

Part 1.

Dragonflies are rapacious insects of large size, brilliant colors, and very striking form. They fly by day throughout the summer season about the borders of every pond and stream and are well known to everyone: especially familiar are those forms that skim over the mirrowing surface of still water in tireless flight. Their immature stages dwell in the water where they are less easily observed; in all stages they are among the more important of nature's lesser carnivora.

The beauty of the dragonfly is that of the sleek, ferocious beast; its agility signifies prowess rather than grace. There are other insects hardly more beautiful but of gentler habits, that have met with more of popular interest and favor.

To the dragonfly are attributed all sorts of malevolent capabilities. The names in common use testify to this; as "devils' darning needles" they sew up the ears of the truant schoolboy; as "snake-feeders" they minister to dreaded serpents; while the belief in their possession of a poisonous sting is so widespread that most persons avoid them as they would wasps or bees. Even Dr. Packard appears to have shared this prejudice; at anyrate he painted a most sinister picture of the dragonfly:--"Not only do its horrid visage and ferocious bearing frighten children, who call it the "Devil's Darning Needle", but it even disturbs older persons so that its name has become a by-word. Could we understand the language of insects what tales of horror would be revealed. What traditions, sagas, fables and myths must adorn the annals of animal life regarding this dragon-among insects. It combines the graces of the Hunchback of Notre Dame and Dicken's Quilp with certain features of its own. Even among insects

a class replete with forms the very incarnation of ugliness and the very perfection of all that is hideous in nature, our dragonfly is most conspicuous. Look at its enormous head with its beetling brows, retreating face and heavy under jaws--- all eyes and teeth--
 and hung so loosely on its short weak neck, sunk beneath its enormous hunch back-- for it is woefully roundshouldered, while its long thin legs, shrunken as if from disease, are drawn up beneath its breast, and what a hobgoblin it is." (Our Common Insects).

Most entomologists, however, do not share the feeling of aversion which dictated this very unflattering portrait. Howard rates the dragonfly next to the butterfly as the most beautiful of our insects. (Insect Book. pg.): and all speak with enthusiasm of the sure and graceful flight, the lacy wings, and of the glittering metallic colors which adorn the body of the insect.

The effortless grace of the dragonfly is marked by a business-like purpose quite in contrast with the dilettante fluttering from flower to flower of the butterfly, but his murderous attacks on small insects trouble us the less when we learn that mosquitos are among his victims. Of course poets have sensed both the beauty and the aerial prowess of the dragonflies; no less a poet than Tennyson was a good observer of their habits, and he left us a most graphic description of their transformations in the oft-quoted lines in "The Two Voices". Their color appealed to Moore, who spoke of the "beautiful blue damselflies, and Rossetti completed a picture of warm, sleepy summer noons with these lines:

"Deep in the sun searched growths the dragonfly,
Hangs like a blue thread loosened from the sky".

Their motions caught Riley's interest:

"And the dragonfly in light
Burnished armor shining bright,
Came tilting down the river
In a wild bewildered flight."

While Longfellow had a similar fancy of an armored knight, for he sings in "Fleur-de-Lis",

"The burnished dragonfly is thine attendant,
And tilts against the field,
And down the listed sunbeam rides resplendent
In steel blue mail and shield."

Their picturesque fitness in association with descriptions of natural scenery has been appreciated by certain Japanese poets as witness these lines gathered and translated by the late Lafcadio Hearne.

There are few more simple or satisfying word pictures than are contained in this couplet by Paul Heyse:

"Ich sitz am Bach, und sehe die Libellen,
Sich fliehen und jagen in der Sommerluft."

Thus the poets of many nations have found inspiration in the life history of the dragonfly, which, grovelling for months in the mud and silt of some stagnant stream, finally with mighty effort casts off the nymphal skin to live thereafter as a lord of the upper air, ever on the wing in the golden sunlight.

Lampert is an enthusiastic admirer of the dragonfly.

"Who is not familiar with the brilliant gleaming dragon-flies? With ever new joy our glances follow the lightning swift, unwearying flight of the larger forms, and the tremulous grace with which the smaller species flutter over the glassy water, alighting now here and now there. The more fervently the sun's rays flood the earth, the more swiftly fly the dragonflies, unceasingly they dart, with a rustling sound, past one's head, their gauzy wings shining in the sunlight, their slender bodies radiant with metallic lustre, and their huge hemispherical eyes gazing in all directions. Iken called them "Wasseryungfern" and "Teufelsnadeln", the former he says is no doubt suggested on account of their slender and graceful bodies, which are more slender in proportion to their size than in any other insect in the whole world.

In the vernacular they are called "Brettschneider", "Augenslosser" and "Himmelspferde". I cannot say whether the French name of "Demoiselles" comes from the same association of ideas as "Wasseryungfern", but, in any case, the English have chosen the most appropriate designation in their term "dragonflies", for these glorious creatures are, in truth, veritable dragons, for while they glide through the air apparently in play, they seize their prey with wonderful cleverness and devour it while on the wing.

This thought has also occurred to other German naturalists, for Oken gallantly writes "Although they certainly deserve the name of "Jungfern" (maidens) on account of their slender bodies, their purity and their shimmering colors, the name would never have been given had their murderous instincts been known; instead of being kindly

disposed and desiring to feed only on the nectar of flowers and on fruits, they are rather far wilder warriors than the fabled Amazons; they wheel incessantly about in the air, only to seize other winged insects and devour them with their splendid teeth."

We find an interesting reflection of the popular attitude toward the dragonflies, as well as a recognition of those "murderous instincts" which Oken so amusingly discusses, in the specific names bestowed by the older entomologists. Their aim in naming a species was not alone to have a name by which it might be conveniently designated, but one which would express some of its striking characteristics. We find a whole series of names connecting the dragonflies with snakes, somewhat as does the popular nomenclature. There is elaps, (signifying a serpent) bace and viperinus (signifying serpent). Among the Li bellula, are L. luctuosa, mournful; L. funerea, of evil omen; L. saturata, gorged, let us hope with mosquitos. One Diplax is D rubicundula, blood red; or imbuta, imbrued with blood; one species of the airy and dainty Heteraerinal, has the appellation longer than its whole delicate self, of H. cruentata--- dyed with blood; while another species bears a name which in all ages and countries has been both feared and hated, H. carnifex, a hangman or executioner.

The dragonflies belong to the order Odonota. There are two sub-orders, the Zygoptera and the Anisoptera, the differences in these sub orders are so marked that they may be readily distinguished even by the most casual and unscientific observer. The Zygoptera are petite and fairylike creatures with slender, gaily colored bodies and delicate wings, the fore wings and the hind wings being

identical in size and shape. When in repose the wings are folded together. The nymphs of this sub-order are also small and slender and have three leaf-like tracheal gills at the end of the abdomen.

The Anisoptera are much larger and more robust, the wings are dissimilar in size and shape, The hind wings being much broader than the fore wings especially at the base. They are unusually expanded in repose. The nymphs are larger and stouter than those of the Zygoptera, and have no terminal tracheal gills, but, instead, a respiratory chamber included within the wide abdomen. The Anisoptera are the dragon-flies proper, while the Zygoptera are usually called damsel flies.

The dragonflies are distributed all over the world, from the tropics to Arctic and Antarctic regions. They are however essentially lovers of heat and are more numerous both as to species and individuals in tropic and sub-tropic countries. The entire number of known species is about 2100, of which 300 are found in the United States. At one time in their history, dragon flies were much more formidable creatures than they are now, for in the Carboniferous rocks are found the remains of insects closely related to our dragon flies, but having a wing spread of twenty-seven inches. Such a "devil's darning needle" might indeed arouse terror in the heart even of the most virtuous of school boys.

In the summer time, then, near every permanent body of water, however small, we are almost sure to find dragon flies of one species or another. They have their times and seasons, however, and a species which are exceedingly common one time may have wholly disappeared a few days later. The smaller species, the Zygoptera

and even most of the *Libellula* do not, under ordinary circumstances, venture far from the pond which was the scene of their nymphal life and which is to be the theater of the culminating event of their life as imagos-- that is copulation and the deposition of the eggs. The large *Geschnids* such as *Anax junius* are much more fearless and stronger of flight and are often found at considerable distances from the pond or lake where transformation took place.