hibernation and open it again in the spring. Possibly from this habit was developed the instinct to build a door with a movable hinge. In the trap-door species of *Lycosidae,* like, for instance, *Lycosa opifex* of the Russian steppes, the hinge is weak and the lid of the burrow is kept normally shut by being very much thicker and heavier at its free margin opposite the hinge so that it readily falls by its own weight. In the burrows made by the Mygalomorphae, on the contrary, the hinge is strong and highly elastic, its component silken threads being laid on in such a way that the door shuts with a snap when the occupant has passed in or out. The lid is sometimes thin and wafer-like as in the burrow of the species of *Nemesia,* sometimes thick and cord-like as in that of the species of *Cteniza* or *Pachylomerus.* Its upper side is always covered by the spider with pieces of the vegetation growing hard by, so that, when the door is closed, the position of the burrow is completely concealed. If an attempt be made by any enemy to lift the lid, the spider seizes its inner side with his fangs and striking his claws into the walls of the burrow offers the greatest possible resistance to the efforts of the intruder. When on the watch for prey the spider slightly raises the lid and, peeping through the chink, darts like a flash upon any beetle or fly that unwittingly passes within reach. Quite commonly the burrow has a second passage running obliquely upwards from the main passage to the surface of the soil, and this sub- sidiary track may itself be shut off from the main branch by an inner door, so that when an enemy has forced an entrance through the main door, the spider retreats behind the second, leaving the intruder to explore the seemingly empty burrow.

There is no doubt that the primary influence that has guided the evolution of the architecture of the burrowing spiders has been that great necessity for the preservation of life, avoidance of enemies and protection from adverse physical conditions like rain, cold or drought. And when we turn to the other line along which the web-building instinct has been developed we find that the primary guiding influence has been that second great vital necessity, namely the necessity of getting food. Reference has already been made to the silken tube or tent, of simple structure, with an orifice at one or both ends, as the possible origin of all snares, however complex they may be. Perhaps the most rudimentary form of snare arose from the spinning of threads round the mouth of the tube to hold it in place. Be that as it may, the snare in many instances, as in that of the *Agalenidae (Tegenaria, Agalena),* a family closely allied to the *Lycosidae,* is a horizontal sheet of webbing, upon which the spider runs, continuous with the lower half of the aperture of the tube, of which it is simply an extension. A very similar sheet is spun by a species of *Linyphia,* one of the *Argyopidae,* but in this case there is no tube connected with the web and the spider hangs suspended beneath the horizontal netting. Snares of another type consisting of a tangled mass of threads amongst which the spiders pick their way with case, but which are impassable to insects, are spun by members of the *Theridiidae* and *Pholcidae;* but by common consent the so-called orbicular web, so characteristic of the *Argyopidae* but by no means confined to them, is regarded as manifesting the greatest perfection of instinct in snare-spinning. These webs, which are typically subcircular in form, consist of a system of threads radiating from a common centre and crossed at intervals, and approximately at right angles, by a series of concentric lines, the whole being suspended in a triangular, quadrangular or polygonal framework formed of so-called foundation lines, attached to the branches or leaves of trees or other firm objects in the neighbourhood. Passing back from the centre of the web to the underside of an adjoining leaf or some other sheltered spot runs a single thread, the trap line affording passage to the spider to and from the sheltered spot and the snare itself. At whatever spot an insect becomes entangled in the frame, the vibration set up by its struggles is transmitted along the nearest radiating thread to the centre and thence up the trap line to the shelter where the occupant lurks awaiting the signal. No sooner is the vibration perceived than the spider descends with all speed to the centre, and by feeling the ends of the radiating lines learns which is ashake and rapidly, without the possibility of mistake, makes its way to the entangled insect. The probable reason for the wall-lines being concentric is that lines passing over the radii as nearly as possible at right angles are the shortest that can be laid on; they therefore use up a smaller quantity of silk and take a shorter time to spin than threads crossing the radii in any other direction; and at the same time they afford them the greatest possible support compatible with delicacy and strength of construction. On account of its delicacy no web is more difficult to see than one of the orbicular type above described. Its whereabouts is thus, to a great extent, concealed both from enemies searching for spiders and from insects suitable for food; and its open meshwork of strong threads makes it much less liable to be beaten down by rain or torn to shreds by winds than if it were a flat sheet of closely woven silk. In constructing, therefore, a snare of radiating and concentric lines, it seems that a spider economizes both time and silk and in addition renders the web as strong and as serviceable and yet as delicate and invisible as possible.

Perfect orbicular webs are made by many genera of *Argyopidae (Zilla, Meta, Gasteracantha)*, the best-known example being that of the common garden spider of England, *Arαnea* or *Epeira diademata',* but these webs are not associated with any tubular retreat except such as are made under an adjoining leaf or in some nook hard by. Some tropical members of the family belonging to the genus *Nephela,* however, spin a web which is intermediate in structure between that of *Αranea* and the complete sheet-like web of *A galena.* It covers an area of about one- third of a circle and its radiating threads diverge from the mouth of a funnel-shaped tube resembling in every respect the tube of the last-mentioned genus. Again some species of *Dictyna,* belonging to the *Amaurobiidae,* also have a tubular retreat opening on to the surface of a snare in which a crude attempt at a radial and concentric arrangement of the threads is per­ceptible. The interest of these two types of web lies in the fact that they bridge over the structural gap between the simple sheet-web of *A galena* and the perfected orb-web of *Aranea.*

*Dictyna* may be cited as an example of a group of spiders, sometimes called the Cribellata, which have certain spinning glands and appliances not possessed by others. These glands are represented externally by a special plate, the *cribellum,* which lies in front of the ordinary spinning mamillae, and by a comb of short bristles, the *calamistrum,* placed in the penultimate segment of the left of the last pair. By means of the calamistrum the silk secreted by the cribellum is teased into a fine thread which is twisted round the main threads of the web, giving it a very characteristic woolly or flocculent appearance.

There are many other uses to which silk is put, besides those mentioned above. By trailing a thread behind them spiders are able to drop from any height to the ground and to retrace their steps with certainty to a particular spot. The possession of silk-glands has also profoundly influenced the geographical distribution of spiders and has enabled them to cross arms of the sea and establish themselves on isolated oceanic islands which most of the orders of Arachnida are unable to reach. This is effected by the so-called habit of “ ballooning ” practised by very young spiders, which float through the air, often at great altitudes, in the direction of the prevalent winds. It was formerly supposed that this custom was peculiar to a single species, which was called the “ gossamer ” spider from the fact that the floating webs, when brought to the earth by rain or intercepted by bushes and trees, coat the foliage or grass with a sheeting of gossamer-like silk; but the habit is now known to be practised by the newly-hatched young of a great variety of species belonging to several distinct families.

As a commercial product spider-silk has been found to be equal, if not superior, to the best silk spun by lepidopterous larvae; but the cannibalistic propensities of spiders, making it impossible to keep more than one in a single receptacle, coupled with the difficulty of getting them to spin freely in a confined space, have hitherto prevented the silk being used on any extensive scale for textile fabrics.