

# THE SCIENTIFIC FISHERMAN

by WILLIAM W. MICHAEL

**T**HE LEGENDARY COUNTRY BOY with the bent pin and the willow pole, which he cut from a bush along the creek that flows through his farm, showing up the city sportsman with his expensive tackle on the hard-fished streams of America has long ceased to exist. In fact, this small boy probably never did have much success. He served and still does serve a useful purpose in the comic strips and on some of the calendar pictures.

The man who has studied his subject or hobby and worked over every phase of it is the man in whom you will place your faith; not the small boy who knows practically nothing of the habits of trout.

This man has in his leisure moments studied the dry-fly techniques from every angle. He has devoted much time to close observation of all the factors which contribute to success. You hear him talk about insect life—the different species of insects, the time of year they are in evidence, their life cycle, and their artificial imitations. He has studied the streams, and although he may not be an expert hydraulic engineer, he knows

stream currents and velocities. He can tell by looking at the stream surface just where there may be a probable lie for a good fish.

His friends may think that all he knows about optics is limited to what he sees through his bifocals; they may be surprised to learn he has made a careful study of what the trout sees of our world of air and sunshine from its underwater domain. From his knowledge of optics, this man knows just how to approach a feeding fish so he will not be visible to his quarry.

His knowledge of chemistry may be limited to the fact that baking soda may neutralize his acid stomach induced by an overindulgence in hotcakes and syrup before he took to the stream that morning. However, he will carry a stream thermometer, and when the temperature rises beyond a certain point, he knows the oxygen content of the water will be less and probably the fish will be found near the cold-spring runs.

When it comes to psychology, he undoubtedly will admit that all dry-fly purists, including himself, need

*Reprinted by permission of the McGraw-Hill Book Company, Inc. from the forthcoming book, DRY-FLY TROUT FISHING, by William W. Michael to be published in April. Copyright, 1951.*

the attention of a psychiatrist, but he is too busy with his sport ever to consult one. His mental attitude will play an important part in his success.

All these factors, together with many others, may readily be classed under the heading of the part played by the sciences. Let us take them one by one and look into their relation and application to dry-fly fishing.

## Entomology

One who has never had the cycle of life of the common stream insect brought to his attention has missed one of the most interesting things in trout fishing. Briefly, it is about as follows: In its initial state an insect is a larva. Grubs and caterpillars, for instance, are larvae. From the larva stage, the insect passes into the pupa and last to the imago, or fully developed insect. A pupa may be likened to the caterpillar and the imago to the butterfly. In so far as it affects the trout fisherman, the metamorphosis is as follows: The female fly deposits its egg on or in the water of the stream; in turn the egg sinks to the bottom and hatches into the larva, which in the pupa stage may or may not incase itself in a covering attached to a stone, log or twig on the stream bottom. In the course of time, usually anywhere from one to three years, certain physical changes take place, until finally the insect is ready to dispense with its covering, rise to the surface, and take to the air. The imitation of this rising nymph from the stream bottom is the common, artificial wet fly.

After the natural nymph reaches the surface, its wings unfold, and it flies away, a fully developed insect. Before flying from the water, it often rides along on the surface while the wings are drying and developing. It is at this stage that the trout fisherman imitates the natural with his floating dry fly. This word "imitates" sounds exceedingly simple, but so many things actually come into account that effective imitation is the most difficult thing the dry-fly fisherman has to contend with.

When this phenomenon is taking place—when new life is being born, the nymphs are rising to the surface, and the fully developed insect is floating on the water—the fisherman speaks of a "hatch." It is his greatest wish, when he is on the stream, that a hatch may develop. Naturally, this is the time that the trout are on the prowl for food. If he can imitate this hatch and simulate its performance, then his chances of good fishing are at a peak.

I have stood beside the pool of one of my favorite streams in the Catskills of New York of an evening and have seen literally hundreds of insects emerging from the surface of the water. So many have been in the air at a time that it was possible to catch some of them in one's hand; one could examine the sample and frantically search through his fly box in hopes of finding a correct imitation of a natural.

We find that on the Eastern streams the "May-fly" season is at its height somewhere from the middle of May until the middle of June. No definite time can be set, however, for this peak. Much depends on seasonal

conditions. If given one month to fish the streams of the Catskills, I would, on the average, choose from May fifteenth to June fifteenth. If given my choice of time for my favorite Rocky Mountain streams, I would probably select from the middle of August to the middle of September. This is not necessarily due to the fact that in the Rockies the biggest and best hatch takes place at this time but more to the fact that by the middle of August the water has dropped to a low level, and the fish appear to be hungrier for a surface food than early in the season. With a dry fly in this region, I have found, after years of experience, that the longer I stayed, the better the dry-fly fishing became. Unfortunately, I was never able to stay long enough to see what might happen after the tenth of September. I had not yet reached the point, if ever I will, of economic security whereby I could fish as long as I desired. I still have to work in order to eat in order to go fishing.

To the American fly fisherman there are probably some four different kinds of natural insects which are of special interest.

1. Neuroptera (nerve-winged insects)
2. Hymenoptera (insects which have a wasp waist)
3. Coleoptera (beetles)
4. Diptera (two-winged flies)

Taking the Neuroptera, we may subdivide them as far as the angler is concerned into Ephemeroidea, which include the May flies, the duns, and the like; Perlidae, which are the stone flies; Trichoptera, which include all the caddis flies; and Chrysopidae, the so-called lacewings and the Sialidae or alder fly.

Ephemeroidea are most plentiful on the Eastern streams during May and early June. They can be recognized by

CONTINUED ON PAGE 18



*Bill Michael ties a dry fly*

their upright wings and long tails. Often they may be observed floating downstream by the hundreds with their wings erect, glistening in the sunlight.

The Perlidae, a subdivision of the family of Neuroptera, are the so-called stone flies which have their habitat in the larval stage on the stony bottom of the stream.

The Trichoptera are the familiar caddis flies. Every fisherman, be he wet or dry, is familiar with the caddis cases found clinging to submerged sticks or to the rocks on the bottom of the stream. Often the bait fisherman will extract the larva from these cases and use it for bait. In cleaning trout one often finds their stomachs full of these caddis cases, a favorite food. The eggs are laid in the water in a gelatinous state, and when the larvae emerge, they incase themselves with any material available, which they cement together to form the "caddis case."

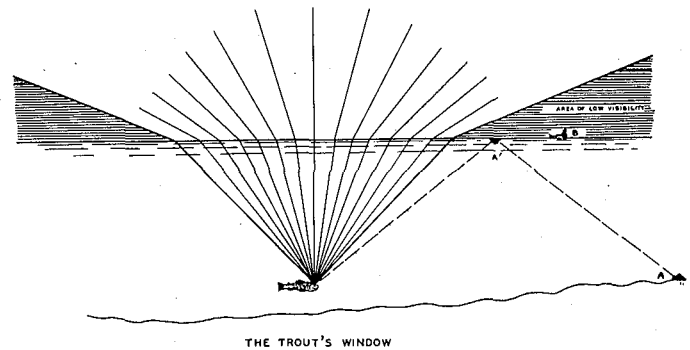
The Hymenoptera are not aquatic insects but at times, through accidental or other causes, do get on the water. They include all the wasp-waisted insects, such as ants, bees, yellow jackets, wasps, and the like.

The Coleoptera, or beetles, are not of interest so much to the dry-fly man as they might be to the wet-fly or bait fisherman.

The Diptera flies, so named because of their two wings, are usually and most commonly used by the dry-fly man in a form tied small as a gnat, the Black Gnat and Green Gnat being typical examples.

Optics

In order to get the trout's point of view, one must mentally project himself into the trout's environment underwater. This introduces a study of optics. A trout usually points upstream into the current, and for that reason the dry-fly fisherman approaching from downstream has the distinct advantage. What the fish sees of our world is limited to what is commonly known as his "window." It is as though the underside of the surface of the water were a mirror with all the stones and other objects on the stream bottom reflected against it, except directly overhead, where there is a circular area through which the trout looks into our world. This can be seen more clearly in the drawing above. The fish's vision is restricted to reflected rays from objects outside the water. A ray of light coming from directly overhead will go directly to the fish. Any ray coming from any other point except directly overhead will be refracted, the angle to the horizontal becoming flatter as the edge of the window is approached. Remember that this window is circular and can be compared to a funnel with the small end at the fish's eye. Finally, we reach a point, shown by the very heavy line in the drawing, where only a small portion of the rays will penetrate the water. Most of them will be reflected up,



so that anything will be less visible to the fish in the shaded area than in the nonshaded area.

The first time I ever was aware of being able to approach closer to a trout in shallow water than in a deep pool was many years ago on a tributary to the famous Esopus in the Catskills of New York.

I had been using a No. 14 Light Cahill fly and had been concentrating my efforts on the deeper runs. I had not been too successful and had attributed the fact to the time of day. It was around two o'clock in the afternoon, not the most propitious time of day for a dry fly. However, with the sun at my back, my shadow must have fallen on the water, and at my advance I observed many fish dart away out of the deeper runs.

As I waded upstream through the ankle and knee-deep water, I saw several fish wait until I was a few feet from them before they would dart away to seek shelter from me. Here, for the first time, I started to analyze the situation. Why could I approach so near to these trout, often seeing them before they saw me? Without trying to get the answer, I immediately changed my tactics and started to reverse my procedure by fishing the shallows and passing up the deeper runs. I started to take fish on what were relatively short casts. That evening I took out pencil and paper and went to work. By the aid of a sketch of the trout's window and the area of vision he covers, it was not long before I had the simple and logical answer to the problem; viz., the nearer the surface the trout may be, the more restricted is his vision. His window area is in proportion to his depth.

In line with this same reasoning, it is my opinion and my experience that the most difficult places to interest a trout with a dry fly on any stream are the deep pools. Not only is the fish's vision area much larger, but also he more often than not is down in the depths of a pool, and the effort to come up through many feet of water to take a surface fly appears to be a useless undertaking. Once in a while he will do this, often at the lower end of the pool where it may shallow off before the water spills out over the downstream end. When he is in this part of the pool, he has purposely taken up a feeding position in the shallower portion of the pool in order to command a better view of the approaching food. Once he returns to the depths, it is extremely difficult to interest him in anything except bottom food. It does not pay to spend too much time

CONTINUED ON PAGE 20

casting over the very deep water. I must admit, however, that these are the very intriguing portions of any stream, and the chances of a big trout in these waters is excellent. We all try them, I know, for the attraction of the big ones is difficult to resist.

The often repeated warning not to let your shadow fall on the water is excellent advice. However, the fish does not have an eyelid and cannot close his eye as a human being does; consequently, when the sun is shining on the eye which is on the side of the sun, it is more or less blinded. This gives the fisherman a distinct advantage if he approaches the fish between the sun and the fish rather than on the shaded side. By casting the fly on the far, or shaded, side, he causes the trout to see it with his eye away from the sun.

Another point to remember is to keep as low as possible, trying to blend in with the foliage, if there is any. Also, one's clothing should be of a subdued color. Avoid wearing anything white, remembering that reflected light from a white object will carry to the trout almost as readily as though a mirror were reflecting the light. And don't forget that a rod held high is more visible than one held low with the cast being made from the side.

It is questionable whether or not the sight of a fish is as important as his reactions to vibration. There is a so-called lateral line running along the fish's side marking a highly sensitized nerve. It is this lateral line that warns him of approaching enemies by the vibrations set up in the water. For this reason, extreme care should be taken when wading and walking along the banks, particularly if they are undercut as we find them in some of the meadow streams. Authorities have stated that the ear of the trout is rudimentary; its chief function is to maintain a sense of equilibrium.

## Chemistry

Chemistry enters into our fishing to a slight extent. We know that a range of water temperature from 50 to 65 degrees Fahrenheit is the most ideal range for dry-fly fishing. When the water reaches 74 degrees, it is almost impossible to interest a fish in any artificial fly. The oxygen content of water is proportional to its temperature. As the temperature rises, the oxygen content diminishes, and the activity of the fish also diminishes. It is for this reason that the expert will carry a stream thermometer to determine whether or not the maximum temperature has been exceeded. If at all possible, he will seek those places where spring runs enter the stream or where the more aerated water is.

## Meteorology

The subject of meteorology has definitely some bearing on trout fishing. It is known that the barometric pressure influences the results to a marked extent. On a falling barometer the fisherman may as well stay at

home as far as any fly fishing is concerned. Once the barometer reaches its lowest point, it may linger there until the storm center has passed, and his chances may slightly improve. Once, however, the barometer starts up or is in a high position, the prospects are excellent. We do not know why an approaching storm affects fishing, but I have seen this condition hold in almost every instance.

## Psychology

What would we see if we were trout? What would we eat? Where would we be? After fishing for years on many streams, one finds that the answers to these "trout-world" questions become a matter of simple logic. It has best been spoken of as "fish sense." It can be gained only by experience, constant observation, and perseverance.

Probably we are prone to credit a trout with much more sense or intelligence than that with which he is actually endowed. After all, the brain of a 14-inch trout occupies a space about the size of a pea. His nervous system is not too highly developed. It must be fear and fright rather than pain that cause him to fight the tension applied to his tackle by the fisherman. You may readily prove this fact if sometime you will deliberately ease off on the battling trout once you have hooked him. More often than not he will cease his struggles and either slowly swim away or remain stationary in the water until you again stir him up by applying tension.

Trout are on the search for food all the time unless their feeding is interrupted by the approach of some potential enemy. The great bulk of their food supply comes from under the water and not from the surface. Much of it is obtained from under the stones on the bottom, from caddis cases attached to sticks and stones, from food washed into the stream when a storm causes a runoff from the adjacent banks. Relatively a very small per cent of their sustenance is derived from the surface feed. No one seems ever to have explained the psychology of a trout's fondness for the very small tidbit he gets from a floating fly. One writer has mentioned that probably a surface-feeding trout expends more energy and burns up more fuel to rise to the surface in order to take a floating fly than is replaced by the nutritive value of the fly itself. It is possible that if a fish fed exclusively on the surface he might, according to this supposition, eventually starve to death!

The intriguing thing about this dry-fly game is the absolute uncertainty of it. You most likely will have several days in a row that have been so successful you come to the conclusion you have the game licked, and from now on it is going to be an easy matter to take as many fish as you want. All at once comes a day when try as you may the fish will not cooperate at all with you! When this occurs, are we put in our place? Decidedly so! Maybe there is more than fish psychology in this performance on the part of a cold-blooded animal with such a small brain. After all, what a fool it can make of a man!