whither they go. Doubt the first, as to whence they come, it is not difficult to solve, though perhaps with the most presuming of flies, as with the most presuming of folks, the more we pry into their places of birth, the more we may be inclined (but with the insect not justly) to hold them in contempt, suffice it, that as the domestic fly makes himself quite at home in our houses, so has his parent, in an incubous, made herself equally free of our stables, where she finds a hotbed for her eggs, and in the same a provision for her infant race. There, in the first and wingless state of maggot or larva, they commence thus early, their important use of helping to rid the earth of all things that offend, and on how grand a scale they are able to carry on this operation may be surmised from this fact, that a single fly will lay no less than 177 eggs. House flies come then chiefly from the stable, the road, and the grazing meadow; though some nearly resembling them come from other places, and exist in their earliest stage on vegetable, instead of animal substances. *Among these we have noticed a very common species*, which finds its first "bed and board" between the upper and under skins of dock leaves, burrowing and feeding on the pulpy flesh. From spring to autumn, we may see them thus busily employed, merely by holding and gathering to the light such leaves as are to be found continually *so* adorned by large, discoloured, transparent blotches, the outward tokens of their inward presence. These, from the above habit, may be ranked among a sect of insect labourers or feeders of more classes than one, hence called leaf miners, some of whose, winding ways we mean, by-and-by, to follow.

For query the second, and that just now is more pertinent to the season, of whither flies go on the arrival of winter, it still remains, we believe, a problem not yet completely solved even by naturalists, who have maintained opinions on the matter nearly as different as on the hybernation of swallows. A great proportion, no doubt, perish from cold, or the many accidents to which their weakness and growing torpor render them, as the year declines, more and more exposed.—Yet how few comparatively of the swarms so agile, head downwards on the ceiling, do we ever perceive (or our housemaids either) stiff and stark, legs upwards, on the floor? That fly survivors there are laid up snugly in secret hybernacula, is further evidenced by the few which are often seen emerging from nobody knows where in mild winter weather, also by those more lonely bodies tempted by the warmth of the fire to creep forth even in nipping frost. Under such forlorn circumstances a fly becomes, to us at least, an object of absolute interest; our dislike, amounting almost to an antipathy, of the intrusive, buzzing, pilfering, booting, tickling varlet, one of the dusky legions which "possess" us in the month of August and September, is converted into sympathy for the poor, mateless, friendless, shivering, silent creature, *lured by deceptive warmth to quit the shelter* of its winter asylum. We would make him as welcome now to his tiny bit or sup as the red breast to his crumbs of comfort, and on occasion would even stretch out a willing finger to save him a flood of milk, or a morass of honey. Yet more, when thus rescued and set, damp or dripping, on the heated mantelpiece, we have often watched with curious and interested eye the poor pilferer's gradual restoration, marking how at first languidly, and then with increasing briskness, he busies his handy claws now, cat-like, stroking and wiping his head and face and large moveless eyes, then with his hinder limbs performing the like operation on his wings and body.

How does the fly feed?—the "busy, curious, thirsty fly, that drinks with me," but does not "drink as I," his sole instrument for eating and drinking being his trunk or sucker, the narrow pipe, by means of which, when let down upon dainties, *he is enabled to imbibe as much as suits* his capacity. This trunk might seem an instrument convenient enough when inserted into a saucer of syrup or applied to the broken surface of an over-ripe blackberry, but we often see our sipper of sweets quite as busy on a solid lump of sugar, which we shall find, on close inspection, growing "small by degrees," under his attack.—How, without grinders, does he accomplish the consumption of such crystal condiments? A magnifier will solve the difficulty, and show how the fly dissolves his rock, Hannibal fashion, by a solvent, a salivary fluid passing down through the same pipe which returns the sugar melted into syrup.

The fly is a perfect insect (*or image*,) having already passed through its two preparatory stages of transformation, those of larva and pupa, corresponding to what, with the bottle fly, is more generally known as caterpillar and chrysalis; so that, like the butterfly, when winged it grows no more. Those middle-sized fly gentry, also nearly equalled, which form the main body of our parlour visitants, are altogether a different species to those of much lesser or greater magnitude, such as some tiny frequenters of flowers, the pouncing blue-bottle, and the black, and gray chequered *blow-fly, those poets pre-eminent of the ladder*, which, as every cook knoweth, are neither,

"Hatched on the road—nor in the stable bred."

Numerous gray-coloured varieties may be seen between spring and autumn, and in September, nearly altogether, grouped in a *tableau-vivant*, settled and sipping on the honeyed clusters of the Michaelmas daisy, that last starry heaven of their existence, at all events of the year. Later still, towards the end of October and beginning of November, when taking a noon-day walk under a southern ivy-covered wall, *you may* be sure to see some or all of them come out to meet you from their dark-green bush of shelter. Even now, if you examine closely between the wall and the ivy stems which embrace it, you may detect behind them many a refugee of the revolutionary year, and you may, perhaps, be rewarded for your trouble by turning out from the shelter, in lieu of a sleepy fly, a hybernating butterfly—

"Starting the eye
With unexpected beauty."

Once more to our picture. You know, we suppose, that the fly has a pair of wings but a hundred to one if one out of a hundred has ever noticed that she has a pair of winglets (or little secondary wings,) and a pair of poisers, drumstick like appendages between the main wings and the body, employed for assisting and steadying her flight. These poisers are much more conspicuous and easily observed without a magnifier in the gnat and in the father-long-legs insects belonging to the same order as flies.

Did it ever occur to you to notice the prismatic painting of a fly's nervous pinion—the iridescent colours wherewith its glassy membrane seems overlaid? If not, only look, we pray you, in a proper light at the next of its kind you may chance to meet with, and if, as is most likely, it *comes, to tell you a pleasant tale of approaching* spring-time, we are verily sure that you will see a hundred rainbows painted on its wing.—*Episodes of Insect Life.*

Arts and Manufactures.

ECONOMIC SCIENCE—IMPROVEMENT OF CALICO MANUFACTURE.

At the annual meeting of the British Association for the advancement of Science held at Ipswich recently, Dr. Lyon Playfair, at a meeting of the Section on Chemistry, read a communication from a Mr. Mercer, "on a new method of contracting the Fibres of Calico, and of obtaining on the Calico thus prepared Colours of much *Brilliancy*," *which seems to offer an improvement* of no little value to the manufacturer. Mr. Mercer, who commenced his experiments in 1844, has ascertained that a cold solution of caustic soda—has a peculiar effect on cotton fibre, causing it to contract and remain so, permanently, after the soda has been washed out. Caustic soda, as Dr Playfair observed, has long been used in the process for bleaching cottons, but this power of altering the structure of the fibre, he says, only belongs to the cold solution. The degree of condensation is equal to form one-fifth to one-third of the total volume of cotton employed. The practical applications of the discovery may be inferred. The first obvious one would be that of converting coarser into finer fabrics, which is effected by taking a coarser fabric and steeping it in the proper solution of caustic soda, in which the contraction of fibre imparts to it a fineness of appearance not before possessed. Dr. Playfair exhibited to the Section specimens, brought from the Industrial Exhibition, and said the improvement is so great that, if the finest calico in England, "known as 180 picks to the web, was thus acted upon, it immediately appeared as fine as 250 picks. Dr. P. also exhibited stockings of open casting condensed in this manner into great closeness. *Another application would be* the improvement of colors, to which the condensation imparts depth and brilliancy. The effect of this alteration of texture," says a notice of the paper which we find in the Athenæum, "was most strikingly shown by colours. The pink cotton had its tint deepened to an intense degree by the condensation process. Printed calico especially with colours hitherto applied with little satisfaction as lilac, had strength and brilliancy; besides thus producing fabrics cheaply finer than can possibly be woven by hand. The effect was shown of patterns being formed by portions of a surface being protected by gum from condensation. Thus patterns of apparently fine work can be easily produced. It was stated that the fabrics by this process have much strength given them—for a string of calico one half condensed by caustic soda will break by 20 oz., while the unacted upon string broke with 13 oz." Mr. Mercer's paper was deemed of sufficient importance to be made the subject of a discussion between such men as Faraday, Dumas, and others; and it was proposed that microscopic examinations should be made for the purpose of ascertaining the mode and date of the change effected in cotton fibre by this new process, which as the reporter declares, "bids fair to exercise an immediate and extensive alteration in the patterns and produce of cotton fabrics."

Miscellaneous.

EDUCATION OF THE HEART.

It is the voice of the age to substitute learning for wisdom—to educate the head, and forget there is a more important education necessary for the heart. The reason is cultivated at an age when nature does not furnish the elements necessary to a successful cultivation of it; and the child is solicited to reflection, when it is only capable of sensation and emotion. In infancy the attention and the memory are only excited strongly by the senses, and move the heart; and the father may instil more solid and available instruction in an hour spent in the fields, where wisdom and goodness are exemplified, seen and felt, than in a month spent in the study, where they are expounded in stereotyped aphorisms.

No physician doubts that precocious children, in fifty cases for one, are much the worse for the disciplines they have undergone. The mind seems to have been strained, and the foundation for insanity is laid.

When the studies of maturer years are studied into the head of a child, people do not reflect on the anatomical fact, that the brain of an infant is not the brain of a man, that the one is confirmed, *and can bear exertions; the other is growing*, and requires repose, that to force the attention to abstract facts, to load the memory with chronological and historical or scientific detail, in short, to expect a child's brain to bear with impunity