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Thought this was an excellent read so I pasted it to here. Enjoy.

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The first home my wife and I owned stands on the edge of a small coal town in the mountains near Altoona, Pennsylvania. The house is bordered by forest land, and a cold but blemished trout stream flows there. I knew about the stream when we bought the house, but I didn't expect much from it. Above town, pungent fluorescent-orange tributaries discharge acidic mine effluent into the stream. And polluted water eventually paints the streambed a sickly carrot color approximately 10 miles below town. But we lived in the space between the orange stretches, where a cool spring day streamside could make you forget what lies above and below town.

One day I stopped at the bridge on my way home from work to look at the stream. I was shocked by what I found. Small pale insects fluttered off the water and raced toward streamside vegetation, trying to avoid the dive-bombing swallows.

I could tell from my perch on top of the bridge that they were mayflies, and I was so excited I climbed down a muddy bank in my good shoes to try to identify them. I remember thinking, "If these things can live here, they can live anywhere." They were Sulphurs, hundreds of them. And trout were rising to eat them, just as if men and coal mines had never existed.

So what exactly is a Sulphur? This term is most accurately used to encompass two well-known mayfly species *Ephemerella invaria* and *Ephemerella dorothea dorothea*. Other unrelated mayflies, including *Epeorus vitreus* and *Leucrocuta hebe*, are also commonly corralled into the Sulphur genre.

Lumping these mayflies together often leads to confusion and the use of ineffective hatch-matching techniques. These various Sulphur species live in diverse habitats, and they complete their life cycles in distinct ways. Fly fishers who can identify individual Sulphur species, and adjust their techniques and fly patterns accordingly, have the most success.

### The Big Sulphur

The Big Sulphur, *E. invaria*, is the first Sulphur to appear each season. Entomologists have studied this mayfly closely and recently merged *Ephemerella rotunda* into it. Fly fishers used to identify *E. rotunda* duns by their "rotund" bodies—supposedly bigger and more robust than *E. invaria* dun bodies—but "rotunda" is no longer an

The Big Sulphur is the most common Eastern Sulphur hatch. One of the reasons it's so widespread is its high tolerance for pollution compared to most mayflies. It often reappears long before other species in streams where catastrophic aquatic insect kills have occurred. The Little Juniata River, central Pennsylvania's Spring Creek, and the little orange trout stream near my former home were all repopulated by Big Sulphurs during the early stages of their rehabilitation.

In Pennsylvania, *E. invaria* hatch as early as the second week of May, and anytime thereafter until the first or second week of June. Fly fishers in the south, where spring comes earlier, witness the hatch in early May, and those in the north see some of the season's final fishable Sulphur hatches. This hatch progression, from south to north, can be applied to all the various Sulphur species.

Because *E. invaria* begin to appear near the end of the Hendrickson hatch (in watersheds where they cohabitate), some anglers mistake Big Sulphurs for female Hendricksons. Both mayflies are approximately the same size (#14-16) as duns and both have three tails and gray wings. More confusion arises in watersheds where female Hendrickson bodies, which are often shades of pink, are colored light tan to yellow. But female Hendrickson wings are usually darker, and their tails are more noticeably barred than those of Big Sulphurs.

When *E. invaria* first emerge in May, they usually hatch in the early afternoon and continue until dark. The hatch timing is a blessing if you live close enough to a trout stream to fish for a few hours after work. It's one of my favorite hatches, because when Big Sulphurs are on the water I typically find rising trout, even after I close the fly shop for the evening.

Tan-bodied *E. invaria* spinners gather over riffles at dusk. The males arrive first and wait for the females to join the cloud. After mating, the females fly to streamside vegetation and wait for their eggs to ripen. Anglers often become impatient while waiting for the spinners to reach the water, and sometimes they leave too early. Patience is key. Once the females return, egg laying commences, and the spent spinners fall to the water.

*Ephemerella septentrionalis* is another large Sulphur, though it is much less common than *E. invaria*. This #14-16 mayfly usually emerges near the third week in May. The duns have three tails and yellowish-orange bodies, which look similar to *E. invaria*. But *E. septentrionalis* has distinctly longer legs. Thankfully, trout don't usually measure mayfly legs, so fly patterns designed for *E. invaria* should work fine if you encounter an evening *E. septentrionalis* emergence.

I fish the various Sulphur hatches with a 12-foot leader and an additional 2 feet of 6X tippet because the trout have usually been exposed to a great deal of angling pressure by the time these insects emerge. Longer leaders are also more effective at this time because the creeks have usually receded from their early spring levels, increasing the natural wariness of the trout.

A long leader will not help you catch fish if you cannot effectively turn over the fly to make a good presentation, so use the longest leader/tippet combination that you feel comfortable casting.

I prefer flush-riding dun and emerger patterns for imitating *E. invaria* because the naturals often emerge in the surface film. Many of my favorite mayfly patterns are parachutes. Bucktail Parachutes (#14-16) are particularly effective for this hatch. The flies float well when they are greased, and tiers can create limitless body colors by twisting together several strands of dyed bucktail. Imitating the exact color isn't necessary because there is so much variation in mayfly color, but Bucktail Parachutes allow you to suggest several body color shades in one fly pattern. The twisted bucktail fibers also give the flies a realistic segmented appearance.

Snowshoe Emergers also catch fish during Big Sulphur hatches. I use a fairly significant clump of snowshoe

rabbit foot fur for the wing to make the flies more visible.

## The Little Sulphur (AKA Pale Evening Dun)

The Little Sulphur (*Ephemerella dorothea dorothea*) is the second most common Eastern Sulphur hatch. This insect was formerly known as *E. dorothea*. Its name was changed when it was regrouped as a subspecies with the Western Pale Morning Dun (*Ephemerella dorothea infrequens*).

Little Sulphurs begin emerging in late May and continue into mid June. They overlap with the end of the Big Sulphurs, and sometimes hatch simultaneously. Little Sulphurs are a summer staple on the East and West branches of the upper Delaware, where they can appear daily for nearly three months (from late May through August), with afternoon emergences blanketing the water. A significant amount of cold water has to be released from the reservoirs for the Sulphurs to appear.

It's possible that upper Delaware Little Sulphurs produce more than one generation per year because they last so long and their size diminishes as the hatch progresses. This anomaly could be created by the artificially cold water temperatures generated by the reservoirs.

In most Eastern limestone and freestone trout streams, Little Sulphurs usually emerge in large numbers at dusk. The tan-colored spinners sometimes form mating clouds so dense it appears as if there's a hazy fog suspended over the riffles.

It can be difficult to know exactly which mayfly stage trout are eating because this all takes place near dark, and some trout key on spinners while others eat emergers and duns. Little Sulphur hatches and spinner falls commonly coincide with Green Drakes and the remnants of the March Brown hatch. But much to the dismay of anglers fishing #10 Green Drake and Coffin Fly patterns, the trout seem to prefer #18 Sulphurs.

Little Sulphur males have exceptionally large red eyes, and fly tiers often finish their flies with red thread to imitate them. Female eyes are much smaller and insignificant for anglers. Both male and female body color ranges from deep orange to pale yellow with hints of olive.

My Truform Sulphur (#16-18) is effective during long-lasting hatches like the Little Sulphur, and it is usually the first pattern I use. Burk Emergers are my second choice. This pattern's brown mink-hair trailing shuck gives the fly the helpless appearance of a struggling mayfly. Its CDC wing stands clearly above the water while its body dangles seductively beneath the surface, making the pattern easy to see and often irresistible to fish.

## The Vitreus

*Epeorus vitreus* has no standard common name, and though some anglers call them "Big Sulphurs," they aren't related to *Ephemerella invaria* or *Ephemerella dorothea dorothea*. They share the color of female Little Sulphur abdomens—pink to deep orange—which prompts some anglers to equate them with Sulphurs. Other anglers identify female *E. vitreus* with the names Pink Lady or Pink Cahill because of their size (#12-14) and color, though they aren't really related to any of the other mayflies we call Cahills, either. "Epeorus" signifies that they are more closely related to Quill Gordons (*Epeorus pleuralis*) than to Sulphurs or Cahills.

The *E. vitreus* emergence usually begins near the end of May, overlapping Big and Little Sulphurs, and adding to angler confusion. I've also fished *E. vitreus* hatches in September. The duns are smaller—approximately #16—but other than their size, they are identical to their late spring parents. This indicates that *E. vitreus* may produce two broods a year, and that the September brood is the mysterious "Peach Mayfly" described in some Catskill fly-fishing literature.

If all *E. vitreus* looked like the male of the species, anglers may have called them Blue-winged Olives. Male *E. vitreus* generally have pale olive bodies. Both males and females have two tails and watery, light dun wings. *E. vitreus* spinner bodies become more intense shades of their dun body colors. The males turn deep olive, and the females, a darker orange or pink. Some anglers call female *E. vitreus* spinners “salmon spinners,” because of their salmon color. *E. invaria* spinner bodies are also a tannish orange to deep orange color, so they can be mistaken for female *E. vitreus* spinners. But *E. invaria* and *E. vitreus* spinners are easily differentiated by counting their tails. Big Sulphur spinners have three tails, and female *E. vitreus* have only two.

The two most common Sulphur species, *E. invaria* and *E. dorothea dorothea*, swim to the surface as nymphs and emerge into duns in, or just below, the surface film. This trait increases the effectiveness of fishing emergers—and dun patterns with trailing shucks—for these hatches. But the best way to imitate *E. vitreus* emergers is with traditional, standard wet flies, tied with a duck quill or mottled feather fiber wing. *E. vitreus* leave their nymphal shucks on the stream bottom, and they are already fully formed duns by the time they reach the water's surface (just like Quill Gordons). Anglers often ignore this important emergence characteristic and treat *E. vitreus* like just another Sulphur hatch.

Anglers won't find *E. vitreus* hatches in every trout stream that has Big and Little Sulphur hatches, but if your stream has an *E. vitreus* hatch, it probably also has the more common Sulphurs. *E. vitreus* are extremely intolerant of water pollution; they live only in cold, clean water. Anglers fishing more pristine Eastern trout waters should not underestimate their importance. If you're struggling to catch trout during a Sulphur hatch, look more closely at the mayflies that are emerging and make sure you are not trying to imitate *E. vitreus* with fly patterns and techniques designed for *E. invaria*.

Use standard parachute patterns with dubbed beaver fur bodies to imitate *E. vitreus* duns. I fish two-toned parachutes with a bright orange abdomen and a pale olive thorax to imitate the multicolored females. But a solid, pale olive body better imitates the male.

## Hebe

*Leucrocuta hebe* (formerly known as *Heptagenia hebe*) is another mayfly often confused with Sulphurs.

Hebes have a long emergence period, beginning in the summer and lasting through the fall, so in some watersheds they can overlap with the more common Sulphur hatches. Hebes are easily confused with *E. dorothea dorothea* because they are approximately the same size and both have hints of olive in their bodies. Hebes turn dark brown when they become spinners, and anglers could also mistake the yellowish-brown Hebe spinners for tan-colored Sulphur spinners.

Physically, Hebes differ from *E. dorothea dorothea*. Their bodies are a cross between Little Sulphurs and Blue-winged Olives—they aren't really yellow, but they are not olive either. Yellowish chartreuse is the best way to describe Hebe body color. They have two tails, instead of the three tails found on *E. dorothea dorothea*. Another simple way to differentiate them from Little Sulphurs is to look at their wings. Sulphur wings are solid gray, without prominent venations. Hebe wings are usually lighter gray with strong, dark gray venations, and their hind wings are much larger than Little Sulphur hind wings.

Hebe nymphs emerge into duns just beneath the surface, not usually in the film, and they often escape the water quickly. This means that emerger patterns, and duns with trailing shucks, are less effective for imitating Hebes than they are for Little Sulphurs. Spinner falls often occur at dusk, but may occur earlier in the day during cool weather. Spinner falls provide the best fly-fishing opportunities during periods of warmer weather when duns are less likely to spend extended periods of time on the water.

Compara-duns are my first choice for imitating Hebe hatches during cool weather when the duns spend more

time on the water's surface. But Catskill-style dry flies sometimes catch more trout during warmer weather. These high-riding patterns provide the illusion of a mayfly getting ready to take flight. Hebes often escape the water quickly after they emerge, so emergers are generally unimportant, but unweighted Pheasant Tails dead-drifted about 6 inches below the surface are good imitations of emerging Hebe nymphs.

## The Great Equalizer

Though knowing the correct scientific names for the various Sulphurs won't impress the fish you're trying to catch, it is important to understand that all Sulphur hatches aren't the same. You will become a better, more proficient angler by understanding the differences among all the mayfly species.

The Sulphur is the great equalizer of Eastern mayfly hatches. Some of us may never have the opportunity to pursue Penns Creek's fabled Green Drakes or the Catskill's legendary Hendricksons. But if you live anywhere near Eastern trout waters, there's a good chance you'll find a Sulphur hatch. Knowing which Sulphur hatches reside in the streams you fish helps you catch more trout.