Observations on a mode practised in Italy of excluding the common house-fly from apartments / by William Spence.

W. Clift Esq
with Mr Spence's best Reg
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[From the TRANSACTIONS OF THE ENTOMOLOGICAL SOCIETY.]

I. *Observations on a Mode practised in Italy of excluding the Common House-fly from Apartments.* By WILLIAM SPENCE, *Esq., F.R.S., &c., Honorary Member of the Entomological Society.*

[Read April 7, 1834.]

THE habits, manners and instincts of insects, their anatomy and physiology, and their useful or noxious properties, will doubtless attract a large share of the attention of the members of the Entomological Society, without inducing them to underrate, as has sometimes been done, the importance of the systematic department of the science, on which all accurate information respecting its objects must be founded. Knowledge as to the structure, habits and œconomy of insects ought, indeed, to be the grand and ultimate aim of entomology; but this knowledge can be neither acquired nor diffused without systematic classification, which is the dictionary that must enable us duly to read the great book of nature, and to which, therefore, so long as that dictionary still remains so incomplete, even the largest portion of the entomologist's labours may be justly given, while, at the same time, no fact, however trifling, relating to the habits and œconomy of the objects of his study is suffered to be lost, the two great branches of the science, system and the natural history of insects (taken in its largest sense), being made to go hand in hand, and mutually to support each other.

To one department of the natural history of insects, which has

been hitherto much neglected, I should beg particularly to direct the attention of the Society,—I mean what may be called the *metaphysics* of entomology, or an investigation of the limits which bound their instincts on the one hand, and that small portion of mind and reason which few will deny them, on the other. And here what is chiefly to be desired are *facts*, the want of a sufficient collection of which has hitherto been the chief cause of the vague and inconclusive way in which this highly interesting subject has been often treated; as by Dr. Darwin, for example, whose theory of the supposed instinctive actions of animals being really referrible to their reason solely, is mainly built on statements as to changes of the instinct of a species having taken place, when in reality species altogether distinct were confounded together.

These facts can be scarcely too numerous or minute if accurately stated; and to show that they may be drawn from sources not hitherto often considered within the range of the objects of a scientific Society, I shall here beg to lay before you a few observations on a very humble and undignified topic,—a mode practised in Italy of excluding the common house-fly from their summer apartments,—which, though it may perhaps at first view seem a subject more appropriate to the pages of a magazine of domestic œconomy, will not, I trust, when its close connexion with the interesting questions just alluded to, and more especially the curious and unexpected light which it throws on a passage of the father of history, are considered, be deemed wholly unworthy to occupy a share of the attention of the Society.

In this country the common house-flies (*Musca domestica*) towards the close of the summer and the commencement of the autumnal months often become a great nuisance, both from their numbers and the pertinacious curiosity with which every individual of the race seems resolved, for its own satisfaction, to taste, see and touch every object around it, even perching upon and exploring the "human face divine," as if in mockery of our boasted supremacy, and to humble us by the conviction that the equanimity of the philosopher as well as the comfort of the suffering invalid is often at the mercy of a fly. But it is to more southern and hotter climes that we must direct our view if we would form a correct idea of the real pest which these little restless intruders become in the warm months, when they literally almost fill the apartments. Every traveller in the South of Europe during the hot months will confirm the assertion of Arthur Young, that "they are the first torments in Spain, Italy, and the olive districts of France. It is not that they bite, sting, or hurt, but they buzz, teaze and worry: your mouth, eyes, ears and nose are

full of them; they swarm on every eatable, and if they are not incessantly driven away by a person who has nothing else to do, to eat a meal is impossible*." And it is evident from various incidental notices in the journals of travellers, that they are to the full as great a plague in the hot climates of other portions of the globe. To omit other instances which it would be tedious to cite, Mr. Stewart, in his recent valuable work on North America, speaks on three several occasions of the annoyance which he suffered from flies, which he seems to have found a worse torment than the mosquitoes†.

Such being the serious and extensive drawback on the comfort of existence caused by the house-fly in the hot months over a large portion of the globe, it will be believed that my curiosity was strongly excited on being told, when at Florence last spring, by a gentleman who has long resided in the neighbourhood of that city, that for two or three years past he had so entirely succeeded in excluding these intruders from his apartments, through allowing the windows to be wide open for the admission of air, that while the sitting- and dining-rooms of his neighbours swarmed with them, in his a strict search would be necessary to detect even two or three; his plan thus superseding all the former modes of removing this plague by poisoning the flies by sweetened infusions of green tea, quassia, &c., which were liable to this great and fatal objection, that unless the windows were closed, or covered with gauze (which necessarily excludes the free entrance of the air), fresh hosts of tormenters were constantly entering to replace those destroyed.

If my curiosity was excited by this statement, my surprise was not lessened by being told, in explanation of the apparent impossibility of thus excluding flies from a room with unclosed windows, that, in point of fact, the openings of the windows were covered with a net, but with a net made of white or light coloured thread, and with meshes an inch or more in diameter; so that there was actually no physical obstacle whatever to the entrance of the flies, every separate mesh being not merely large enough to admit one fly, but several, even with expanded wings, to pass through at the same moment, and that, consequently, both as to the free admission of air, and of the flies if they had chosen, there was practically no greater impediment than if the windows were entirely open, the flies being excluded simply from some inexplicable dread of venturing across this thread-work.

My friend did not profess to have discovered this plan of excluding flies: he first saw it adopted in the monastery of Camaldoli (or La

* Travels in France, vol. i. p. 298. † Vol. i. pp. 29, 195, 405.

Verna, I forget which,) near Florence, the monks of which assured him of its efficacy, and afterwards by an artist at Rome, who warmly expatiated on the important advantage which it conferred on him of being able to work in his studio with open windows, and yet free from the personal annoyance of flies, and the equally great one of their settling on his newly painted pictures.

Furnished with these hints,my friend, whose practical good sense and habit of observation turns every new fact to profit, lost no time in having thread-nets made, and adapting them to his windows, (which, as in Italy generally, are what we call French windows, opening interiorly, so as when thrown back to leave the whole space free,) with the completely satisfactory result already mentioned, and this with the least possible expense, trouble, or inconvenience, the cost of a thread-net being a mere trifle, and all that is necessary being to fix it as soon as the flies begin to be troublesome, across the outside opening of the window, where it neither intercepts the air nor view, and where it is suffered to remain until the approach of winter, and the consequent disappearance of the flies. It is not even necessary to be at the expense of an actual net, for if small nails be fixed all round the window-frame at the distance of about an inch from each other, and threads be then stretched across both vertically and horizontally, the apparatus will be equally effectual.

Here, however, it is necessary to state a remarkable fact which my friend discovered in the course of his observations, namely, that for this plan of excluding flies to succeed, it is essential that the light enter the room on *one side* of it only, for if there be a *thorough* light either from an opposite or side window, the flies pass through the net without scruple. This circumstance, though not at all materially lessening the value of the practice, as rooms are usually (or may be) lighted from one side only, must yet be borne in mind in investigating the subject.

Before we proceed to speculate on any extraordinary fact, it is essential to be certain of its accuracy, and not only did the result of numerous minute inquiries which I made of my informant, who, though no entomologist, is a very careful observer, convince me of the correctness of his statements, but they have been since amply confirmed in all points by other intelligent friends resident in Italy, who inform me that they have repeatedly seen this mode of excluding flies adopted with perfect success. One of them added that it is not even necessary to have a net, or threads arranged both vertically and horizontally so as to resemble one, but that if threads be stretched in a horizontal direction only, across the openings of the windows, at the distance of about an inch from each other, this

is sufficient to keep out the flies. This gentleman also confirmed my previous impression, from all the inquiries I had made, that this mode of excluding flies has not been long practised in Italy and is still little known there, while as far as I could learn it is entirely unknown in France.

Such being the facts connected with this subject, the next point to be considered, and that which will chiefly interest the entomologist, is as to the causes of so unexpected a result; in other words, What is it that gives to these thread-nets so terrific an aspect in the imagination of the house-fly, as to deter it as if spell-bound from ever venturing to penetrate through their meshes, though so much wider than its size demands? and to this query I confess that I have no satisfactory answer to offer.

The most plausible supposition stated has been, that the flies take the thread-nets for spiders' nets or webs, and as they are led by their instinct to avoid the latter, they equally avoid the former. Several objections, however, may be urged against this explanation. In the first place, judging from the numbers of flies which are constantly caught in spiders' nets and webs, it may be doubted whether they are endowed with any peculiar instinct leading them to avoid these snares. In the second place, supposing the existence of such an instinct, this feeling should lead the common house-fly chiefly to avoid the horizontal webs of the house-spider (*Aranea domestica*, Linn.), to which the thread-nets have no resemblance. And, thirdly, supposing its instinct to be equally directed against the concentric-circled nets of the garden-spider (*Epeira Diadema*) to which the thread-nets have a greater, though still but a remote similarity, it is unaccountable how the having a thorough light in the room should dispel the apprehension of the fly, since this very circumstance would make the thread-nets more closely to resemble these spiders' concentric nets, which are usually fixed in open places with a free admission of light on each side.

But in truth it is premature to speculate as to the motives of the actions of the flies until the facts have been with this view more carefully observed by professed entomologists, and it is chiefly in the hope that some of the members of the Entomological Society will direct their attention to the subject in the course of the ensuing autumn, that I have thrown together these hasty and imperfect notices. The points to which it is most important to advert would seem to be, the thickness and colour of the threads, whether those of a dark are as effectual as those of a light colour, and the result of substituting for them thick cord or worsted; the size of the meshes,

and the ascertaining the extreme width at which they cease to have effect; how far mere horizontal threads are as effectual as a network of both vertical and horizontal ones, &c.: and by observations on these points and various others which will suggest themselves, and especially by carefully watching the motions of the flies on the outside of the windows, as to their approaching or avoiding the net, and their different conduct when a thorough light is admitted, there can be little doubt that some approach may be made to a solution of the question, whether their movements in this case are influenced by pure instinct or by reason and calculation, and thus some valuable additions be made to the metaphysics of entomology, that branch of the science which, as I began by observing, has been hitherto so much neglected, but is in itself so highly interesting.

Another point, too, to which it seems desirable to pay attention is as to the precise species of flies which have this dread of passing through a net. It seems probable, from the facts stated, that not merely the common house-fly (*Musca domestica*), which chiefly swarms in our apartments, but the other species of the same genus which in smaller number intermingle with them, as well as *Stomoxys calcitrans*, which from its attacks on our legs is often a greater pest, and, indeed, the dipterous tribes in general, are all equally deterred from traversing this imaginary boundary. But before this supposition can be fully adopted, more exact observations than have yet been made require to be instituted, and it would also be desirable to have similar experiments made as to the house-flies of America and other hot countries, in which it is probable that in the same way as our common sparrow (*Fringilla domestica*, Linn.) is replaced in Italy by another species (*F. cisalpina*, Temm.), which to an ordinary observer seems identical with ours, but is really distinct, the prevalent house-fly may be a species nearly allied to *Musca domestica*, which it replaces, but distinct from it.

I shall conclude my remarks with briefly adverting to the connexion, alluded to in the introductory paragraphs, which has been unexpectedly found to exist between this subject and a topic of classical criticism. On mentioning the facts above recorded, when I first learnt them at Florence, to my family circle, my eldest son observed that he recollected a passage in Herodotus in which a similar statement was made as to gnats, and fetching the volume, he pointed out the chapter in which the father of history distinctly says, that certain Egyptian fishermen defended themselves at night from the gnats by covering their beds with the nets which they had used in the day for fishing, and through which these insects, though they bit through linen or woollen, did not even attempt to bite. But as to

enter fully into this matter would at present occupy too much of the Society's time, on which I have already trespassed longer than I originally meant, and as, besides, it will be best that he to whom this unexpected coincidence first occurred should himself explain the subject in detail, I shall leave it to him to lay before the Society the passage in question, and such comments as it may suggest, at a future meeting.

II. *Remarks on the Passage in Herodotus referred to in Mr.* Spence's *Paper, read at the April Meeting. By* W. B. Spence, *Esq., M.E.S. France, For. Sec. Ent. Soc.*

[Read May 5, 1834.]

I beg leave to lay before the Society a few remarks on the passage of Herodotus referred to in my father's late paper, which was brought to my recollection on hearing him mention that flies were kept out of houses at Florence by merely having a net stretched across the windows.

The passage in question occurs in the second book of Herodotus, in which, after having given a general description of the customs, manners, and religion of the Egyptians, he goes on to describe the natural history of the country, and forms the 95th chapter, which is as follows:

95. Πρὸς δὲ τοὺς κώνωπας ἀφθόνους ἐόντας τάδε σφί ἐστι μεμηχανημένα. τοὺς μὲν τὰ ἄνω τῶν ἑλέων οἰκέοντας οἱ πύργοι ὠφελέουσι, ἐς οὓς ἀναβαίνοντες κοιμέονται· οἱ γὰρ κώνωπες ὑπὸ τῶν ἀνέμων οὐκ οἷοί τέ εἰσι ὑψοῦ πέτεσθαι. τοῖσι δὲ περὶ τὰ ἕλεα οἰκέουσι τάδε ἀντὶ τῶν πύργων ἀλλὰ μεμηχάνηται. πᾶς ἀνὴρ αὐτέων ἀμφίβληστρον ἕκτηται, τῷ τῆς μὲν ἡμέρης ἰχθῦς ἀγρεύει, τὴν δὲ νύκτα τάδε αὐτῷ χρᾶται ἐν τῇ ἀναπαύεται κοίτῃ· περὶ ταύτην ἵστησι τὸ ἀμφίβληστρον, καὶ ἔπειτα ἐνδὺς, ὑπ' αὐτῷ καθεύδει. οἱ δὲ κώνωπες, ἢν μὲν ἐν ἱματίῳ ἐνελιξάμενος εὕδῃ ἢ σινδόνι, διὰ τούτων δάκνουσι· διὰ δὲ τοῦ δικτύου οὐδὲ πειρῶνται ἀρχήν.

Of the above passage the following is a translation, which I have made as literal as possible; but that there may be no doubt of its general accuracy I have compared it with the various translations of Schweighæuser, Larcher, and Beloe, with which in substance it exactly agrees:

"But against the gnats, being in great numbers, these are the means they have invented: the towers are of service to those who inhabit the upper parts of the marshes, and ascending into them, they sleep there, for the gnats, on account of the winds, are not able to fly high. But those who live around the marshes have invented other means instead of towers. Every man of them possesses a casting-net, with which during the day he catches fishes, and at night he makes use of it in the bed where he reposes, round which he places the net, and then, having crept under it, he sleeps. But the gnats, if he sleeps wrapped up in a woollen or linen garment, bite through these, but through the net they do not even attempt to bite."

From this passage, then, it is clear that Herodotus affirms the same fact with regard to the Egyptian *Conopes* (which, both from what he says of their frequenting marshes and biting by night and the received interpretation of the word, there can be no doubt were one or more species of gnat, musquitoe, or *Culex*,) as has been observed of the house-fly, namely, that they will not pass through the meshes of a net although the space is sufficiently large to admit them. If Herodotus had mentioned merely a net, one might have supposed that he meant some very thin gauze or other net-like substance, such as the gnat-curtains are made of at the present day; but he says it was a casting-net (ἀμφίβληστρον) used by fishermen, and must have had meshes much wider than sufficient to admit a gnat; nor, I think, can there be even a shadow of doubt on this head, when we consider that he adds that they bite through linen amd woollen coverings, and yet do not even attempt to bite through the net; which circumstance seems to prove that he was struck with this as a curious fact, which he imparts to his readers in his usual concise manner. It will also be seen from the expression used, that the net was not merely laid on the bed as a covering, but sustained by some support, (as a pole or bedstead,) so as to form a kind of tent, into which form the casting-net from its shape could be easily arranged, and under which the fishermen then crept, and thus slept secure from their formidable assailants. This is also the meaning attributed to the passage in Schweighæuser, who says, "lecto circumponit rete, deinde subrepens sub illo dormit." Thus it would seem that the beds so covered agreed in all essential points with the Florentine rooms, of which the open windows had nets stretched across them, the gnats in the one case being asserted by Herodotus to be kept out under nearly the same circumstances as the flies are known to be excluded in the other.

But here an objection may arise: May not this coincidence be accidental? Can we be sure that if flies are excluded by nets, gnats

will be so also? In short, can we warrant the conclusion that the assertion of Herodotus is correct? And, until the experiment has been fairly made, we cannot be certain that gnats will be excluded from beds as flies are from rooms. But at the same time, judging from analogy, and the great improbability that so unusual a mode of defence, and one so unlikely *à priori* to be effectual, should have been a mere fiction without a foundation of truth, there seem strong grounds for believing the fact to be as stated by Herodotus; and that though, as is well known to people who live in hot climates, gnats soon find their way through holes in gauze curtains, yet it is very probable that they may be afraid of venturing through a net, just as this last is sufficient to keep out flies, though we know that they will creep through the linen sides of a meat-safe. And thus the father of history may be found to be as correct in this passage as Geoffroy de St. Hilaire has shown him to be in the history of a bird (*Charadrius Egypticus* of Hasselquist) taking the gnats out of the mouth of the crocodile, which was deemed a mere fable until fully confirmed by the evidence of this naturalist when in Egypt. (Vide 'Déscription de l'Egypte,' *Histoire Naturelle*, tom. i. p. 198—205.)

If it shall be proved by experiment, as seems not unlikely, that a person in bed may protect himself against the attacks of gnats merely by stretching a wide-meshed net over the place where he lies, it may be regretted that this simple fact related by Herodotus as known to the Egyptian fishermen 2300 years ago, has been so long overlooked, and remained in reality quite unknown. Adopting this simple mode of protection, a traveller in marshy districts would have only to provide himself with a piece of netting three yards long and a yard wide, not taking up, when rolled, more than a few square inches of his trunk, and throwing this over a slight support of a few pieces of cane or whalebone equally portable, he would be secure from attack, though the net were but a few inches above his body, and the width of the meshes would not offer the slightest impediment to respiration and the free circulation of the air; whereas it is almost out of the question to use a piece of muslin or gauze in the same manner at a slight elevation above the body, on account of the suffocating heat that would ensue; and if, in order to obviate this, the traveller were to carry with him common gauze curtains, as now in use, sufficiently spacious to inclose the whole bed, the time and trouble required in arranging and applying them would often be such as even to deter him from making use of them, and to make him prefer taking his chance without any defence.

If there is thus cause for regret that this fact, which appears so important, should have been so long and so completely overlooked, it

seems not less to be wondered at that the passage in Herodotus which announces it should have been so little noticed by commentators, not one of whom seems to have been struck with the singularity of his statements, which, whether correct or not, equally required observation. One would think that in reading this passage it must have seemed to them rather strange that a casting-net whose meshes must have been wide enough to admit several gnats at a time should yet be asserted by Herodotus to be a sufficient defence from them, though they bit through either linen or woollen; and one may be well surprised that whilst they have spent pages on passages far less curious, they should pass this over with a mere reference to Juvenal or Horace where these authors allude to the *conopeum*, or gnat-curtain.

The fact seems that all these commentators have been led astray by the word *conopeum*, confounding the casting-net of the Egyptian fishermen with the gnat-curtain of the Romans, which both from the definitions given of it, "linum tenuissimis maculis nectum," ("thread knitted together in very fine meshes,") and from the use as banners, to which Horace supposed it applied,

> "Interque signa (turpe!) militaria
> Sol aspicit conopeum," (*Epod.* lib. ix. ode 9.)

was evidently of a texture resembling our muslin or gauze. If, therefore, they had been duly struck by the passage, they ought either to have shown how it was that a casting-net could exclude gnats as effectually as gauze, or else, that in point of fact the texture of both was the same, the casting-net having, notwithstanding the apparent absurdity of the supposition, meshes so small as to prevent gnats from coming through them, or, on the other hand, the *conopeum* though applicable for a banner, having meshes as large as a casting-net. But nothing of this kind has been attempted in the way of explanation by Schweighæuser, Larcher, Baehr, or any of the commentators I have consulted, who all seem to regard the *conopeum*, or gnat-curtain, to be the same as the *amphiblestron* of Herodotus, when in fact, except in the advantages derived from each, they have no more similarity than the paper bags used for covering grapes have with a cherry-tree net†.

In concluding these imperfect remarks, I hope, in order to put beyond question the accuracy, or the contrary, of the statement of He-

† In a curious poetical tract, entitled 'An Epistle from the Fens to Mr. *** *** at Rome," dated May 1, 1727, which my friend the Rev. F. W. Hope, F.R.S., purchased at Mr. Heber's late sale, and which he has had the goodness to show me since the above was written, the author falls into the same error with all the com-

rodotus, that such of the members of the Entomological Society as may have an opportunity will make experiments as to the efficacy of nets in excluding gnats from beds, noticing particularly whether the result be affected by the circumstance of the room being light or dark, or by the colour of the threads or the size of the meshes; and I trust also that such entomologists as may hereafter travel in Egypt will direct their attention both as to the exact species of gnats which may abound there, and as to the fact whether the fishermen still defend themselves from them in the mode pointed out by Herodotus.

mentators in referring, in the following lines, to the passage of Herodotus in question, which he quotes:

> " See with delight the great relief appears,
> Known by the fame of twice a thousand years;
> See the close net of size immense and deep
> Flows round the bed and guards the dome of sleep.
> What though the gnats incessant wave their wings,
> Vain their efforts, and harmless are their stings.
> Soon as their swarms the adverse bound beset,
> Checked they retire, nor pass the impervious net."

He here, like the commentators, regards the modern gnat-curtain as precisely identical with the *amphiblestron* of Herodotus, without giving himself the trouble to point out how his epithets 'close' and 'impervious' could be applicable to a casting-net.

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