

# Sarah McBride: Pioneer Angling Entomologist

By Kenneth Cameron



SARA J. McBRIDE of Mumford, New York (south of Rochester) was the first American to publish anything original, native and based on field study of aquatic insects. Her work was noted at the time that she wrote, just at the beginning of the last quarter of the nineteenth century, and the flies that she tied were much praised, but she disappeared from the angling scene too soon to fit into the tradition that would, in her absence, begin some years later with Theodore Gordon.<sup>1</sup>

To read her first published essay, "Entomology for Fly Fishers", included here, may at first glance suggest that she was less interested in the angler than in the insect. If, however, the essay's title is taken seriously, it comes into perspective: it is a study of insects *for fly fishermen*, not a study of fly-tying. The fishermen must draw their own conclusions -- often, make up their own patterns. Seen against the background of the age in which she wrote, this approach is understandable and commendable: most fishermen were ignorant of entomology, even of the distinctions between caddis and ephemerid, between sub-imago and imago; as well, they lived in the burgeoning of the American passion for the fancy fly. Non-imitation was the rage, and it was imitation that Ms. McBride preached.

Her heritage was Irish and English, Irish from her fly-tying father and English from the available books on the art. Not surprisingly, the Irish influence showed: considerable interest in the caddis flies; a use of fur bodies; imitation of mayflies with the super-long tails of the "caughlan" style.<sup>2</sup>

Her taxonomy was weak. She put caddis and stoneflies into the *Phryganidae*, a Linnaean classification that had been changed as early as 1840. (See, for example, *Introduction to Entomology*, by James Duncan, edited by Sir William Jardine, 1840). She had evidently not read Ronalds, but she may well have read Taylor and Bowker and others. While she developed several new patterns, most notably the "Bright Fox", she used old ones creatively as imitations of the insects she closely observed. I ascribe her use of existing patterns to her professionalism and to her father; she was a business-woman, after all, whose livelihood depended upon tying flies. Standard patterns were her bread and butter. Yet she recommended the Jenny

1. The principal books that mention her are Charles Stevens' *Fly-Fishing in Maine Lakes* (1881) and Mary Orvis Marbury's *Favorite Flies* (1892). She published in *Rod and Gun* and *Forest and Stream* and advertised her flies in those periodicals in the late eighteen-seventies and the early eighties.

2. See my two-part article, "The Girls of Summer", *The Flyfisher*, V. X Nos. III and IV, 1977.



The McBride House in Mumford, New York.

Spinner as the imago of the Blue Dun, while standard British practice (in Ronalds and Francis Francis, for example) made the Jenny Spinner the imago of the Iron Blue or the Little Iron Blue. The Blue Dun -- in Cotton, Chetham, Bowker and Ronalds -- changed into the Red Spinner; yet for McBride, the Red Spinner was the imago of the Great Dun, at least on her home waters.

Of those patterns that are most associated with her -- the Fox series, especially the Bright Fox and the Silver Fox -- there are few precedents.<sup>3</sup> Only "Halcyon" in 1861 and Taylor in 1800 gave attention to the Fox flies, and in Taylor, at least, there is Irish influence. Both mention the Light and the Dun Fox, to which Taylor adds the Ash, but the Bright Fox and its imago the Little Egg are her creations -- imitations of a wonderful sulphur ephemerid and its egg-yolk-colored imago.

It must be remembered in reading "Entomology for Fly Fishers" that McBride was almost certainly thinking of what we would now call wet flies. The floating fly existed, to be sure -- Norris had seen it in the 1860's; Ogden had already introduced it to the Wye; Halford's predecessors were using it on the Dove and Itchen -- but McBride's style of tying was wet-fly and so were her materials. It will be the more confusing, therefore, to read that she clearly intended that the winged insect be imitated and not the nymph. "It is only those insects that in leaving the water rise from the current of the stream" that interest the fly-fisherman, she wrote in "Entomology for Fly Fishers."<sup>4</sup> There are few possible conclusions to be drawn from this seeming paradox; she was a fool who thought that the floating insect looked just like the underwater insect (patently not true on the evidence of her own writing); she was talking about dry flies even though she never mentioned them (unlikely because of the few precedents); she lived among fishermen who fished dry but had no theory for it, much as Halford was doing in the same years (possible, and an intriguing idea I am a little tempted to believe); she never thought about what she was

3. Actually, the fly most associated with her in the nineteenth century may have been the large fancy fly, the Tomah Joe. Several versions of its origin are in print; however, if the whole Wood Duck-feather wings were turned back to back instead of face to face, the result would be a silver-bodied Mayfly -- Ogden's Green Drake, perhaps, with embellishment. The true source may be any of several Irish mayfly imitations for lakes.

4. Elsewhere she wrote that "it is only when (aquatic insects) assume the perfect form . . . and with gossamer wings float in the air, that they are of interest to the fly-fisher . . ." and "It is that insect floating off into a new element that the fish are watching and waiting to feed on." ("Metaphysics of Fly Fishing.")

doing but simply tied imitations of the winged insect (possible, but it does not jibe with what we know of her.) I would point out that Spring Creek (her Caledonia Creek) is about as close to a chalk stream as one will get in New York State and that its fishing conditions are very similar to those of Halford's streams - - abundant hatches, clear water, slow but powerful current, heavy vegetation, numerous and free-rising trout (even if they were brook trout). The existence of pockets of specialized angling practice is too well proven elsewhere - - the floating fly on the Wye and perhaps the Axe, the tiny, soft-hackled nymph in the border country - - to say that such a thing was impossible. However, if we even seriously entertain the speculation that a group of New York State anglers was fishing the surface in 1875 on a limestone stream, we must admit that they were probably not false-casting and that they did not fish with flies tied to float - that is, they did not use out-turned wings made from matched feathers and, except for the Hare's Ear, they did not use materials chosen for their floating qualities. What they *may* have done was use a "dry" fly in the sense that both Norris and Pulman meant the word - one fresh from the fly-book - - and they may have fished with the wind at their backs to dap the fly on the surface, and they may even have cross-lined as the Reverend Durnford did on the Itchen in 1809 to keep his fly afloat.

Or it may simply be that a tradition-bound Sara McBride tied flies as she had been taught even though the styles violated her own observation. The flies would have caught trout because

they were superb imitations of emergers, even to the suggestion of husk in the hair bodies and the air bubble caught in the delicate fur. They may have been fished slightly below the surface (downstream, although that is far from certain) and manipulated slightly against the current.

How the nymph can have gone so long ignored by her - - and others, of course - - is a maddening mystery. The woman had an aquarium, and her remarks indicate that she almost certainly used a microscope, yet nowhere does she ever even hint that imitating that "anatomical structure (which) is grace and symmetry combined", would have advantages for the fly fisherman. And to suggest that the trout were simply too easy to catch with existing flies is nonsense. She noted elsewhere the frustration on Caledonia Creek of the angler using the wrong fly. Even then, the trout did not leap out of the current and commit suicide at the fisherman's feet.

Sara J. McBride was born in 1844 or 1848, depending upon which United States Census one chooses to believe. (In 1870, she gave her age as twenty-two; in 1850, her age was given as six.) She began to publish in 1876. She disappeared from the angling press in 1880. Yet, in those few years, she proved herself a unique and talented pioneer in American fly-fishing - - not infallible, not perfectly creative - - as "Entomology for Fly Fishers" will, I think, show. She set about to build a strong foundation of observation and fly-tying skill, but nobody put a structure on it, and, like those weed-choked cellar holes one finds in the woods today, her work was forgotten.

## Entomology for Fly Fishers

by Sara McBride  
Edited by Ken Cameron

The following article by the pioneer American Angling entomologist Sara J. McBride first appeared in the Rochester, New York "Express" of 15 February 1876; it was reprinted as "Entomology for Fly Fishers" in "Rod and Gun" for 3 March 1877.

### Beside the Singing Stream <sup>1</sup> A Study of the Insect Fauna of Caledonia Creek <sup>2</sup> The Phases of Insectivorous Life Trout and their Habits

Mark well the various seasons of the year,  
How the (succeeding) insect race appear;  
In this revolving moon one color reigns,  
Which in the next the fickle trout despairs.

**T**HE habits of aquatic insects have always been a fruitful theme for contemplation and study, although a subject of which the very best entomologists know comparatively little. Our accomplished lady contributor, Miss McBride, who resides, so to say, almost on the famous trout stream of Caledonia, has been an assiduous student of this branch of entomology, and therefore writes of it and describes it from individual observation and experience. If the theory of prevailing opinion be correct that in order to fish successfully the angler must use an imitation of one or other of the natural insects on the water at the time, a familiarity with their habits cannot be too highly estimated by the angler who would aspire to well-filled baskets. <sup>3</sup> Be this as it may, a knowledge of the habits of insects which abound more or less on all streams where the trout "most do congregate" is always a matter of pleasing



Two flies associated with the McBrides, taken from Stevens' FLY FISHING IN MAINE LAKES (1881): No. 5 is the Tomah Joe, and No. 2 is the Fiery Brown.



study, and does much to enhance the pleasures of this, pre-eminently, the "contemplative man's recreation." We trust to hear further on this subject from our esteemed contributor, at a future date. -- ED. EXPRESS.

1. The original title. The first paragraph was not reprinted in *Rod and Gun* and is not McBride's.
2. Now Spring Creek in Monroe County, New York. A remarkably rich stream, it was the site of Seth Green's hatchery and is still prime trout water. A year after McBride's study, it was the subject of another article that, sadly, did not cite her work and whose author had not consulted with her. He had dealt with Green, who was far less knowledgeable in the field of aquatic entomology. (See J.A. Lintner, "Report on the Insects and Other Animal Forms of Caledonia Creek, New York", New York State Fishery Commission Tenth Annual Report, 1877-78, pp. 12-36.)
3. The theory of imitation is not usually thought to have been "prevailing" in this country in 1876. However, it may well have had local importance on Caledonia Creek and similar limestone streams.

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About one-half of insect life feed, breathe and sport in the water. In the grace of their movements, in the quick adaptation to circumstances, they show a joyful feeling of pleasure in their existence. Some live an aquatic life in all its three phases, others in two, and some in but one. It is a strange instance in the economy of nature that although insects use the six feet in walking, yet for swimming the latter two pair are only employed. The forelegs when not adapted for prehension are partially aborted. All aquatic insects that I have been able thus far to rear feed on vegetable matter on exclusion from the egg. After the second and third molts that appetite varies. A large proportion are nocturnal, both *larvae* and *imagines*.<sup>5</sup>

Springs, rivers ponds and pools have their own peculiar insect fauna. In some there is an excess; in others a marked scarcity. The essential elements of a rich fauna are sunlight, healthy vegetation and uniform temperature. These Caledonia Creek possesses in a wonderful degree.<sup>6</sup> There is also an equilibrium of the forces of nature that preserves each species in the same proportion for successive years. Carnivorous devour gregarious, multitudes remain; some denizens devour all species; multitudes of all species remain.

The *larvae* of all the insects are fish food, and in this connection there is this query - - Do trout burrow in pursuit of food? I have found the *larvae* of insects in their stomachs that feed and transform buried in the soft mud eight, ten and twelve inches below the water. Although there are so many and various forms of life, yet the imitation of comparatively few can be used by the fly-fisher. *It is only those insects that in leaving the water rise from the current of the stream and those that in returning to the water to perpetuate their race, hover over the current.*<sup>7</sup> The reason of this is apparent to those who know the habits of trout. Whether insects feel the vibrations of sound with their antennae or have auricular orifices is a disputed question. They certainly hear some way. It is the music of the ripple that guides them back, sometimes a mile or more, and they will always be found in the greatest abundance where there is a dam or break in the current, causing the flow of the water to be heard at a greater distance.

The trout understand this and congregate in such places to feed; for trout, although gorged to repletion, will rise to their favorite food - - the fly, that comes to them like manna from above.

The largest of articulate life is a crawfish, *Cambarus acutus*.<sup>8</sup> The young are found in April and May among the leaves of the water plants, feeding on *Entomostacea*, water fleas and small *Ephemerina*;<sup>9</sup> later in the season, and when fully grown, they burrow under gravel and stones. There is but one other *Crustacea* in the stream; it belongs to the family *Gammaridae*. It is these as a food that give the *Salmo fontinalis*<sup>10</sup> of the stream their peculiar color flavor and numbers. In life the color of the *Gammarus* is a uniform dark green. After death, they turn a

4. What follows is McBride's. The *Express* and *Rod and Gun* versions are identical, with minor variants as noted.

5. Scientific names are generally italicized in *R. & G.*, left in Roman in *Express*.

6. The Creek still has enormous beds of cress and a constant temperature that varies from 48 to 52 degrees F. year-round.

7. So italicized in *Express*, not in *R & G.*

8. Lintner, "Report", cites a "craw-fish, *Cambarus Bartonii* (Fabr.)". McBride's Latin terminology is often inaccurate.

9. *Ephemerina* is used by McBride for the small *ephemerids*.

10. The trout of Caledonia Creek were brook trout; browns were not introduced until some years later by Green. Lintner, "Report", found the stream's plants "swarming" with *Gammarus fasciatus*, probably the gammarid referred to by McBride.

bright salmon. An infusion of them dried, with the addition of a mordant, colors a permanent rosy salmon. Twenty-five or thirty of these small pigments form but an ordinary meal for a trout. The *Gammarus* are single brooded - - dying in April and May. The young resemble the parents. Their food is decaying vegetation and vegetable mold.

The *Ephemerina* differ in many respects from the type. They are of small size, triple brooded, or with a succession of broods;<sup>11</sup> the second wings rudimentary. They live twenty-four, thirty-six and sometimes forty-eight hours after leaving the water before casting the last parchment-like covering. After this they live about the same number of hours before they perish. The germ cells, from thirty to forty in number, are inclosed in a globulous gelatinous membrane that expands in contact with the water, and adheres to any object it meets. The food of *larvae* and *pupa* is decaying vegetation and vegetable mold. Their anatomical structure is grace and symmetry combined, and actively swimming up, down and round through the water their tactics are continually of the defensive. When placed in a position of danger, or if taken from the water, they throw their *setae* up at right angles with the body, and present such a formidable appearance that if one were not certain of their harmlessness they would prefer to handle them with gloves.

The *Ephemerina* leave the water mornings and evenings, the greater number in the evenings, and if the sun is obscured they will rise all day. When ready to leave, they swim to the surface and lie in the current. The case slits open on the thorax, a pair of wings unfold and are held upright, the head and feet are drawn out; it rests on the old hull an instant while the abdomen is being freed, and flies away to cast the last covering. It is then brighter colored and more transparent, so that *imago* and *subimago* are known by different names to the angler.<sup>12</sup>

*Potamanthus rufescens*, (sic) "blue dun" and "jenny spinner", leaves the water, if the weather is favorable, in the middle of March. *Boetis longicauda*, (sic) "great dun" and "red spinner", the first of May. The "dark fox" and its *imago*, the "silver fox", the last of April. The "bright fox"<sup>13</sup> and its *imago*, the "little egg", the first of May. This is the most abundant fly on the stream. The "brown coffin" and its *imago*, the "gray coffin", the first of August.<sup>14</sup>

The *Pbryganina*, "Case worms," Caddis bait, "are the best known of water insects.<sup>15</sup> There are in the stream twelve distinct species, nearly all vegetarians, and partly nocturnal in their habits. The *pupae* are quiescent, and when ready to transform rise to the current, leaving the water just before twilight. The

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11. The meaning is unclear. Brooding - - reproducing - - three times a year?

12. Indeed. Most fishermen of the day thought them quite different insects.

13. McBride's nomenclature is unfortunate. Apparently neither *Potamanthus rufescens* nor *Boetis (sic) longicauda* has ever been correctly applied to an American insect. (I am indebted to Professor George F. Edmunds, Jr. of the University of Utah and to Professor Lewis Berner of the University of Florida for checking this for me in detail; the information is from their correspondence with me.) As well, her use of English patterns to match these insects, whatever they were, is idiosyncratic, but it suggests that she worked from careful observation and not from theory - - an excellent example for a fly fisherman, a rather poor one for a scientist who wished to communicate with others in the field. Any attempt at correct imitation is mere guesswork. The Bright Fox is still used on Spring Creek during the abundant hatches of the natural.

14. I do not believe she meant the modern Coffin Flies here, but the Irish "Cofflin" or "Coughlan", very long-tailed imitations of *ephemerids*.

15. The confusion of caddis and stone flies is, again, unfortunate. Lintner, "Report", cited several species of caddis and noted their abundance; despite her error here, McBride showed a healthy awareness of the importance of the caddis, perhaps because of her fly-tying heritage from Ireland, where caddis were very important.

larvae weave coverings of fine silk, some employing extraneous matter for the dress, others using it only as a ballast, but each species clinging to its own style of garment through all time. One species selects three small branches, varying from one to three inches in length, places them longitudinally around the body; inside of this is another covering of finer texture. This is the "pale stone fly". It begins to leave the water in November, on warm days through the winter, and in March and April. Another larva that feeds on the leaves of the water-cress, building laterally and forms a rhomboid case, using only what silk is necessary to bind the pieces together. This is the "stone fly"; it leaves the water and is found hovering over it in July, August and September. One species weaves together small snail shells, first eating the toothsome mollusk. Its costume is thus a series of spiral folds. This resembles in color the preceding. Two use sand and gravel, adding on as they increase in size. One is the "poor man's fly." It leaves the water in April. The other is the "wren hackle".<sup>16</sup> It is seen the most in July. Two use silk only. One of these is shaped like a horn. It is the raven of the stream, and "comes off" in June and July. The other resembles a cucumber seed, and is the "black hackle" for June, known in Pennsylvania as the "June Spinner."

The sub-family *Rhyacophilidae*, of which there are three species in the stream, weave tents of silk with two entrances. This is a place of rest and refuge, leaving it to seek their food. They are all solitary in their habits -- quiescent pupa and single brooded.

There are two species of dragon flies, *Odonata*, single brooded, hibernating in the larvae form. Their food varies in different stages. I have noticed this in connection with all the *Odonata* I have reared in aquaria -- twenty varieties. Up to the time of the third molt, their food is vegetable matter. After this they live on small *Ephemerina* and other small insects until fully grown and ready to leave the water. They are rapid swimmers, using the feet as oars and moving with an undulating motion. They are fond of coming to the surface, and if disturbed, by a sudden contraction of the trachea they will spurt a spray of water eight or ten inches; the same movement impels them suddenly away. There is the same contraction when they dart for their prey; throwing out the long under lip, they grasp and swallow instantly. Authors have often referred to this contraction, and considered it their only method of propelling themselves through the water.<sup>17</sup>

The *Diptera* are all small-sized species, and belong to the families *Chironomidae*, *Tipulidae* and *Simuliidae*. *Chironomous* larvae are slender, worm-like, distinct head, one pair of prolegs and retractile anal hooks. Their food is decaying vegetation. Pupae are in a thin, rude case, formed of debris; transform in two weeks to a graceful fly with large feathered antennae, transparent wings shorter than the abdomen; hibernate in the larvae form, doublebrooded. There are five species. The first brood appears in March and April; the second in August and September. They leave the water almost invariably in the morning. They are named, piscatorially, "black gnat", "dark claret gnat," "bright claret gnat," "gray gnat," and "Olive gnat". *Tipulidae* larvae are a dirty green color, scaly head, almost entirely drawn within first thoracic segment, without feet, live on vegetable mold and growing confervae. They are

single brooded and hibernate in the pupa form. *Simulium* larvae are maggot-like, without feet or distinct head, transparent, varying in color according to the vegetation they feed on; spin a slipper-shaped pouch for the pupa; transform in three weeks; are triple brooded.

The *Coleoptera* are nocturnal.<sup>18</sup> In the winged form they breathe by coming to the surface. They take occasional flights, flying with a heavy whirring sound. They are strong, rapid swimmers, using their feet as oars. When seized, they emit a milky fetid liquid. *Hydroporus piceus* is olive black, an inch and a quarter long. Its armor is a sharp spine on its breast. The larvae is a soft fleshy grub with well-developed mouth parts, when grown three inches in length. If touched, they emit a black liquid; it discolors the water and enables them to escape. They are herbivorous. In the late fall they leave the creek and seek neighboring pools, where they live in torpor until the following April. The *Dysticidae* have earned their reputation as water tigers. Besides insect larvae they attack tadpoles, mollusks and young fish, and if hungry they will not spare their own species. They are dark brown, with stripes of paler brown on the exterior edge of the elytra; are large, burly beetles, and when flying, have an alar expanse of over three inches. The *Gyrinidae*, or whirligigs, are all small-sized beetles, oval, some bluish black, others brown. They will be seen in numbers, swimming in circles near the surface. They rise from the water and fly when pursued by fish, and dive to escape the water scorpions. They are remarkable for the arrangement of their eyes, which are apparently double. The lower eyes look into the water, the upper eyes into the air above. I have traced five species of this family through the different stages, and there are at least five more in the stream.<sup>19</sup> Of all insects that creep, fly or swim, the water scorpions (*Hydrocorisae*) are the most destructive. They seem to kill and destroy to satisfy a feeling of wanton cruelty, and nothing but a living, breathing meal will satisfy their appetite. Clumsy swimmers, they lie in wait and dart on their prey like a cat. Of the genus *Nepa*, there are two species, oval, very flat, and of an ashy gray color. One species is two and a-half inches long. The body is terminated with two grooved threads, through which the adult insect breathes. *Ranatra fusca* has a long linear body, its respiratory tube consisting of three grooved threads an inch in length.

18. Again, McBride gives no pattern for the water-beetles. British tradition relied on small Hackles and a few patterns like the Welshman's Button.

19. Lintner, "Report", identified eleven.



The Silver Fox, believed to have been tied by Sara McBride.

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16. The Poor Man's Fly was an old pattern; the Wren Hackle, (or Wren's Tail), no longer seen because the feathers are not available, is a very small, very delicately colored fly using a wren wing feather as hackle.
17. McBride gives no dragon-fly imitation. One had been offered as early as Rennie's *Alphabet of Angling*, 1833 (whose fly illustrations were pirated for Scott's *Fishing in American Waters*, 1869) but the fly was certainly not popular. I have known one instance of enormous success on Maine brook trout when dragon flies were hatching, with big Wulffs and fuzzy nymphs. Anglers of McBride's day may have successfully used the popular Brown Hackle, knowingly or otherwise.