desumpti.

Aranei vel fila mittunt, ut sunt qui aut pradandi causa texunt

vel Reticula orbiculata, numero IX.

1. Araneus subflavus, albo paululum acuminata inflexaque.
2. Araneus rufus, cruciger, cui utrinque ad Superiorem alvi partem velut singula tubercula eminent. (modum.
3. Araneus cinereus, pictura clunium in 5 fere partes divulsa, iisque plenis ad-
4. Araneus flavus, quatuor albis, præter picturam foliaceam, in clune maculis insignitus.
5. Araneus nigricans, clunibus ad similitudinem querni folii pictis.
6. Araneus ex viridi inauratus, albo præterni proceraque. (trâ.
7. Araneus cinereus, sylvarum incolæ, albo in mucronem fastigiata, seu trique-
8. Araneus viridis, caudâ nigris punctis supernè notatâ, ipso ano croceo.
9. Araneus pullus, cruciger in albo plenâ.

Plagas globatas, n. IV.

10. Araneus variegatus, albo orbiculatâ.
11. Araneus rufus, clunium orbiculatorum fastigio in modum stellæ radiato.
12. Araneus pullus, domesticus.
13. Araneus cinereus macula nigra in summis clunibus insignitus, minimus.
- Telas sive lintheamina, n. VIII.
14. Araneus subflavus, pilosus, prælongis pedibus, domesticus.
15. Araneus nigricans, prægrandi macula in summis clunibus, cæterum iisdem oblique virgatis, domesticus.
16. Araneus fuliginosus è Craven, insigni candore distinctus, caudâ bifurcâ.
17. Araneus subflavus, nigricantium macularum quadratarum catenâ in clunibus insignitus, item cui utrinque ad clunium latera singula oblique virgula flavescences.
18. Araneus cinereus, maximus, caudâ bifurca.
19. Araneus niger aut castaneus, glaber, clunibus summo candore interstinctis.
20. Araneus cinereus, mollis, cui in albo, oblique virgatâ, macula latiuscula è nigro rubens.

21. Araneus plerumque lividus, sine ulla pictura, albo acuminata. aut ideo nihil texunt (nisi filorum ejaculatio ac volatus illorum spectet) cum tamen alias possint: nimirum Telas ad tutandum sætum aut ad hybernâ, sed aperto Marte muscas venantur; atque si sunt

vel Lupi dicti, n. V. Hi verò cum superioribus singulis dicto habent oculos.

22. Araneus subrufus, parvus, citissimo pede.
23. Araneus cancriformis, oculis è viola purpurascens, tardipes.
24. Araneus cinereus, albo undulatis picta, insignitè procerâ, acuminatâ.
25. Araneus fuscus, albo oblique virgata.
26. Araneus niger, sylvicola.

Phalangia, sive ultimum ingredientes, n. III. Hi verò sex tantum oculos habent.

27. Araneus cinereus, sive ex argento nigroque varius. (crocea.
28. Araneus subflavus, oculis smaragdinis, item cui secundum clunes tres virgulæ
29. Araneus subrufus è Craven, sive Ericetorum sive rupum.

vel omnino nulla fila mittunt, ut sunt qui plerique

Longissimis tenuissimisque pedibus donantur: atque hi duos tantum oculos habent, telasque sive brachia digitata, n. IV.

30. Araneus rufus, non cristatus, gregatim vivens.
31. Araneus cinereus, cristatus.
32. Araneus è candido nigroque varius, minima bestiola, sylvicola.
33. Araneus, ut puto, coccineus, vulgè dictus a Cant Anglicè.



*An Extract of a Letter from the same hand, May 30. 1671; concerning an Insect feeding upon Henbain, the horrid smell of which is in that creature so qualified thereby, as to become in some measure Aromatical; together with the colour yielded by the Eggs of the same, &c.*

Sir,

**Y**OU may please to annex a late Observation to the last I sent you: both being chiefly concerning the improvement of colours, and from the Insect-kind.

There is a *Cimex* of the largest size, of a red colour spotted black, and which is to be found very frequently and plentifully, at least in its season, upon *Henbain*: I therefore in my private notes have formerly intitled it, *Cimex ruber maculis nigris distinctus super folia Hyoscyami frequens*. This Insect in all probability doth feed upon this plant (on which only we have yet observed it) if not upon the leaves by striking its trunk (the note of distinction of this kind of Insect from the rest of the Beetle-kinds) into them, and sucking thence much of its substance, like as other sorts of *Cimices* will upon the body of man, &c; yet upon the unctuous and greasy matter, with which the leaves seem to the touch to abound. It is further observable, that that horrid and strong smell, with which the leaves of this plant do affect our nostrils, is very much qualified in this Insect, and in some measure Aromatick and agreeable, and therefore we may expect, that that dreadful *Narcosis*, so eminent in this plant, may likewise be usefully tempered in this Insect; which we refer to tryal. About the latter end of *May* and sooner, you may find adhering to the upper side of the leaves of this plant, certain oblong Orange-coloured Eggs, which are the Eggs of this Insect.

Note 1. that these Eggs yet in the belly of the Females are white, and are so sometime after they are layd; but as the young ones grow near their time of their being hatched, they acquire a deeper colour, and are hatched *Cimices*, and not in the disguise of worms.

2. As



2. As to the colour, these riper Eggs yeild, if they be crushed upon white paper, they stain it of themselves (without any addition of Salt) with as lively a Vermilion or *couleur de feu*, as any thing I know in nature; *Cochneil* scarce excepted when assisted with oyl of Vitriol. Whether this be not precisely so, I refer to the tryal and judgment of the Curious. I have sent you a couple of the *Cimices* themselves, though you scarce find a Henbain-plant without them. I add concerning the *Purple-husks*, whereof I gave you an account in my last, that I have found them since on Rose-tree-twiggs also, and that very dark coloured ones, yeilding an exquisit Murey: so that I conclude, that the Tree they may be found on, scarce contributes any thing to the colour or vertue of the husks, but they are the sole work and product of the Mother-Insect, indifferently choosing a twig of any tree in order to the convenient placing and hiving her Eggs.

*Some Observations concerning Glow-worms, communicated by Mr. John Templer in a Letter to a friend of his in London. May 31. 1671.*

**I**N case you have met with any observations about the *Glow-worm*, I would intreat you to give me some account of them. I met with a *Glow-worm* last Saturday night, on which I made these Observations, upon putting her into a small thin box (such as pills are usually sent in.)

*May 27.—71.* Between 11 and 12 at night, I saw her shine through the Box very clearly on one side, the box shut; putting white paper into the Box, and the Worm into the paper, it shined through the paper and box both.

*May 28.* In the morning about 8 of the clock, she seemed dead, and holding her in a very dark place, I could perceive very little light, and that only when she was turned upon her back, and by consequence put into some little voluntary motion, which happily the darkness of the place would not let me observe. After Sun-set that night, she walked briskly up and down in her box, shining as clearly



as the night before, and that when there was so much day-light that I could read in *Sylvius* without a Candle.

May 29. In the morning she seemed dead again, at night recovered her self, and shined as well as ever through the box, and opening the box, and holding a large Candle in my hand, the light of it did not sensibly diminish that of the Glow-worm.

May 30. *Hor. 10. vesper.* I set the box with the worm in it in my bed Chamber about four yards from my bed-side in a window, where I perceived it shine through the box for almost an hour; I then falling a sleep, at my awaking I found it shining, and observed it in plain day-light for about  $\frac{1}{2}$  hour, and then wholly ceasing. Looking immediately upon my watch it was near four a clock in the morning.

May 31. The worm shined pretty clearly in my Kitching, which you know a very lightsome room, at five a clock in the evening, at which time the ☉ shined gloriously into the same room. Give me leave to add,

1. I never saw her shine without some sensible motion either in her body or legs.

2. In her clearest shining she extends her body a third part beyond its usual length.

3. If my senses fail me not, she emits a sensible heat in her clear shining.

Even now looking into my box, the Glow-worm shined little, having contracted her body into a bending posture, the light scarcely so big as a great pins head; upon touching of her she extended her self, walked in her box, and at first extent shined as gloriously as ever.

An.