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 Sett 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-flyes, 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. WHat 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 Graſhoppers, *Cicadæ*, &c. as *Interpreters* falſly make *Ariſtotle* to ſay, firſt *Aldrovandus*, and lately *Kircher* (V. *Ariſt. Hiſt. Nat.* lib. 1. cap. 19. Confer Interpret. *Tho. Gazæ, 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?

Hiſt. Nat. lib. 1. c. 27. lib. 3. c. 9.

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 Muſcæ 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?

Ariſt. Hiſt. Nat. lib. 1. cap. 20.

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 Glaſs 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 uninflammable; 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, gr eniſh,

greeniſh, blewiſh, dark hair-colour, *&c?* Whether the ſtrength of the *Barmudo* 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?

* N°. 50. p. 795.

20. Whether its being to be eaſily drawn out at any time and at what length one pleaſes, and many threds together in ſpight 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 Poultrey, 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

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

Aranei *vel fila mittunt, ut ſunt qui*

- *aut prædandi cauſa texunt*
  - *vel* Reticula orbiculata, *numero* IX.
    1. *Araneus ſubflavus, alvo 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, alvo prætenui procerique.* (*tri-*
    7. *Araneus cinereus, ſylvarum incola, alvo in mucronem faſtigiatâ, ſeu triquetrâ.*
    8. *Araneus viridis, caudâ nigris punctis ſupernè notatâ, ipſo ano croceo.*
    9. *Araneus pullus, cruciger in alvo plenâ.*
  - Plagas globatas, *n* IV.
    10. *Araneus variegatus, alvo 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 linteamina, *n.* VIII.
    14. *Araneus ſubflavus, piloſus, prælongis pedibus, domeſticus.*
    15. *Araneus nigricans, prægrandi macula in ſummis clunibus, cæterùm iiſdem obliquè virgatis, domeſticus.*
    16. *Araneus fuligineus è* Craven, *inſigni candore diſtinctus, caudâ bifurcâ.*
    17. *Araneus ſubflavus, nigricantium maculârum quadratarum catenâ in clunibus inſignitus, item cui utrinque ad clunium latera ſingulæ obliquæ virgulæ flaveſcentes.*
    18. *Araneus cinereus, maximus, caudâ bifurca.*
    19. *Araneus niger aut caſtaneus, glaber, clunibus ſummo candore interſtinctis.*
    20. *Araneus cinereus, mollis, cui in alvo, obliquè virgatâ, macula latiuſcula e nigro rubens.*
    21. *Araneus plerunque lividus, ſine ulla pictura, alvo acuminata.*
- *aut ideo nihil texunt (niſi filorum ejaculatio ac volatus illorſum ſpectet) cum tamen alias poſſint: nimirum Telas ad tutandum fœtum aut ad hyberna, ſed aperto Martio muſcas venantur; atque ii ſunt*
  - *vel* Lupi dicti, *n.* V. *Hi verò cum ſuperioribus ſingulis octo habent oculos.*
    22. *Araneus ſubrufus, parvus, craſſiſſima pede.*
    23. *Araneus cancriformis, oculis è viola purpuraſcentibus, tardipes.*
    24. *Araneus cinereus, alvo undulatim picta, inſignitèr procera, acuminata.*
    25. *Araneus fuſcus, alvo obliquè virgata.*
    26. *Araneus niger, ſylvicola.*
  - Phalangia, ſive aſſiltim ingredientes, *n.* III. *Hi verò ſex tantum oculos habent.*
    27. *Araneus cinereus, ſive ex argento nigroque varius.* (*croceâ.*
    28. *Araneus ſubflavus, oculis ſmaragdinis, item cui ſecundum clunes tres virgulæ*
    29. *Araneus ſubrufus è* Craven, *ſive Ericetorum ſive rupium.*

vel omnino nulla fila mittunt, ut ſunt qui plerique

- Longiſſimis tenuiſſimiſque pedibus donantur: *atque hi duos tantùm oculos habent, telaque 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, vulgò dictus a* Can, 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,

YOu 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 *Henbane*: 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 ſomtime 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.

IN 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 ½ 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 glorioufly 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 glorioufly as ever.