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AMONG THE HONEY-MAKERS.

THE luxury of all summer's sweet sensation is to be found when one lies at length in the warm, fragrant grass, soaked with sunshine, aware of regions of blossoming clover and of a high heaven filled with the hum of innumerable bees.

It is that happy hum — which seems to the closed eyes as if the silent sunbeams themselves had found a voice and were brimming the bending blue with music as they went about their busy chemistry — that gives the chief charm to the moment; for it tunes the mind to its own key, the murmuring expression of all pleasant things, the chord of sunshine and perfume and flowers.

And it is, indeed, the sound of a process scarcely less subtle than the sunbeams' own, of that alchemy by which the limpid drop of sweet insipidity at the root of any petal is transformed to the pungent flavor and viscid drip of honey. A beautiful woman, weary of her frivolities, once half in jest envied the fate of Io, dwelling all day in the sun, all night in the starshine and dew, and fed on pasturage of violets; but there is the morning beam, the evening ray, the breeze, the dew, the spirit of the violet and of the cow-

slip, all gathered like a distillation and sealed into the combs, and this is the tune to which it is harvested. Beyond doubt there is no such eminent sound of gladness in all the world. The cricket seems to speak of more spiritual things than those of this sphere. As to bird-song, poets differ.

“O nightingale, what doth she ail,
And is she sad or jolly?
Sure ne'er on earth was sound of mirth
So like to melancholy,”

exclaims one in compromise with all the others. Every echo is full of a lonesome sadness. The musical baying of a distant dog by night accentuates the depth and darkness and stillness; the crowing of cocks from farm to farm, in their cordon of sentinelship against the invasion of the dawn, tells the hearer how all too well the world is getting on without him; the lowing of kine through the clear noon air comes robbed of roughness, in its deep, mellow sonority, like the oboe and bassoon, full of a penetrating pathos. Let Nature but interpose a sheet of water or a bit of wood, and the merriest joy-bells that ever rang are infused with that melancholy which is the overplus of rapture. But there is no distance to lend that

enchantment to the buzzing of a bee: it is close about us, a universal sibilation; the air is made of it; it sings of work, that joy and privilege,—of a home, of plenty, of a world whose color and odor make one giddy with good cheer; it may have many varying elements, but its constant is content.

“ When the south wind, in May days,
With a net of shining haze,
Silvers the horizon wall,
And, with softness touching all,
Tints the human countenance
With a color of romance,
And, infusing subtle heats,
Turns the sod to violets,
Thou, in sunny solitudes,
Rover of the underwoods,
The green silence dost displace
With thy mellow breezy bass.”

And although this burly rover is not our little bee of the hive, but his saucy, sonny*country-cousin, the song of the one is scarcely sweeter than that of the other, while they blend into rarest unison. And well may both be sweet, it is such a pleasant thing to live; there is the hive to furnish, there is the dear nest underground; they forget yesterday's rain, to-morrow's frost is but a dim phantasm,—the sun is so warm today on their little brown backs, and here is such store of honey. It is true, the humble-bee is much the most dazzling,—he has the prestige of size, moreover; but the other may find some favor in his new bronze and gold armor and his coarse velvet mantle,—there are few creatures that can afford to labor in half such array as that, but when the work is so nice one's dress must correspond: it would never do to rumple round among the rose-leaves, black as a beetle, and expect not only to be heaped with delicacies, but to be intrusted with love-tokens. One cannot be so splendid as the moths and sphinxes, who have nothing to do all summer but to lay eggs among the petals that their offspring may devour them; no, there is work to be done. But though one toils, one has a dignity to maintain; one remembers it readily when he has been made the insignia of royalty, when kings have worn his effigy, when popes have put him in their coats-of-arms; one

cannot forget that he has himself been called the Winged Pontiff of the Flowers. See him now, as he hovers over the clover, not the red kind,—for him each floret of that is deep as those shafts of the hashish-eater's dream, where the broken tubes of the honeysuckle being planted in the sand, their mouths level with the floor of the desert, they became wells, and the Arab women dropped their buckets therein and drew them up dripping with honey,—it is the small white clover on which he alights, whose sweets are within reach of his little proboscis; or, lost in that great blue-bell, he swings it with his motion and his melody; or he burrows deep in the heart of a rose, never rolling there, as it has erroneously been said, but, collecting the pollen with his pincers, swims over the flower while brushing it into the baskets of his hinder legs, and then lights again for a fresh fare, till, laden and regaled, he loudly issues forth, dusty with treasure; and *les rois fainéans*, the Merovingian kings, who powdered their heads and their beards with gold, were no finer fellows than he. But a few months' wear and tear will suffice to tarnish him; by-and-by the little body will be battered and rusty, the wings will be ragged and worn; one day as he goes home heavily burdened, if no sailing blue-winged swallow have skimmed him up long ago, the flagging flight will fail, a breeze will be too much for him, a rain-drop will dash him down, he will fall, and some garden-toad, the focal length of whose vision is exactly the distance to which he can dart his tongue, will see a tired bee blundering across his sky, and will make a morsel of him, honey-bag, pollen, and all. Yet that is in the future, far outside the focal length of any bee's vision, that fortunate vision which finds creation so fair and himself the centre of it, each rose made for him to rifle, and welcome everywhere. “The docile flower inclines and lends itself to the unquiet movements of the insect. The sanctuary that she had shut from the winds, from the sight, she opens to her dear bee, who, all impregnated with her

sweetness, goes carrying off her messages. The delicious precautions that Nature has taken to veil her mysteries from the profane do not for a single moment arrest this venturesome explorer, who makes himself one of the household, and is never afraid of being the third. This flower, for instance, is protected by two petals which join each other in a dome above; it is thus that the flag-flower shelters her delicate little lovers from the rain. Another, such as the pea, coifs itself in a kind of casque, whose visor must be raised. The bee establishes himself at the bottom of these retreats fit for fairies, laid with softest carpets, under fantastical pavilions, with walls of topaz and ceilings of sapphire. But poor comparisons borrowed from dead stones! These things live and they feel, they desire and they await. And if the joyous conqueror of their little hidden kingdom, if the imperious violator of their innocent barriers, mingles and confounds everything there, they give him thanks, heap him with their perfumes, and load him with their honey," says M. Michelet, in a brochure upon the insect, which, however uncertain its statements, would be perfectly charming in tone and spirit but for the inevitable sentimentalisms.

It is a brave companionship to which our tiny adventurer comes, likewise,—a world of opening blossoms, a crowd of shining intimates. There is the *Chrysopa*, a bright-green thing, with filmy transparent wings wrought like the rarest point-lace, and with eyes redder than rubies are; there is the *Rose-Chaffer*, the little *Cetonia* of the white rose, with an emerald shield upon its back, and carrying underneath a breastplate of carbuncle; there are the butterflies,—the silver-washed *Fritillaries* of June,—the *Painted Lady*, found in every clime, and sometimes out at sea,—the *Admiral* of the *White*, peerless in his lofty flight,—the *Vanessa Atalanta* of August,—the *Purple Emperor* of the Woods,—the *Peacock-tailed* butterfly of the autumn; and there are the beautiful, savage *dragon-flies*, with their gauzy wings of silvery green and blue,—all flying flakes of liv-

ing splendor, which seem to be only flowers endowed with wings. And in truth the analogies between flowers and insects are noticeable enough, between the egg and the seed, the chrysalis and the bud, the wide-spread wings and the expanded corolla; there is a vital principle enjoyed by both, individuals of both have the power of emitting light, there are ephemera of both; as certain buds always bloom at fixed hours, so certain moths break their coverings to the minute; as there are flowers that part their petals only at dark, so there are insects that fly only by night; there are plants that are miniature barometers, there are insects equally sensitive to every variation of the atmosphere; for fragrance there is the musk-beetle, the tiger-beetle, which affords a scent like that of the attar-of-roses; and whereas some blossoms have fetid odors, there is the little golden-eyed, lace-winged fly to offset them. It is easy to detect the rudimentary flower in the folded bud, thus the lovely little aerial butterfly with its ocellated wings may be found all ready for flight wrapped in the caterpillar that feeds on the wild strawberry,—the one has the freedom of heaven, the other seems bound by the spells of some beautiful enchantment; these *Libellulæ* are sporting in the air, these sweet-peas are just about to depart; there are locusts which appear to be walking leaves, and finally there is the bee-orchis, which deceives even the bees themselves.

It must fairly seem to this busy, bustling fellow, culling nectar and ambrosia, that all outside is shadow, that the earth is made for him and his kind, and that, let him cull never so tirelessly, he cannot hive half its honey,—so that there will always be a drop or two left over for his little poor relations, the violet-carpenter, the roseleaf-cutter, and the poppy-bee. They have need of it, that drop or two, to sweeten all the anxieties of their solitary lives the span of a summer long, vagabonds at best, and not always allowed what domesticities they have in peace. The pitiful fortunes of a mason-bee, as told in "A Tour round

my Garden," are liable to befall one as another.

"Look at her," says the author, "returning home with her provisions; her hind feet are loaded with a yellow dust, which she has taken from the stamens of flowers: she goes into the hole; when she comes out again, there will be no pollen on her feet; with honey which she has brought, she will make a savory paste of it at the bottom of her nest. This is, perhaps, her tenth journey to-day, and she shows no inclination to rest.

"All these cares are for one egg which she has laid,—for a single egg which she will never see hatched; besides, that which will issue from that egg will not be a fly like herself, but a worm, which will not be metamorphosed into a fly for some time afterwards. She has, however, hidden it in that hole, and knows precisely how much nourishment it will require before it arrives at the state which ushers in its transformation into a fly. This nourishment she goes to seek, and she seasons and prepares it. There, she is gone again!

"But what is this other brilliant little fly which is walking up the house-wall? Her breast is green, and her abdomen is of a purple red; but these two colors are so brilliant that I am really at a loss to find words splendid enough to express them, but the names of an emerald and a ruby joined together.

"That pretty fly—that living jewel—is the 'Chrysis.' I scarcely dare breathe, for fear of making it fly away. I should like to take it in my hands, that I might have sufficient time to examine it more closely. This likewise is the mother of a family; she also has an egg to lay, from which will issue a fly like herself, but which she will never see. She also knows how much nourishment her offspring will require; but, more richly clothed than the bee, she does not, like her, know how to gather the pollen from flowers or to make a paste of it with honey.

"She has but one resource, and that resource she is determined to employ; she will recoil neither from roguery nor theft to secure the subsistence of

her offspring; she has recognized the solitary bee, and she is going to lay her egg in her nest. It will hatch sooner than that of the true proprietor; then the intruder will eat the provisions so painfully collected for the legitimate child, who, when it is hatched in its turn, will have nothing to do but to die of hunger.

"There she is at the edge of the hole, — she hesitates, — she decides, — she enters.

"This insect interests me, she is so beautiful. The other likewise interests me, she is so industrious. But here she comes back through the air: one would think her a warrior covered with chased armor and a golden cuirass; she buzzes as she comes along. The Chrysis has heard the buzzing, which is for her the terrible sound of a war-trumpet. She wishes to fly; she comes out; but the other, justly irritated, pounces upon the daring intruder, beating it with her head. She bruises and tears the brilliant gauze of her wings, and beats her down to the dust, where she falls stupefied and inanimate.

"The bee then enters into her nest, and deposits and prepares her provisions; but still agitated with her combat and her victory, she sets out again through the air. I follow her with my eyes for a long time, and at last she disappears.

"The poor Chrysis is not, however, dead: she gets up again, shakes herself, flutters, and attempts to fly; but her lacerated wings will no longer support her. What can she do to escape the fury of her enemy? It is not her business to fly away; her business is to deposit her egg in the bee's nest, and to secure future provision for her offspring,—but the bee came back too soon. She ascends, climbing painfully: at times her strength seems to fail her; she is forced to stop, but at last she arrives,—she enters,—she is in! This time the interest is for her. Then she was only beautiful, now she is very unfortunate. I am aware that a long plea might be made for the other. I should not like to be appointed judge between

them. Ah! she is out again, — she flies away! But, oh, how happy she is to have succeeded! Now I begin to feel for the bee. The poor bee continues to bring provisions for its young, which, nevertheless, will die of hunger.”

Nor is the *Chrysis* her only tormentor, it may be remarked; there are some frivolous little vagabonds of her own kind that never think of building for themselves, but always appropriate the homes of others in this style, and they are known as cuckoo-bees.

It is no wonder that the happy bee of the community, escaping all such trial, makes blithe murmur to itself over its luscious labor. Perhaps all artisans would sing as cheerfully, were their task as sweet; it can be no such severe duty to fill one's basket with the bountiful store at hand, when one has just banqueted on the very dew of the morning. There are a few secondary products of Nature on which words cannot be wasted. It is pleasant to recall the poetical charms of wine, its tints, its aromas, and its sparkles; yet, with all that fire and fragrance, it seems but poor, thin stuff, when poured out beside the heavy flow of honey with sunbeams dissolved in every splash. The Hungarian huntsman may praise his rosy Cotnar, fine ladies sip cordial Rosolio and Levantine sirups, the fancy warm over African Constantia; but every peasant has honey in his garden, and they buy it of him to enrich their best Muscats. The great globes of the grape on which the wind and weather have breathed a bloom, pulped with rain, and sweetened with sun, the dew-drops slipping down among them as they stir beneath the weight of some bird that springs from the stem into the sky, — these lend their beauty and innocence as a kind of chrism to cover the profanities of wine, which, before it can be used at all, undergoes a kind of decomposition; but the wild wine of the bramble-rose has no need of its youth in apology for its age. It is stainless honey still; the sweet earth-juices stolé up the tiny ducts of the flower to secrete it; showers and odors, warmth

and balm, distilled together into the nectary to give it wealth and savor; it yet preserves the essence of long summer days, of serene nights, of wandering winds, of mingled blossoms; it is the link between vegetable and animal productions; it has undergone the processes of a higher organization than that of the plant; it is, in fact, the bee himself, and not all the art of all the laboratories can reproduce it. Into all these other secondary products some stain of humanity enters; but little sinless sprites of greenwood and glen alone share the occult science of this with the blossoms. As light and heat are the generative forces of the world, honey seems to be their first result; it is lapped, indeed, in flowers, but it looks like candied sunshine. From the beginning, it has been regarded as a sacred substance; some have supposed it the earliest element of vegetation. The ancients made offering of it to the souls of the departed; they preserved their dead in its incorruptible medium; they sacrificed it to the gods. “With honey out of the rock should I have satisfied thee,” said the Psalmist, as if earth had nothing more to give. Nor has it to our bee. Let him fill his honey-vesicle, he will regurgitate the deposit into a cell that he closes with a thin waxen pellicle, or into another already partially occupied by the farina of flowers, which he knows to be perishable, and therefore secludes from the air in the same fashion that the Romans used to seal their flasks of Falernian, — with a few drops of honey at the mouth. Give him a grain of pollen, a taste of stagnant water, a drop of honey, and kings could not enrich him. The honey is his food, in the stagnant water he finds salts requisite as remedies; but what the bee wants with the grain of pollen is still a doubtful matter among apiarists. He makes of it a confection for the brood, it is also an ingredient of the royal jelly, he eats it himself, and he elaborates it in scales of wax upon his body, say those who follow Huber; on the other hand, the brood receive no confection or food whatever, there is

no such thing as royal jelly, the insect will die sooner than partake of pollen, and there is no wax elaborated in scales upon the body of any bee, say those who oppose Huber. But if the brood are not fed, one may ask, why does the wild bee, the tapestry, or the carder bee, take such pains, before closing the nest where her egg is hidden, to store there the little drop of honey? and what is it that occasions the greater consumption of honey during the brooding period than during any other portion of the year? It is really a pity, when Huber has given us so many interesting relations, that people must needs go prying into their truth. How is it possible that Nature could improve upon them? Kirby, indeed, accepts them all, and hands them down to us; subsequent encyclopedists have profited by his example; and Michelet, who between a true story and a picturesque one never hesitates a moment, — who tells us that the down on the butterfly's wing is a collection of exquisitely minute balloons, and that the silkworm files its way out of the cocoon with its eyes, — leading us to think, that, if his great history partake of the nature of his lesser works, it must be an assemblage of splendid errors, — M. Michelet out-Hubers Huber himself. Contrary to these, Mr. Huish, a British author, declares that a rod ought to be pickled for the man who dared impose such sheer inventions upon the credulity of a weak-minded public; and although he does not say it in so many words, he has evidently pictured to himself the consternation with which Huber's wife and servant must have looked at one another when he announced to them his intention of publishing a book of the fairy stories with which they had amused him, and suffered him to amuse his friend Bonnet. Huber has novelty, romance, and interest, upon his side; Huish has certainly a little logic. The latter's book upon the subject is, nevertheless, as quarrelsome an affair as ever was published; he seems to be as choleric and adust of temperament as the bees themselves; he contradicts every

one who has dared to speak upon the matter, and, while insisting that they could by no possibility have seen what they pretend to have done, asserts opposing facts, which he could no more have seen than they.

There is a close classification in Huber's system, the results of which give us several ranks among bees, — those of the queen, the drone, the jelly-maker, the artists in wax, the nurse, the harvester, and a certain little useless black bee. Adversely to this, Mr. Huish, who would carry bee-craft back to a pre-Réaumurite period, reverts to the original observations, and declares there are but three sorts of bee in the hive, — queen, drone, and worker, — which obviously simplifies matters; while as for the little black bee, he regards it as existing nowhere but in the head of its discoverer, so that, if the worthy person had not the traditional maggot in his brain, he might at least be said to have a bee in his bonnet. The sociable caterpillars, we are told, work as each one pleases. John Hunter said that bees did, too; and here Mr. Huish is of the same opinion, — this or that worker scours the fields or fashions the cell according to the fancy that may overcome him. Him? That is exactly the question. Mademoiselle Jurine, following the anatomical researches of her father, promulgated the discovery that the common bee was a decided female, with its organs undeveloped. To counterbalance her statements, M. Epignes published a treatise in which he proved satisfactorily to himself that the common bee is a decided male. Mr. Huish insists that the common bee is a decided neuter. Discarding M. Epignes with a fillip, Mr. Huish stoutly argues, against Mademoiselle Jurine's theory, that the possession of organs destined to no use is an incident out of the course of Nature, — to which, even were the statement quite true, it might be added that the creation of a community of a thousand males and one female is equally out of the course of Nature. Mr. Huish insists, that, if these bees were all females, yet forbidden the func-

tions of their sex, it would be an anomaly; he forgets that the existence of a neuter is already an anomaly. Allowing that Mr. Huish is here in the wrong, as seems probable, it involves a slight trouble of its own; for there would then seem to be need of but two kinds of eggs in the hive, whereas it is well established that three kinds are laid, — that of the male, the female, and the worker, or imperfect female. Huber, however, in such dilemma, adopting the previous hints of Schirach, at once seized upon Mademoiselle Jurine's discovery, and assured us, not only that from the egg of a worker a queen could at any time be produced, but enlightened us as to the manner of conducting the experiment. The queen is dead? It is lamentable, but nothing so easy as to make another. There is only to tear down some dozen cells, to set the youngest embryo afloat in royal jelly, and a queen appears, who, if not in the legitimate line, is capable of performing perfectly all the office of a sovereign. There is a moment of intense despair, great riot, and agitation; work is suspended; the temperature of the hive mounts many degrees. All at once the old art is remembered, — the administration of that delicious medicament, of so astonishingly affluent nature that it can make a queen out of a commoner, the enlargement of the narrow cradle to that ampler space which forbids the atrophy of a single fibre of the body. The preparations are made; and, with tranquillity restored, the people await the event. One day there comes a singular piping sound, — it is the cry of the royal babe, — the hive is filled with rejoicing, — there is no longer any interregnum of the purple, — the queen is born! Perhaps the queen-makers have been too much in earnest, and at nearly the same moment the inmates of two royal cells issue together. Then is the time to try one's mettle, — no shrinking, no bias, nothing but pure patriotism. Let a ring be formed, and she who proves herself victor is worthy of homage. Is one of the two a coward? The impartial circle bring her back to

the encounter, bite her, tease her, tumble her, worry her, tell her plainly that life is possible to her on no terms but those of conquest. At length the matter decides itself; the brilliant and victorious Amazon bends her long, slender body, and with her royal poniard pierces the abject pretender through and through. Then these satisfied subjects surround her, load her with endearments, cleanse her, brush her, lick her, offer her honey on the end of their proboscides, and, if there are yet remaining other royal apartments whose tenants give notice of timely appearance, they conduct her on an Elizabethan progress, in which, filled with instinctive dismay, she pauses at every cell, and stabs her young rivals to death with her sting. As the story runs, there are still other conditions to be fulfilled by the aspiring princess, — she must give her people the assurance of a populous empire. Should she fail in this, they have recourse to their old manœuvres, becoming manifestly insubordinate and unruly. If, however, they at any time wax unbearable in their insolence, the young monarch has it in her power, by assuming a singular attitude, standing erect at a little distance, her wings crossed upon her back and slightly fluttering, while she utters a shrill, slender sound, to strike them dumb, so that they hang their heads for shame.

All this pretty story the later apiarists deem a tissue of fiction and fallacy. If, when a hive is deprived of its queen, there happen to be a royal egg remaining in it, they say, it will shortly produce a queen, as, if it had been a common egg, it would have produced a common bee. They insist that the organism of the creature to be produced is inherent in the egg, and do not believe it in the power of a bee to alter a law of Nature; they deny the statements of Schirach, Huber, Dunbar, Rennie, and others to this effect, — scout the idea of the existence of such a thing as royal jelly at all, with the supposed aristocracy of its compounders, — share with Huber the amazement he says he felt, when, in a time of disturbance, he dis-

tinctly heard a queen address her bees in the French language, saying, "*Je suis ici, je suis ici*," — entirely repudiate the royal duels, which the editor of the "Naturalist's Library" himself, an advocate as he is of the Huberian principles, confesses he has never, in all his experience, been able to witness, — and go to the extreme of declaring, that, far from being the truculent and jealous tyrant described, the queen is the most timid of all creatures, flying, at the first intimation of danger, into the depths of the hive, and never using her sting under any circumstances through the whole course of her life, while, should you get one in your hand, you may offer her indignities with impunity; she knows her value to her people, and that, should she sting and be unable to withdraw her barbed weapon, the effort would disembowel her, and prove her own death and the ruin of her kingdom. The royal larvæ, Huber tells us, in spinning their cocoons, leave the lower rings of the body unprotected by the gossamer envelope, that thus, — and it is certainly considerate on their part, — the head being too well shielded by the hard nature of its substances, and the cocoon endangering the safety of her sting by its entangling flimsy threads, their queenly assailant may destroy them without detriment to herself, by stinging that portion left exposed. On the contrary, we are informed by his refuters, that, even were the body destitute of this covering, which is not the case, it would present a horny, scaly surface, from which there would be infinitely greater difficulty in extracting the sting than from the silken meshes of any cocoon, — and that, as no sting could pierce the waxen wall of the cell, and as the royal cell is vertical, and the nymph lies with its head towards the orifice of it, unless the queen, with her sting of the eighth of an inch in length, had the power of darting it through the orifice to the distance of three fourths of an inch, the act would be otherwise an impossibility, — and that, to finish the affair, these infant princesses are destroyed by the bees themselves, who,

finding them unnecessary for further swarming, tear them from their cells, and despatch them, not by dart or venom, but, when they are in a sufficiently advanced stage, by an attack of the teeth at the root of the wings, in the same way that they despatch the drone, disabling and dragging them out of the hive, after they have become supernumeraries, where they drop to the ground, and, powerless to fly and escape, perish with cold, or become the prey of bird, mouse, and reptile. It is possible that none of the various tribes of all the tiny arm-bearing people make use of the *coup de grâce* in their power, except as a last resort. Still, when the bees find it necessary, they use it with Spartan cunning. Bruin can testify to that in his sensitive muzzle; and thus, when he takes a fancy to their conserve of blossoms, he carries off the hive in his hug, and plunges it into the nearest brook or pool till the bees are drowned, and all their riches made his undisturbed possession. The bee that is not irascible betrays a dismal home and a miserable mother; he has nothing worth fighting for. But far from him be malice; unmolested, he does not molest. For one who has lived in an old mansion, with bats' nests under the eaves and wasps' nests everywhere, waking in autumn mornings to count the customary inhabitants of the latter clustered on the cornices by threescores, while observing that they always made themselves sufficiently at home, not only to claim a place at table, but to walk across the cloth and help themselves, pausing sometimes midway to flirt out the purple enamel of a wing for admiration, and never giving offence to one of the house, — for one who has seen this fierce and fell fury so prettily and quietly behaved, it is pardonable to claim an equal amount of moderation for the sweeter and purer nature of the little honey-maker, who has learned his gentler manners of the flowers themselves. There are occasions, moreover, when the bees positively forget they have a sting at all, as when, in swarming, they are so entirely absorbed that

they may be lifted in handfuls. M. Lombard states the circumstance of a child's being cured of her fear of the sting by an experience of this season. "A swarm having left a hive, I observed the queen alight by herself, at a little distance from the apiary. I immediately called my little friend, that I might show her this important personage. She was anxious to have a nearer view of Her Majesty; and therefore, having first caused her to draw on her gloves, I gave the queen into her hand. Scarcely had I done so, when we were surrounded by all the bees of the swarm. In this emergency, I encouraged the trembling girl to be steady, and to fear nothing, remaining myself close by her, and covering her head and shoulders with a thin handkerchief. I then made her stretch out the hand that held the queen, and the bees instantly alighted on it, and hung from her fingers as from the branch of a tree. The little girl, experiencing no injury, was delighted above measure at the novel sight, and so entirely freed from all fear that she bade me uncover her face. The spectators were charmed at the interesting spectacle. I at length brought a hive, and, shaking the swarm from the child's hand, it was lodged in safety without inflicting a single sting."

But however greatly opinions may vary in this branch of natural history on one or another topic, the principal dispute is concerning the relations that may subsist between the queen and the drones. Huber had a complicated arrangement in reference to this, which his admirers accepted enthusiastically, while Latreille and other apiarists reject it as a cluster of prurient fancies. The opinion of Huish upon the subject, which would seem to have more probability to support it than others have, is that the queen commences to lay immediately on being established, and that the eggs being in their separate cells, it is the office of the drone to make them fruitful, after the custom of certain fish and of frogs.

When the population of the hive has been so increased by the opening of

the brood-cells that accommodation has become insufficient, and the heat so unendurable that every wing droops wet and flaccid with perspiration, as grand an emigration as those of the early Northern tribes is ordered, scouts are sent out to select the future place of abode, and in some propitious moment of perfect sunshine, honey-pouches full and nothing to delay, the great exodus takes place with a noise as if the whole hive were attacked by vertigo; and Homer himself could find nothing to which to compare his multitudinous Greeks thronging from their ships fitter than these nations of close-swarmling bees. That the young queen should lead the departing swarm seems the natural occurrence, being desirous of fulfilling her own destiny and of hastening from a hive hostile to all but one mistress whom they already know and love. Huber, however, will have it that it is the old queen, who, outraged and indignant at her treatment when a rival is allowed to live, sounds the alarm and sallies forth with her adherents. In support of this Mr. Duncan mentions having deprived an old queen of one of her antennæ, and noticing her thereafter at the head of a swarm, although Huber previously makes it known that any bee deprived of one of its antennæ is rendered useless. And in opposition to it may be given the circumstance quoted by Mr. Huish, in which the German apiarian Scopoli asserts, that, having clipped the wings of a queen, he found her still in his hive after an interval of many months, during which two excellent swarms had been thrown, and rather plumes himself on the triumphant fact, as if by any possibility she could have gotten away. A hive will throw off from one to four swarms in a season, but the last two are generally worthless, and should be deprived of their queens and returned to the parent stock. We have an old adage to this purpose, —

A swarm in May
Is worth a load of hay,
A swarm in June
Is worth a silver spoon,
But the swarm of July
Is n't worth a fly." —

and any one may verify it who chooses to investigate the condition of such swarms at the conclusion of the harvest, when it will be seen that those which founded their colony at so late an hour have not collected sufficient honey even for their winter provision, and must be fed in order to be saved till spring.

They have dainty appetites, these little people. They will work away with their forceps at a bit of sweetmeat, but they can absorb only liquids through their proboscides. Being in a state of civilization, their food must be administered in a civilized way: it must be boiled for them. They fancy stimulants; and sugar dissolved in ale, old brown October, or, better still, made into a rich sirup with Port wine, they find very delectable. Those authors who regard pollen as a part of their subsistence deem that it is because they require nitrogenized substances; and in order to prove that it is used as food, they remark that the bees continue to harvest it so long as a single flower blows, and that entirely after the formation of the cells has ceased. This, however, may be owing simply to the instinct which prompted them in the first place to bring it home, as instinct is generally in all creatures stronger than reason and overloaded; and that it cannot be any portion of the food of bees seems evident from the fact that whole hives are known to have perished by hunger while still abundantly supplied with bee-bread, as the pollen is often called. It is more probable that pollen is really the chief constituent of wax, although Huber submits that honey has that honor; but that this wax is produced in the manner that Huber states is extremely doubtful. It is his opinion that the wax-workers, having first gorged themselves with honey, suspend themselves in festoons from the flowers, where they remain for twenty-four hours,—which in a chilly spring night would break many a link of the chain,—after which, one detaches herself from the festoon, enters the hive, and takes up her situation, with her forceps detaches

a scale of wax from her side where it has recently exuded, works it with her tongue, and fashions it to the required consistency, succeeded in turn by others, artisan and apprentice. But as honey is the normal and established food of bees, it would follow that these scales must be in a state of perpetual exudation, and thus before long the hive would become filled with them, unless bees have a control of their bodily secretions enjoyed by no other order of beings. Anatomical dissection has found pollen only in the second stomach of the bee, of which the mouth is the sole and single opening; it is therefore presumed, that, being taken in a crude condition, and having undergone its due elaboration there, it is disgorged again and becomes the wax of the cells. This was the opinion of Réaumur; and for additional proof, it is stated, that, though the workers are seen to collect large quantities of farina during the season in which the cells are being made, no particle of crude farina is meanwhile to be found in a single cell, the whole of it being used in their composition. All this, however, will long remain in uncertainty; for, till some one is born with eyes of his own, ready to devote his lifelong labor to such observations, and perhaps in the end be stung to death for his pains,—since there are rebellions even in heaven, we learn,—there will be general willingness to accept the most piquant little statements regarding this most peculiar little people.

Wax itself is a substance that has no similitude to any other known. It is now thought, that, as there are three orders of bee, so there are three substances merely in the hive,—honey, farina, and wax. Pliny enumerates three others,—*commosis*, *pissoceros*, and *propolis*. Of these many moderns still retain the last, calling it a resinous matter collected from alders and willows, and used for the more secure foundation of the comb. But upon subjecting a lump of propolis to the boiling process by which wax is purified, it turns out simple wax of nearly its former weight; and it is ac-

cordingly presumed to be only wax in a much more crude stage of elaboration. Dr. Bevan, in experimenting with his hives, says that he melted wax and spread it upon a certain place, and, while fluid, attached a slight guide-comb to it, which the bees immediately adopted, suspending their whole comb thereby; from which it is evident, that, wax being strong enough itself for a foundation, propolis is unnecessary, and Nature is not apt to afford superfluities in her economy of construction.

The beautiful geometry of the cells is, after all, the marvel of the whole. Koenig demonstrated, that, in the problem of space and material, the bee had at once arrived at the solution which he himself reached only after infinitesimal calculations; and it furnishes fresh proof of the great mathematical relations of the universe, when even instinct is found to take on the accuracy and method of crystals. This honey-comb, by the way, is a favorite figure in Nature. If one examines microscopically the beautiful and brilliant petal of a gladiolus, it will offer this cellular structure in loose and irregular outlines; but under the same lens, the eye of a dragon-fly, which displays by daylight a jewel-like transparency, will be seen a strict crowd of glittering hexagons, with every alveole so closely arranged and so symmetrically shaped as to afford instant testimony to the superiority of the animal organization. It is by no means the habit of all bees, however, to dispose their affairs with such precision, though many other methods may have an equal grace. Don Felix d'Azara tells us of South American bees which deposit their honey in small waxen cups, and are known as *Angelitos*, because never using the sting; while the little black stingless bee of Guadeloupe, which inhabits the clefts of hollow rocks by the seaside, stores its honey in cells the size of a pigeon's egg, each sacket being filled only so far as it will hold without tearing from its fellow, and a pretty piece of color being effected by the amber honey in its receptacles of dark violet-colored wax which never blanches, as the whole

hangs together like a great cluster of grapes. This is a species of bee not greatly differing from that which makes the honey of Estabentum, that *Clavigero* says is taken every two months and is the finest in the world. The Mexicans are reported to attend with care to the culture of these bees, not so much for their rich honey as for the wax, of which large quantities are used in their common church ceremonials.

There are many singular incidents related by Huber, which, if they are not true, one may exclaim, "The more 's the pity." When he notes, that, in a time of disorder in the hive, he beheld the queen ascend a royal cell and seat herself upon it as if it were a throne, and, having sympathized for a season, suddenly assume the awful attitude and strike her disloyal people motionless, it interests us like some recital of the haps and heroics of Boadicea and her Britons. It is remembered that in the early days of what are known as spiritual manifestations, while one wit thought our furniture made of Dodonean oak, another regarded the manifestations as a wise provision in aid of the customary May ramble of city families from their respective domiciles. It is from a similarly provident point of view, with the current price of coal, that we should look at Huber's statement concerning the heat of a hive, when he tells us that twenty hives will warm an apartment comfortably, and twenty-five, occasionally well shaken, will furnish the proper temperature for a conservatory,—which throws Count Rumford's feat of boiling water without the aid of fire far into the shade. But when Huber proceeds to say that the queen is followed on her rounds by a royal guard, who wait on her with obsequious reverence, although it seems to be a pretty custom enough, the actual custom may be found a far prettier one: for the queen attends to her affairs, as others are assured, quite unaccompanied; only as workers at all times cover the comb, when she passes from group to group, each bee for a moment leaves labor, bestows a caress upon its mother, offers her honey, refreshes her,

sees her pass to the next group, which hastens to do the same, while the first returns to the business of the moment. The elder Huber taxes the credulity, however, hardly more than his son does, in presenting a drawing of humble-bees hindering a toppling comb from falling by taking acrobatic postures, standing on their heads and supporting it with their hind legs till relieved, converting themselves, in fact, into a kind of flying-buttresses. Indeed, the trouble with all these things is, that naturalists persist in endowing the little creatures with human passions; and having once given the rein to imagination, it runs away with them. Now and then they find themselves in a quagmire; but sometimes the result is simply amusing, as in old Butler's most graphic and entertaining description of the pillage of a weak hive by its rich and powerful neighbor, in the "Feminine Monarchie." Yet these stories have been told ever since the Flood. Aristotle assures us, that, when a bee has a head-wind to encounter, he ballasts himself with a little pebble between his feet; and the Abbé della Rocca, who made observations on the bees of the Grecian Archipelago, had the pleasure of witnessing the circumstance in person,—which would cause one to conjecture that the Greek bees, ever since they made honey on Plato's lip, have had habits peculiar to themselves, were it not that the little solitary mason-bee comes to the rescue,—the mason-bee, that, loaded with gravel and material for her nest, both Aristotle and the Abbé della Rocca undoubtedly saw. It is Virgil, however, on whom, in practical matters, apiarists have not yet improved, who has told the most amazing stories about bees, certifying that the body of their people may be bred from decay, and particularizing the blossom on which the king of the bees is born; but Virgil lived, it is to be recollected, nearly two thousand years ago, and two hundred have not yet passed since Redi, sometimes called the father of experimental entomology, first brought discredit on the doctrine of spontaneous generation: having

tried the recipe for the manufacture of snakes, by his friend the learned Kircher, he could never witness, he says, "the generation of those blessed snakelets made to hand." M. Michelet, having a kind word for everybody, has a graceful apology also for the errors of Virgil, avowing that this was not Horace, the elegant favorite of Rome, nor the light and indiscreet Ovid, but Virgil, the child of the soil, the noble and candid figure of the old Italian peasant, the religious interpreter of Nature; and though he may have been mistaken as to names, what he said he saw; he was simply deceived, as subsequently Réaumur was for a moment, by the rat-tailed larvæ or sewer-flies, which, having escaped from their cradle of corruption, now shining and adorned, are thereupon brevetted to the rank of noble Virgilian bees.

Certain superstitions seem to have prevailed in all countries ever since bees were first domesticated. In England they must not be bought, though they may be bartered; but there can be no haggling. In this country they are not even to be bartered. As their homeward flight is supposed to be westerly, it is necessary to obtain them from a place due east of their future residence; and their first swarm is to be hived and returned to the original owner, the bees relying on your good faith and working one summer on credit, so to say: they are not slaves, to be exchanged for silver. At this and all subsequent swarmings, it is requisite that they should be stunned by a confused clatter of bells, pans, pebbles, and cries, although it was long ago explained by Butler that this noise came into custom merely in signal of the ownership of a vagrant swarm. When a death occurs in the household, the hives are to be told of it and dressed in crape, in Switzerland turned topsy-turvy, as without such treatment the bees do not consider themselves used as a part of the family, and will fly away.

Among all the anecdotes given, perhaps the best instance in relation to the intelligence of the bee is that narrative

of its stratagems in warfare with the famous Death's-Head Moth. Mr. Huish, to be sure, leaning upon Buffon, laughs at it, believes it on a par with Jack's Beanstalk, and is grimly satisfied that no bees ever erected fortifications of any kind other than as against the effluvium of murdered mouse or snail when they wall up its source in a tomb of wax; but it is impossible to look at the benevolent, bland face in any picture of Huber, with its sweetness of expression, and its innocent, wide, wandering eyes, and not wish to believe every word he says. M. Michelet tells the story so pleasantly that it would be difficult not to quote it, especially as it is well to be credulous in good company.

"About the time of the American Revolution, a little before that of the French, there appeared and multiplied a thing unknown to our Europe, a being of frightful shape, a large and powerful moth, marked plainly enough in yellowish gray, with an ugly death's head. This sinister creature, that had never before been seen, alarmed the rural regions, and appeared to be an augury of the greatest misfortunes. In reality, those who were terrified by it had brought it upon themselves. It had entered the country as a caterpillar upon its natal plant, the American potato, the fashionable vegetable of the time, extolled by Parmentier, protected by Louis XVI., and spreading everywhere. The *savans* christened this stranger by a name not too reassuring, — the Sphinx Atropos.

"This animal was terrible indeed, — but only to honey. Of that it was gluttonous, and capable of everything in order to obtain it. A hive of thirty thousand bees did not appall it. In the depth of midnight, the voracious monster, profiting by that hour when the outskirts of the city are weakly guarded, with a little dull lugubrious noise, muffled as if by the smooth down which covered him, invaded the hive, sought the combs, gorged himself, pillaged, spoiled, overthrew the stores and the brood. In vain might the attacked party awaken, assemble, and riot; stings

could not pierce the covering, — the species of soft, elastic mattress with which he was everywhere garnished, like the Mexicans of the time of Cortés in their cotton armor that no Spanish weapon could penetrate.

"Huber took counsel with himself for some means of protecting his bees from this daring robber. Should he make gratings? should he make doors? and how? That was his doubt. The best imagined closure possible had the inconvenience of hindering the great movement of exit and entrance always going on at the sill of the hive. Their impatience rendered these barriers, in which they would entangle themselves and break their wings, intolerable to the bees.

"One morning, the faithful servant who aided him in all his experiments informed him that the bees had already solved the problem for themselves. They had in various hives conceived and carried out divers systems of defence and fortification. Here they had constructed a waxen wall, with narrow windows, through which the huge enemy could not pass; and there, by a more ingenious invention, without stirring anything, they had placed at their gates intersecting arcades or little partitions, one behind another, but alternating, so that opposite the empty spaces between those of the first row stood the partitions of the second row. Thus were contrived numerous openings for the impatient crowd of bees, who could go out and come in as usual, and without any other obstacle than the slight one of going a little zigzag; but limits, absolute obstructions, for the great, clumsy enemy, who could not enter with his unfolded wings, nor even insinuate himself without bruises between the narrow corridors.

"This was the *coup d'état* of the lower orders, the revolution of insects, executed by the bees, not only against those that robbed them, but against those that denied their intelligence. The theorists who refuse that to them, the Malebranches and the Buffons, must consider themselves conquered. We

go back to the reserve of the great students of Nature, the Swammerdams, the Réaumur, who, far from contesting the genius of insects, give us numberless facts to prove that it is flexible, that it can increase with dangers and with obstacles, that it can quit routine, and in certain circumstances make unexpected progress."

Intelligence among the inferior animals seems always more or less an affair of acute senses; the bee certainly ought to manifest much of it, for his senses are extraordinary. Not to speak of that singular sixth sense of the antennæ, by whose power alone he fashions his cell and seems to make and receive communication, nor of his wonderful eyesight, to which a double kind of eye contributes, one portion of it being for distance and another for vertical objects or for closer work, — although there are naturalists who consider these stemmata as a possible organ of hearing, — he has a sense of smell which must surpass that of any other creature on the wing: it is perhaps to this lively faculty that he owes his marvellous cleanliness. Féburier states that at one time the bees, attracted by the lemon-trees and flowers of Cuba, emigrated thither in a body from the mainland of Florida, a distance of twenty-five leagues, — the fact, however, being that their owners emigrated and took them with them. But they have been positively known to track heath a distance of four miles, and that across water, through an atmosphere in which the faint scent of the heath must have mingled with all the powerful salt odor of the sea. Strong little wings they must be, too, to travel these distances, and yet perform all the other labor allotted them; for every day, while some with their burdens are entering the black hive, and some are darting out again into the glaring sunlight full of business and on new errands, others may always be distinguished stationed by the door and fanning their bits of wings backward and forward in ventilation of the hive. Although disputatious to the last, Mr. Huish insists that this motion is nothing but the ex-

pression of intense satisfaction and joy. Either way, it would seem as if an answering rest must be required in order to repair such wear and tear; and on this point an old Spanish writer sets it down that bees sleep during every night and on all fast-days in addition, and a corroborating investigator remarks that he has seen them withdraw into the empty cells, and, composing themselves, their heads towards the bottom, enjoy the deepest slumber, the body gently heaving with the breath, and every little limb relaxed, — to which another person replies, that this is an outrageous statement, for it is a decided fact that sleep is as much a stranger to the eye of a bee as it is to the eye of a herring. Yet in the German countries much of the labor of flight is after all spared them, their owners collecting them into caravans, conducting them gypsy-wise, encamping here and encamping there, through whatever districts linger latest in bloom. They build bee-barges, too, in France, capacious enough for a hundred hives, and drift them down the rivers, so that the bees shall follow the summer as it flits southward. And in Lower Egypt, where the blossoming continues much longer than in the upper regions, Niebuhr saw an assemblage of four thousand hives upon the Nile, anchoring at places of plentiest pasturage: the bees thus float from one end of the land to the other before they return and enrich their proprietors with the honey they have harvested from the orange-flowers and jasmies of the Said and all the wealthy banks of the mighty river. The hunter in America takes advantage of this clear sight and of this strength of wing when he lines a bee to its nest, by alluring one to a bait of honey within a circle of wet white paint, watching the subsequent flight, letting off another, similarly secured, at right angles to that, and looking for the nest at the intersection of the two white lines. Nor is the hunter their only depredator. At the Cape of Good Hope there lives a bird known as the Honey-Guide, that enters into alliance with man, sounds its shrill note, and, flut-

tering from spray to spray, leads the way to the sweet resort: it would be sacrilege, if the Hottentot did not leave a portion of the honey to the informer. There, too, is the rattel, a little beast that at sunset shelters its eyes with a paw, for clearer view, spots a bee, and follows it: often these two make fellowship together, the one for the honey, the bird for the brood. But these are not the terrors of a temperate clime; the hives can despatch a field-mouse unassisted; the master who cannot rid them of the wax-moth they will desert without regrets; sounding the slogan for aid, no two bees will hesitate to grapple with the bold butchering wasp that invades them; the humble-bee, making her underground nest, the poppy-bee, fitting her splendid scarlet tapestry, however many each may have, reck of few enemies beyond the rain and storm. What should any one of them all remember about the tomtit that comes and taps outside and snaps each resident up as it appears inquiring at the gate? of the little feathered monster that tears bees to pieces, making shreds of heads and wings for his mere amusement? To them a briefer memory makes brief life blessed. The happy murmurer of our morning knows of little but peace and security, he does not even dream that *savans* infuriate

themselves about him, he buzzes from flower to flower, daringly puts aside the curtain of sacred shrines and makes himself luxurious hermitage in the snowy depths of the lilies, lets the south wind swing him a moment on the golden cradle of kingcups, pursues his pleasures in the purple recesses of the hyacinth, or, gliding into a labyrinth of petals, between the silken linings of perfumed chambers, the tinted sunlight softly sifting through, revels with the gracious nymphs that wait there, that hail him, caress him, and give him their confidence all under the rose; he goes his way, and his music spurns the trail of melancholy that never fails to follow the most delicious warble that ever trilled from throat of bobolink or thristle. As you lie and listen, in the golden tenor of the hive-bee's hum seems diffused the wide whisper of continuous gladness; and giving the innermost note of summer and of noon, the booming bass of the humble-bee blazons abroad all poetry and beauty and sumptuous delight.

“ Hot midsummer's petted crone,
Sweet to me thy drowsy tone
Tells of countless sunny hours,
Long days and solid banks of flowers,
Of gulfs of sweetness without bound
In Indian wildernesses found,
Of Syrian peace, immortal leisure,
Firmest cheer, and bird-like pleasure.”

COUNTESS LAURA.

IT was a dreary day in Padua.
The Countess Laura, for a single year
Fernando's wife, upon her bridal bed,
Like an uprooted lily on the snow,
The withered outcast of a festival,
Lay dead. She died of some uncertain ill,
That struck her almost on her wedding-day,
And clung to her, and dragged her slowly down,
Thinning her cheeks and pinching her full lips,
Till, in her chance, it seemed that with a year
Full half a century was overpast.