

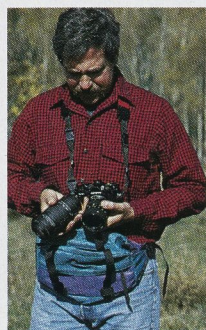
OUTDOOR SKILLS

TED KERASOTE

CAMERAS FOR THE FIELD

Point-and-shoot cameras can produce excellent photos, but they do have limitations. Try to photograph a V-formation of geese high overhead, and the birds appear as tiny dots. A fleeing buck develops into nothing but a blur, and a delicately colored sunset can become no more than a dark horizon.

Although a single-lens-reflex (SLR) camera accompanied by several lenses is capable of making great photos of the above subjects, such a system comes with associated costs: steep purchase price, weight, and time invested in learning how to use it. However, there is a third choice: an autofocus, autoexposure SLR with a zoom lens. With such an outfit even the novice can take excellent photos in many difficult situations, while more advanced photographers can exercise their creativity by using the camera's manual controls to



Keep size and weight in mind when buying.

adjust focus, shutter speed and aperture. This means that a hunter, fisherman or backpacker can carry one camera body fitted with a 28-105mm zoom lens (total weight, about 2 1/4 pounds) and make a wide range of photographs.

AUTOFOCUS SYSTEMS

Canon, Minolta and Nikon are the current leaders in these sorts of cameras. Canon makes the EOS Rebel, EOS 630, EOS 10S, EOS RT and EOS-1 (\$170 to \$1000); Minolta, the Maxxum 7000i, 8000i and 7xi (\$300 to \$450); and Nikon, the 4004s, 6006 and 8008s (\$250 to \$550). Each company also makes a large selection of autofocus lenses compatible with these bodies. But how to choose one model over another? Consider these points:

1. For the casual snapshooter, price and size are important. Canon's lower-priced models are the lightest and least expensive.
2. Autofocus speed. Since Canon places its autofocus motor in each lens, its autofocus system tends to be a tad faster than the other two.



Some good examples of lightweight outdoor cameras, from left: Minolta, Canon and Nikon SLRs.

3. Compatibility. Nikon is unique in that its autofocus cameras accept all previously manufactured Nikkor lenses, both manual and autofocus. The Canon EOS and Minolta Maxxum bodies accept only autofocus lenses designed for them.

4. For the money, Minolta's Maxxum 7xi (\$450) offers the greatest array of features.

ZOOM LENSES

If you already own an SLR, one or two zoom lenses can turn it into a do-almost-everything outdoor camera. Use a 28-70mm for action, snapshots and vistas; a 70-210mm for wildlife and more intimate landscapes.

The following lenses are compatible with many major brands of camera bodies:

Tamron 28-70mm/3.5-4.5 (\$115) and 70-210mm/4-5.6 (\$120). Weighing 11 and 13 ounces, respectively, these are the lightest manual-focus (MF) zooms around.

Focusing is a bit sloppy, and the photos

they produce are suitable for snapshots,

Nikkor 35-200mm zoom: a compact but sharp lens perfect for those who already own an SLR.

not for enlargements or publication.

Sigma 28-70mm/3.5-4.5 UC (manual focus—\$95; autofocus—\$108 for Minolta Maxxum, \$113 for Nikon, \$175 for Canon EOS). At 12 ounces this, too, is a lightweight lens. Big enlargements will not be perfectly sharp, however.

Vivitar Series 1 28-105mm/2.8-4 (\$210). One of the most useful MF zooms I've seen. At wide angles, it's fast enough for dim light, and at all focal lengths, it's sharp enough for publication.

Nikkor 35-200mm/3.5-4 MF (\$723). If a photographer had to carry only one lens, this could very well be it. It's very sharp, but difficult to find. Try Del's Camera, 330 E. Canon Perdido, Santa Barbara, CA 93101; 805/962-7557.

Tokina AT-X AF 28-70mm/2.8 (\$314). For the price, the sharpest, fastest autofocus zoom around—it's a constant f/2.8 at all zoom settings.

Angenieux 28-70mm/2.6 AF and 70-210mm/3.5 MF (\$1400 and \$1800).

Meticulously built, incredibly sharp and fast, these are the finest zoom lenses I've used. They can be had from Mountain Camera, Box 1848, Jackson, WY 83001; 307/733-7998.

(Prices quoted are average for the discount market.)

WHICH FILM?

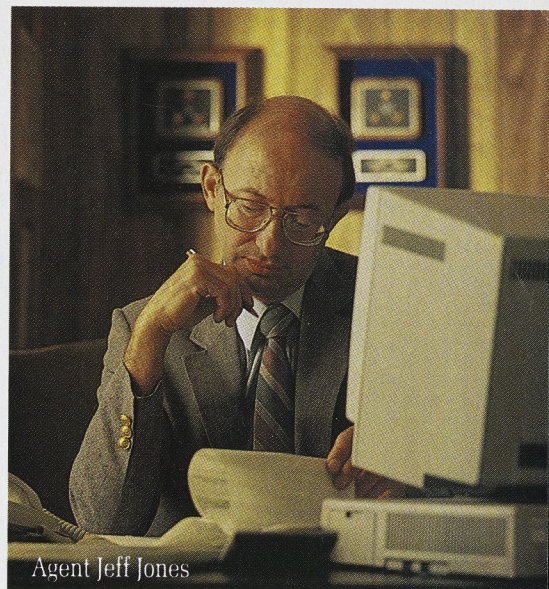
Three films see me through almost all of my shoots. I use Kodachrome 64 for wildlife and sunny landscapes (exposing it at ISO 80 for better color saturation). For people and cloudy days, I turn to Fujichrome Velvia (ISO 50). When I run out of light, or I have to use a telephoto, I'll push Velvia to ISO 100, and the results have been excellent—grain equal to Kodachrome 64 and a modest increase in contrast. For low-light situations, I shoot Kodachrome 200, and if I have to, I'll push it to ISO 400. Shot at 400, it offers better results than those high-speed slide films actually rated at this ISO.

You must tell your lab you've pushed your film so it can process accordingly.



Paoli, Indiana since 1972:
3,650 people,
1,260 babies,
2 floods,
2,647 auto claims

...and 1 State Farm agent.



Agent Jeff Jones

Paoli's not a big city by any stretch. But even in a small town like this, things keep changing. They put up a new church not far from the courthouse last year. Families are building houses. Babies are being born. And every time something changes, someone's insurance coverage needs reviewing. That's where Jeff Jones, Paoli's State Farm agent for the last 18 years, comes in.

Like State Farm agents across the country, Jeff offers all his policyholders a free State Farm Family Insurance Checkup. That helps them make sure that no matter what's changed, their insurance coverage won't be out-of-date. Whether it's auto, home, life or health insurance.

In 18 years, about the only thing in Paoli that hasn't changed is Jeff. And that's the way folks in Paoli like it.



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THE EYES HAVE IT

I DO NOT know the statute of limitations in the crime of poaching. Many years ago I drove several hundred miles for a job interview in Plymouth. I did not get the job. In fact, so rapidly did I not get the job that I had time to spare in the afternoon and took a leisurely route home across the moors. I was a bit cross, and I was muttering things when a dip in the small road brought me to a small stream bordered with close-cropped grass. There was no-one in sight.

I got out and looked at the water. It was very clear and inviting. I had a small rod in the car. I rather thought that if I were to see a fish I would be unable to resist a cast or two. I looked very hard. There were trout everywhere, hovering above the bottom and then flashing away from me as I walked the bank, leaving tiny puffs of silt in the current and slipping under the big brown stones in mid-stream. So be it; I would have a cast or two.

Looking guiltily over my shoulder, I skulked a little way downstream where the banks were fringed with a few stunted trees and the stream dropped down a low waterfall into a small pool beside a large rock. I hid behind the rock and flicked a fly up to the bubble and froth where the waterfall emptied. The hungry moorland fish grabbed the fly as if there were no tomorrow — which, for a couple of the fatter ones, there wasn't.

I was watching the steady progress of the fly down the line of bubbles across the pool when a voice, quiet and very close, said: "Any luck?"

How he had come upstream with his dog so quietly I did not know — or care. I was too preoccupied fashioning a convincing, but innocent, explanation for the trout rod in my hand. I blustered something about "... not really fishing, more trying the little rod out — don't suppose there are any fish in the stream anyway..." Frankly, it sounded thin — particularly as I had a brace for supper in my pocket. Then I saw on his face that expression one might use for a small boy fishing in a bucket — more amused pity than anger.

"Well," he said, "I've walked up this river bank most days for eleven years and I've never seen a fish — but good luck anyway".

Pretty soon we had established that he was not a bailiff. I showed him the two nice fish and we walked together up the stream to the car. On the way I tried to show him the fish that were still there in

Spotting fish beneath the water's surface is a skill, claims JON BEER, but the technique can be learned and practised like anything else in fishing

the clear run above the pool. I pointed to a small trout in midstream. "See it?" I asked.

"How?" he asked back.

I was nonplussed. How do you explain to someone how to see? But he was disconcertingly right; seeing fish beneath the surface is just a technique — a skill that can be learned and practised like anything else in fishing.

Why bother? There is a great deal to be said for *not* looking for fish. If you can see them then it is equally true that they can see you. In fact, they can see you much more easily as you are up in the daylight and they are in the relative gloom of the river with a half-silvered mirror (the water surface) between you and them.

There are, however, several

good reasons for spotting fish before you start fishing. The first is illustrated in my illicit fishing on Dartmoor; we all fish better when we know that there are fish to be had, when there could be a take at any second, and when we have confidence that there is something scrutinising the fly. Conversely, it is quite possible for a compulsive fish-spotter to get dispirited if he doesn't see any fish — although they may still be there.

Of course, it is not necessary to see fish below the surface to know that they are there. The sight of a rising fish concentrates the mind wonderfully, but not all fish will be rising (particularly the big ones) and it may be possible to find better, more accessible fish with a careful search of the water.

At the very least, you will look for any non-rising fish that might take fright and disturb the one you are going for. It is all too easy to concentrate on a rise across the water, step carefully into the water only to be startled by a whirl of silt a foot away from your wader as a bigger fish dashes off to wreck the tranquillity of your quarry.

I have to confess slight reservations about what I have just written. It is obviously very sound advice, frequently given, to search and fish the closer water before going for the fish further away in case you disturb the nearer fish. What is not so obvious is how you avoid disturbing the nearer fish if, eventually, you want to go for the one across the pool.

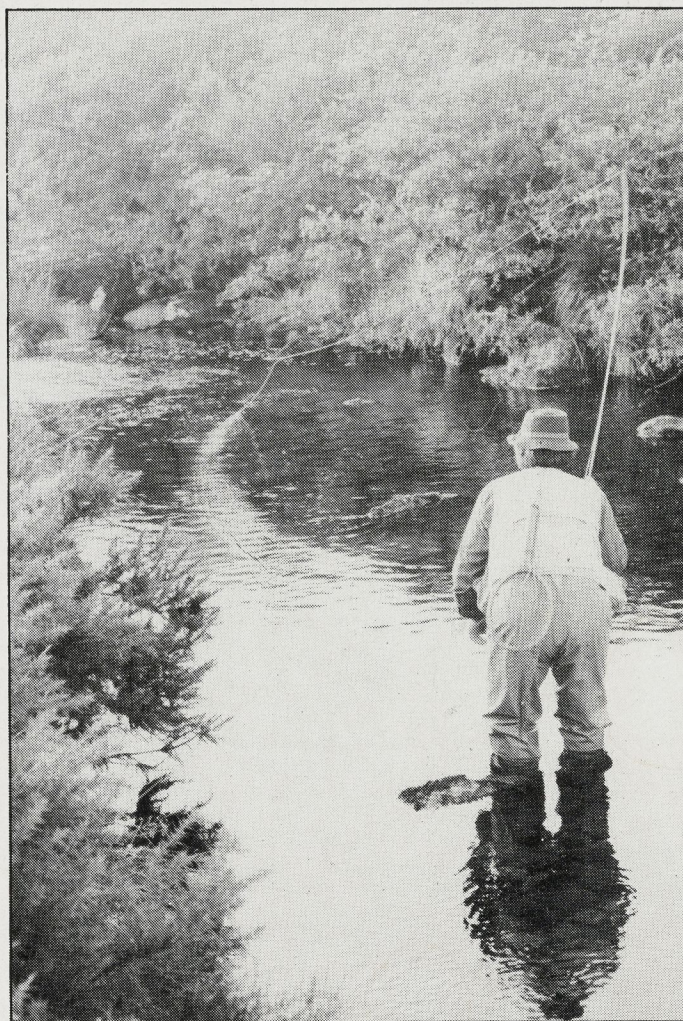
It has always seemed to me that catching the nearer fish is just as likely to disturb the pool as wading carefully through them — and if you don't catch them, which is most likely, you will either have disturbed them anyway or be in the same position as when you started. Better, I think, to try to find some other approach to the rising fish across the pool.

All too often the larger, wiser fish are not those which are rising. If you are after these specimens it will be necessary to watch them carefully and discover what they are eating and their patterns of behaviour. A larger fish, particularly in slower water, will often be taking the natural fly some distance below its habitual station. The trout rises slowly in the water, drifting back with the fly, before committing himself. The angler casting perfectly to the point of the rise may be casting several feet behind the waiting fish.

Seeing the fish beneath the surface may be a luxury in dry-fly fishing, or when the fish are rising. It is vital when fishing a nymph or a wet-fly upstream, when there may be little or no evidence on the surface, that the fish that has taken the fly and is about to spit it out again can be seen.

We see an object when light from the sky is reflected off it into our eyes. Relatively little light enters the water, much of it being reflected away at the surface. Of the light that does enter the water much of it is absorbed by the water itself or by the particles of silt and whatnot, which is why you can't see fish in a brown flood.

More is absorbed by the fish itself, as trout, like most fish, are darker on their backs than on their bellies. The little light that is reflected from the fish then travels up through the water, passes through the surface and from



Spotted, covered, raised and struck. This is the West Dart, in the Dartmoor National Park.

THE EYES HAVE IT

there can enter the eye of the angler.

If that were the only light entering the angler's eye there would be no problem; the eyes would adjust to that small amount of light and we would see the fish as clear as day. Unfortunately, the little light from under the surface is competing with huge amounts from everywhere else, particularly from the sky and reflecting from the surface of the water. The eyes adjust to this relatively bright light and our view of the fish under the surface disappears in the same way as our view of a moonlit garden seen through a window disappears when the room light is switched on.

Freshwater pearl fishermen see perfectly into the water by looking through a glass-bottomed bucket pushed into the surface of the water. The competing light from the sky and reflecting from the surface is cut out by the sides of the bucket and only the dimmer light from beneath the surface enters the eye. Result — a perfectly clear view. I don't recommend this solution to the fisherman. It disturbs the fish somewhat!

The fisherman can do something to reduce the competing light entering the eye. A hat with a large brim will cut out a lot of the sky. A large brim will also cut out a lot of rain down the back of the neck. This is the headgear I use and I can report one drawback — folk laugh at you. Some people prefer a light cap with a large peak. American style, but a surprising amount of light can enter from the side.

If a hat is too hot, try an eye-shade. These are usually white (for tennis) on the upper surface and could have been designed to scare fish. Try dyeing them. For people who really get hot-headed in a hat, Orvis sell a "Solar Helmet", a sort of mesh *sola topi* with an electric fan in the brim,

powered by a solar panel perched on the top of the helmet, and with back-up batteries (not included) secreted under the crown. A word of caution: folk will laugh at you, and one can hardly blame them.

The other source of competing light, reflecting up from the surface of the water, is more of a problem because it is superimposed on the light coming from beneath the surface.

Dark reflection

We see reflected light as an upside-down scene on the water. If that scene is very bright, eg the sky, there will be an overwhelming amount of reflected light and little or nothing will be seen below. If the angler changes position until there is a *dark* reflection on the surface he is trying to peer through, the light from below may be able to compete. A dark cloud is better than nothing, but a high bank in deep shadow is best of all.

Light from the sky "vibrates" in all directions. We cannot see these "vibrations", but some creatures, many insects for example, can. When light is bounced off a shiny surface (a water surface, say) most of that reflected light is vibrating in just one direction, horizontally, having been "polarised".

The glass of polarised sunglasses will only allow light vibrating in one direction to pass through it, and all other light is cut out. When glasses are made the lenses are mounted to cut out horizontally polarised light — the light reflected from the surface of the water.

If you turn the glasses on their side, the reflections will miraculously re-appear. This is worth bearing in mind as you peep round a tree to view the water. The head is rarely held vertically (the way the glasses were designed) and will not be cutting out as much reflection as they can, but try tilting your head from side



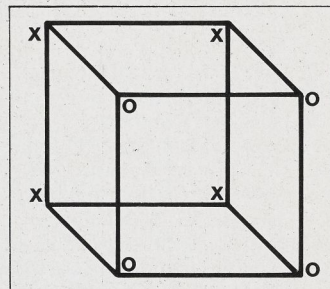
A cautious angler peers round a tree at the water, but the polarising glasses are ineffective at this angle.

to side to get the best possible effect.

There is a penalty to pay for this reduction in reflected light. The light from below the surface is unpolarised, vibrating in all directions, and so the glasses will cut out about half of this valuable light. This is a small price to pay on a bright day with clear water, when there is plenty of light coming from beneath the surface. As the light drops in the evening, or on a very dull day, there comes a time when this reduced light from below the surface is too little to be of any use, and you are better off removing the glasses and coping with the reflections in other ways.

Polarised glasses cut out about half of unpolarised light, so they look "grey" to us. Polarised glasses with some colour tinting will be removing even more light without any advantage, so avoid these. There are super models with small magnifying lenses beneath the polarizing lenses.

If you prefer to wear a hat with a peak, rather than an all-round brim, it is well worth buying the glasses with broad sides, like blinkers, to cut out side light. I once had a pair so surrounded by shields that they were virtually goggles, and any exertion or excitement, like hooking a fish,



One pattern of lines can produce two different objects.

would cause them to mist up, leaving me befogged in a small white world.

So, you have done everything possible to get light from below and cut out light from above. Your brain has to do the rest. Perception (seeing things) does not work passively like a camera; the brain actively constructs a world of objects from a few patterns of light and colour falling on the retina at the back of the eye. You had to learn it at birth, and the angler has to learn to do it all over again. As a first exercise — and to show you that perception is active — take a look at the frame-work on this page.

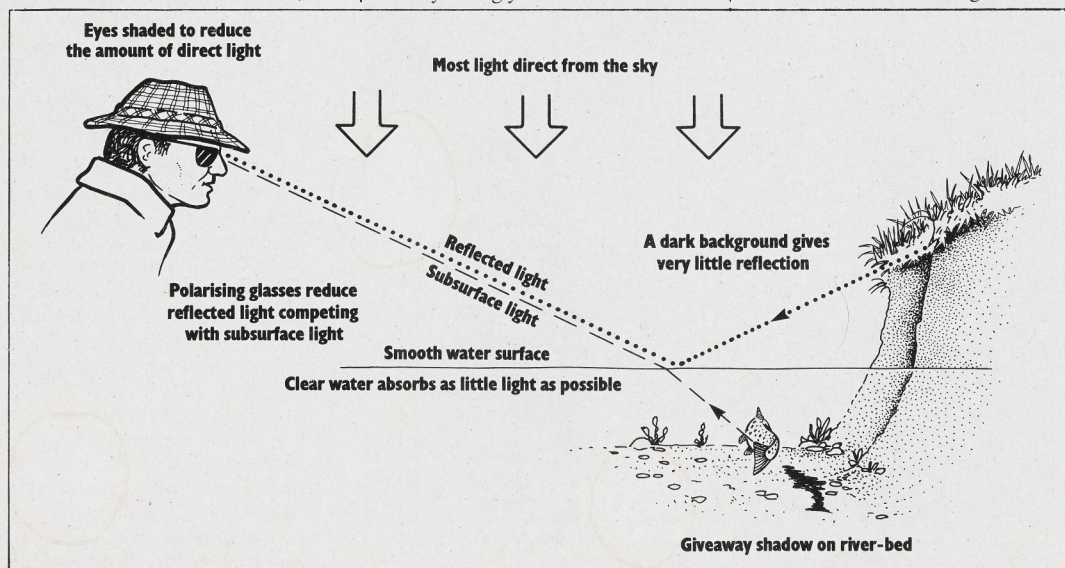
Most people see it first as a box seen from slightly above and slightly to the left, with the face marked with "O"'s nearest the viewer.

Two objects

But it can just as easily be seen as a box viewed from slightly below and slightly to the right — with the face marked with "X"'s nearest the viewer. After a little time you should be able to see both boxes, often switching from one to the other and back again. Your brain has constructed two different objects from the same pattern of lines entering the eye and falling on the retina.

Now practise. Practise holding one of those perceptions; run your eye over the box without "flipping" to the other box. Now deliberately "flip" the perception and practice holding and looking at the other box. (If you find it difficult to flip deliberately, try looking at the face that you want to have in front.)

You are practising to hold just one perception when two are possible. This is *exactly* the problem you encounter when seeing through the water surface; the scene under the water and the reflections on the surface are superimposed. Your brain can construct and hold one or the other, but it will usually flip to the reflection as that has more light and detail.



Now practise by the water. Make it as easy as possible to start practising before moving on to more difficult conditions. Start with the water's edge, preferably viewed across a small river or pond, say, five yards away. Find an object on the waterline — a large stone perhaps — and follow it down beneath the water. Look at neighbouring features on the river bed.

Now "flip" the perception to the reflection of the bank at that point. If the bank is in deep shadow and the water is smooth there will be very little reflection, but look for the reflections of light objects, such as grass-stems and stones.

Now flip back to the perception of the bottom underneath. Extend your view into deeper water, moving your attention from one object on the bottom to its neighbour.

When you can do this easily you can practise under increasingly difficult conditions. Looking through the surface gets more difficult as the water surface is disturbed (bathroom windows depend on this) and as the angle between the line of sight and the water surface gets smaller (when the angler crouches down behind cover). As this angle gets smaller, more of the daylight is reflected at the water surface and, to make matters worse, the light reflected at these angles is only slightly polarised so that your glasses become ineffective in cutting it out.

Any skill needs practice. I am lucky. I live next to a small river and have a chance to watch fish on station outside the kitchen window. Even so, I find it a lot harder to see these fish in March than later in the season, when I have been peering into the water for several weeks. The solution is to start the season early.

Before you feel tempted to cast a line, take the time to walk up the water you will fish later on. The low angle of sunlight and heavier water of early spring will make fish spotting difficult, but it will stand you in good stead later in the season. You will also have the leisure and the new skill to study the changes in the underwater features of the river that the floods of winter bring about.

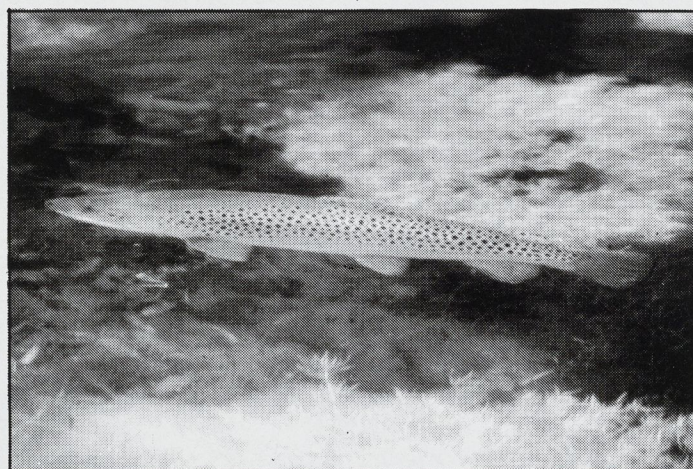
I once spent several early mornings in June watching a large rainbow patrolling the reed margin of a small lake. The only way I could devise of casting to him in the clear, shallow water was to lie flat on my back on a small boat jetty that reached out beyond the reeds. I could watch the fish cruise past from behind the reeds. I then had about six minutes to wriggle on my back along the jetty before his circuit brought him back to the spot. I had flicked a slow-sinking fly into place and was awaiting developments when I felt and heard footsteps on the boards of the jetty behind me.

Etched against the bright-blue sky was my uncle, John, who is no

fisherman and, I hope, will never read these words. On that perfectly still morning he could see right down into the water, he told me. There were no fish ... no, no, he told a lie; there was a fish, a huge one, coming towards the fly.

Uncle John pointed to it excitedly, in case, perhaps, I was tired of lazing on my back on the jetty and wished to get up and have a look myself. "Here it comes," he called, "Oh ... no, it's swimming away again." I cannot blame the trout, he was not to know that the figure waving against the sky was quite harmless to fish. The moral: when possible, look into the water without fishing, then fish without looking into the water.

Sometimes, the first sign you will see of a fish is a puff of silt as the startled creature tears off across the pool. Better that happen now before you come to fish the place in earnest. Identify



A big chalkstream brownie on the fin. Seeing a fish starts with finding tiny clues to its presence.

the spot relative to a bank feature before the silt disappears — you can look for the fish on your way back to get the rod.

The business of marking a spot in the water where a fish has been seen is another tool in the angler's box. It is not enough to see the thing; you have to be able to find it again.

Similarly, it is much easier to see a fish if you know where it is, from a rise or a bulge of water at the surface. On stillwaters the rings of the rise stay more or less stationary and you have time to look around and fix the spot (in line with the willow, three yards out, say). On a river the problem is deceptively more difficult as the rise moves downstream and, however much you try to resist it, your eyes move with it.

Technically, this is called the "optomotor response", present in all creatures with good eyesight. The eyes over-rule your wish to stare at the same spot in the space because their job is to provide you with a good, steady image of an object on the retina — and if the object is moving downstream then, by golly, they will move with it whether you want them to or not.

If you want to demonstrate this phenomenon to yourself, ask

someone to move their gaze smoothly from one side of the room to the other; it can't be done. If you look closely at their eye movement you will see the eyes flicking from one stationary position to another, a series of jerks around the room.

Perhaps the eye muscles can only supply this jerky movement? Not so. Now get them to follow their moving finger as they sweep it through the same arc. The eye movements follow the finger smoothly, because the eyes are holding fast onto a moving object. In both cases the eyes are trying to provide as steady an image as possible.

Because of the optomotor response, most people trying to fix a rise will place it downstream of where it occurred. As soon as the rise is spotted, either look directly above it to the bank or, if you have mastered the art of focussing attention on the reflections, fix the

suggest fish. Watch a while for a regular rhythm to the movement; irregularity means fish. Similarly, a flexible object that *isn't* moving with the rhythm of the weeds can be a fish.

Because the eye is attracted to movement, the first sign of a fish may be a fin or, more usually, the tail. Trout-tail movement is rhythmic, like weed, but differs in two ways: first, the trailing edge of a trout tail is more or less vertical in the horizontal world of weed in the current. As the tail has no silvery scales to reflect the light the trailing edge can stand out as a dark, vertical line.

Second, the rhythm of a trout's tail, as it holds station, is usually faster and somehow more purposeful than the languid movement of weed. If you find a rhythmic, languid movement *and* a dark tail line then you could well have found a chub which has a much more "limp-wristed" action to its rear end.

If you suspect a tail, look upstream for fins and a mouth, which can also be opening rhythmically to reveal a white interior (a great white cavern confirms a chub). The perceptual system should have done its work by this time and you will be able to see the fish. Even now it can miraculously disappear before your eyes, particularly if it is hanging in mid-water on a sunny day.

The reflecting surfaces on a fish's scales are aligned in such a way as to reflect light from the side. On a sunny day, with plenty of light bouncing around down there, the fish seen from the side is a mirror, reflecting the surroundings and becoming, seemingly, transparent. Under these sunny conditions it can still be given away by its shadow on the river bottom.

Seen from above, the scales do not reflect the light; it would be a bit of a give-away if they did, although they might possibly blind a predator by dazzling it! This difference means that the whole fish is commonly seen as a rather thin, dark line moving across the river, the sides having disappeared leaving only the darker back visible. When the fish twists over to scrape a shrimp from a stone, or take a nymph, the mirrored side is momentarily uppermost and we get the "flash" or "wink" of a taking fish — another dead give-away.

Seeing fish is immeasurably easier when you know where to look, but a detailed examination of all the favoured lies of trout is a book in itself. Besides, now you can see the things you can write the book yourself.

Finally, a word of caution. I get so much pleasure from watching the fish in the stream that runs past the house that by watching them they have become individuals — and who could bring himself to deceive and hook a friend? And so I have had to give up fishing this stream.



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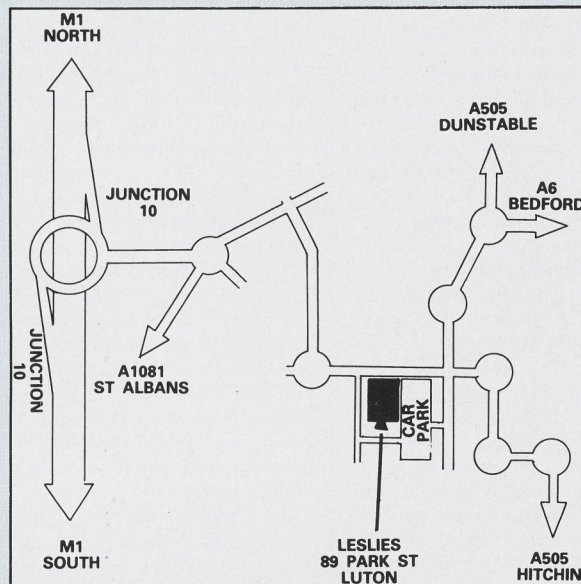
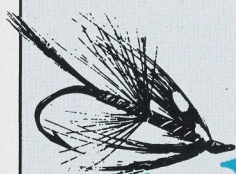
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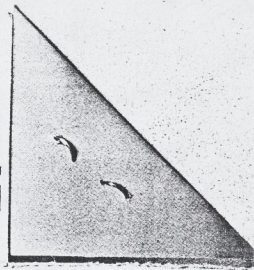


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Look at wildly conflicting advice!

Fishing Glasses



Not all sunglasses are for fishermen—here's how to keep from making a spectacle of yourself

TOM ROSENBAUER

On a steelhead trip to a Lake Ontario tributary a couple of years ago, I showed up with a pair of those high-tech sunglasses that make you look like an insect from a B movie. "We can't fish with you while you're wearing those lifter glasses," said my fishing buddies. They practically live on the river, where they wage a constant battle with the lifters—slobs who practice a delicate foul-hooking technique, using a single hook and placing it as close to the mouth of a visible fish as possible.

If you're fishing by legal means, you count on the fish moving at least a few feet to impale himself on your fly, but with lifting there's no margin for error. Especially if the guy next to you may be an undercover warden. You want to stick that hook in a spot that looks like there was at least an attempt at sportsmanship. Lifters stare at a likely holding spot, looking for fish, and peripheral vision—or, for that matter, any light coming in from the side—is a hindrance. So they can be identified by those inexpensive polarizing sunglasses with flat lenses in front and big side shields. But side shields and glasses with narrow slits have never caught on with fly fishermen.

An article in this magazine six years ago dealt with the sunglasses available to fly fishermen, including some models that weren't even polarizing. Today, recommending sunglasses that don't have glare-reducing properties is like trying to sell fly/spin outfits without including a fly reel. A pair of regular sunglasses will protect you from ultraviolet rays, but why cut down the amount of light on the subject without also cutting down glare? Ordinary sunglasses reduce all light reaching your eyes, but polarizing glasses selectively cut glare without greatly reducing the resolution of other objects. Today, optical-quality glass polarizing sunglasses are available at half the price of three years ago, and some with scratch-resistant plastic lenses boast minimal distortion.

Light striking a nonmetallic surface—water, glass, snow, etc.—becomes polar-

ized; because of the smooth reflecting surface, the rays align in one direction, one plane, producing glare. Polarizing film, which looks like sandwich wrap, contains a microscopic grid of iodine crystals that blocks the polarized light coming in on only one plane—for most applications, the horizontal. (This is why, when, for example, you turn your head sideways to get a better look at a mayfly floating downriver, you sometimes get a sudden flash of glare as the glasses tip off horizontal.)

Polarizing sunglasses are not a cure-all for vision problems, and in fact they don't even eliminate all glare. The worst glare occurs when light is reflected at an angle of 15 degrees above the horizontal, so sunglass polarizers are set to absorb glare coming off a surface 30 feet away at an angle of 15 degrees. Glare that's closer can be eliminated only if you bend down or back up.

According to my optometrist, Dr. Kenneth Begun, such sunglasses should be worn only for special circumstances. "I don't like them," says Begun; "They make things look fake. Polarizing sunglasses may even give you headaches if you wear them for more than a few hours. Except for fishing or driving on glare ice at sunset, I don't recommend them."

As far as I can tell from my sources, all polarizing film is identical—the stuff in a pair of drugstore glasses is the same as the film in a pair of \$200 designer jobs. And everything that's sold for the fisherman is aligned to block horizontal glare. But for its own protection, polarizing film must be laminated between two pieces of plastic or glass, and it's here that we find differences in quality and price.

The front surface of a pair of sunglasses will tell you a lot about the quality of their construction. First look at how they're curved—or whether they're curved at all. Those "lifter" glasses have flat lenses, which are okay as long as you don't use your peripheral vision. If you shift your eyes off to the side, you get parallax, or a magnifying effect. (If

you turn your head to see in a different direction, you can eliminate this problem.) The very best sunglass lenses are not molded but are optically ground, the front element convex and the rear concave. These lenses follow the natural curve of the eye's cornea, but obviously not exactly; if they did, the lenses would look like bubbles, which would give you minimum distortion but maximum social unacceptability. Optically ground lenses are a good compromise between comfort, practicality and optics.

You have little to fear about distortion when you buy a pair of optically ground glasses, but some of the inexpensive ones with plastic lenses aren't bad either. To check a pair of glasses for distortion, Dr. Begun recommends holding them at waist level under fluorescent light and rotating the front lens element until you catch a reflection. Move the frames around, keeping this reflection in the lens, checking as much of the lens surface as possible. If the reflection looks smooth, the glasses should be all right. If the reflected image looks distorted anywhere, find another pair.

A lot of fuss is made about light transmission and ultraviolet-light absorption, but much of the evidence that UV light is harmful to the eye is theoretical. According to Dr. Ben Houser, a noted eye surgeon who spends every moment that he's not behind a laser beam in fishing for trout, salmon, bonefish and tarpon, ultraviolet poisoning is overrated. "The average fisherman's eyes are in no danger from UV light," says Houser, "unless he is an ultra-blonde. Light-skinned people have retinas with very little pigment, so they are sensitive. Unless you're on the flats for weeks you really don't have to worry."

In fact, says Houser, it's much better to wear sunglasses only when you need them to avoid eyestrain: "A healthy eye doesn't need sunglasses all the time. You're much better off letting your pupils get light-adapted. Pupil constriction gives you better depth-of-field. A pair of two-millimeter pupils, for example, will give you as much help seeing fish

as any pair of sunglasses. I had this bonefishing guide in the Bahamas once, Hartman Russell, who could see a bonefish, I'm not kidding you, a hundred yards away. He had the best eyes I've ever seen.

Most brands of fisherman's sunglasses are available in a choice of either gray/green or brown/amber. The exact shades vary, depending on who's making them. The gray ones are neutral-density, and should absorb all visible light in equal amounts, thereby preserving normal color perception. The amber shades heighten contrast and are helpful under a cloudy sky in morning or evening; they sharpen the definition between light and dark objects. Some bonefish guides recommend them for use throughout the day because they improve the contrast between a light-colored fish and a pale sand bottom. But most go to gray lenses when the sun gets high because the ambers, like yellow shooting glasses, can cause eyestrain and headaches if worn for prolonged periods. The lighter shades can also cause temporary color-blindness, as many Florida guides have found.

I recently checked two pairs of polarizing sunglasses that I've been wearing for about a year, one with plastic lenses and the other with optical-quality glass. The plastic ones aren't of the drugstore variety, though; they have rugged, well-designed frames, and lenses of scratch-resistant CR-39, the same stuff used in visors for NASA astronauts. The plastic glasses cost about \$25, the glass ones twice as much.

I wore both pairs the same amount of time, and they certainly weren't coddled. (It's even fair to say I abused them.) The cases disappeared within a week. I stuffed the glasses into my fishing vest, left them on the car seat, sat on them, used them in fresh water and salt. Vision seemed to be equally clear with both pairs. About when I decided it was stupid to pay twice as much for glass lenses—because they're about twice as heavy—I noticed the scratches. On the plastic lenses were a few small scratches, not enough to affect my vision (I've had prescription glasses that were much worse), but after another year they'd be ready for the trash. The glass lenses were perfect.

The real kicker, though, was when I checked the polarizing properties of the glass versus the plastic lenses. My test was similar to how they sell polarizing sunglasses in the drugstores—with the little round card of polarizing material that you rotate in front of the lenses. If the sunglasses are "genuine polarized,"

the square will darken completely, because its polarizing screen will eventually align at 90 degrees to that of the sunglasses, thereby blocking almost 100 percent of the light. I used a screen that I knew to be of good quality—a new polarizing filter for my camera lenses.

Rotating the filter while looking through it and the glass polarizing lenses blocked out all the light and showed no abnormalities. However, when I held it against the plastic lenses, all sorts of interesting designs showed up—hotspots where the light leaked through no matter how I rotated the filter. This doesn't happen with a new pair of plastic lenses, and I assume that plastic lenses, because they are less rigid than glass, eventually shift and delaminate the polarizing film.

Is this an endorsement for glass lenses? Yes—but only if you're going to carry but one pair of sunglasses, and want absolute, long-term dependability. Having grown up with several ounces of prescription glass on my nose for 18 hours a day, I prefer plastic lenses if I'm going to be fishing for more than a short time. Some of the new plastic-lens models weigh half an ounce, and you literally forget you have them on. The pair I've been wearing for about six months now appears to be free of any obnoxious defects and is surprisingly durable.

About clip-ons: Buy several pairs at a time. They're all made of thin plastic (glass is too heavy) and they scratch very easily. Try to find the kind that are recommended for large-frame glasses, because if they don't cover the whole front of your prescription glasses you'll get internal reflections between the clip-ons and your glasses that will drive you crazy. A hat with a long brim in front will help correct this problem; in fact a hat will help you see more clearly no matter what kind of sunglasses you wear. Side shields also help by cutting out stray light, especially if the sun is at your side. Some sunglasses come with them, or you can make a pair out of leather or vinyl. Just cut a triangular piece and put in slits to accommodate the side arms. Don't forget that you will lose your peripheral vision if you use side shields.

And don't let anyone mistake you for a lifter. □

TOM ROSENBAUER edits the Orvis News.

We present here a staff-written review of the fishing glasses that fly fishermen are most likely to be interested in; we can't bill this as a complete roundup because we've skipped most of the drugstore glasses and, in truth, have not combed every fly-

tackle catalog either. But most tackle shops and mail-order companies offer one or more of the glasses discussed here. Some of the larger retailers—Orvis, Bailey's, Cabela's, etc.—offer some private-label sunglasses that are different, and where possible we've addressed those individually. The Smith and Costa Del Mar glasses rank as "finds" since few of the fly-fishing companies we spoke with were familiar with them. Perhaps we'll see them in more of "our" catalogs and shops in the future.

—the editors

ActionOptics

P.O. Box 2099, Napa, CA 94558

ActionOptics' Everest glasses (shown in their black nylon Glacier frame) may be the most versatile lenses available to sportsmen. Not only are they polarizing and photochromic, they boast an anti-reflective coating on the inner surface (to protect the eye against bounce-back) and highly reflective mirror coatings above and below the center zone. (These mirror coatings are inside the outermost lens, where they can't chip or peel away.) And although they feel unusually light—only 1½ ounces—all ActionOptics sunglasses have precision-ground and polished glass lenses.

The Glacier frame's side shields are certainly beneficial for mountaineers, and may aid concentration when stalking fish, but the shields cut peripheral vision to the point that we feel the glasses are dangerous for such things as driving or bicycling. The shields are removable, but that leaves four little molded-in mounting wings on the frame, and they may bother some wearers.

ActionOptics offers two other styles for more general use: the "unbreakable" black nylon and the black metal frames. Both have relatively large, more or less rectangular lenses for good coverage, and both are light and comfortable—only two ounces, and that for top-notch glass glasses. The nylon frame is fitted with adjustable-length side arms (there are four detents) and is available with either conventional or flexible hook-type earpieces. Removable sideguards are also available.

All three frames may be purchased with either Everest or Spectrum lenses, which are gray or amber and also polarizing and photochromic. ActionOptics says both its lens types absorb 99% of the ultraviolet portion of sunlight, which is sometimes linked to snow-blindness, cataracts and skin cancers. Because of their laminated construction, the lenses meet or exceed federal standards for impact- and shatter-resistance.

Prices are approximately \$50 to \$75; a semi-rigid snap-top case is included. Spectrum models are also available in prescription single-vision and even bifocal lenses; see an eyeglasses dealer or ophthalmologist for information and prices. (Orvis offers this option on its ActionOptics glasses for \$185 and \$235.) Made in California.



Aqua-Mates

Foster-Grant, 289 N. Main St., Leominster, MA 01453

At about 5½ inches across, Aqua-Mates fit heads that many other sunglasses can't. They're big enough, in fact, to be worn over normal prescription glasses—not entirely impractical when you consider that the lenses can flip up out of the way.

Two versions are available (in drugstores, marinas and tackle shops just about everywhere): one with normal side arms and one with wide arms that have dark lenses set into them for side protection. Both have "sun roof" overhangs built in. Black-frame Aqua-Mates have gray polarizing lenses; brown frames carry brown polarizing lenses. They are light, comfortable, and generally stay on most faces very well. The lenses are too lightweight to be very durable, but at \$12 they make excellent back-up glasses or inexpensive replacements for glasses that were lost or destroyed. Aqua-Mates float, and their snap-front leatherette case floats too.

Bill Dance

Polarized Fish'n Glasses
Strike King Lure Co.

174 H'way 72 W., Collierville, TN 38017

Available from Cabela's for only \$9.95, these plastic-lens glasses seem to offer good value. At two ounces, they weigh as much as some glass glasses; the extra weight comes mostly from the metal side arms and hinges. (The ear pieces are plastic-coated for comfort.) The matte-black plastic frame is slightly heavier-built than most, and provides good eye coverage and comfort. The fit is quite tight on some people, but a few licks with a file on the hinge end of each side arm will fix that. (Don't make them so loose they slip off too easily.)

The lenses are dark gray with a slight green cast. In our sample, some distortion is visible around the lens edges, but it doesn't interfere with normal vision. Imported from Taiwan and decorated with Bill Dance's "signature" on the side arms. (He's a bass-fishing pro.) The glasses are blister-packed and come with a braided lanyard.

Corning Chameleon

Laura & Company, Rte 3, Box 47A
Coudersport, PA 16915

Laura & Company bought out the entire stock—4,000 pairs—of these sunglasses from Corning, and is offering them at near giveaway prices (\$4.95 each, plus 75 cents shipping & handling). They are very basic glasses, with two points in their favor: First, they're made by Corning (or maybe for Corning, in Korea), which by itself is some guarantee of quality; and second, they are polarizing, even at that low price.

But they're not for everyone. The black frames are on the small side and thus fit best

on narrow to medium-wide faces. The lenses wrap around for adequate side coverage, but they are fairly "short" from top to bottom. Whether they are too short depends on the size of the wearer's face. Among our staff, they fit the ladies best, and some of the smaller men. The lenses are neutral gray. They're plastic, with few obvious distortions in spite of the lens curvature, and Laura & Company says they meet FDA impact-resistance standards. The hinges are metal, and our sample pair weighs just over an ounce. A case is not included.

Costa Del Mar

310 Division Avenue, Ormond Beach, FL 32074

This Florida company offers a very wide assortment of frame and polarizing-lens combinations, and they appear to be very high-quality products. Hard-to-fit anglers should note that Costa Del Mar offers five sizes of sunglasses—lens widths of 52, 54, 56, 58 and 62 millimeters, and while not every one of their dozen-plus frames comes in every width, there should be enough variations possible to suit almost everyone. Frame styles vary from the traditional to the new-wave, and include a particularly handsome (in tortoiseshell) aviator called the Catalina, and a metal-frame (gold or pewter) aviator called the America's Cup. And in case these combinations and permutations aren't enough, there are about a dozen different frame colors to choose from, and about half the frames are available with a choice of straight or wire-core wraparound earpieces. Something for everyone, indeed, and backed up by an "unconditional lifetime guarantee."

The polarizing portion of Costa Del Mar's lineup includes a dark gray version and double-gradient blue or gold tints laid over a dark gray lens. All are optical-grade plastic, hard-coated for scratch-resistance, and said to be virtually shatterproof. They absorb approximately 85% of available light and 100% of ultraviolet light. Costa's hinges are specially tapped for no maintenance, and their plastic frames are not injection-molded nylon but rather a cellulose acetate that accepts colors and polishing very well, shows no mold seams, and adjusts well. The company is proud that their products are made by hand in the U.S.A. Retail prices range from about \$40 to \$85, and each pair of glasses comes with a well-padded leatherette slip case. Your eyeglass dealers should have Costa's impressive catalog for you to study.

Custom Clip-Ons

The Orvis Company, Manchester, VT 05254

Anglers who can't function without corrective lenses find themselves in a bind when it comes to shopping for polarizing sunglasses. The three alternatives are contact lenses under normal sunglasses; prescription polarizing glasses; and polarizing clip-ons. Number

one doesn't work for some people; number two is always expensive; and many clip-ons are less than perfect. Some are downright worthless.

These "customs," however, are another story entirely. The lenses (neutral gray, plastic, no apparent distortion) are way oversize so they can be trimmed with scissors to the shape of the glasses they'll be worn over. That's a good start right there, but these also flip up out of the way; using a camera or binoculars with eyeglasses is enough of a nuisance even without an extra lens in between. And these clip-ons really do clip into place, solidly. They fit frames up to a quarter of an inch thick, with 9/16ths of an inch or more across the nose between lenses. (They fit every pair of glasses in this company of 40 people.) The lower clips are on long spring arms that hold well yet present no irritating obstacles in the field of view. Finally, the lenses are shipped with plastic vacuum-sealed over them; leave it on—to protect against scratches—until you've trimmed them to your glasses.

The metal parts are coated against corrosion, and the flip-up spring locks positively. Two small rivets secure each lens. At \$4.95—or two or more for \$4.25 each—several of our staffers have ordered pairs for themselves. Made in Japan.

Fisherman Eyewear

1700 Shelton Drive, Hollister, CA 95023

Rudy De Luca, Vice-President of Cable Car Sunglasses, is an ardent angler. He counts among his friends some of the best-known professional fly fishermen, and he relies in part upon their advice when it comes to designing new products for his pet division of the company, called Fisherman Eyewear. As a result, Fisherman offers what must be the largest selection of fishing glasses available anywhere. Once you've seen their line, you begin to recognize their products in many of the fly shops in this country.

A look at every model would fill the rest of this magazine, so we limit the detailed discussion to two of Fisherman's most popular styles. But the 1986 catalog shows some 16 different fishing glasses, all polarizing; two are made with Polaroid lenses (trademark of the Polaroid Company), which De Luca feels are among the best plastic polarizing lenses. Others include metal-frame aviators, full-frame flip-up glasses (that fit over many prescription glasses), a one-piece wraparound polarizing mask, clip-ons and others. Suggested retail prices range from \$10 to \$45. Each pair comes with a soft case that will float the glasses.

PolaFocus

These are certainly the most unusual sportglasses currently available, but they clearly (as it were) fill a niche, especially for those middle-aged anglers who find that their

arms are getting shorter. The little clear windows south of the gray lenses are optical-grade magnifiers that make such tasks as tying tippet knots considerably easier. These are non-prescription fishing bifocals; four magnifications (+1.50, +2.00, +2.50, +3.00) are available. Truthfully, these are pretty helpful in dealing with tiny flies even for those of us who still have 20/20 vision.

The sun lenses themselves are high-quality glass polarizers. The shaded side panels on the ear pieces are dark plastic. Although the glasses look a bit clunky, our sample weighs only 2½ ounces. The black plastic frame is relatively massive, with its seven-leaf metal hinges, overhanging "sun roof," wide side arms drilled for a safety cord, and the extra material needed to hold the magnifiers, but feels adequately comfortable, thanks in large part to an oversize nose bridge that distributes the weight evenly.

The glasses provide excellent sun protection above and on the sides; the clear windows below admit some glare reflected up off the water, but being able to wear the same glasses for fishing and for knot-tying generally outweighs this minor shortcoming.

PolaFocus shades appear in several fishing catalogs: Orvis sells them as their "Crystal Clears" for \$25; Dan Bailey's offers them at the same price also. Made in Japan.

Polarizing Fishing Glasses

Widely available through mail-order catalogs and across the counters of tackle shops for about \$12, these glasses are now the fisherman's standard. Simple, serviceable and reasonably well made, they offer genuine polarizing glass (scratch-resistant) lenses in gray or greenish-yellow mounted in rugged black plastic frames. The side arms are chromed metal with plastic earpieces drilled for a lanyard. Some versions of these glasses are fitted with dark (polarizing, even) lenses on the side arms; others just have solid panels as side shields; still others have ventilated fabric shields, hook-type earpieces and a lanyard. Anyway, the glasses provide effective protection all around. The nose bridge is comfortable and the seven-leaf metal hinges are almost massive. Our sample pairs average about 2½ ounces, on the heavy side for simple non-photochromics.

People with wide faces may have to bend the side arms to fit. In so doing, be careful not to pop the rivets that fasten the shields in place. (But if that happens, it's no great task to glue them neatly back in place.) Because of the weight of the glasses and the shape of (some of) the earpieces, most wearers should use a lanyard.

Locators + 2

Teeny Nymph Co.

P.O. Box 970, Gresham, OR 97030

The original Teeny Locators (still available, in regular and clip-on styles) resemble

nothing so much as Eskimo snow goggles—horizontal slots of dark polarizing material set into wide frames with side shields. They force the wearer to look straight ahead—since you can't see anywhere else—and thus effectively force you to concentrate on fish. But they're something of a hazard in the real world; a friend of ours walked right off his dock while wearing a pair.

Enter the Locators + 2: much larger field of view, with less-restrictive shields and no more bulbous, insect-eye lenses. They are reasonably comfortable, very effective in high-glare situations, and hinder peripheral vision far less. The setscrew in the top of the black frame lets the wearer change or replace lenses, from smoke gray to amber (both polarizing, both said to be unbreakable). Our sample lenses are a bit loose in the frame, but they're so light it doesn't bother. Although a close fit, the pivoting side shields don't bother either, and they are pierced for ventilation. The three-leaf hinges work smoothly and are molded in. Locators come in a cloth case, and Teeny also offers a brown neoprene retainer strap that reportedly will float the glasses if they drop into the drink. Suggested retail price (with both lenses) is \$24.95.

MultiSport 3-in-1

MultiSport Optical, 6 Susan Lane,
Falmouth, ME 04105

We're always suspicious of "all-around" items; they often wind up being not specifically good at anything. And the price of these glasses (Orvis lists the whole set for \$32, for example) does nothing to reassure us either. But the British MultiSports turned out to be a very pleasant surprise. What we first regarded as their prime weakness—their lightness—is actually their strength. With normal side arms, a pair weighs exactly one ounce, but the matte-black frames are super-tough Crylon and have taken all the abuse we've given them over the last six months—and then some.

The system includes: three sets of interchangeable plastic lenses (dark gray, light amber, both polarizing, and high-contrast yellow); removable soft side shields to keep out glare or wind; conventional side arms, plus flexible hook-type side arms; and the frame. All this is packed—stuffed is a better word—into a convenient, soft suedelike envelope.

To change lenses, the center panel of the frame snaps open, freeing the lenses from their grooves. It's a positive lock, and it works well. The side arms are not only interchangeable, they're adjustable—by means of three detents—for length as well. Edge-to-edge, the frames measure 5 7/16 inches, enough even for wide faces. The fit is excellent, and even with the normal side arms, the glasses aren't likely to slip off the "average" face. None of our sample lenses show any distortion.

Orvis Half-Ounce Glasses

The Orvis Company, Manchester, VT 05254

These handsome French-made sunglasses weigh substantially less than one ounce, making them probably the lightest full-frame fishing glasses available. The fit and construction of the frame ensures that they stay comfortably in place in spite of their insignificant mass. (Some of the flies we fish big rivers and salt water with weigh more than these glasses do.)

The semi-teardrop lenses are large enough for almost any face, and come in neutral gray or amber. Orvis says they block 78 percent of visible light and 98 percent of ultraviolet light. Both colors are, of course, polarizing. They appear to be optically good.

At a half-ounce, it almost doesn't matter how the frames fit. But it so happens they fit very well on most faces, and since they're made of nylon (black), the sidearms can be shaped, with a little heat, to accommodate ears that grew in non-standard locations. The five-leaf hinges are metal and they work better than \$14.95 glasses have a right to. (Proof again that a dollar goes farther in Europe than it does here.) The frames flex but don't break under normal loads. You can hear the lenses working in their grooves when the frame twists, but they show no sign of popping out. A terrific value, and a soft case is included.

Simms Polarized Fishing Glasses

Simms, Div. of Life-Link International, Inc.
Box 3330, Jackson, WY 83001

What is more natural than for Simms, the company that brought us the excellent Croakies glasses retainers, to add fishing glasses to their product line? These are French-made (the cloth sleeve says Bollé) plastic-lens polarizing glasses tinted to a slightly warm amber-brown. Since they don't filter out as much sunlight as a pair of dark gray glasses would, they may not be the first choice for the tropical flats. For stream fishing, however, they are more than suitable, and the lenses do appreciably increase contrast—and without the harsh effect of yellow shooting-type glasses.

Our sample pair weighs a tad over one ounce, fits every male in the office, and is unusually comfortable yet doesn't feel as though it's about to slide off. (The frame is fully 5½ inches wide.) The frame and side arms are golden-brown nylon, with three-leaf hinges molded right in. This sample has a slight dimple in one lens, but it's adjacent to the top of the frame and thus out of the direct field of view. Simms includes a donut of polarizing material with the glasses so you can check the polarization. Last year these glasses were available for \$30, which included a Croakie and a zipper case; for 1986, Simms dealers sell the glasses for only \$19.95, with a simpler case and no retainer.

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ing Truth

glasses are like earmuffs in the Arctic—nice, but not enough

CARTY



JEFF SLACK

The wide brim blocks glare from sneaking around the sides of your glasses (side-shields, which attach to your eye-glass frames, are better yet); pulled low over your eyes, a hat brim can boost the effectiveness of polarizing lenses quite a bit. In extreme glare—tropical ocean flats, for example—a hat brim that is dark on the underside helps keep sunlight from re-reflecting back downward, behind your glasses, into your eyes.

You can avoid glare completely by putting the sun at your back, but since this usually involves fishing the side of the river you're not standing on, it's good advice only to a point. It's impractical, and sometimes dangerous or impossible, to wade across the Madison or similar rivers. (On a bonefish flat, fishing on foot or in a skiff, it's usually fairly easy to get the sun at your back, or at least to one side—but then you may find the wind coming from a bad direction.)

However, on a river, if you keep track of the sun's path—not hard to do, as its course is

pretty consistent from day to day—you can plan and place yourself accordingly. This is such a simple precaution that I invariably forget to do it, which necessitates my maneuvering, every evening, to get the sun to my right or left—which is not always possible either, but it's something to remember if you're a little weak on astronomy.

Interestingly, you can also duck “under” glare. Why a practice so patently simple eluded me for so long is a mystery, but it's true: If the sun is bouncing off the water and into your eyes, making the surface look like hammered silver, bend your knees and look under the rays. If you bob around enough you can usually follow your fly line through all but the longest/widest glare patches.

The greased leader technique is limited to flat water, because the slightest ripple will cause the leader to break through the surface

film and sink the fly, rather than suspending it properly just below the surface. But here, for once, glare can be an ally. A greased leader on a calm, mirrored pool is as easy to see as a crack in a window. A twitch in the line is a strike, and from that point you're on your own.

Since fly line seems to drag the moment it's out of sight, I try to mend my line just before it reaches a blind spot. Depending on the breadth of the glare patch, you might then be able to get through the worst of it with a free-floating fly. Also helpful is the pile cast: Tie on an extra-long tippet, snap the rod up a bit at the end of your cast and let the whole inert mess fall in curves near the fly, which will provide a few feet of drag-free float while the leader straightens out.

Spinfishermen are rarely bothered by glare, and for one reason: They fish a tight line, and takes are felt, not seen. Fly fishermen can fish a tight line too, and the best way I know is to fish streamers.

Now I realize that few of us are going to tie on a Mickey Finn during a caddis hatch just to

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ANGLER OF THE YEAR

Continued from page 23

but nobody even has any recollection of him having lived there."

In the years since, Nick has, by his own account, tried "every fly-fishing technique there is." But he has been and remains primarily a dry fly fisherman. "It's a quiet, challenging way to fish," says Nick. "The dry fly gives you a chance to observe the fish and the insects while you're fishing. When I'm out watching I feel at home on the stream, I feel I belong there."

Perhaps this is why Nick fishes as much as he does. He's the only person I know who fly-fishes almost every day. In fact he sends his favorite rods—the Midge Nymph and a 7-foot 3-weight Orvis 7/3—back to the factory on alternate years for new ferrules. He wears them out.

His lovely wife, Fanny, whom he married in 1952 and who is fully behind his dedication to the sport, has dinner waiting when he comes home from work. Then he's off fishing, sometimes driving two hours each way (which may not be far, as Nick is one of the world's slowest drivers) to make one or two perfect casts at dusk. In fall and winter he fishes on weekends for sea-run trout in coastal streams. Nick confesses, however, that he's doing less fall and winter fishing these days. Hercules, a big chocolate lab, has tempted Nick back into the upland hunting and waterfowling he loves almost as much as fly-fishing.

Late winter finds him spending warmer weekends fishing stoneflies on local rivers. In spring he haunts the rivers of southern New Hampshire. Summers, he makes the long drives to the cooler rivers of Maine or northern Vermont and New Hampshire, with frequent time-outs for the Hex hatches on certain home ponds.

Very often his companion is son Tony, who has been fly-fishing since he was very young (a photo in the family album shows him at age eight with a fly-caught 20-inch brown). Daughter Nikki Burdick has contributed to the next generation of fly fishermen with grandson Thomas Anthony, born in May.

Like most dedicated anglers, Nick has his eye on the future of the sport—for his son and grandson, but also simply because he loves fly-fishing and wants to pass it safely on. Wherever you go to fly-fish with Nick, he's always greeted warmly by both old friends and younger fishermen. Talk to many of these younger ones and you find that Nick was instrumental in getting them started in fly-fishing. I've never met anyone with a bad word to say about Nick.

Nick was involved with the start-up of Trout Unlimited in New Hampshire, but has since chosen to give his efforts instead to the Manchester Fly Fisherman's Association. "It's a good group of people," he explains. "More social than political. I believe that we need a place where people can come to find the fun part of fly-fishing. Some of them will choose to get involved in the politics of protecting

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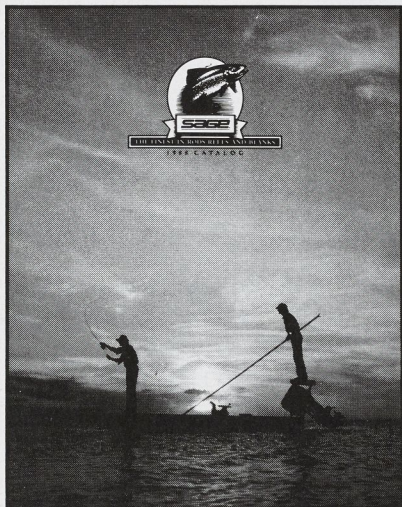


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The Glare

When sunlight bounces directly into your eyes, the best

DAVID



A^T_{7:00}
that
eve-

ning the sun bounced across the top of the Madison Range like a fat, peeled orange and the reflected light from the Madison River made my fly line, settled into gentle S's on the water, look like spaghetti on a mirror. A big mirror. I wondered if the sun had deliberately chosen that moment to blind me.

I could see only a sheet of white, broken here and there by the rings of feeding trout. But even with polarizing sunglasses, it was difficult to see my fly and I was missing strikes. When I finally connected, I nearly jerked the fish out of the water—all four inches of it. Disgusted, I packed up my rod, put my sunglasses in my vest and walked back to the car, in the process wading through the pool I'd been fishing. And then I discovered why I'd been missing strikes: the "pool" was only two inches deep. I'd probably been casting to four-inch fish all evening. In the sun's glare I simply hadn't been able to gauge the stream depth.

I first saw polarizing glasses back in the '60s, although I'm sure they were around before then. They were funky looking things, with the Coupe de Ville wings popular on the

eyewear of the time or, worse, clip-on jobs that made the wearer look like half an umbrella. Polarizing glasses were supposed to "eliminate" glare, and they were, and still are, a big step in that direction.

But when the sun bounces directly into your eyes, the best polarizing lenses in the world are like earmuffs in the Arctic—nice, but not enough. Sunglasses are best employed as an adjunct to avoiding the problem in the first place.

Glare would be far easier to live with if it were sporadic and unpredictable. Instead, stream fishermen are stuck with it every day, like clockwork—just when the trout start rising in the evening or, if you're an early riser, as soon as the sun ascends to where it can shine on the water, creating a blind spot in front of you. Flatwater anglers, ocean or lake, have to deal with it too.

Working a fly line you can't see over fish

that
may or
may not
be there is
bad enough,
but missing
strikes is worse,
especially when fishing dry

flies in a current. Since you can't see your line, that five- or six-foot drift through the reflected sun is usually enough to drag your fly, and dragging trout flies rarely work. Also bad are trout that take the fly, decide it's not the real thing and spit it out before you're aware anything has happened, but worst of all are the fish you catch accidentally. Hey, you're supposed to be in control of the situation, not a hack who hooks fish on the backcast.

THE SUN, 93 million miles away and untouchable, doesn't care if it ruins your fishing. But while you can't eliminate glare entirely, you can lessen its effect and get a peek at your fly once in a while.

One way to do this is to buy a big hat. Indulge yourself and get one of the pricey safari jobs you see in outdoor catalogs. Indoorsmen may regard them as mere fashion statements now, but once upon a time in the West (and elsewhere—Africa, Australia, etc.) big hats were born of the need to fight sunlight.



Everywhere from Madison Square Garden to her native Phillips, Maine, Cornelia demonstrated her mastery of the equipment that inspired her pen name.

personal telegram of congratulations; the Maine Sportsmen's Fish and Game Association, its membership rolls replete with prominent politicians, judges and businessmen, elected her as its first female member; even the New England Women's Press Association invited her to join. The Maine sports-woman also met with Buffalo Bill Cody, who was touring the East Coast with his Wild West Show, and became friends with Annie Oakley, who gave her a quiver said to have been carried by Sitting Bull at Little Big Horn. From the Winchester company Cornelia Crosby received the rifle, engraved with the words, "Fly Rod, 1896," with which, the following year, she downed what turned out to be the last caribou legally taken in Maine.

(This was yet another reputation-enhancing feat. The deer were spooked; her guide urged her to shoot. Fly Rod instead waited, cool, calm and collected, until the small herd spread out a bit. She picked out the bull, running now, and, said a contemporary newspaper account, whacked her trophy in the neck at 125 yards. The guide reportedly stood up, wiped his forehead, and declared her to be his unrivalled equal.)

Undoubtedly the most significant honor to befall Fly Rod came in 1897. Fly Rod was in Washington, D.C., that year when she received a telegram urging her to speak before the Maine legislature on behalf of a proposed law to organize and register Maine guides. Guides had always worked as unofficial freelancers, and their professional reputations were often damaged by unscrupulous operators who abused legal game limits. Fly Rod rushed back home to ardently support the bill, which passed almost unanimously. In appreciation for her work both for the bill and to promote

Maine as a sportsman's paradise, Fly Rod was granted the very first Maine guide license.

DESPITE her well-publicized enthusiasm for traditionally male sports, Cornelia took pleasure in traditionally female activities as well. She gave "pink teas" for the New England Women's Press Association and she founded a young women's Christian civic society in Phillips that met once a week to play music, read poetry, and do fancy handiwork. On her sojourns in the woods, she would sometimes take with her a satin-lined wicker basket filled with delicately hand-painted cups and a teapot, no doubt startling any woodsman who happened to come upon her sitting by a trout pool, daintily sipping tea between strikes. Perhaps by chance, perhaps by choice, she never married and she left no record of any boyfriends.

"Still, you never know," notes Ron Turmenne, of Oquossoc, who knew Fly Rod when he was a young man. "She might have had a boyfriend in every state she went to." Certainly she won the admiration of Native American Lewis Sockalexis, of Old Town. He was at one time a crack right fielder for the Ohio baseball team eventually renamed, in his honor, the Cleveland Indians. He danced with Fly Rod at the wedding of two Penobscot Indians in Old Town, and later commented, "Her face is white, but her heart is the heart of a brave!"

For Fly Rod, the '90s, which had begun so auspiciously, ended in debilitating misfortune. In 1899, while boarding a train, she caught her dress and was dragged some distance, seriously injuring her leg. For months she lay in a Portland hospital, where she was much taken with the kindness of the Catholic

nuns that nursed there. Although born a Protestant, she converted to Catholicism and vowed that if she recovered she would devote her life to the construction of a chapel in the woods at Oquossoc. True to her word, she later succeeded in raising \$5,000 to build a little red church known as Our Lady of the Lakes, which still stands in the woods at Oquossoc. When the first mass was held, the church's benefactor was there, kneeling humbly in the very last pew.

Her recovery, however, had only been partial: after the accident Fly Rod used a crutch to walk. Nevertheless, she continued to gather the news of the Rangeley area camps and hotels and to record them faithfully in her column. And, although her own participation was greatly curtailed, Fly Rod was encouraged by the increasing number of women beginning to enjoy outdoor sports. She was no doubt aware of the part she had played in the transition when she wrote, "The time is past, I thank kind Providence, when it was thought unladylike for a woman to be a skillful angler or a good shot . . . There is no more graceful, healthful, and fascinating accomplishment for a lady than fly-fishing, and there is no reason why a lady should not in every respect rival a gentleman in the gentle art."

As Fly Rod grew older she suffered from illnesses that cost her the sight in one eye and kept her more and more confined to her cottage in Phillips. Finally, on November 11, 1946, after nearly a century dedicated to enjoying and promoting the Maine outdoors, Cornelia Crosby, 92, died. She left as her legacy a trail of innumerable newspaper columns and sporting articles, a trail that has led now millions of visitors to Fly Rod's—and the nation's—playground. □

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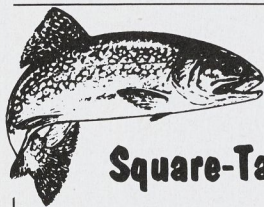
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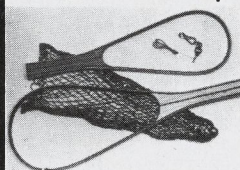
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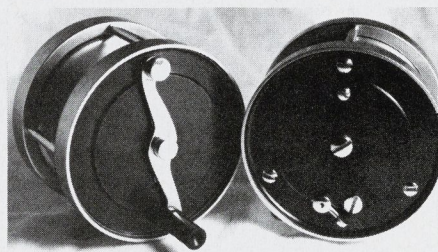
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GLARE

Continued from page 47

detect strikes. But if nothing points to the use of a nymph or dry, a streamer worked through a glare-hidden stretch of water might pick up a fish you wouldn't have caught otherwise, and strike detection is easy.

In some situations, dries and nymphs can be fished with a tight line also. Nymphs can be drifted directly downstream with a (relatively) tight line, and retrieved upstream through riffles and pools with good results. Though classic wet fly techniques aren't particularly popular anymore, they were and are extremely effective.

Not long ago I shared a stream with a teenager, and while I cast dries to the far bank, he drifted a caddis nymph directly downstream and slowly hand-twisted it up again. We both caught fish, but I was intrigued and not a little surprised by his method, since most of the fish he took were hooked just a few feet upstream of me. More interesting still was that he missed very few strikes. Trout that took his nymph on the retrieve almost hooked themselves.

With care, you can also fish dries by drifting them straight below you. You won't actually be able to keep the line tight but, by feeding fly line downcurrent through your rod guides and other little tricks, you should manage a drift through glare with very little slack, and any trout that hits will be felt instantly.

IF ALLELSE fails, take off your sunglasses. Think about it: It's late in the day, the sun is setting and the light is dim. So why are you wearing those dark glasses? O.K., there's a reason for those polarizing lenses that cost you so dearly, but in the evening you can sometimes see better without them. This is rarely the case when fishing dries; there you need all the visual help you can get. But the fluorescent strike indicators used by nymph fishermen, for instance, depend on contrast for their visibility, and contrast in low light is sometimes more pronounced without the shades.

A long time ago, before I learned that life is finite, I dabbled in rock climbing with a crew of equally innocent high-school buddies. On one outing, in the company of a more experienced college-age friend, we hoped to learn the art of anchoring pitons, and then rope, to the rock, the better to protect ourselves in case of a fall. After driving half a dozen pitons into a crumbling granite wall, our college mentor called our attention to the web of rope and hardware and reminded us to "use a lot of mediocre anchors if you can't find a good one."

So it goes with glare. Every technique I've described is an anchor in a weak wall, a compromise that will never be so pleasant as not having to deal with the problem at all. You'll never learn to love glare, but you can learn these techniques and do something about it. □

dard tied styles.

The color of the body should match the predominant color of the underside of the natural. When you examine a natural fly, notice also that segmentation is almost always visible, and note the proportions of the body—its taper, diameter and length. Fur dubbing should be soft, with guard hairs removed or well blended. To imitate the natural segmentation, use two to four strands of tying thread (depending on how prominent the segments of the natural are) twisted together. Ribbing should be spaced closely together near the tail and widen gradually toward the wing. There are exceptions to this rule, most notably the Green Drake.

I prefer to use a thorax on "Real" flies, to imitate more closely the real silhouette. After tying in the hackle, wind on a dubbed fur thorax also to match the color and shape of the natural. (Actually, make it slightly larger than the natural; wrapping the hackle will compress it to the proper size.) The thorax is the center of the mayfly dun, and with it the "Real" fly is a better imitation. At this point, the unfinished fly in your vise will catch fish as an emerger, especially if you shorten the wings slightly. You'll notice that the silhouette of the "Real" fly is that of a winged nymph.

When choosing hackle, match as closely as possible the length and color of the legs of the natural. This is often overlooked.

An example: a standard Green Drake tied on a #8 hook is not very effective on educated trout, but if a #12 or #14 hackle is used on the same #8 hook, its effectiveness increases. In many cases you will find two colors are necessary, as the front legs of some species are darker than the others. Do *not* overhackle the fly—eight or 10 turns are sufficient in most cases. Put two or three turns behind the head, two to four around the wings, "thorax" style, and two or three behind the wings. The hackle should finish behind the wing, and tie off there. Then wrap the thread through the hackle, reinforcing it. After the fly is finished, "V" out the bottom (to about 45 degrees) to improve the silhouette and the visibility of the thorax from below.

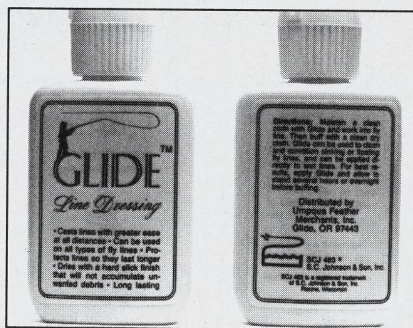
The head should be built up in the same relative position as that of the natural. This is another area where standard flies can be greatly improved upon by attention to detail. Most tiers simply use the same size head for all their flies of similar size, but when looking at different species, you'll notice that some heads are more prominent, or separated from the thorax, than others. Once again, let the natural fly be your guide in determining size and placement.

After a season's hard fishing, I'm convinced that attitude can be a prime trigger of trout feeding (especially "educated" trout), at times exceeding the importance of exact size and color. I hold no patents on the "Real" mayfly and encourage others to use it and change it as conditions and fishing experiences indicate; it is more a style of tying than a specific recipe. □

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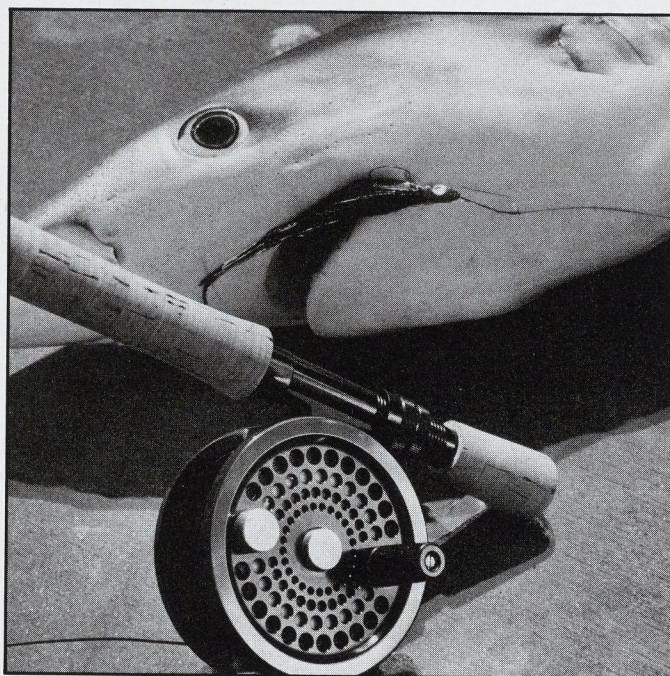


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Crisp autumn days may signal the near-end of the year's trout fishing—but, oh, what action they can bring!

LATE-SEASON TROUT

BY ALAIN WOOD-PRINCE

Tumbling down to the blue waters of lakes and rivers, the leaves of fall drift in chromatic patterns that signal the changing of the seasons. Beneath this colorful flotilla, gamefish come alive with a burst of vigor, their appetites stimulated by a strong instinct to fatten up before winter sets in.

Inland waters offer some tempting choices in autumn. I'm happy pursuing almost any species, but I have a special weakness for sparkling waters up north

which hold the promise of trout fishing with a fly rod.

On a bright, early fall day a few years ago, I sampled the rewards of stream fishing near the tail end of the season.

The setting was a tumbling stream that winds through a heavily wooded area up in the northeast corner of Wisconsin. I'd arrived at a spot where white rapids pour into a foam-flecked pool. The rippled water gleaming in the September sun looked trouty and inviting.

Wading out with fly rod in hand to

a fast-water ledge above the pool, I began casting a small Royal Coachman streamer toward a promising stretch of dark water just to one side of the main current. Several casts went unanswered. I stripped more line and dropped the fly into the whitewater at the top of the pool, letting the current wash it deep.

A quick tug (*Continued on page 56*)

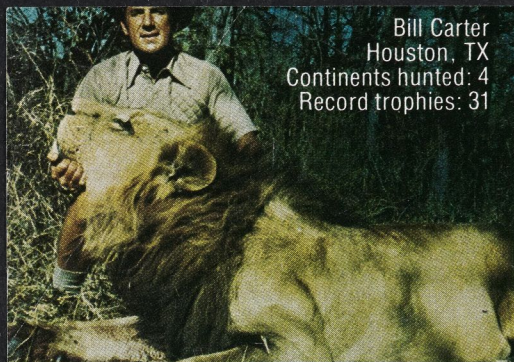
After his discovery about late-season trout, the author looks forward to the last few weeks of fishing each fall.



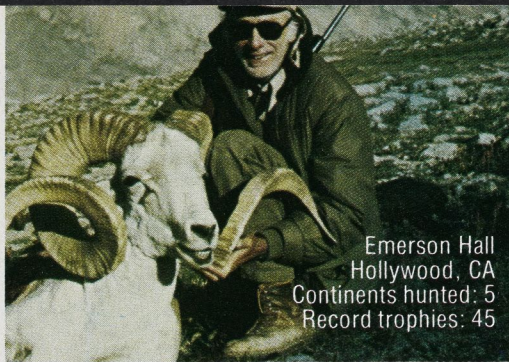
Clockwise, from top: fishing northern Wisconsin trout waters in late September; this plump brown was taken on a Muddler Minnow; small brookie shows vivid spawning colors.

PHOTOS BY THE AUTHOR

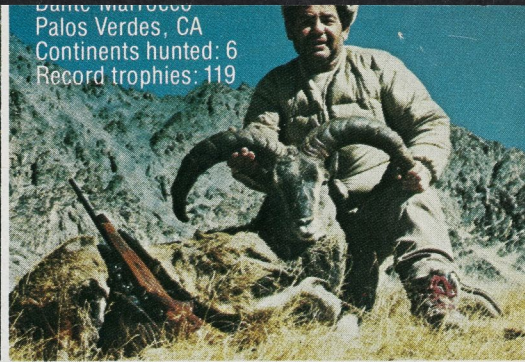
↑↑ note
leaves



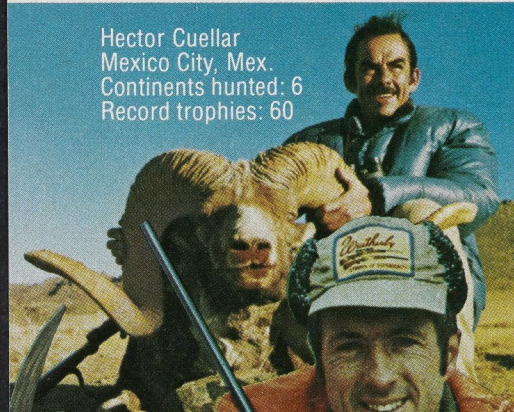
Bill Carter
Houston, TX
Continents hunted: 4
Record trophies: 31



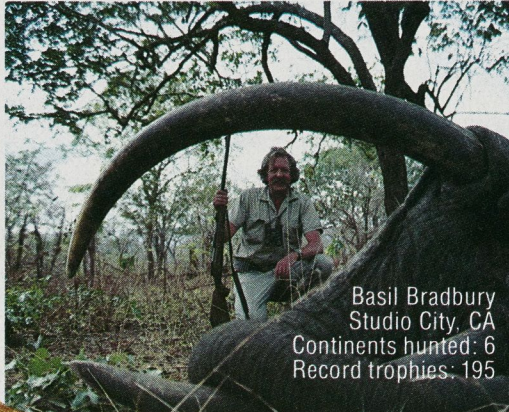
Emerson Hall
Hollywood, CA
Continents hunted: 5
Record trophies: 45



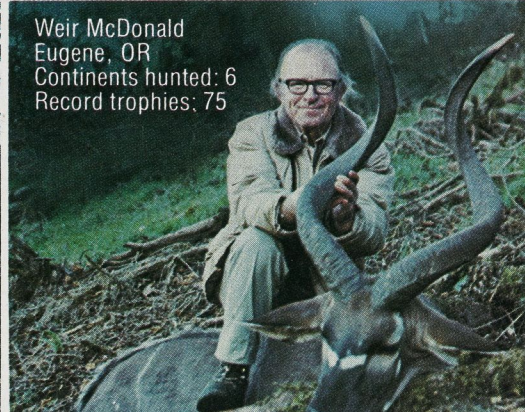
Dante Marocco
Palos Verdes, CA
Continents hunted: 6
Record trophies: 119



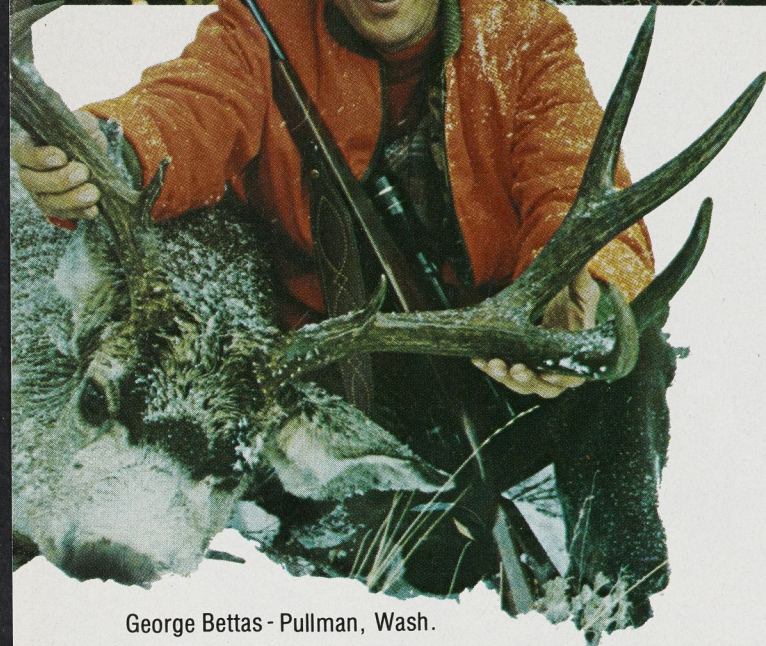
Hector Cuellar
Mexico City, Mex.
Continents hunted: 6
Record trophies: 60



Basil Bradbury
Studio City, CA
Continents hunted: 6
Record trophies: 195



Weir McDonald
Eugene, OR
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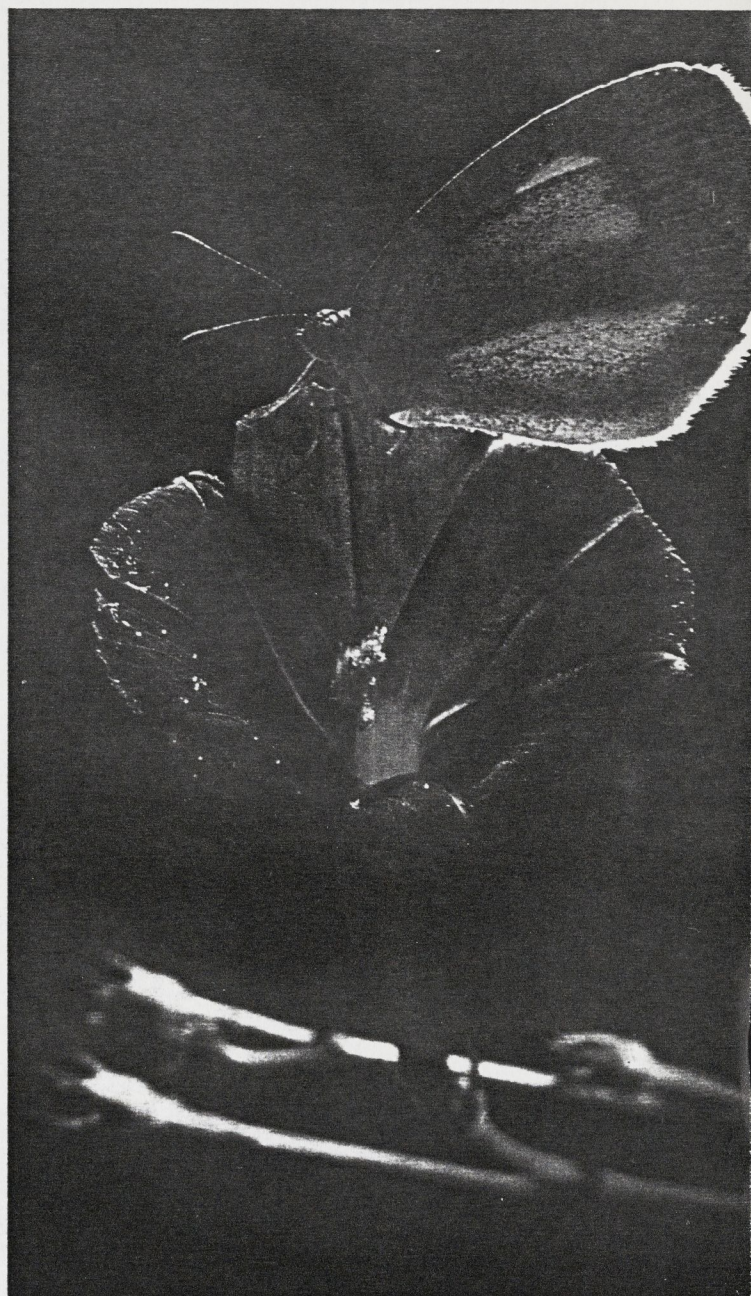
Tired of blurred insects on the wing and creepy-crawlers hiding from the light in your otherwise brilliant color slides? Curious as to how the pros capture their prey for those vivid close-ups in various nature magazines?

Well, wonder no more. Photographer James H. Robinson, who knows his unicorn caterpillars from a hole in the leaf, shows us four examples of how to pluck what you want out of nature and make it come alive on film. In order to get crisp, detailed studies, Robinson brings his subjects indoors "where conditions can more easily be controlled."

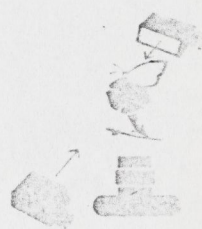
Is the photographer cheating nature and his audience? Not really. You might say he is helping the camera and film do a better job. Robinson is quick to point out: "I'm always most careful that all props are in keeping with the subjects' natural habitat."

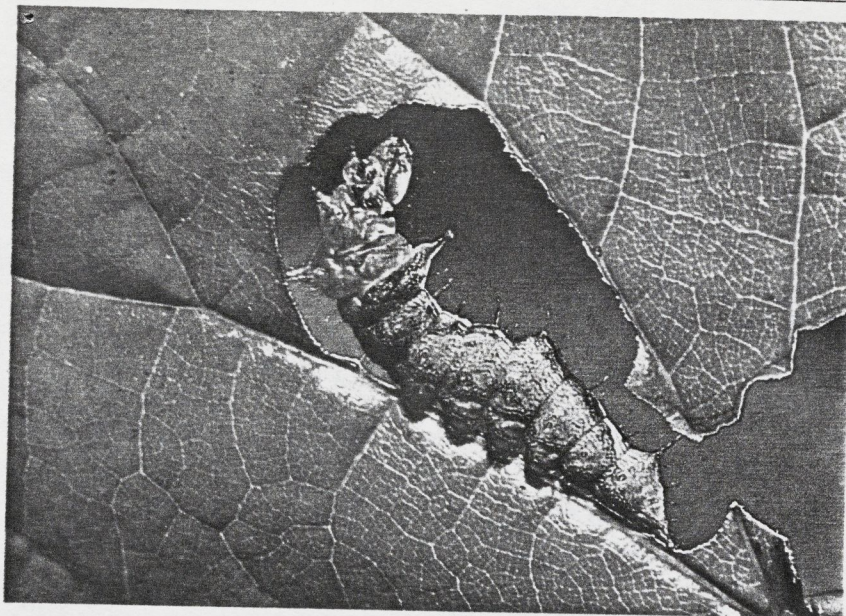
Robinson uses a maximum of two small flash units for any situation, a dual PC sync cord connector and extension cord. When using automatic flash, he sets his OM-2's auto-exposure dial at $-\frac{2}{3}$ stop to deepen tones. With manual flash, bracketing is the order of the day.

But how do you get an active butterfly or tiny red water mite to cooperate and hold still for these glamour portraits? You study their habits, for one thing, and find tricky little ways to subdue the creatures without harming them. That's what Robinson does and he reveals his methods in the captions at right. Lighting diagrams show the setups. As for the patience involved, you're on your own.—TONY GALLUZZO

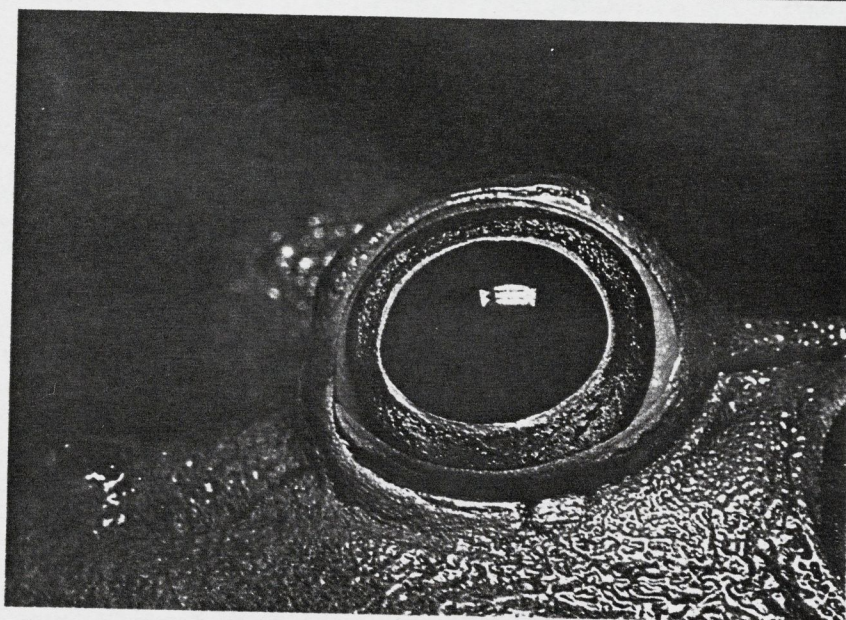


Balanced lighting. "This clouded sulphur butterfly was first refrigerated for a few minutes to calm it down. The insect was then coaxed to a twig, and gently transferred to the flower, without damaging its delicate wings. One small electronic flash unit was placed behind and slightly to the right of the subject but at an angle to avoid lens flare. Another small flash was set facing the subject as a fill light but at four times the distance of the back light. This ratio assured back light dominance. Both units were fired simultaneously with a dual PC extension cord." (Olympus OM-1 with 55mm macro Vivitar; at f/16 with Kodachrome 25.)





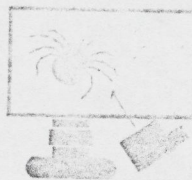
Balanced environment. "The caterpillar was lifted—leaf a red bud tree, and brought the twig clamped to a work high-intensity lamp was to predetermine where it should be placed. One behind the leaf to emphasize vein pattern. Another unit was placed up front but three times further away. Green leaf and caterpillar fill the frame and still seem to be outdoors." (Data same as at left.)

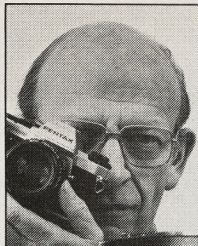


Eyelight up. "After this bullfrog was netted at night (by stunning him with a flashlight beam), he was restrained for a short while indoors under the warmth of a high-intensity desk lamp. Relaxed and still, a single flash caught his big eye when tripped about 6 in. away and slightly above. The dark, distant background eliminated the possibility of any distracting shadows." (Olympus, 50mm Zuiko at f/16 with extension tube; Kodachrome 25.)

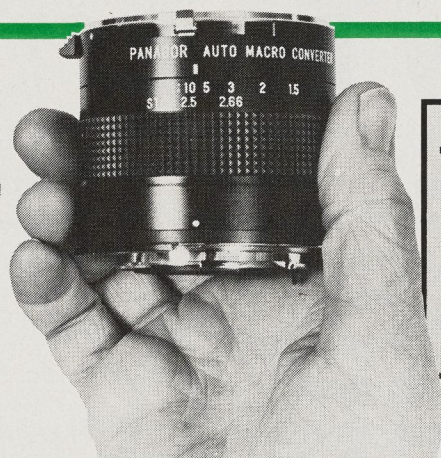


Through a glass brightly. "Slide-mount glass was used to construct a very small tank around this red water mite, restricting its quick movements to an area that would optimize depth of field. An aquatic plant and sand created the right background. One flash unit was placed in front but at an angle to avoid reflections in the glass. The lens was a 17-85mm Pan Cinor 16mm movie zoom mounted in reverse on an Olympus in order to obtain 3X magnification on the 3mm-wide mite without extension tubes. Zoom lever can be used for instant focus changes." (f/16; Kodachrome 25.)





KEPPLER'S slr notebook



Operational differences: For closer focusing, Vivitar converter barrel extends; Panagor optics move internally.

Panagor vs. Vivitar macro converter

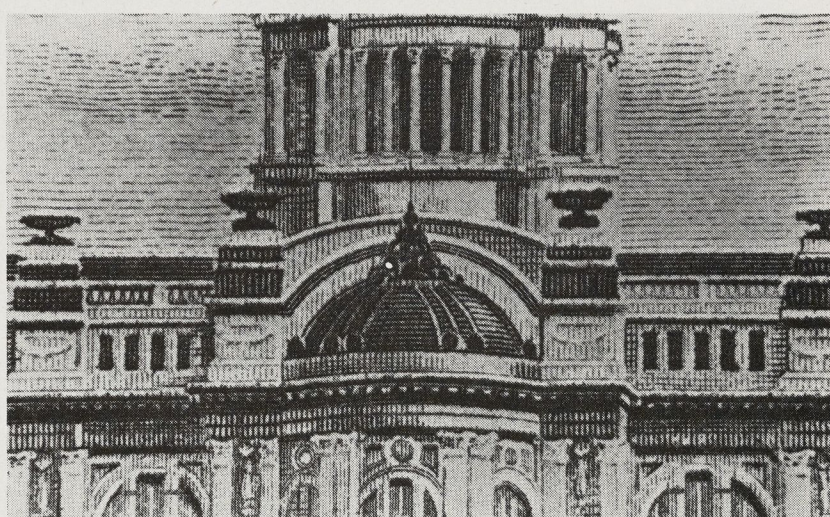
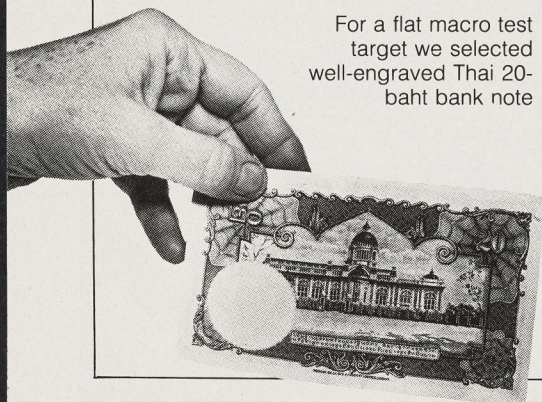
Given our continued fascination for tele converters (which increases a lens's focal length at moderate cost and size but with some loss of sharpness and speed), it isn't surprising that lens makers try to make them do new tricks.

We have so far had teleconverters of two, three, four, five and seven lens elements, converters matched to specific focal length lenses or groups of lenses, converters of 1.4, 1.5, 2, 3X and some variable-magnification converters, converters that converted into extension tubes and one that converted into a wide-angle lens.

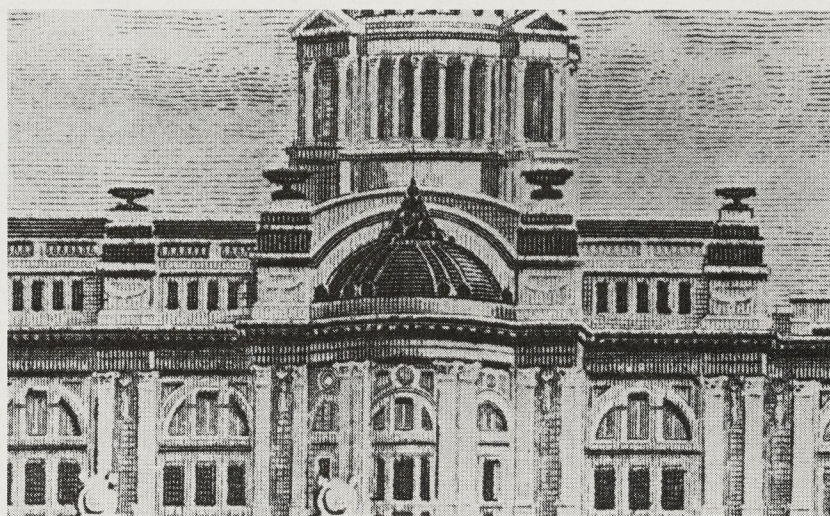
The latest stage of this evolution may be the most useful yet: converters which transform your normal-focusing lens into a macro-focusing lens.

There are two of these: the Panagor Auto Macro Converter and the Vivitar Macro Focusing Tele Converter. While we have written on them separately, we haven't let them go head on with one another's abilities and quality of results. So here goes.

For a flat macro test target we selected well-engraved Thai 20-baht bank note



Panagor converter on 50mm lens provided maximum 1.24:1 greater-than-life-image.



Vivitar converter on 50mm lens provided maximum 1:1 life-size magnification.

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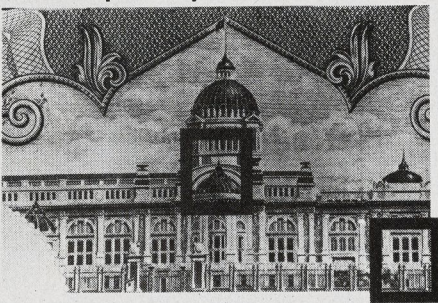
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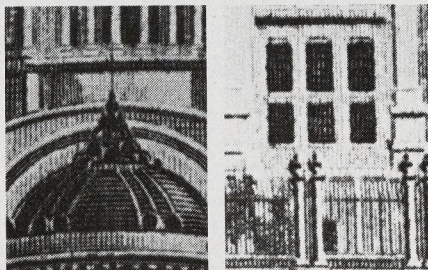
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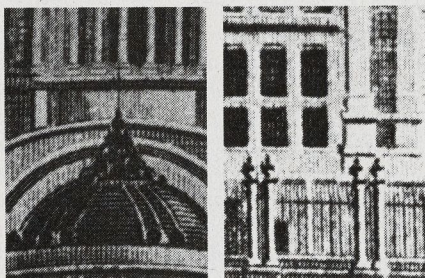
Close-up Comparison



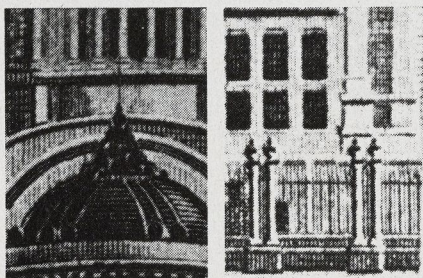
Our test target: We shot Thai bank note at 1:2 with 105mm f/4 Micro-Nikkor, then Panagor, Vivitar converters with 50mm lens.



105mm f/4 Micro Nikkor: As expected, center and edge portions of note were sharp and clear when copied at f/11.



Panagor converter with 50mm f/1.8 Nikkor: With lens set at f/5.6, 2X converter delivers equivalent of f/11. Center and edge sharpness are incredibly good.



Vivitar converter with 50mm f/1.8 Nikkor: At f/11, center and edge sections are hardly distinguishable from 105mm f/4 Nikkor.

Both the Vivitar and Panagor share several characteristics. Both are 2X converters, meaning that they double the focal length of the lens to which they are fitted and reduce the aperture of the lens by two f/stops. A 50mm f/1.4 lens, for instance, becomes a 100mm f/2.8 with either unit. Both fit between the camera lens and camera body, both are available for most popular SLRs, both provide full auto diaphragm and metering between lens and camera and both offer variable macro ranges via a control ring.

Now we come to the differences. The 9-oz., 1 $\frac{1}{8}$ -in.-long Vivitar has seven elements, and focuses your 50mm lens from infinity to 1:1. The 8 $\frac{1}{2}$ -oz., 2-in.-long Panagor has four elements and does not focus to infinity. (Measurements are in Nikon mounts. Others may vary slightly.) With a 50mm lens, the Panagor's minimum focusing magnification is 1:10 for most SLRs, 1:7 for Minoltas, 1:5 for Canons and 1:4 for Konicas and focuses closer than 1:1 with most SLR cameras.

The Vivitar macro converter has fixed-position lens elements and an extending helical tube which moves the attached lens away from the converter optics as you focus the converter closer and closer. The Panagor converter has a fixed length tube with movable optics that move backwards for maximum close focusing (see photo page 44). The Panagor focusing ring has white magnification figures from 1:10 (or the other minimum magnifications already given) to 1:1 with a 50mm normal lens set to infinity. Necessary additional exposure increases are engraved in blue. (With through-lens metering, of course, the additional exposure is automatically compensated for.)

The Vivitar also has two scales. But both are magnification scales: the blue indicating magnification with your 50mm normal lens set at infinity, and the white with your normal lens set at closest focusing distance.

Oh yes, price. Both the Panagor and Vivitar sell in the \$65 to \$80 range depending on the store and whether the lens is in screw-thread or bayonet mount.

In terms of maximum magnification, the Panagor provides greater-size images than the Vivitar. For instance with a 50mm f/1.8 Nikkor, the Panagor reached 1.24:1 while the Vivitar got to exactly 1:1. (With 50mm lenses that close focus to a minimum of more than 18 in., you may not be able to reach 1:1 precisely with the Vivitar). Unde-

Vivitar as tele-converter



Our test target: View from office window made on semi-overcast day.



105mm f/4 Micro-Nikkor: At f/11, as expected, center and edge of distant scene were registered with clarity, sharpness.



Vivitar converter on 50mm f/1.8 Nikkor: Big surprise! At f/11 equivalent, center and edge sharpness were also fine.

niably, however, the Vivitar's ability to focus any lens to infinity—providing a full function tele converter capability at all distances right to macro—is an important point in its favor.

How about image quality? We mounted a Nikon on my Nikon Multiphot copying stand and placed a bank note from Thailand beneath. We photographed a building engraved on the back of the note with a 105mm f/4 Nikkor, with a 50mm f/1.8 Nikkor plus Panagor and with the 50mm f/1.8 Nikkor plus Vivitar macro teleconverter, all at the equivalent stops of f/4, f/11 and f/22.

Continued on page 132

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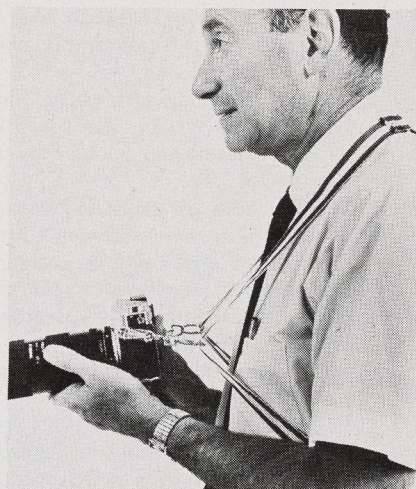
RGB

QUICK NOTES

Continued from page 36

case of poison ivy to contaminate your chemicals. Then slip on a pair of Multi-Flex disposable vinyl gloves and go to work. Afterward you can throw them away or use them again, according to manufacturer Dayton Flexible Products (2210 Arbor Blvd., Dayton, OH 45439). In packs of three, sizes M/L or L/XL and ambidextrous. At dealers.

Strapless strap? Not really. Wintop's Non-Sway Safety Strap is more like a loop (actually a continuous strap) with two O-rings to which are attached two standard metal camera holding clips (with plastic protective covering). After adjusting the 1-in. wide nylon strap to your desired length (and attaching camera, of course) you slip it



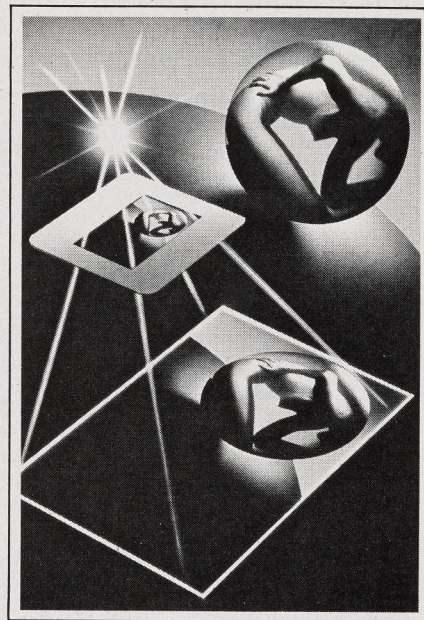
over your head and under your arms so that it resembles a pair of suspenders. Strap remains fixed, camera slides up to eye level and down to rest level when you want to move it. Or fold it over and use as a conventional strap. From Wintop Enterprises (6 Seventh Ave., Halifax, Mass. 02338).

SEEING PICTURES

Continued from page 42

to it. It's clear now that putting away my books is not simply a job of housekeeping. Looking at those rows of books, each one representing someone's efforts at expression, each one an attempt to convey knowledge or feeling or insight or ideas, leaves me with two opposing observations. One is a sense of how rich I am in resources and, the other, of how much I don't know—even within the relatively small field in which I've spent most of my life. I also realize that my library is like my home town, peopled by photographs I love and admire, by books that represent the achievements of friends or of strangers whom I might get to know someday; full of reminders of losses and mistakes that are part of experience. My library is a symbol of possibilities and limitations, an indicator of what's important and what isn't, a hint at what's knowable and what isn't. —THE END.

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KEPPLER'S **slr notebook**

Continued from page 45

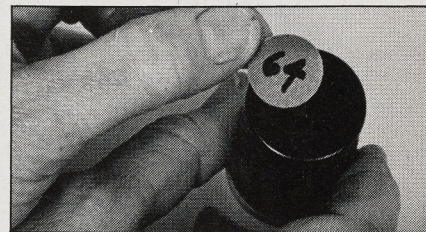
From the negatives we made identical prints of the f/11 aperture, using a glass carrier for near-absolute flatness of the negative. We then examined the prints. At f/11 (an aperture which we would normally use for such critical work) the images of all three prints, both center and edge were incredibly sharp and well nigh indistinguishable from one another—a really splendid feat for the two macro converters. (see photos page 45). For such work, both the Panagor and Vivitar can be highly recommended.

With longer standard-focusing lenses than 50mm mounted to the Panagor or Vivitar converters you still get macro focusing but not 1:1. The longer the focal length fitted, the less maximum magnification abilities of the two lenses. Of course, if you use them on lenses which already offer macro focusing, you can often get even greater magnification than 1:1. Yes, they can be fitted to zoom lenses for closer focusing and many zooms which have 50mm or less in their ranges can also focus to 1:1 with either Panagor or Vivitar macro converter. Lenses of shorter than 50mm focal length will provide greater magnification than a normal

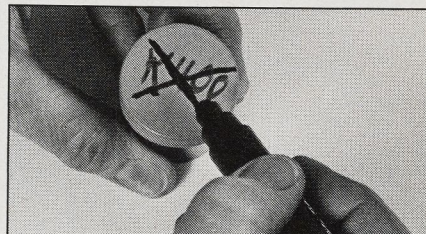
lens—but few wide-angle lenses are corrected well for close work, so results will generally not equal what you can get with 50mm or longer lenses.

How good a regular 2X converter is the Vivitar? We tested it strictly as a regular tele converter vs. other non-macro tele converters. Well, we didn't test it against the specialized expensive Canon, Nikon, Minolta and Olympus converters, but it can certainly hold its own against any quality independent brands including the regular 2X Vivitar. However as with all regular tele converters, you will also lose some definition at the center and a bit more at the edges when shooting at normal or greater distances at full aperture. The amount lost depends on the lens to which you fasten the converter and the aperture used—as with all converters. For best results, stop the main (prime) lens down three or so f/stops. At f/11, the Vivitar was superb (see page 45).

So now you have it. My recommendation is the Panagor if you want maximum magnification and the Vivitar if you want to use the unit also as a regular tele converter able to focus to infinity.



After shooting, transfer tabs to container bottom to distinguish from unshot film.



Tab system is better than my old way of marking container top with felt pen.

mark the top with an X meaning, naturally, "exposed." If you want, you can also mark the film's expiration date on the top.

"You might be interested in an identification system that I have used for about two years now, and which I find easy and convenient," writes Notebook reader James M. Keefe. "I have enclosed four sheets of stickers (red, blue, green, and yellow). I stick one of these on the bottom of each film container—red for Kodachrome, blue for Ektachrome, green for Tri-X, and yellow for Kodacolor. They can easily be written on, and this may be useful to do if for example you use both K-25 and K-64, as I have indicated on the red sample stickers.

"Whenever I expose a roll, I replace it in its container and peel off the sticker. That way I don't have to go into the container only to discover that I have already exposed the film inside."

I have modified Mr. Keefe's system slightly by peeling off the sticker after exposure and replacing it on the container bottom so I can identify the film after exposure. Then I don't have to separate Kodachrome from Ektachrome from Kodacolor or whatever before sending the film out for processing.

Cheap photo vest may be the best ever

Frankly I hate photo vests. I feel silly wearing one. If I get cold and need a sweater or coat, pray what happens then?

Despite my own antipathy towards this
Continued on page 134



Self-adhesive colored tabs available at stationery stores label film cans nicely.

Keeping your film from utter chaos

As I've often pointed out, anyone who packs his bag with unopened 35mm cardboard film boxes ought to have his head examined. Who needs the frustration and time wasting involved in ripping open the boxes and trying to throw away the box and instructions (if any) before loading up?

It's better—far, far better—to strip the containers naked prior to dumping them in your bag. But make sure they are marked as

to what's inside since many film companies leave all canisters the same color no matter the contents. (Yes, Fuji does provide semi-transparent containers with different colored caps for each film, but Kodak people I've talked to feel there is danger of fogging the film through the lip if by accident the semi-transparent container is accidentally turned toward direct sunlight. Me? I think the danger is small.)

Anyway, if you are stuck with opaque plastic containers, you can mark 'em as I've always done as per the photo, above. A permanent felt marker works nicely. After use, I put the film back in the same container and

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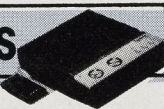
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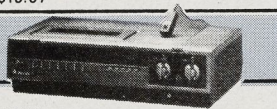
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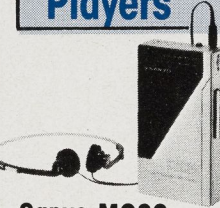
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Photographing Naturals

CHARLES J. BAGDADE

FLY FISHERMEN ARE EXPOSED to an uncommon amount of beauty, due largely to the nature of the waters that they frequent. They also tend to be acutely aware of that beauty. The proliferation of photographs by amateur photographers attests to the fly fisherman's desire to record what he sees around him. Camera technology has reached the point where an amateur photographer can purchase a quality camera that permits him to simply aim, focus, and shoot with results that are technically good under most circumstances. There is one area, however, where technology has not kept up with us: the fascinating world of close-up photography.

Anyone who has tried to take consistently high-quality photographs of insect life in the field, or even of examples of the fly-tier's art, knows the problems that color film poses. The simple technique that follows will allow you to take superb pictures of a mayfly on a leaf or a #14 Adams in your vise, without having to worry about proper exposure, subject movement or color balance.

Most of the equipment that is needed for this technique can be found in the

camera bags of many photographers. You will need a 35mm, single lens, reflex (SLR) camera with a 50 to 55mm lens. A macro lens is preferable in that it simplifies the method even more, but the standard lens on the camera will work quite well. The next requirement is a small electronic-flash unit. In this case, the smaller the better; and the unit doesn't even have to be automatic. If it has automatic capability, it must be switched to manual for this technique. You will also need a set of auto extension tubes or a bellows; extension tubes lend themselves better to this technique. These will permit your lens to focus to a matter of inches away, instead of the normal minimum focusing distance of 1½ to 2 feet. The film that you should use is probably the same that you use now: either color-slide or color-negative film with a film speed of 25 to 100 ASA. The last essential items are a pack of lens-cleaning tissue and a small rubber band. The addition of a tripod and an automatic winder or motor drive for the camera will simplify matters, but these devices are not critical to your success.

The one essential element of this technique is standardization. Once you have established your personal standards, you will never have to change anything in the procedure.

First, load your camera with the film that you will be using, and connect the

DR. CHARLES BAGDADE lives in Buffalo Grove, Illinois. This is his first contribution to FFM.

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electronic flash cord to the camera's flash outlet. Do not put the flash in the accessory shoe atop the camera. Attach one or more extension tubes totaling about one inch in length. If you're using a macro lens, do not use a tube, but focus the lens to its closest setting. Find a small subject, such as a flower or a fair-size fly mounted in your vise. Set the lens to f16 and focus. Now, hold the flash so that its front surface is even with the front surface of the lens and pointed toward the subject. Take a picture. Using the rubber band, secure one piece of lens tissue over the flash and take another picture at the same f-stop and focus. Continue taking pictures, adding one piece of lens tissue each time. My system, using Kodachrome 64 film, requires six layers of lens tissue. When you get your pictures back, find the best frame to determine how many sheets of tissue produce the best results. Once you have done this, the work is over, and you can take pictures from a 1:5 reproduction ratio (where the image on the film is 1/5 life size) or 3:1 or more (where the image on the film is three times life size) without ever having to change a thing, except to add or remove an extension tube as you change shooting distance. Just remember to keep the lens at f16 and the flash aimed at the subject.

The use of an electronic flash is one of the greatest benefits of this close-up technique. It gives a constant level of light, whether it is used at midday under a bright sun, at dusk or indoors. The use of floodlights indoors gives excellent light control, but it requires the use of special film that is color balanced to artificial light, or a color correction filter if used with daylight film. This system allows you to use your regular color film without filters or problems with color balance. The flash also permits the use of a small lens opening—in this case f16—for maximum depth of field. In close-up photography depth-of-field (the field in which objects are in focus) can total less than one inch, so the small lens opening gives you a safety margin. The very short duration of the electronic flash tends to freeze slight movement by the camera or the subject. Without a flash, the slightest breeze can move the branch that the mayfly is perched on, preventing sharp focus.

Since learning this simple method I have used it for more than 90 percent of my close-up photography. It is so simple that it allows me to concentrate on the picture, not on equipment and technique. Run a test roll of film through your camera and see for yourself how easy close-up photography can be. 

Aquatic Entomology

A glimpse at a major new book

THE CLICHÉ THAT FLY-FISHING partakes of both art and science is an old one, but it is confirmed once more by the artwork that appears on these pages. The drawings are the work of Arwin V. Provonsha. They are a tidbit of *Aquatic Entomology*, to be published this month by Science Books International, of Boston, Mass.

That FLY FISHERMAN was selected by the publishers to introduce such a monumental undertaking is not surprising, for the book, a \$50 item, is described as "the fishermen's and ecologist's illustrated guide to insects and their relatives."

In outlining what he intends to accomplish in writing the book the author, W. Patrick McCafferty, professor of entomology at Purdue University and a fly fisherman too, notes that British naturalist-anglers have "long succeeded in arranging the art and science so they march happily together, with the object of catching fish in as deft, delicate, dashing and dramatic a method as possible." He concludes: "I would simply add that avid North American fly fishermen now, as never before, are felicitously joining the ranks of the angler naturalists, and all indications are that fly-fishing and aquat-

ic entomology will live together happily ever after."

If this book has anything to say about it, they will live happily ever after. The text brilliantly applies the discoveries of science to the uses of the fly fisherman. With the help of artist Provonsha, curator of insect collections at Purdue, McCafferty communicates these discoveries in fishermen's English without sacrificing scientific accuracy.

For fly fishermen who want to understand what has often been a hopelessly arcane subject this book will be greeted with delight. Its best features include binomial keys that vastly simplify identification of North American insect species, illustrations that are beautiful as well as accurate and a special guide to fishermen's mayflies of North America that correlates the vast and often confusing array of common fishermen's names with up-to-date nomenclature.

We have not seen the book as it will appear off press, but what we *have* seen exhibits the highest order of publication production standards, including very high quality color separations and paper for the book's 124 color paintings, 372 continuous-tone black and white drawings and 520 line drawings.

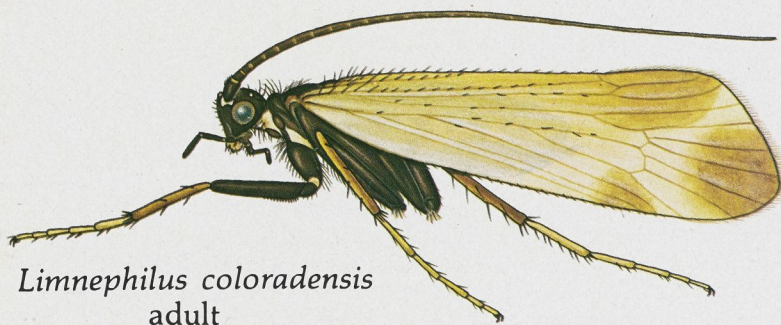
Aquatic Entomology (500 pages) should become a standard—perhaps a classic—for the student, the naturalist and the fly fisherman. It can be found at Science Books International, 51 Sleeper Street, Boston, Massachusetts 02210 and on bookstore shelves after July.



Limnephilus sp.
larva



Limnephilus sp.
case



Limnephilus coloradensis
adult

CADDISFLIES

Trichoptera

Northern Case Makers

Limnephilus sp., larva: 14 mm (often larger); individuals of this genus, which is found in most of North America, inhabit ponds, lake margins, marshes, streams, and cold springs.

Limnephilus sp., case: 20 mm; one of many kinds of plant and rock cases for this genus; some range to 50 mm in length.

Limnephilus coloradensis, adult: 10 mm; the Orange Sedge is a popular tied fly imitation of this small, western species; develops in cold water at higher elevations of the Rocky Mountains.

First Look

Tamron Adaptall-2 Trio

Interchangeable mounts fit close-focusing lenses to almost any current 35-mm SLR

350-mm Tamron-SP f/5.6 Catadioptric

- 350-mm f/5.6 telephoto with silver-evaporated reflex mirrors
- Continuous focusing to 3.6 ft.; maximum image/subject ratio, 1:2.5
- Built-in tripod mount
- Self-storing, detachable screw-in lens hood
- Length at infinity, 2.9 in. (74.5 mm)
- Diameter, 3.4 in. (86 mm)
- Weight, 20.4 oz.
- Comes with set of five screw-in filters that mount at lens' rear
- Optional Flat-Field 2X teleconverter; maximum image/subject ratio, 1:1.25X

80-210-mm Tamron f/3.8-4 Adaptall-2

- Zoom lens; focal-length/maximum aperture range from 80-mm f/3.8 to 210-mm f/4
- Continuous focusing to 35.4 in.; maximum image/subject ratio, 1:2.8
- Infrared focus index mark
- Single-control, one-touch focus/zoom operation
- Half-stop aperture detents to f/16; full-stop detents to f/32
- Accepts 58-mm screw-in filters
- Built-in, retractable lens hood
- Length at infinity, 5.8 in. (146.5 mm)
- Diameter, 2.5 in. (64.5 mm)
- Weight, 21.5 oz.

35-80-mm Tamron-SP f/2.8-3.8

- Zoom lens; focal-length/maximum aperture range from 35-mm f/2.8 to 80-mm f/3.8
- Continuous focusing to 10.6 in. at 80-mm focal length; maximum image/subject ratio, 1:2.5
- Separate focusing and zoom controls
- Half-stop aperture detents to f/22, full-stop detents to f/32
- Accepts 62-mm screw-in filters
- Length at infinity, 3 in. (76.5 mm)
- Diameter, 2.5 in. (64.5 mm)
- Weight, 13.6 oz.
- Optional lens hood

Tamron is one of the few companies left offering interchangeable-mount lenses to fit the various makes of 35-mm SLRs. This makes it economically less painful to hop from system to system, or even use them in conjunc-



L. to r.: 35-80-mm f/2.8-3.8, 350-mm f/5.6, 80-210-mm f/3.8-4.

tion with one another. The decline in popularity that interchangeable-mount lenses have suffered in recent years isn't necessarily because the idea is bad; it's because earlier executions of these mounts didn't do justice to the concept. The three Adaptall-2 lenses I examined permitted mounts to be changed quickly and easily and stayed securely. The system uses a series of locking-bayonet ring adapters to fit almost any current 35-mm SLR.

Starting with the 350-mm Tamron-SP f/5.6, this is a good example of a modern mirror lens. It has a decent aperture for its focal length, yet is compact enough for easy carrying and hand-held use. However, the outstanding advantage of this convenient "cat" is that its telephoto capability can be employed at fairly close camera-to-subject distances. This means one can get rather tight close-ups without sticking the lens practically on top of the subject. A good example of this is when you want to photograph some

bees buzzing about a rose garden without attracting unpleasant attention.

Optically speaking, this Tamron will put a sharp, contrasty image on the film. The seven-element, four-group design is aided by multicoating and a nice long lens hood that attaches to the lens for compact storage. A 30.5-mm screw thread at the lens' rear accepts five filters provided with the lens. These include a 4X neutral-density, yellow (52), orange (56), and red (60), plus a normal one to be used when none of the others are required: the optical system is calculated for optimum performance with a filter in place.

To sum up, this lens offers a useful combination of telephoto and lens speed, optical performance, close-focusing capability, and compactness.

Next, the 80-210-mm Tamron f/3.8-4. There are a great many close-focusing zooms of this type, and the majority are credible performers. However,

continued on page 232

LATE FLASH!

Pentax Introduces Autofocus SLR

The new MEF offers through-lens focusing aid plus new servo-driven 35→70-mm f/2.8 zoom

By Norman Goldberg

Once again Pentax seems to have won the race to be first to market a camera incorporating a major technical innovation. The just-announced Pentax MEF is a through-lens autofocus 35-mm SLR based on their successful ME Super. The autofocus feature adds nothing to the camera's size. It operates by electronically analyzing the light falling on a focus sensor on the floor of the mirror box. The user locates the subject in the finder's central aiming ring, which also contains a conventional optical focusing aid (split wedge and microprism).

As the shutter-trip button is lightly touched, the focus-indicating display below the finder frame turns on. If the subject is in focus, a green hexagonal LED glows and a piezoelectric vibrator beeps demurely. (The beeper can be switched off.) If the subject is not in focus, a red LED arrow glows on either side of the green LED, indicating which way the top of the lens should be turned to bring the subject into best focus. The red arrows also indicate when there's insufficient contrast and/or luminance in the scene to permit the system to work.

The solid-state image-detection system used in the focus sensor is described as being effective for scenes calling for exposures between EV 4 to EV 16, and it uses the light coming through a semitransparent main mirror, then reflected downward by an auxiliary mirror to a small slit in the mirror-box floor. A beamsplitting prism system behind the slit divides the light to sample the focus condition on either side of the geometric equivalent of the film plane. The resulting images are detected by tiny photosensitive devices whose signals are processed by the appropriate circuitry.

In addition to the focus-condition indicators in the finder, the MEF provides for electrical coupling to servo-driven lenses. Five contacts at the bottom of the body-flange face mate with those of the first of these lenses, a Pentax AF 35→70-mm f/2.8. Its built-in servomotor drives it from its close limit to infinity in 1.5 seconds when the light is good, longer in dim light. Further details on this fascinating first realization of the long-awaited SLR with through-lens autofocus will be given next month.



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Books

continued from page 156

forms of light. The text, which gives form to the whole book, is a clear statement on the process by which we become more aware while experiencing nature through photographing it.

The emphasis of this book is to exhibit how we see nature spiritually, and how we are transformed. The images, superb for the most part, are moving in themselves. But a few are boring and poorly composed, particularly those which show wildlife close up. The layout is an important consideration, affecting how we view the pictures. At times, the writing and the photographs complement each other admirably. Like the visuals, the text varies in its intensity and artistic caliber. Describing nature images, Shaw states: "A sense of movement must be there, of a breeze just stilled, a raindrop just fallen."

In contrast to this lovely thought, which accompanies the picture, "Spring woods in light rain," is a somewhat senseless, rather banal quote earlier in the journal:

"Where's (Larry) West? I thought he was photographing the stream."

"He's lost. West and I are always lost. Some people prefer to be that way."

Although the juxtaposition of beautiful images is often delightful, this collection of visions of the wild is marred by a scattered approach to a delicate subject. Nevertheless, this is a lovely book, if only for its best pages, which compare with the finest nature work being seen today.

Bruce Poli

Visions of China: Photographs by Marc Riboud, 1957-1980, with introduction by Orville Schell. New York: Pantheon Books, 1981; unpagged with 102 black-and-white photographs; hardcover, \$30; paperback, \$14.95.

Of all Western journalists who have been permitted to enter (and assess) The People's Republic, Marc Riboud probably possesses the most rounded vision. Since his first visit in 1957, when post-revolutionary liberalization of national control allowed outsiders a brief glimpse of the changes wrought by the communist takeover, Riboud has fortuitously returned to China at politically sensitive intervals.

He was there on the eve of the "Cultural Revolution" in 1965 and, again, in 1971 just before President Nixon's landmark visit. And with cultural and

economic exchange between China and the West becoming a solid—if not yet commonplace—reality, he returned last year to see how life there may have been altered as a result of the new international dialog.

Visions of China is a compilation of all Riboud's visits to date. Many of the images are already classics—old friends warmly recalled from previous, all too rare, showings of his work in book or exhibit format. Only 15 of the group are from his most recent tour and, to judge by those, Westernization has indeed arrived in China, bringing with it all the familiar benefits and ills of a consumer society.

The heroic-sized propaganda poster of 1965 has been replaced by a billboard advertisement for toothpaste. The phalanxes of young women who drilled so determinedly now sit in rows and wait like Medusas while metal bonnets change their hair from straight to curly.

Rather than move in chronological order, Riboud has arranged his photos so that the juxtaposition of time provides its own message. As he puts it: "The best way to discover China is . . . to use one's eyes. Intense attention to detail and to the moment, here even more than elsewhere, can lead to knowledge and understanding."

Yvonne Kalmus

First Look: Tamron Lenses

continued from page 250

this Tamron distinguishes itself, except at its very extremes, though even there it handles them fairly well. Stop it down, though—just a bit—don't focus too close, and stay just shy of the 210-mm setting, and you'll get really nice results. With that little tweaking of the controls you'll see a good overall pickup in image quality. Helping to maintain the 12-element, 10-group zoom's good contrast is Tamron's multicoating, and the built-in retractable lens hood.

The aperture barely changes from wide-angle through telephoto; in fact, it is very decent of Tamron to mention the difference at all. It certainly isn't enough to bother about when using automatic flash. Another thoughtful plus is the half-stop detents on the aperture ring—a useful feature neglected by some much more expensive lens lines.

While this telephoto zoom would be somewhat front-heavy on a very compact camera, on full-sized SLRs it handles very well.

The 35-80-mm Tamron-SP with its

f/2.8 maximum aperture comes close to the all-purpose function that such medium-range zooms are intended to fill. True, Tamron has had one on the market for years, but this is a much improved lens. Unlike the earlier design, it focuses *continuously* down to 10.6 in. at 80-mm for a maximum reproduction ratio of 1:2.5. Moreover, the linear distortions are now minimal, and instead of "one-touch," it has separate focusing and zooming controls so that you won't inadvertently lose focus as you zoom. The reverse, however, does happen as you close in beyond three ft.

As you turn the focus control in for the close-up, the zoom ring will start to move toward the longer focal lengths. That's okay, but working in the middle range I found myself fumbling a lot when trying for wider angles because the focal-length ring would often lock. Not a big problem, but it tends to slow one down. Interestingly enough, Tamron touts this coupling approach of theirs as a means to get closer focusing, an acceptable premise which might be more workable in the field with a one-touch zoom.

Optically considered, this nine-element, eight-group zoom has nothing to apologize for—it is very usable even wide open. Still, it benefits from moderation. By f/8, it is just fine throughout the range of focal lengths and working camera-to-subject distances. Through-the-lens metering is highly desirable for this variable-aperture lens to assure consistent exposures. It takes 62-mm screw-in accessories; the lens hood is optional.

All three lenses seemed consistently good in terms of construction. Mounts were sturdy, focus and zoom controls were smooth, and the aperture rings worked in a positive manner. Markings were quite legible.

Part of the those markings were for an optional 2X teleconverter that was specifically designed for the Adaptall-2 zooms and teles. This seems to be a good idea also for added macro capability if you can compensate for the loss of exposure, two f-stops' worth.

Mounts for these lenses in the Adaptall-2 series are available for virtually all current 35-mm SLRs. The 350-mm f/5.6 is \$553; the 35-80-mm zoom is \$437; the 80-210-mm zoom, \$341. All prices include fitted cases and carrying straps. The optional 2X Flat Field teleconverter is \$134; each adapter, \$31. Distributor is Tamron Industries, Inc., 24 Valley Rd., Port Washington, N.Y. 11050.

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Lessons in Light

Two techniques in studio still life

T*o the beginner, studio photography is a formidable unknown, a chaos of stands and lights and bounce boards and clamps and other paraphernalia in complicated and expensive setups. But the principles of lighting are basic, and much can be done with a minimum of studio tools. Good lighting depends, for the most part, on practice—and the courage to make mistakes. To start, it makes sense to master a number of standard techniques. Practice in basic setups provides the photographer with a problem-solving bag of tricks and helps build the confidence and mechanical skills necessary to develop a singular and unique lighting style. Here we offer two standard lightings: the single backlight and lighting for translucent objects. Both deserve a place in the repertoire of the serious photographer.*

SINGLE BACKLIGHT

Many photographers habitually rely on at least two, and sometimes as many as four, separate light sources for a single photograph. In some specialized circumstances a multitude of lights may be indispensable, but one of the most versatile and flattering lights of all—a light that is relatively easy to produce and appropriate in a wide variety of indoor situations—is based on a single light used in conjunction with a few reflectors.

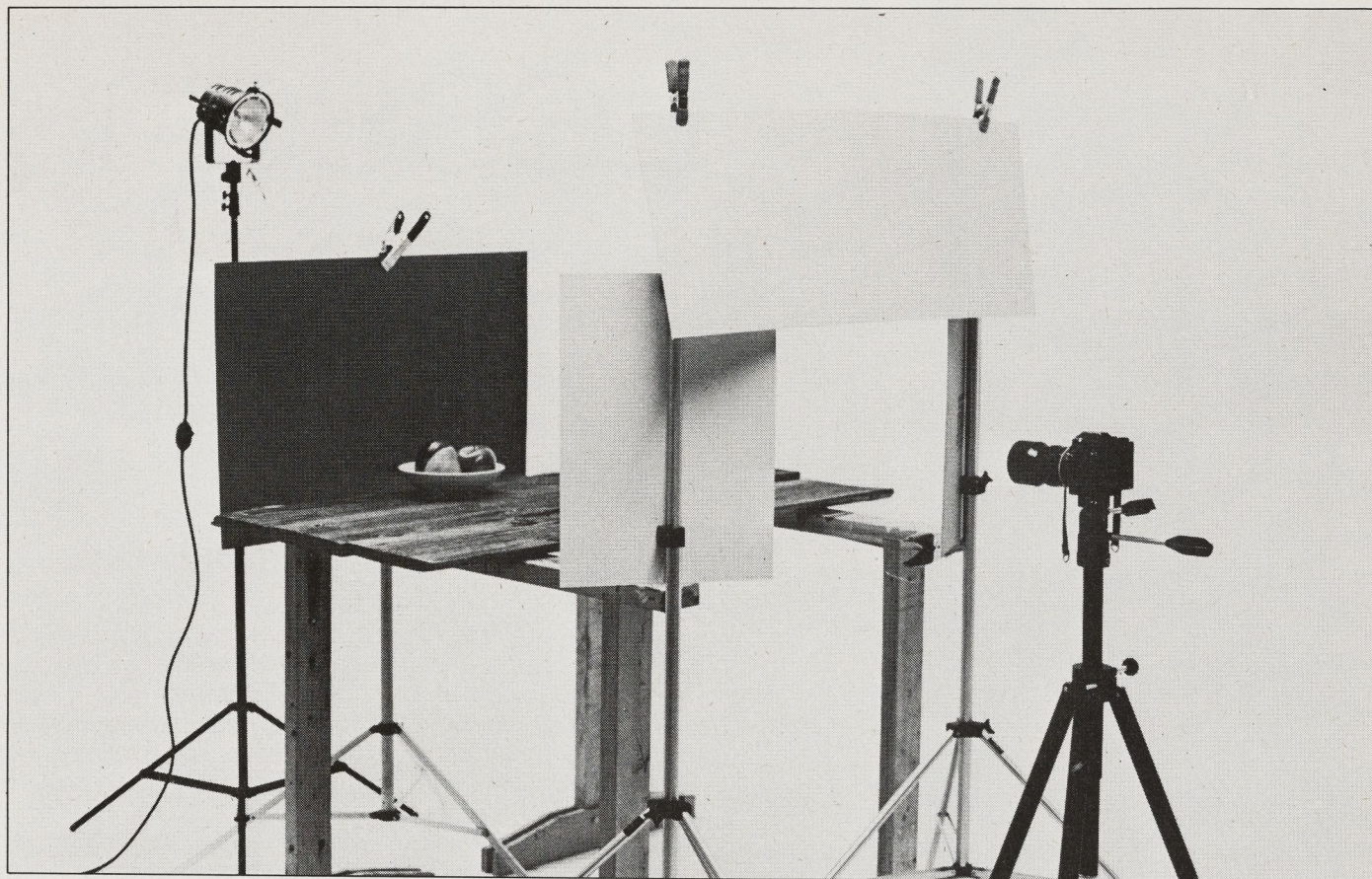
Properly handled, the light from a single lamp located behind the subject can bathe a person or an object in an exceptionally even, low-contrast light that is easily controlled and that gives consistently pleasing results. The technique seems complex at first glance, but is not difficult to learn and is extraordinarily useful.

If you were to place a lamp above and behind a subject—that is, with the lamp facing the camera and the subject in between—the outline of the subject would appear bright, but the side of the subject facing the camera would appear dark. The net effect would be a silhouette surrounded by a rim of bright light (a “rimlight”).

If you were then to place reflectors so that they bounced light from the lamp onto the front of the subject, the silhouette would start to lighten up and fill in. As the intensity of

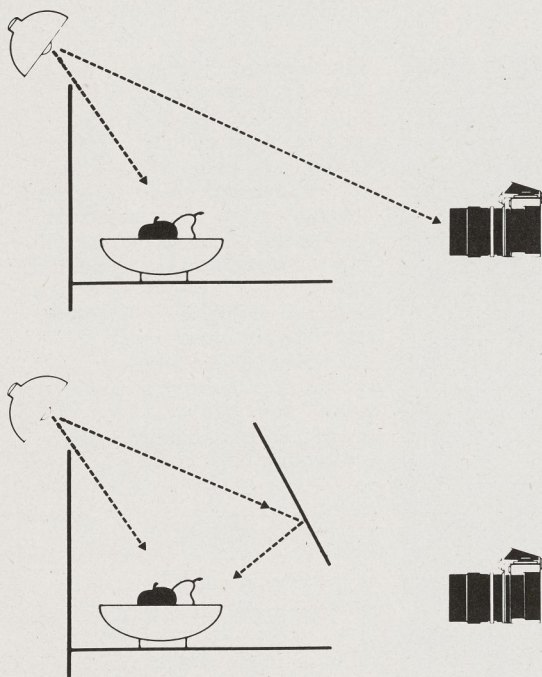


PHOTOGRAPHS BY TOM GRILL



Few indoor lighting setups give better results with less equipment than the single backlight setup shown here. Although this arrangement may at first glance seem elaborate, with only a little practice it can be easily mastered. The most important characteristics of a single backlight are a sharp delineation of the subject against the background, and an exceptionally even light along the front of the subject. In addition, since the backlight casts a single shadow of the subject forward onto the foreground, backlit photographs usually have a feeling of depth. Notice in the above photograph how the various elements of the

setup are arranged. The light itself is located behind the background, and the background is positioned so that some direct light can fall on the subject. Reflectors on either side of the camera throw light onto the front of the subject and are bridged by a horizontal reflector which will both reflect light and, when lowered into position, block direct light from entering the camera lens. If more reflected light were needed, a fourth reflector could be added beneath the lens. If only a few photographic stands had been available, the cardboard reflectors could have been folded and placed directly on the table.



Unless the direct light coming from the light source is prevented from entering the camera lens, lens flare will result.

The easiest way to prevent lens flare is to position one of the reflectors so that it blocks direct light. When the reflector is positioned correctly, it will cast a noticeable shadow across the camera lens.

Backlight is a sophisticated lighting method that is as useful for portraits and other large subjects as it is for small still lifes like this.

the reflected light increased by making the reflectors larger or moving them closer to the subject, a point would eventually be reached where the reflected light falling on the front of the subject would be nearly as bright as the direct light illuminating the subject's outline.

Such are the conditions in a properly established backlight. The effect is to have a subject illuminated very evenly by the large surface area of the reflectors, and outlined by a rimlight.

Positioning lamp and background. In order to make sure that the subject contrasts well against the background, the background should be darker than the subject. Therefore, the lamp should be located *behind* the background, and the background should be short enough so that the lamp can shine over the background's top edge. Since the background will be farther from the reflectors than the subject, the background will appear comparatively dark.

Positioning the subject. The nearer the subject to the background, the brighter the background will be and the more it will be in focus. The distance to place the subject in front of the background will vary depending on conditions, but should be at least one foot.

Positioning the reflectors. Where the reflectors are located has a strong effect on the photograph. If the reflectors encircle the subject (leaving only a gap through which the camera can point), the light they throw will be very even, creating essentially no shadows or shading. This arrangement is especially flattering for color portraits.

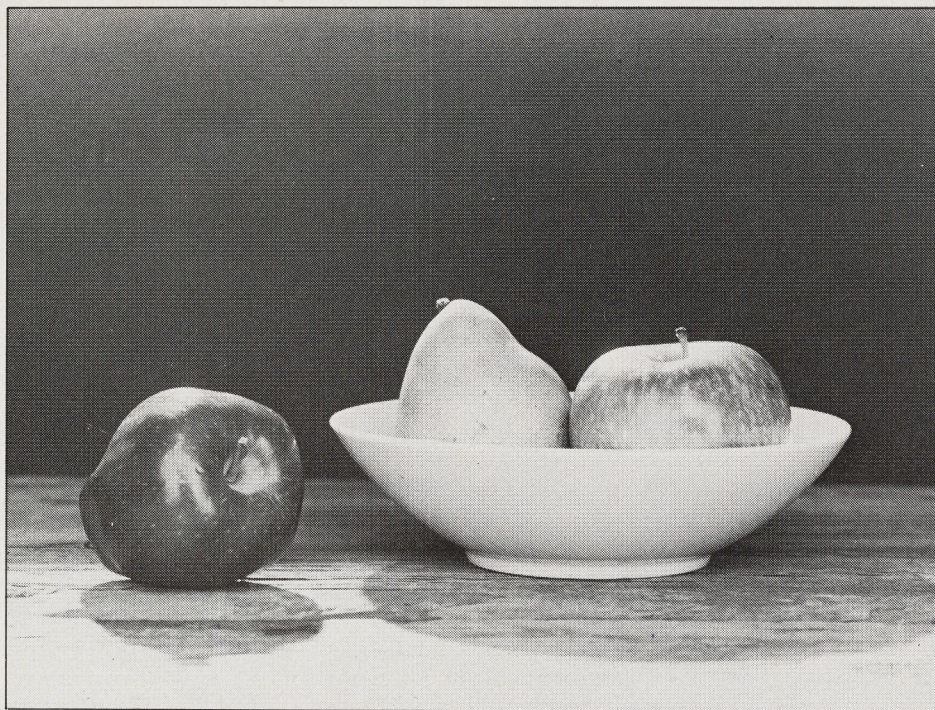
If reflectors on one side of the subject are farther away than the reflectors on the other side, a "modeling effect" occurs whereby some shading appears to define features of the subject. Often some modeling of the subject is desirable with black-and-white film, since without the tonal variations contributed by color, black-and-white photographs can appear "flat" if the light is very even.

The effect produced by the reflectors depends also on their size. The larger they are, the more even the light they produce, and the greater its intensity.

Preventing lens flare. Because the light source is pointed directly at the camera lens, lens flare must be prevented or the photograph will suffer from greatly lowered contrast (see photo). The easiest way to prevent lens flare is to bridge the gap between the reflectors on the right and left sides of the subject with a horizontal reflective sheet, which both blocks ("gobos") direct light from entering the lens and throws additional light on the subject. Simply look at the front of the camera to make sure that the shadow formed by the horizontal reflector (the "gobo") is falling across the lens.

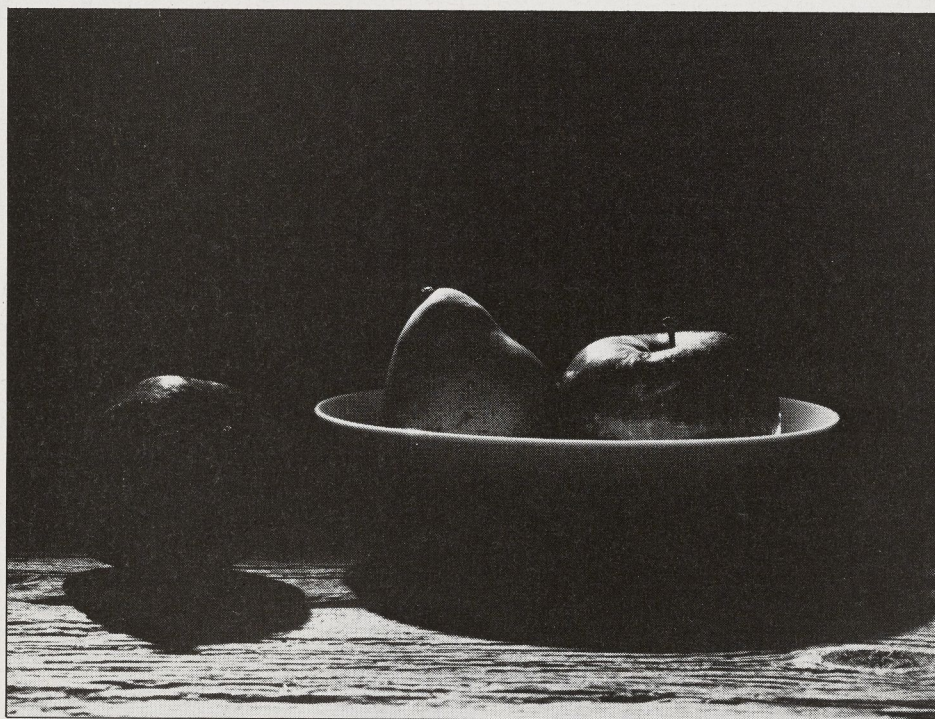
Metering the scene. The difference between the intensities of the direct light falling on the back of the subject and the reflected light falling on the front of the subject is critical, and usually should be no more than one f-stop with color film and two f-stops with black-and-white.

You should take two *incident* readings, both while holding the meter as close to the subject as possible. Take one reading with the meter pointing directly at the lamps, the other with the meter pointing directly at the front reflectors (be sure no direct light enters the meter). Take the photo-

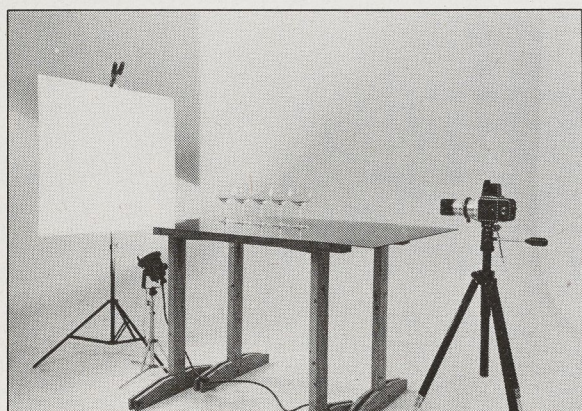
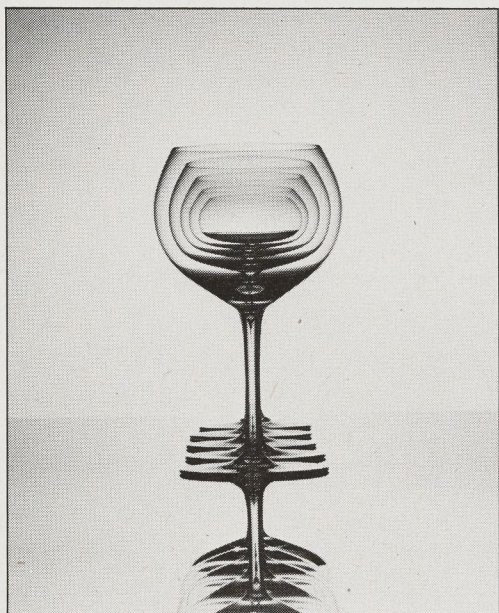


Lens flare causes a loss in contrast.

In this photograph, the "gobo" was in the wrong position and light directly entering the lens ruined the backlight effect. Notice how the range of contrast in the scene has diminished substantially.



If the difference between the intensity of the rimlight is too much greater than that of the reflected light, contrast will be too extreme and detail will be lost. This photograph could have been saved by using larger reflectors, moving them in closer to the subject, by raising the height of the light source above the floor, or by a combination of all three. Had the photograph been exposed to give a proper exposure of the fruit, all detail would have been lost in the rimlight areas and in the foreground.



A photograph of glassware is really a photograph of the background. To take the photograph above, the glasses were lined up on a sheet of black Plexiglas in front of a sheet of white cardboard. Light shining on the sheet passes through the glasses and is bent on its way to the camera producing the highlights and shadows that form the image. The Plexiglas reflects the whiteness of the wall and appears gray. The Plexiglas forms a single-image reflection of the glasses, unlike a mirror, which would form a double-image reflection. Stray reflections in the glassware would have spoiled the photograph.

graph using the exposure setting you obtained by reading off of the reflectors.

To adjust the relative intensities, you can raise or lower the lamp or change the position of the reflectors. Moving the lamp has less effect on the intensity of the reflected light than on the intensity of the direct light, while moving the reflectors affects the intensity of the reflected light only.

The single backlight setup requires some experimentation, and no two setups are ever exactly the same. However, the procedure followed in taking the photographs on these pages is typical.

First, the task was to establish the subject's relationship to the background. Because the subject was small, the background could be close. Second, the light was set up to provide the degree of rimlight desired. Third, the reflectors were set in place. Fourth, the gobo was positioned to eliminate lens flare. Finally, light readings were taken, and adjustments were made in the position of reflectors and light source for proper light balance.

Practice project. A little practice with this basic lighting technique can be enlightening. Set up and photograph a simple still life illuminated by a single backlight. Use both color film and black and white. With each film, take a series of exposures. In the first exposure, arrange the reflectors so that the difference between the direct reading and the reflected reading equals one-half f-stop. In each succeeding exposure, move the reflectors sufficiently farther from the subject to increase the meter reading difference by one-half f-stop, until you have covered the entire range of meter reading differences from one-half f-stop to four f-stops inclusive. In some frames, remove the gobo to see the effects of lens flare. With the black-and-white film, expose enough frames with reflectors at unequal distances from the subject to gain a feel for the effect of reflector distances on how well the subject is modeled.

When you have your results in hand, select the frames that show the best balance between the rimlight and the reflected light. As a guideline, remember that the rimlight should not be so overexposed that detail is lost. For later reference record the exposure differences that appear to you to give the best results.

TRANSLUCENT SUBJECTS

The way an item reacts to light depends on the materials from which the item is constructed. To be skilled in photography requires that a photographer be aware of, and pay attention to, how all of the items in a scene respond to light. However, since most items photographers encounter are opaque and not especially shiny, they often ignore the effects of variations in materials and apply standard techniques to subjects that do not interact with light in standard ways.

Glass is a classic example of a material that reacts with light in an unusual manner. The notable characteristic of glass is that it *passes* light, not that it *reflects* light. The key to photographing glassware is to photograph not the item, but the light shining through it.

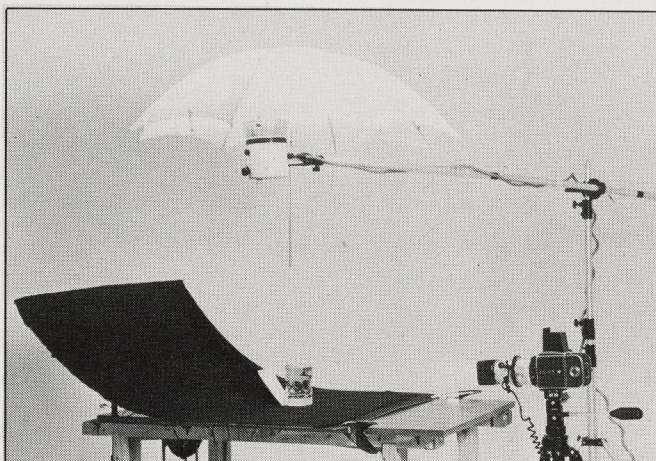
When you photograph a glass object, you are really

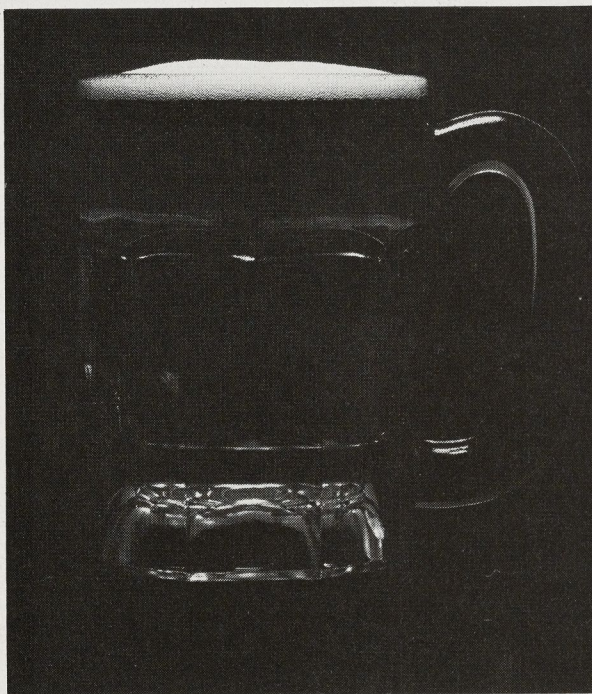


If the background is dark, some means is necessary for directing light through the glassware.

In the photographs on these two pages, the light source is located above the mug. In the photograph at far right, only the head of the beer is clearly defined.

A sheet of paper placed behind the mug and angled upward reflects the light through the mug and into the camera (see photo above). As a result, the mug and its contents become illuminated effectively. The black background is produced by using black velvet. While black paper or cardboard reflects enough light to appear gray in a photograph, the texture of the velvet traps all light, producing the jet-black color present here.





taking a photograph of the background located *behind* the glass. In the process of passing through the glass, the light originating from the background is bent by the curves and irregularities in the glass and produces the image of the glass on the film. You focus your camera on the glass, but it is the background light that forms the image.

The background should be light enough in color to throw light through the item of glassware and into the camera. Even black backgrounds are possible with the use of a technique often used by commercial photographers. By placing a small sheet of white cardboard immediately behind the item and slanting the cardboard upward at a 45-degree angle, light shining down on the item from above will be reflected through the glass into the camera. The size and exact position of the reflector must be determined by trial and error, but the technique permits the glassware to be illuminated against black.

Reflections. Glass reflects as well as transmits light, but generally reflections in glassware constitute a distraction. The items producing the reflection are often identifiable or confusing, and the presence of the reflection usually obstructs the light passing through the glass, which otherwise would reveal the structure of the glass item. A single, unidentifiable reflected highlight on one side of an item of glassware can help convey its three-dimensional form, but otherwise you should eliminate reflections by covering the source of the reflections.

For the sample photographs shown here, all room lights were turned off and light-colored objects were covered with black cloth to eliminate reflections. The light shining on the background in some of the photographs was located under the table on which the glasses were placed.

In the photograph of the glasses it was necessary to place sheets of black cardboard on both sides of the glasses but immediately outside the frame of the photograph in such a way that the missing sections of outline were delineated. The exact position of the cardboard was determined by experimentation.

In the mug photographs, the shape and position of the reflector behind the mug also was determined by trial and error until the entire mug was illuminated without any of the paper showing.

Metering. Since the subject of a glassware photograph is really the background, you should take your light readings off of the background rather than off the item of glassware itself. Thus, if the background is a sunset, you should set your camera for a correct exposure of the sunset. If the background is a surface with light falling on it, you need to expose for that surface.

Practice project. To practice this technique, photograph an item of glassware against both a light background and a dark background. Illuminate the item in some photographs from the front, and in others from the back. Make sure that the item is defined by the light.

Evaluate your results in terms of how thoroughly you were able to eliminate all reflections in the backlit photographs. Also, check to see that the outline of the item clearly contrasts with the background.

For an advanced project, photograph a glass containing wine held in a hand, with a sunset as background.

DUAL-PURPOSE METERS

New hand-held units measure flash as well as ambient light

The current trend in hand-held metering is a dual-purpose meter that is, first of all an ambient light meter that can also measure bursts of electronic flash without attachments. (Flash meters that measure ambient light have low ambient sensitivity and/or are limited in operation.)

There are three dual-purpose meters now available: the Gossan Luna Pro F and two of the Vivitar LX series, the 260LX and 230LX. All three meters have an ambient low end sensitivity of -2 EV at ASA 100. In the flash mode, all three are sensitive enough to give a reading of $f/2$ at ASA 100. The Luna Pro F reads flash only in a cordless mode, but it does yield either single or cumulative flash readings. Both the Vivitar 230LX and 260LX have both cord and cordless modes and give single or cumulative flash readings.

The Luna Pro F is a scaled-down version of the Luna Pro SBC. The F has a silicon blue cell and employs the null method of measurement used with the Luna Pro SBC. The null method, for those who do not know how it operates, uses only one position, the null point, for all readings at all light levels. Conventional meters use various points along a full-length scale. With the null method, the meter needle is connected to the computer dial: you position the meter to take the reading you want, press the metering



Ambient light exposure by window light was 1 second at $f/8$ on Agfapan Vario XL film rated at ASA 400.

button on the left-hand side and then turn the computer dial until the needle is at the null, or center point, on the scale. Then you simply select the shutter and aperture combination you wish to use. When taking a reading, you do not have to hold the metering button in to null the needle, for the meter stores the reading for 90 seconds before shutting itself off.

On either side of the null position plus and minus 3 EV are marked in one-third stop increments. Among



Flash exposure on same film was at $f/13.5$. Both photos were metered by Vivitar 260LX, shot with Hasselblad.

other things, the ± 3 EV is used to make scene brightness measurements and for zone system applications. The F calculator dial includes a zone system scale that can be used either alone with a single null reading or with the needle scale.

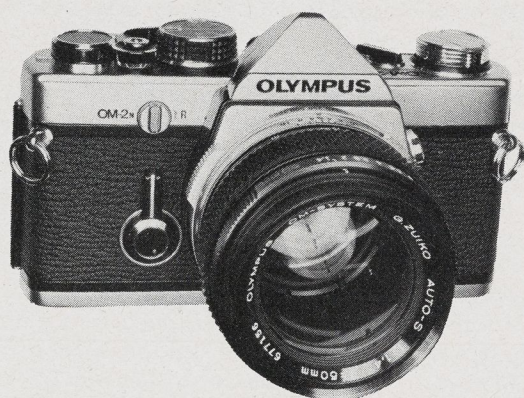
Ambient or flash modes are selected by a red push button located just behind the metering button. In the down position the meter is set for ambient light, while in the up position it is set to measure the short bursts of

Lab Report

By Norman Goldberg and Michele A. Frank

Olympus OM-2_N

No. 609472



Camera Type: 35-mm aperture-preferred auto-exposure SLR

Normal Lens: 50-mm Zuiko f/1.4; 55-mm f/1.2, 50-mm f/1.8 and 50-mm f/3.5 macro also available

Shutter: Electronically governed, horizontally

traveling cloth focal-plane with stepless speeds from 120 to 1/1,000 sec in auto mode, 1 to 1/1,000 in manual, plus B

Viewfinder: Fixed, eye-level type with interchangeable focusing screens; standard screen has central rangefinder spot surrounded by microprism ring on groundglass-fresnel field; single moving needle for proper exposure indication when used in manual mode, on auto needle indicates shutter speed selected over range of 1-1/1,000 sec; overexposure warning and single LED indicating full flash charge and correct exposure when used with Olympus T20 electronic flash unit; exposure-compensation warning flag

Exposure Meter: Through-lens, full-aperture reading off film plane during exposure, using twin silicon cells when camera is set in auto mode; on manual, camera uses two CdS cells located in finder; EV range ASA 100 with f/1.2 lens—EV -6.5 to 18 in auto mode, ASA film-speed range, 12-1,600; auto/manual/off/battery-check-mirror reset switch; metering system uses two 1.5-volt S-76 batteries or equivalent

Flash Synch: Detachable hot shoe and single switchable X and FP PC terminal, X at 1/60, FP at 1/60 or faster, M class bulbs at 1/30 sec or slower

Film Loading: Conventional via swing-open back

Film Transport: Ratcheted, single-or multi stroke 150-degree wind stroke with 30-degree standoff

Film Counter: Additive, auto-reset

Other features: Variable self-timer, depth-of-field preview button on lenses; plus/minus 2 EV exposure compensation, removable camera back; contact for Recordata Back built into camera; memo holder

Weight: 762.5 g (27.23 oz.)

Dimensions: L, 140 mm (5.6 in.); H, 88 mm (3.5 in.); D, 91.9 (3.7 in.)

Price: \$672 with 50-mm f/1.4.

Distributor: Olympus Camera Corp., 145 Crossways Park, W., Woodbury, N.Y. 11797

Field Check

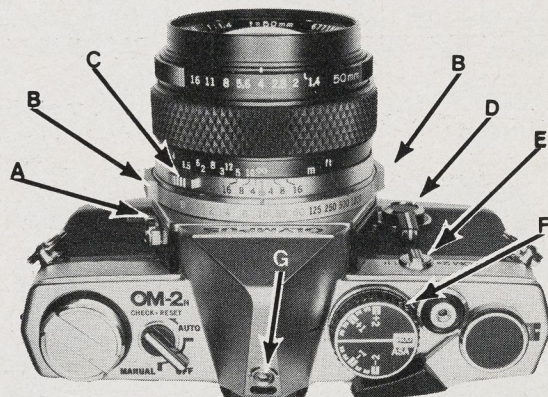
By Bruce Poli

I looked forward to taking the new Olympus OM-2_N into the field. It is, by my reckoning, the great-great-grandson of the Pen F—the compact SLR that started the whole trend that is so strong today. From the first, the Olympus SLRs have been small, light-weight, and backed by a wide choice of lenses, and the OM-2_N carries on this tradition.

I was able to use the camera with 85-mm and 28-mm lenses as well as the 50-mm normal lens. I found the rubberized focusing rings of the lenses easy to grip and turn. And, almost without exception, the other controls are unambiguous, accessible, and easy to master quickly.

The OM-2_N is an aperture-preferred automatic camera with speeds from 1/1,000 sec to two full minutes provided automatically plus, of course, a "B" setting for very long exposures. On manual, the shutter-speed settings are from 1 to 1/1,000 sec.

There is an exposure-compensation dial on top of the camera body that allows for two full stops of under- and overexposure. I found it easy to set quickly for corrective measures when unusual lighting (sunlit snow scenes, back-



P.C. outlet "A" has switch for X or FP synch. When master control switch is set to "manual," shutter speeds are selected by rotating shutter-speed-setting ring using finger grips "B". Lens is removed by pressing bayonet latch release "C", turning lens 1/8 turn counterclockwise. Self-timer is cocked with lever "D", released with small lever hidden by top of "D". Counterclockwise twist of ridged button "E" permits film rewind, multi-exposures. Dial "F" is lifted, then turned to select film-speed setting. It also serves as exposure-bias setting. Hot shoe is separate, mounts atop prism ridge through threaded connector "G".

Lab Report

(continued)

lighted portraits, etc.) might tend to fool the built-in metering. The dial is divided into click stops for each 1/3 f-stop and also serves for setting ASA speeds from 12 to 1,600.

Lens-changing proved to be quick; the bayonet-mount Olympus lenses lock in with a 70-degree clockwise turn. Removal is equally simple: depress the release button on the side of the lens-mount ring and turn the lens counter-clockwise (as the camera faces you). The lens-release button is easy to press except when aligned with the shutter-speed-dial grip. However, this happens only at slower shutter speeds, so that you needn't worry about difficulty when changing lenses for spontaneous, fast-shutter-speed, hand-held shots.

I found that both the lens-release button and the shutter-speed grip are best handled with the thumb.

Another button, this one for depth-of-field preview, is also found on the lens-mount ring. Pressing this as you use the viewfinder shows an approximation of the depth of field at the stop to be used as it will appear in the photo.

I should also tell you about the OM-2N's provision for shutter-speed setting. Whereas most cameras have a traditional topside dial to set speeds, Olympus provides a shutter speed "ring" around the base of the lens flange. In manual mode, shutter speeds are set

here. On "automatic," of course, the camera sets the proper speed for the aperture used no matter what shutter speed has been set on the ring.

On the shutter-speed ring, speeds from "B" to 1/60 sec are marked in blue. This is a visual reminder that those speeds are "dangerous" (possible camera-shake) for hand-held exposures but all right for electronic-flash or tripod-held exposures. In the viewfinder, the blue range ends at 1/30 sec.

But despite the unusual location of the shutter-speed control, in using the OM-2N I came to *prefer* this way of working. I found it easier and faster to turn the ring than to grope up on the top deck for a dial. However, it takes some getting used to. Several times I reached for the dial on top (as other cameras had taught me to do) but on the OM-2N, the dial is for exposure-compensation setting. In a week or so, though, my conditioned reflex led me to the metal ring behind the lens.

The master-control switch, which is very simple and positive to use, has four positions: "manual," "auto," "off," and "check-reset." When used with automatic exposure, the lever is turned to "auto" and the viewfinder displays the complete shutter-speed scale just at the left of the picture area. Under- and overexposure marks and the meter needle are shown as well. You simply

choose the aperture setting and shoot.

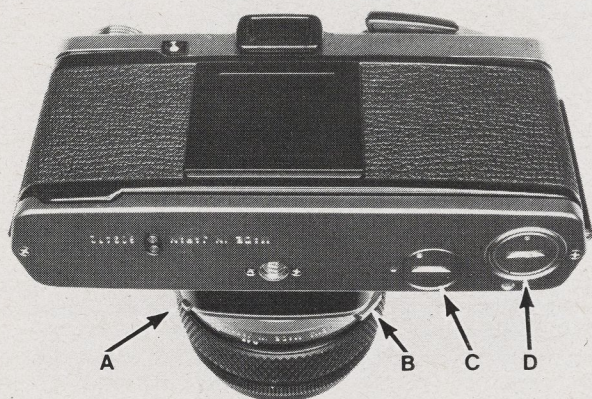
In "manual," the shutter speeds disappear, since you are choosing a speed manually, and the exposure-meter index area alone remains in view.

You simply choose either aperture or shutter speed, set it, and then adjust the other exposure component until the needle in the viewfinder is centered between the two black triangles of the exposure meter index.

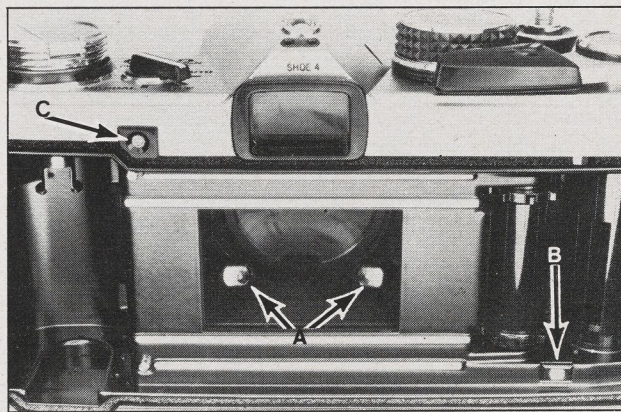
A plus sign at the top and a minus sign at the bottom of the index show the limits between which the proper aperture or shutter speed can be set for a specific lighting condition and still produce a technically proper exposure.

The "check" position is for testing the batteries' condition. When there is enough energy, the red battery-check lamp on the back of the camera will light; it flashes when the two 1.5-volt silver-oxide batteries are weak and remains dark when they are dead. In the "off" setting, nothing appears, since the meter is off.

Even with the switch at "off," the OM-2N meter works automatically as the shutter is released for pictures at normal light level. Shutter speeds will be selected automatically—but only for 1/30 sec or shorter exposures to avoid battery drain. This makes it possible to get one of those split-second, there-and-gone shots, even though you forget to



Button "A" must be pushed to set shutter to B. Button "B", on lens, provides manual stop-down to check depth of field. Motor-coupling cover "C" is stored in recess in motor. Two S-76-type batteries are under cover "D". Note memo-holding frame on back and LED battery-check to left of eyepiece.



Twin silicon photocells "A" on mirror-chamber floor read light reflected from film aperture when mirror rises, then monitors exposure until mirror returns. Contact "B" is for special data back. Battery test LED "C" ignites when master-control switch above it is pushed forward.

switch the idle camera to "auto" as you bring it quickly to your eye for that once-in-a-lifetime picture opportunity.

The OM-2N's ASA film-speed dial handles settings from 12 to 1,600, which would seem to take care of most of today's needs nicely—push-processing high-speed films, both black-and-white and color, seemed right on.

All three lenses produced sharp images with plenty of good detail. The viewfinder image is clear and clean, and I could notice no visible aberrations. However, the designers have allowed the shutter-speed scale and exposure-level index to intrude into the picture area of the viewscreen. This rates a demerit from me. There shouldn't be anything but picture in the picture area, as far as I'm concerned.

Also seen in the finder is a small warning flag which appears when the

exposure-bias dial is set to any position other than its null point. There is also a single LED located to the top left out of the picture area above the 1,000-sec indication. The LED lights when the camera is used with Olympus's T20 flash unit to signify that the flash has recycled. Its second use is to inform the user that enough light has been supplied by the flash/aperture combination for proper exposure—this it does by blinking very rapidly after the picture has been taken. A handy LED, this one.

The standard factory-supplied focusing screen is the familiar matte-type with split-image center and surrounding microprism doughnut. I found it to be satisfactory, although Olympus provides 13 other types of screens with varying special characteristics to meet special needs. You can even do the interchanging yourself.

Meter-sensitivity pattern

Center-bottomweighted



Speaking of viewcreens, no one type is of any use if the mirror locks up, blacking out this screen. This can and did happen while I was using the camera. In this case, it was due to dead batteries. Another less likely cause is the advancing of the film while a longish exposure is being made.

The de- /continued on page 255

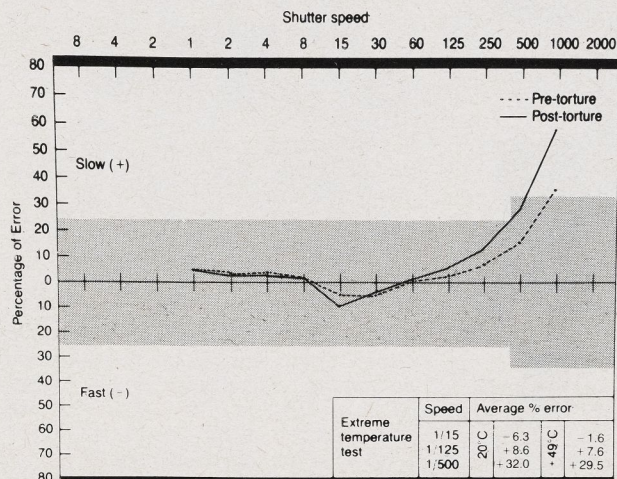
Exposure System

EV ERROR: Top figures are pre-torture, low figures post-torture.

ASA	25			100			400		
BLV	5	10	15	5	10	15	5	10	15
1.4	+0.4	+0.8		+0.6	+0.8		+0.8	+1.1	
	+0.3	+0.8		+0.5	+0.8		+0.8	+1.3	
2.0	+0.3	+0.4		+0.3	+0.5		+0.3	+0.8	
	+0.0	+0.3		+0.3	+0.5		+0.3	+0.9	
2.8	+0.3	+0.3	+0.5	+0.3	+0.3		+0.4	+0.5	
	+0.0	+0.3	+0.8	+0.1	+0.3		+0.1	+0.4	
4	+0.3	+0.3	+0.4	+0.3	+0.3		+0.3	+0.3	
	+0.1	+0.3	+0.5	+0.1	+0.3		+0.1	+0.3	
5.6	+0.5	+0.3	+0.3	+0.3	+0.3	+0.5	+0.3	+0.3	
	+0.3	+0.3		+0.1	+0.3	+0.8	+0.3	+0.3	
8	+0.4	+0.1	+0.3	+0.1	+0.3	+0.4	+0.3	+0.4	
	+0.3	+0.1		+0.0	+0.3	+0.5	+0.3	+0.1	
11	+0.3	+0.0	+0.3	+0.1	+0.0	+0.3	+0.4	+0.3	+0.6
	+0.4	+0.0		+0.0	+0.0	+0.3	+0.1	+0.1	+0.5
16	+0.0	+0.3	+0.3	+0.0	+0.3	+0.3	+0.3	+0.0	+0.4
	+0.5	+0.3		+0.3	+0.1	+0.3	+0.1	+0.0	+0.8

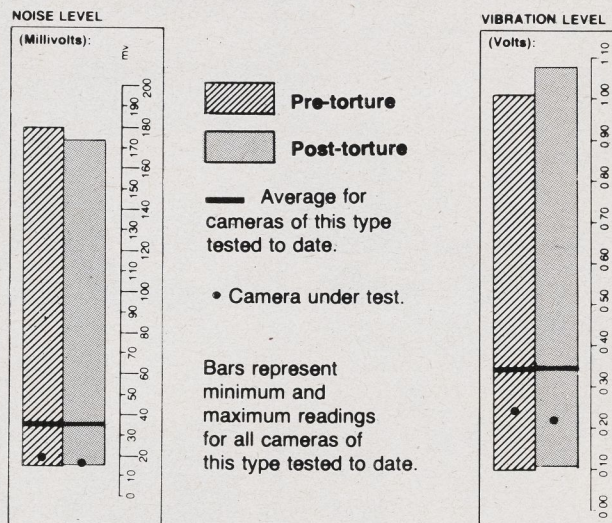
Blank spaces show limits of camera's dynamic range and/or values tested.
BLV: scene luminance = EV @ ASA 100. ANSI tolerances: ± 0.5 EV.

Shutter Performance



Suggested ANSI (formerly ASA) shutter-accuracy standards are shown by shaded area. Higher speeds have more tolerance.

Vibration and Noise



Noise and vibration standards do not exist, but relative levels become evident when values for several cameras are compared.

Miscellaneous Data

FUNCTION	PRE-TORTURE	POST-TORTURE
Shutter trip:	200 grams	200 grams
Shutter travel:	2.0 mm	2.0 mm
Self-timer:		
Minimum:	3.5 sec	3.5 sec
Maximum:	14.5 sec	14.5 sec
Viewfinder:		
Framing accuracy:	OK	OK
Synchronization:		
Electronic flash:	0.0 msec @ 1/60	0.0 msec @ 1/60

Lab Report

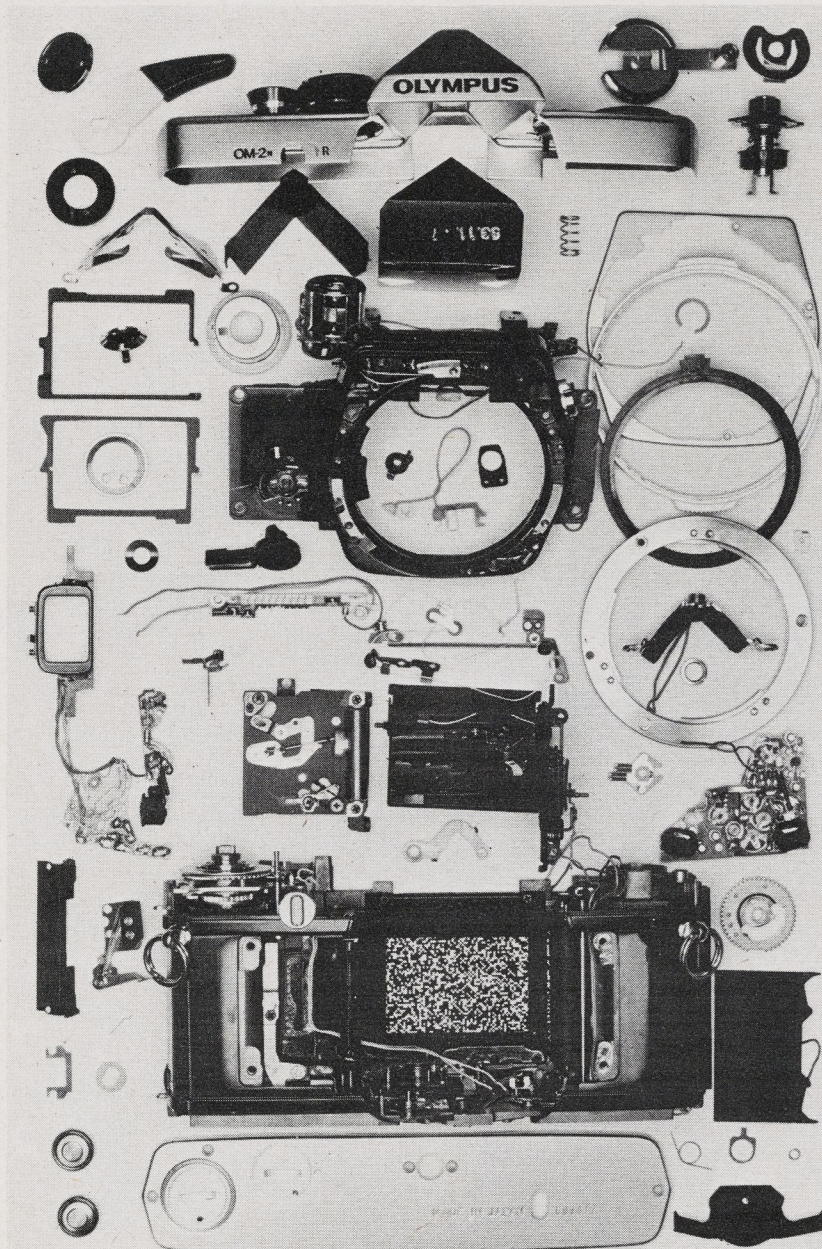
(continued)

Stripdown Report

	Interior	Exterior	
Material choice:	Good	Good	Seal against dirt: Poor/Fair
Assembly, Finish:	Good	Good	Repair access: Good/Fair

Do frequently made adjustments require major stripdown? No

Modular construction? Partly Replace key parts easily? Most



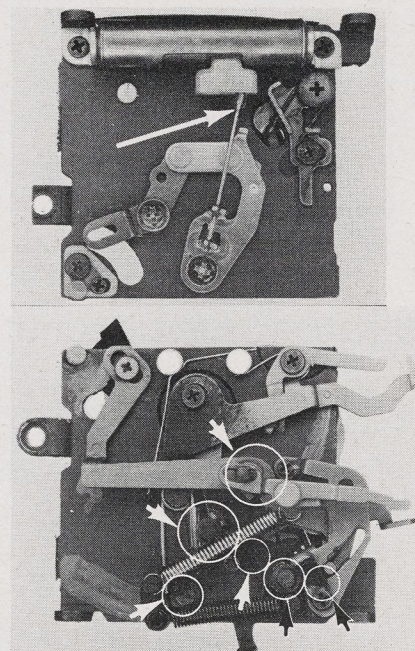
Surprisingly few electronic components are used in the OM-2N, many of whose functions are electronically governed. Camera employs uncommon construction, minimum number of parts—most of which are skeletonized for minimal weight.

Since it uses four photocells in its unique metering system, and an electronically governed shutter that responds to manual and automatic-exposure system commands, you would think that the OM-2N would be crammed full of electronic devices. Not so; it has a surprisingly small number of such components, being at heart a masterpiece of mechanical compactness.

The electronic guidance of the shutter speeds, the exposure determinations made from image-forming light reflected from the film, and the communication between the camera and its flash units have been accomplished with very few electronic components, compared to similar cameras.

It is constructed like no other camera (except the OM-1), and seems to have been inspired by the credo of getting much from little. Wherever possible parts have been "skeletonized" (removal of material except where weakness would re-

/continued on page 192



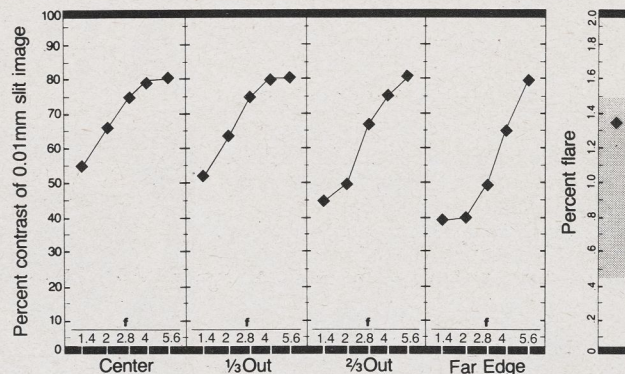
Noise and vibration reduction measures in OM-2N's mirror box include circled regions containing resilient cushions at impact points on one side of box. Other side has pneumatic cylinder coupled to mirror operating lever through plastic-tipped spring-wire (arrow). Cylinder damps mirror action in both directions.

Lens Performance

G. Zuiko Auto-S 50-mm f/1.4 Ser. No. 677156

Dimensions: O.D. 60.5 mm (2.38 in.), L. 40 mm (1.57 in.) Weight: 230 g (8.05 oz.) Filter size: 49 mm
Close working limit: 353 mm (13.89 in.) Close limit field size: 164x250 mm (6.45x9.84 in.)
Focal length: Marked: 50 mm Measured: 52.00 mm f-number: Marked: f/1.4 Measured: f/1.53 T-number: T-1.65

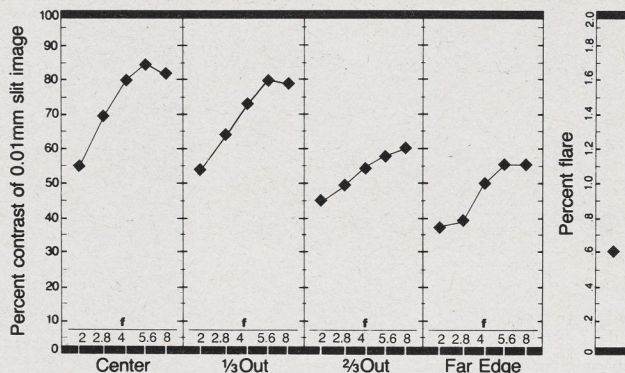
Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	2.8	4	5.6	Critical f-stops
Astigmatism	2	1.4	1.4	
Lat chrom.	None	None	None	Focus shift
Long. chrom.	blue—red = 0.07 mm			
Spherical	f/1.4—f/4 = + 0.03 mm			
Distortion	Moderate barrel			
Vignetting	None beyond f/3.5			
Centering	Slightly off			



Zuiko MC Auto-W 28-mm f/2.0 Ser. No. 115614

Dimensions: O.D. 60.0 mm (2.36 in.), L. 43.5 mm (1.71 in.) Weight: 249 g (8.71 oz.) Filter size: 49 mm
Close working limit: 199 mm (7.83 in.) Close limit field size: 177x269 mm (6.96x10.59 in.)
Focal length: Marked: 28 mm Measured: 28.54 mm f-number: Marked: f/2 Measured: f/2.04 T-number: T-2.15

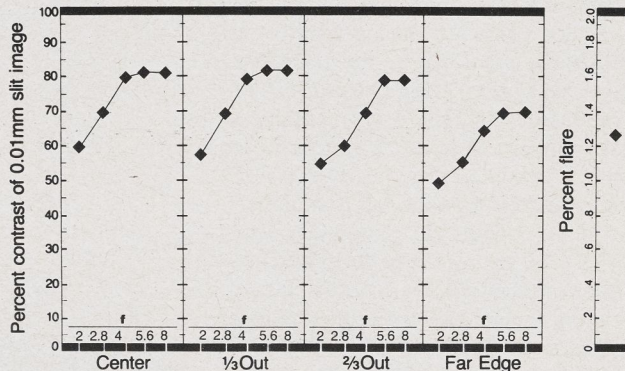
Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	3.5	3.5	5.6	Critical f-stops
Astigmatism	2	2	5.6	
Lat. chrom.	Very slight	Slight	Moderate	Focus shift
Long. chrom.	blue—red = 0.07 mm			
Spherical	f/2—f/5.6 = + 0.04 mm			
Distortion	Moderate barrel			
Vignetting	None beyond f/4.5			
Centering	Near-perfect			



Zuiko MC Auto-T 85-mm f/2.0 Ser. No. 117235

Dimensions: O.D. 60.0 mm (2.36 in.), L. 48.0 mm (1.89 in.) Weight: 264 g (9.24 oz.) Filter size: 49 mm
Close working limit: 730 mm (28.74 in.) Close limit field size: 186x279 mm (7.32x10.98 in.)
Focal length: Marked: 85 mm Measured: 85.61 mm f-number: Marked: f/2.0 Measured: f/2.09 T-number: T-2.20

Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	2.8	2.8	4	Critical f-stops
Astigmatism	2	2	4	
Lat. chrom.	None	Slight	Moderate	
Long. chrom.	blue—red = 0.10 mm			Focus shift
Spherical	f/2—f/5.6 = + 0.02 mm			
Distortion	None			
Vignetting	None beyond f/3.5			
Centering	Perfect			



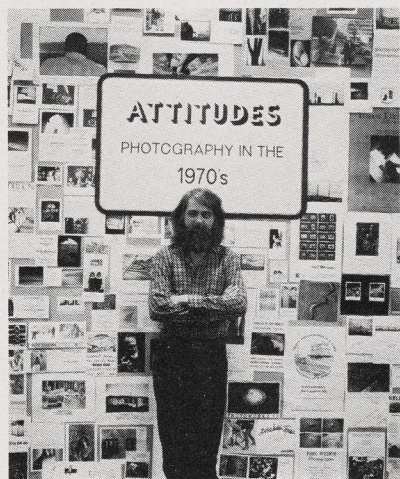
Mechanical: Each lens uses an all-aluminum focusing helioid with twin parallel focusing guide arms. The auto-diaphragm systems are strong, simple devices with shock-absorbing resilient plastic bumpers.

Both the 28-mm f/2 and the 85-mm f/2 feature floating-element construction, where the spacing between certain

groups of elements changes during focusing. The change is pronounced in the 28-mm f/2, whose rear group, except for the last element, shifts. A more subtle shift occurs with the 85-mm f/2, whose entire rear group shifts. In each case the shift is continuous, and in step with the focusing action, but at a different rate.

Photography in the '70s: A West Coast View

Fred R. Parker of the Santa Barbara Museum of Art designed "Attitudes: Photography in the 1970s" around his philosophy that an exhibit of such massive proportions should be unstructured to let images make their own statements, and to share with viewers his sense of discovery.



By Natalie Canavor

With scant fanfare and housed in an unlikely habitat, a regional museum that had previously possessed not a single photograph in its archives, one of the most ambitious shows recently assembled was presented this past summer in California.

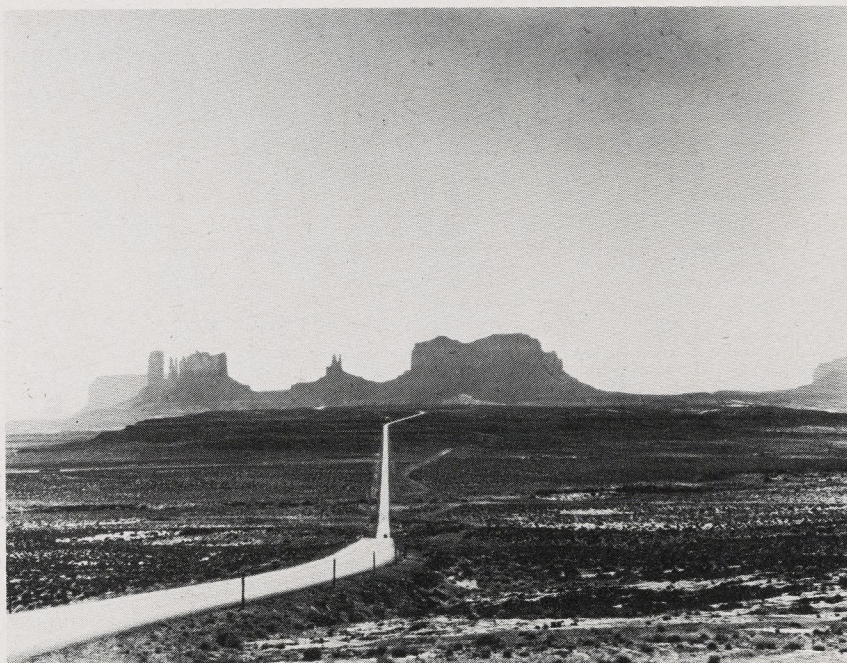
Called *Attitudes: Photography in the 1970s* and sponsored by the Santa Barbara Museum of Art, the exhibit encompassed virtually every contemporary current in fine-art photography with a dazzling array: nearly 500 individual works by about half that number of photographers. The assemblage was of special interest not only because overall caliber was high, but for factors relating to its creation and presentation techniques.

The relative lack of publicity accompanying *Attitudes* was directly related to finances. National attention is expensive and requires a considerable input of time and staff. This huge exhibit left no available resource unused for its mere existence.

On the curatorial side, *Attitudes* was



Terry Wild, 1977



Michael Burns, 1978

Stripdown: Olympus

continued from page 132

sult, for the purpose of weight reduction). Gears and levers have thin profiles, but are heat-treated for toughness and wear-resistance.

In a space just big enough for two shirt buttons the shutter's gear-stack is poised on twin rows of ball bearings. This region typifies the entire camera: crowded but uncluttered.

Large sections of the camera can be uncovered easily for servicing, while other sections seem devilishly contrived to make access difficult and time-consuming. Most of the camera's "vital organs" are under the floor of the mirror box. Here we find the main circuit board, containing such things as integrated circuit devices, discrete resistor array for manual shutter-speed selection, whisker-like gold-plated switch elements, five potentiometers for adjusting all of the electronic functions, and two silicon photocells, each in a tiny housing with a lens in front.

The housings are angled to point the lenses toward the center of the film aperture because these are the photocells that detect the light reflected from the film during the actual exposure. It is, in truth, a real-time exposure monitoring and determination system.

Since the exposure times selected by the camera's auto-exposure system are determined just as the mirror rises (before the film is exposed), the first shutter curtain has a dappled, computer-

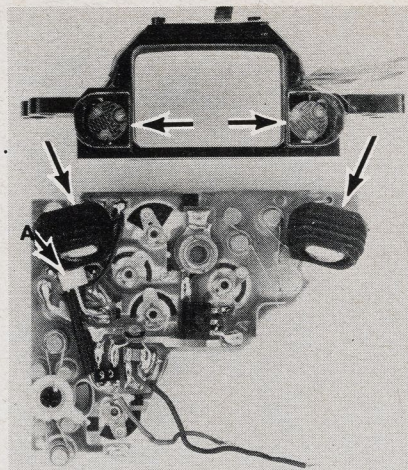
generated white-on-black pattern that simulates the average reflectance of a broad variety of film surfaces. This then, is what the photocells look at until the film itself is uncovered by the curtain.

For brief exposure times the curtain is the only thing they will see. Long exposure times find the film fully uncovered by the shutter and the photocells read the light being reflected from the film itself.

If, during a long exposure, the light suddenly increases or decreases, the photocells detect it and the exposure time is regulated appropriately. This means that the OM-2N has no exposure memory system that can be fooled by a sudden change in light level.

The left-hand silicon photocell has a small LED tucked into the bottom of its housing, out of its field of view of the film aperture, but situated to spill some of its light onto the photocell's surface. The LED is ignited automatically after the longest auto-exposure time elapses (2.73 minutes on this sample), and it's the tiny burst of light from the LED on the photocell that terminates the exposure by de-energizing the electromagnet that traps the closing curtain. The same LED is ignited to clear any jam caused if film is inadvertently advanced while the shutter is open, or a battery is replaced while the camera is midcycle in its shutter operation.

In addition to the two silicon photocells reading the light reflected from the film aperture, there are two CdS photo-



Arrows point to all four photocells used in OM-2N. Cells straddling finder eyepiece are CdS. Cells on circuit board are silicon. LED "A" peeks into housing of cell, blinks on to trigger close of shutter at end of ultralong exposure and reset camera cycle after battery change. Fine bare wires are gold-plated switch elements. Five potentiometers on board provide adjustments.

cells: one on either side of the finder's eyepiece. These cells read the light coming through the viewscreen; thus, they get blinded when the mirror rises. Their job is to guide the user in setting the exposure when the master control switch is set to "auto."

This switch has two other positions: "off" and "check-reset." In the "off" position that battery circuit is open, but only until the shutter is tripped. As soon as the mirror rises, the silicon photocells begin to register how much light they see on the first curtain. The exposure is then automatically regulated through a shutter speed range of 1/30 through 1/1,000 sec. In other words, the camera provides normal aperture-priority auto-exposure operation, even when turned off, but only for exposure times of 1/30 sec and shorter.

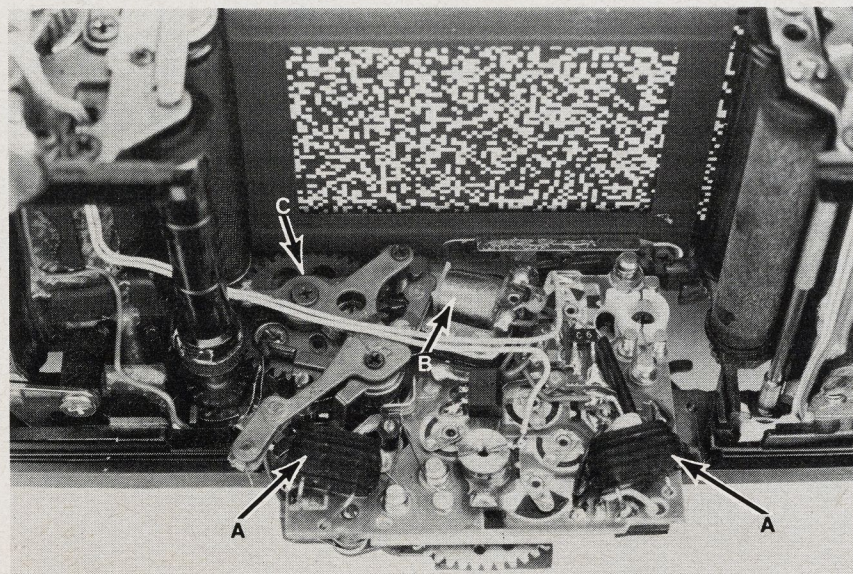
This has obvious advantages for eliminating a battery-draining ultralong exposure if the camera is accidentally tripped while in a gadget bag and to assure it's ready for abrupt use under average outdoor daylight conditions, even when turned off.

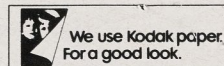
The "check-reset" switch position is a momentary setting, having a strong spring-return. When pushed to this position, the switch causes both the battery test LED and the silicon photocell LED, described earlier, to ignite.

A third LED, tucked against the edge of the pentaprism, glows when the OM-2N's special flash units are ready to fire. It flickers when the flash exposure just made is correct, or goes out to indi-

continued on page 196

View looking down into camera with front plate removed. Computer-generated speckled pattern on first shutter curtain simulates reflectance of average film surface. Silicon photocells "A" read light reflected from curtain for brief exposures, and from film during long exposures. Electromagnet "B" traps closing curtain, gets released when exposure is to be terminated. Shutter's high-speed gear stack "C" is poised on twin rows of ball bearings for minimizing friction.





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Stripdown: Olympus

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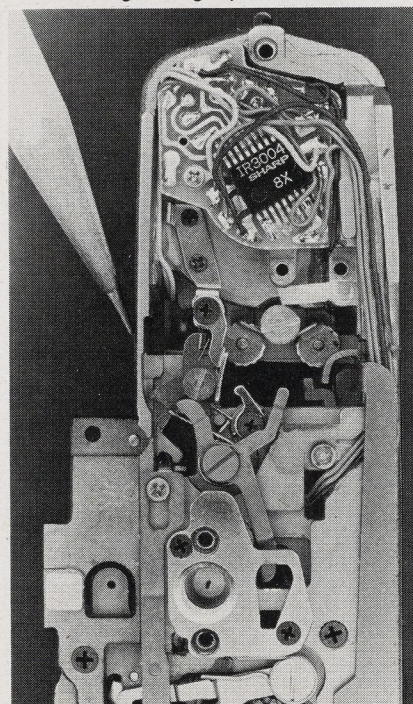
cate the subject is beyond the range of the flash. No intricate light-pipes are used here; just the well-defined reflection of the spill-light from the LED onto a polished rectangular patch of the viewscreen's metal mask.

This is a very neat, much-from-little philosophy which is carried throughout the camera, and perhaps most apparent in the mirror mechanism. Here, in combination with the diaphragm-actuating mechanism, the mirror's action has undergone a series of impact-cushioning steps that other camera designers would do well to examine.

One side of the mirror box contains most of the moving parts associated with the mirror and diaphragm motions. There are no less than six regions in this small area that have resilient pads to absorb the impact of moving parts coming to rest, thus reducing noise and vibration.

On the opposite side of the mirror box, a pneumatic cylinder dissipates the momentum of the mirror in both directions of its swing. Even here, the coupling between the mirror and the cylinder's piston is through a short length of spring-wire, whose plastic covered tip engages the plastic socket of the (metal) piston.

Main casting has several thin sections, especially at bottom. Pencil points to front edge whose thin section is buttressed by chrome-plated brass bottom cover. Other thin sections are similarly reinforced by adjacent support plates. Users should avoid overtightening tripod screw.



The flexing, yielding coupling of motion is a living textbook in shock absorbing techniques for small mechanisms.

Both the first (opening) and second (closing) shutter-curtain actions are effectively snubbed by separate braking systems, and even the diaphragm-actuating arms in the lenses have shock-absorbing cushions. Add to this the foam strips at the forward corners of the interchangeable viewscreen's frame to absorb the final impact of the mirror's upward swing, and it's apparent that Olympus spared no effort to reduce noise and vibration.

The camera's one area of weakness seems to be acknowledged in the instruction book, where it cautions against using excessive force when mounting the camera on a tripod. Although the OM-2N tripod socket is considerably more robust than those found in the early OM-1 models, the main casting, to which the socket is mounted is somewhat "lacy" on the bottom.

Certain sections are quite thin. These sections are only visible after cover panels and/or various mechanism plates have been removed. These panels and plates, once securely fastened to the casting, serve as bracing and stiffening members. There's no question about the security of the camera or any bottom-mounted accessories. As long as normal care is exercised, this region can be considered as tough and well-anchored as the camera's strap lugs. But users will be wise to check all tripod-mounting surfaces for evenness before securing the camera to them, and then use good sense in tightening the tripod screw; no grip of steel is needed.

These words of caution apply to all cameras in general, but in particular to those cameras like the OM-2N whose compactness has been accomplished, in part, by reducing the thickness of its casting. If the casting becomes bent or twisted at a critical point it could affect camera operation in a number of ways.

While speaking of caution, it should also be pointed out that the meter movement in the OM-2N, like all its predecessors (OM-1, etc.) is vulnerable to dust when the interchangeable viewscreen is removed. Common sense dictates that this operation can be done in a clean area.

This last phrase, "clean area," can be used to characterize the OM-2N's design and execution. The tidiness of many small parts, each one graceful in looks and function, cooperatively working in minimal space, is a pleasure to see. It's clean. It's efficient. It's getting much from little.

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Field Check: Olympus

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signers, however, have thoughtfully provided a remedy for just such an occurrence. By setting the selector lever on the camera top to "check-reset," you release the mirror.

After I reset the locked-up mirror, of course, I had to put in new batteries before continuing to shoot. The lock-up is actually a warning system to indicate either dead batteries or (temporary) jam due to misoperation.


The lever-type film advance permits either a single or several short strokes to bring the next frame along.

Not unusual but useful is the film-box-end holder on the camera back. With the end of a film box inserted, this serves to remind all long-time-between-takes photographers of the film they loaded into the camera.

Another control that takes a bit of getting used to is the rewind release. On most current 35-mm cameras, this is a little button on the baseplate that is depressed just before you rewind the exposed film.

On the OM-2N, however, it is a small knob on the front of the camera just above the self-timer lever that is turned 90 degrees counterclockwise to disengage the camera sprockets for film rewinding.


The self-timer provides a 4-12-second delay and is far enough from the rewind release to prevent any confusion or accidental interference.

This latest Olympus update of the OM-2 carries on the good features of its forebears (with some improvement) and is worthy of the top spot it has in that family of cameras. 

The Simple Art of 110manship

continued from page 248

seem to be a potential problem. But the mass of metal and glass dampens vibrations quickly. Exposure times are fairly long, but results are so good I am loath to make unnecessary changes. Smaller print sizes, I might add, are cheaper to frame, carry, and, store away.

So, what is this really all about—making 'serious' photos with such a small negative? Well, for me this is all just a prelude for the last, incredible photograph, a summation of my craft/self before I leave this reality for the next, walking down some yellow-brick road (with print under arm), yelling for Smith, Weston, et al, to tell them there is a new boy on the block. 

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Just Out

By Joseph P. Fesce

Cameras



■ Minolta 110 Zoom SLR Mark II features a 25–67.5-mm Zoom Rokkor-Macro f/3.5 lens stopping down to f/16 and focusing from 3.6 ft., and from 7.7- to 34.6 in. in macro mode, with full and intermediate clickstops. It also has a TTL aperture-priority CdS metering system, electronically governed metal shutter with speeds of 1/4 to 1/1,000 sec, self-timer with pulsating LED in front of camera, “dedicated” flash system that sets shutter speed at 1/125 sec automatically, exposure override control, variable-diopter eyepiece with built-in blind, and tripod and cable-release sockets. Focusing is by means of a split-image rangefinder spot with matte screen surround, and viewfinder includes LEDs to show shutter speed in use, over/underexposure warnings, and that any Minolta X-series flash is charged and ready. Price, \$342 with de-



tachable handgrip and collapsible lens hood.

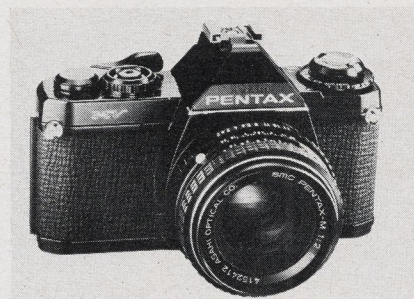
Companion Auto Electroflash 118X offers two automatic modes plus full manual operation, is supplied with a snap-on wide-angle diffuser panel, and is priced at \$52.50.

Also introduced is an addition to the 35-mm SLR XG series, the Minolta XG-9. User selects f-stop, and shutter speed from 1 to 1/1,000 sec in stepless speeds is selected automatically; there is an exposure override. (On manual operation, shutter speeds are stepped.) “Feather-touch” electromagnetic shutter release activates meter; LEDs in the finder show shutter speed and over/underexposure. Focusing is via a split-image range-finder spot, micropism-collor surround, and Acute Matte field (conical prisms stated to provide visually accurate depth-of-field check through a stopped-down lens). Finder also shows f-stop in use.

Camera accepts Auto Electroflash X-series “dedicated” flash units, autowinder, data back, and over 40 Minolta lenses. Other features include: a single switch atop camera for on, off, self-timer, and battery check, self-timer with pulsating LED in front of camera, shoe or PC synch, film safe-load signal, film-tab memo holder, and shutter-release lock. Price, \$433 with 45-mm MD Rokkor-X f/2 lens. *DIST.*: Minolta Corp., 101 Williams Dr., Ramsey, N.J. 07446.

Pentax MV, an aperture-preferred automatic SLR 35, has LEDs in the finder to indicate proper exposure. Green means okay to shoot, yellow means shutter speed selected by camera is too slow (use tripod, flash, or larger aperture), red indicates overexposure (stop down until green LED appears), and an X tells that companion autosynch AF 200S flash is charged.

Vertical-run focal-plane metal shutter is variably stepless from 1 to 1/1,000 sec, but camera can be operated



without batteries at 1/100 sec on “B” setting. Focusing is by means of split-image micropism screen. Price, with 50-mm SMC Pentax M-Series f/2 lens, \$315. *DIST.*: Pentax Corp., 98 Cutter Mill Rd., Great Neck, N.Y. 11021.

Lenses

■ Single-touch operation 80–200-mm Komura f/4.5 compact zoom is now available in a mount for meter coupling to current Rollei 35-mm SLR cameras. Price, \$350. An accessory 2X extender is available. *DIST.*: Hindaphoto Inc., 446 Sunrise Hwy., Rockville Centre, N.Y. 11570.

Measuring $2\frac{5}{8} \times 2\frac{5}{16}$ in., the compact 250-mm RF Rokkor-X mirror telephoto lens weighs $8\frac{5}{8}$ oz. Fixed aperture is f/5.6; 4X ND filter (supplied) cuts light transmission equal to an aperture of f/11. Focusing is from 8.2 ft.; angle of view, 10° . Price, \$380, with case, ND filter, and screw-in lens shade. Yellow, orange, red, and 8X ND filters are available. *DIST.*: Minolta Corp., 101 Williams Dr., Ramsey, N.J. 07446.

The 70–150-mm Vivitar f/3.8 One-Touch is an automatic fixed-mount zoom that remains in focus throughout the entire focal-length range. Minimum focus is $4\frac{1}{2}$ ft. (1.4 m), angles of acceptance are from 34° to 17° , and lens stops down to f/22. Price, \$269.95. *DIST.*: Vivitar Corp., 1630 Stewart St., Santa Monica, Ca. 90406.

continued on page 246

First Look

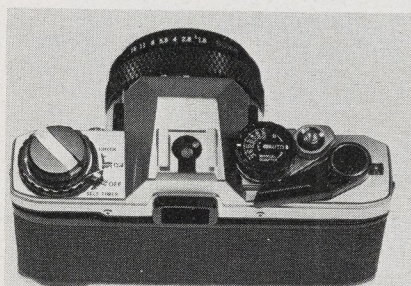
By Michele A. Frank

Olympus OM-10

It's the less expensive, real-time auto-exposure model in the line



- Aperture-preferred auto-exposure single-lens reflex camera
- Uses single silicon photocell for light reading during exposure
- ASA range 25-1,600
- Plus/minus 2-EV exposure control
- Horizontally traveling cloth focal-plane shutter; speeds 2-1/1,000 sec
- Electronic self-timer
- Operates on two 1.5-volt silver-oxide cells, EPX-76 or equivalent
- Audio-visual battery check



Controls on top of OM-10 are large, easy to use. Dial around film rewind serves as self-timer switch, on-off control, battery check. Eyepiece has bezel for correction lenses; hot-shoe has contact for T20 flash. At its right is control for setting ASA speed, ± 2 -EV meter override, manual adapter selector. Pressing coaxial switch around shutter release turns on finder display for 90 sec.

Olympus adds a third camera to its line of diminutive SLRs—the second auto-exposure model, but this one with a difference. It follows the trends set by Pentax, Canon, and Minolta and has no shutter-speed dial. One need only set the film's ASA on the camera, focus, and shoot. To get this ease of operation while still delivering well-exposed pictures has required some very sophisticated thinking.

Like the pioneering OM-2, the OM-10 meters during exposure. This differs from most auto-exposure SLRs whose electronic-control systems meter just before exposure, store that reading, and then deliver an exposure based on the stored information. The OM-10 has a single silicon photocell—at the bottom of the mirror chamber—that gazes back

toward the film plane. Thus it reads the light, reflected from the focal plane, either from the film or the specially patterned first curtain of the shutter.

This is a real-time exposure-measuring system. Like the more expensive OM-2, it can take automatic flash exposures in the same manner with the companion T20 unit off the camera.

Since this system is automatic-only—you can't manually set the exposure without the addition of the Olympus Manual Adapter (more on that later)—it can present a few headaches. The problems are not insurmountable—just painful. Primarily I became frustrated when I wanted to get a very accurate reading of a certain segment of a scene. As with most cameras of the nonspot-reading type, it means first walking up to the subject, metering, and returning to shooting position while remembering the setting as displayed by the LEDs in the finder. Then I had to adjust the exposure-override (± 2 -EV) control that resides around the switch on the top of the camera, to try to match the close-up reading. An exposure-hold switch would be nice, but it's not possible with the "real-time" system. Olympus would have to incorporate a memory circuit, the very thing that they worked so hard to eliminate.

This, of course, is a rather unusual situation for a camera that, I believe, was primarily designed for ease of use and quick shooting. Indeed, one of the finest features of the Olympus OM-2 that's carried over to the OM-10 is that when it's off—it's on. It's done with a special mode-override switch.

Even with the camera switched to the "off" setting, as the mirror rises it automatically turns on the silicon-blue-celled metering system, reads the light, and gives a correct exposure. Unlike the OM-2 which, /continued on page 242

'Found' Lighting for Portraits

I have suggested that your exposure times for found-light portraiture would often be in the 1/30- to 1/2-sec range, which isn't very extreme. Actually, you can use much longer times if your model can hold still enough, which isn't a very tough problem in a comfortable pose. In the early days of portraiture, *all* exposure times were long, lasting seconds or even minutes, yet millions of pictures were taken. In those days heads were even fitted into clamps to hold them still. Though these clamps are no longer available, you can nevertheless use long times for easy-to-hold poses—for example, when your model is lying down.

When taking pictures in very dim light using very long exposure times, your light meter probably won't do you much good. It may fail to register at all. Then you should just guess your exposures and back up your guesswork with bracketing. One way to bracket is to open the lens aperture all the way and give a series of different exposures in which only the exposure time is changed. Start with the exposure that you guess may be the correct one. Then shoot two or three additional exposures in which the time is progressively doubled. Then shoot an equal number in

which the time is progressively halved. The point is that one of these exposures will be correct, even if your original guess is far off.

Bracketing may seem to be a haphazard technique, yet many professionals use it all the time—even when they can get good readings with their light meters. They regard it as a kind of insurance guaranteeing good exposures. You can use a lot of film this way, of course, but you should try to think of film as cheap. With a professional it is the least of the expenses, and this is always kept in mind.

Since my found-light portraits illustrate this lesson, you might like to know what I experienced while I was making them. My model was 16-year-old Robert Doub, the ambitious young man who trims my lawn each week with his father's sit-down power mower. Once he knew what I was going for, which took him only a minute or two, he was very matter-of-fact about the whole project. I did everything but stand him on his head, and he didn't complain.

Though I am an oldtimer in photography, I managed to surprise myself with my found lightings—none of them worked in quite the way that I thought

they would. This was a little scary, of course, but a lot of fun, too.

All of my exposures were good except for one that was a little thin (I made the mistake of assuming that a match would put out as much light as a candle). Oh, I got a little flare in a couple of pictures, but it didn't really matter. This is a kind of flattening effect you get when you point your camera right at a light source. Using a high-contrast printing paper usually takes care of it.

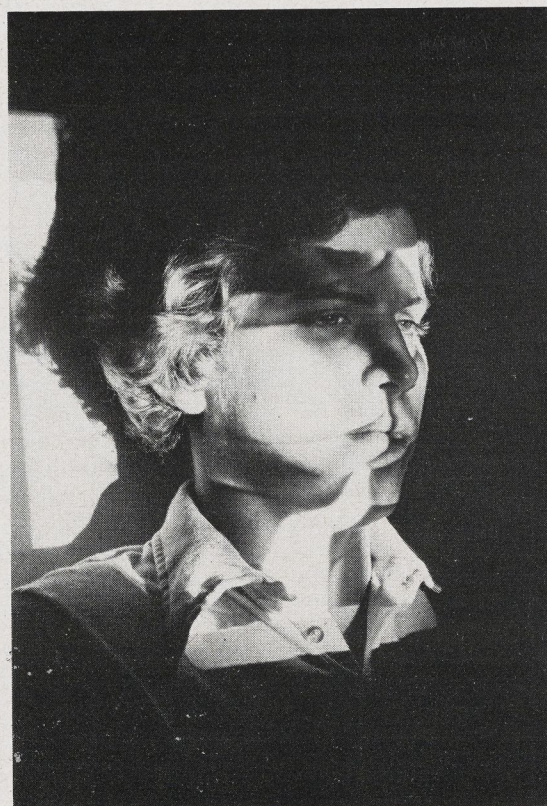
When I started using my 35-mm slide projector as a light source I was really amazed at what happened. I projected various color slides, mostly portraits, onto Robert's face. The effect was dramatic and unexpected, for the projected slide images powerfully dominated my pictures, and you could hardly see Robert at all. If I were to do the project over again, I would probably lessen this dominance by bringing up an extra light source to shine on my subject, thus introducing greater subject visibility. As things stand now, however, my friend Robert is hardly visible at all in about half of the pictures I shot. Even so, the slide-projection technique seems to have numerous possibilities that I haven't even begun to explore. ●



Robert with a crowd of silhouetted people.



"Dr. Robert" as "Mr. Hyde" with a slide of a bush.



Another body on Robert's mind.

First Look: Sankyo Sound

continued from page 232

wow-and-flutter—so, while they are well suited for the spoken word, their main problems with more critical musical recordings are such that cannot be solved by a different kind of input.

The camera possesses an input for a nine-volt d.c. power supply, meant for use with an external battery pack containing six C cells. This is particularly beneficial for cold weather and/or long-run shooting. During testing, however, the six AA cells contained within the camera handgrip proved adequate for the proper exposure of three 200-ft. cartridges, with an indeterminate reserve of power to spare.

Manual and power zooming of the lens was smooth and comfortable. However, power zooming can be conducted only while the camera-drive motor is running, as a common motor powers both. Although relatively few filmmakers need to rehearse power-zooms prior to shooting, those who do will find this a complicating factor.

Optical quality generally was acceptable throughout some 1,800 ft. of test footage, although the image becomes discernably softer at maximum-aperture/wide-angle combinations, and with small-aperture/full-telephoto.

With the caveats outlined here understood, the XL61-200 is an agreeable and effective camera. It is well balanced and comfortable to operate. Its controls are arranged in a workable layout, and all buttons and switches are large enough for easy manipulation. Particularly agreeable is the way the run-lock switch is set up. It is designed so that the operator need just press the trigger all the way, which will cause the camera to lock "on"—a point of convenience during lengthy shots—yet a second squeeze of the locked trigger causes it to release without need to grope for separate locking controls.

Price of the XL61-200 is \$665. Supplier is Sankyo Seiki (America) Inc., 149 Fifth Ave., New York, N.Y. 10010.

Don Sutherland ●

35→140-mm Soligor f/3.5 Zoom & Macro

- Single control for focal lengths from 35- to 140-mm and normal focus down to 5 ft.
- Macro to 1/3 life-size
- Aperture range f/3.5-22
- Filter size 72-mm

I'm certain many readers have dreamed of carrying just one all-purpose lens—one that would give medium-wide to

telephoto focal lengths and permit making close-ups as well. That dream is now reality in the 35-140-mm Soligor Auto Zoom and Macro f/3.5 lens.

In normal operation, this is a true zoom that holds its focus as the focal length and image size are changed. It is the only really portable zoom commonly available for still cameras that has a 4:1 zoom ratio. (True, there are 50-300-mm lenses around, but how portable are they?) It has the commonly used rotating front for focusing to 1.5 m (5 ft.) at all focal lengths.

If you want to get closer at any focal-length setting, simply depress the button labeled "Macro." This is located just behind the zooming ring. You've now activated a short variable extension that moves the entire optical assembly forward. As is true whenever extensions are used, the shorter the focal length, the closer the working distance and the greater the magnification for any given amount of extension.

Aha! You've reasoned that the greatest magnification 1:3, or 1/3 life-size, is obtained with the zooming ring set at 35-mm focal length. At this setting the front-element-to-subject distance is about 3 1/8 in. You can work at lesser magnifications by retracting the extension. A scale, figured for the 35-mm focal length, lets you know whether you are working at 1:3, 1:4, 1:5, 1:6, 1:7, 1:8, or 1:10 magnification. At the 140-mm as well as other focal lengths you can also work closer than 1.5 m, but image magnifications won't be as great, or working distances as close as at the 35-mm setting.

In the macro setting, the 35-140-mm Soligor becomes a varifocal rather than a zoom lens. This means that if you change focal length, you will have to refocus. This is done much faster than it took me to tell you. After turning the zooming ring, rotate the macro ring in the opposite direction to restore focus.

This lens, with which you can do so much—make wide-angle shots of scenes and interiors; portraits at the medium focal lengths, such as 85-mm, or close-ups of distant subjects as in sports action; and take ultraclose-ups to 1:3 magnification—is just 124 mm (4.9 in.) long, weighs 800 g (28 oz.), and takes 72-mm filters.

It comes in mounts for the Canon FD, Contax/Yashica, Konica, Minolta MD, Nikon AI, Olympus OM, and Pentax K and M-42 screw mounts. Price is \$599. Distributor is AIC Photo, Inc., 168 Glen Cove Rd., Carle Place, N.Y. 11514.

Norman Rothschild ●

First Look: Olympus OM-10

continued from page 128

on "off," limits correct exposures to shutter speeds shorter than 1/30 sec, the OM-10 will try for exposures of much longer duration. Tripping the shutter with the lens capped, I clocked an exposure of 30 sec before the camera closed the second curtain.

The OM-10 has a second metering system. This one receives its information from the pentaprism's CdS cell. That's how you know approximately what the camera is going to deliver during the actual picture-taking. It must be an approximation because, if the lighting changes substantially after you press the shutter release, the camera will adjust to whatever speed is necessary for the correct exposure.

Again, remember that the final exposure reading, taken off the film, is a real-time exposure measurement. Thus you could find yourself in a situation such as the following: you are photographing a sunset and the sun is just above the horizon. You set up, adjust focus, and shoot. You are expecting the speed (according to the CdS-controlled LED display in the finder) to be 1/30 sec—reasonable for hand-holding the camera if you are careful. But just as you get yourself settled, the last sliver of sun drops below the far horizon, thus removing your major bright-light source. The shutter speed indicated in the finder is not going to be that what is actually delivered—it's going to be longer since that light source just dropped below the horizon. Such cases are not frequent: in all the time I used the OM-10, the shutter speeds given in the finder appeared to be about the same as those delivered by the camera.

The controls of the OM-10 are sensitive
continued on page 244

Manual adapter fits onto stud and into receptacle on right side of OM-10. With camera set for manual adapter, user can control shutter speed, lens aperture. Adapter does not cross-couple to meter.



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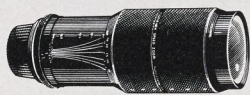
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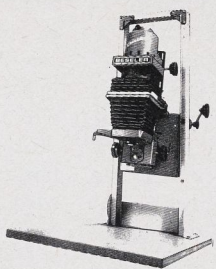
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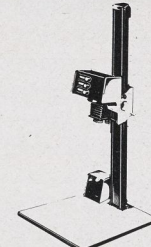
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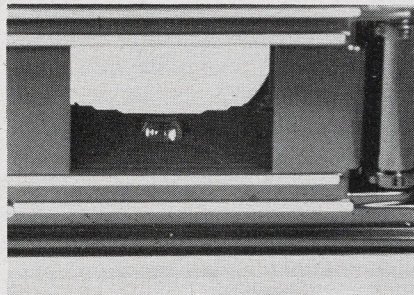
First Look: Olympus OM-10

continued from page 242

bly placed, large, and easy to work. The finder is bright; its noninterchangeable focusing screen consists of a horizontally-split rangefinder center, surrounded by a microprism ring in a groundglass fresnel field. Along the left-hand side are a series of 13 LEDs. Eleven of those LEDs are next to the lineup of shutter-speed numbers, 1 to 1/1,000, which intrude slightly into the finder. Just above the "1000" LED is LED No. 12 which lights up when the aperture selected is too large and overexposure will result; this is a warning to select a smaller aperture.

The 13th is not an unlucky LED. In fact, it's very handy when used in conjunction with Olympus' T20 electronic flash. By inserting the flash in the camera's hot-shoe and setting the unit to "auto," the shutter is automatically keyed to its synch speed of 1/60 sec. When the T20 is fully charged, the 13th LED will light in the finder. But then, after you've taken the picture, this LED will also confirm—by blinking very rapidly—that you did get enough light on your subject. It is able to do so because the camera itself controls the flash according to the amount of light

Silicon cell in mirror box gazes toward film plane: it reads the light, transmitted by lens, as it is reflected by first shutter curtain or film. Thus it provides real-time exposure measurement.



T20 flash unit sets OM-10 to synch speed and tells in finder when it is fully recycled. After shot has been taken it also signals, by blinking LED in finder, whether enough light has reached film.



Here's the OM-10 with its T20 flash unit and single-frame autowinder.

reflected off the film's surface.

The camera incorporates some of the circuitry normally found in our electronic flash units. When using the camera with units other than the T20, you'll have to set the camera's mode selector to either its "manual adapter" or the X setting.

Olympus is the only camera company at present to offer a manual-adapter device for its no-shutter-speed-dial model. This small optional accessory, inserted in a socket on the front of the body, permits the user to select manual shutter speeds from 1 to 1/1,000 sec. Thus, if you want to do any trick photography calling for very high over- or underexposure, or whenever you want to set the shutter speeds, you do have the option.

There is no coupling of the meter when the manual adapter is used so you first have to note, in the finder, what shutter speed the camera is calling for and then set the manual adapter to it. Or, conversely, set the shutter speed on the adapter and then turn the aperture ring until the LED opposite the shutter speed you've chosen lights up.

My likes and dislikes of the OM-10: I don't like the lack of an "exposure-bias" warning in the finder. I do like the audible/visual self-timer and battery check. I like the fact that the viewfinder display turns itself off after 90 seconds, thereby conserving battery power.

The OM-10 is for anyone who is not a photographic snob. It's lightweight, easy to use, and takes good pictures.

Price of the OM-10 with 50-mm f/1.8 lens is \$359; with 50-mm f/1.4 lens, \$423; body alone, \$266; manual adapter, \$34; T20 flash unit, \$85. Importer is Olympus Camera Corp., Crossways Park, Woodbury, N.Y. 11797. ●

Book Review in Brief

continued from page 207

guidelines to their understanding and, if you are so inclined or persuaded, their appreciation. Leaving nothing either to chance or to the reader's own perceptive abilities, Alinder's introduction analyzes virtually every plate included in the collection, explaining not only what hidden meaning(s) each contains but why they are, in fact, wondrous artistic creations.

Plate 1 ("Watermelon/Bread, 1970"), for example, is termed "a masterpiece" that is at once "amazing, meaningful, mysterious, and delightful." That's quite a tall order for one image. Unfortunately the logic by which a fairly muddy view of half a melon with a slice of bread (probably white) pasted to its side, set down on a cluttered kitchen table, can be deemed amazing, let alone full of meaning and/or delight, completely escapes me.

Alinder may assure me that this is the case, but the doubt remains. Perhaps the affixing of a slice of bread to the side of a watermelon is a task so difficult that it is nigh on to being impossible. At least that would explain the mysterious quality inherent in this image (how was such an achievement accomplished?), as well as amazement that it was done so neatly, and delight in the fact that the bread held on in place—at least until after the photographs of this momentous event had been made.

Then there is the duo (Plates 18 and 19) entitled "Zero Plus Zero Equals Zero" and "A Doughnut Plus A Doughnut Equals Two Doughnuts, 1974." This particular diptych doesn't even have the grace to provide visual excitement to either its pastry "stars" or to the stucco wall on which they were placed prior to their immortalization via the latent image.

And so it goes, for 44 prints. Whether singly or in pairs, from a supposedly subtle dig at an Ansel Adams TV commercial to a quasiscientific illustration intended to lampoon statistical analyses, the images in this collection are uniformly lacking in stimulation, either graphically and intellectually.

Robert Cumming, *Photographs* is available only by direct-mail order from The Friends of Photography, P.O. Box 239, Carmel, Ca. 93921. Purchasers should include, in addition to the price of the book, \$1 for postage and handling. (California residents must add a 42-cent state sales tax.)

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Catch the bug

On location or in a studio insect photography is one of the most rewarding subjects to tackle



Wherever you happen to find yourself, an insect will not be far away. Whether you are in the house, in a field, by a pond or near the sea, a species from the most abundant group of animals in the world will be near to hand.

The purists among us will probably insist that the best way to photograph an insect is by natural light in the field. Unlike flowers, this is not the case. Large insects such as moths and butterflies do in fact photograph very well in their natural surroundings, but the smaller insects and spiders will only be at their best in a studio situation where controlled electronic flash is at hand.

Before you decide whether you are going to photograph insects in their natural state or indoors you must first track down your bug. Delving into a good reference book such as 'The Oxford Book of Insects', will at least guide you to the right places to start looking for a particular species. There's not much point looking for a Privet

Moth in a holly bush! Knowledge about an insect's life cycle, feeding, breeding habits, and habitat will save a lot of fruitless searching.

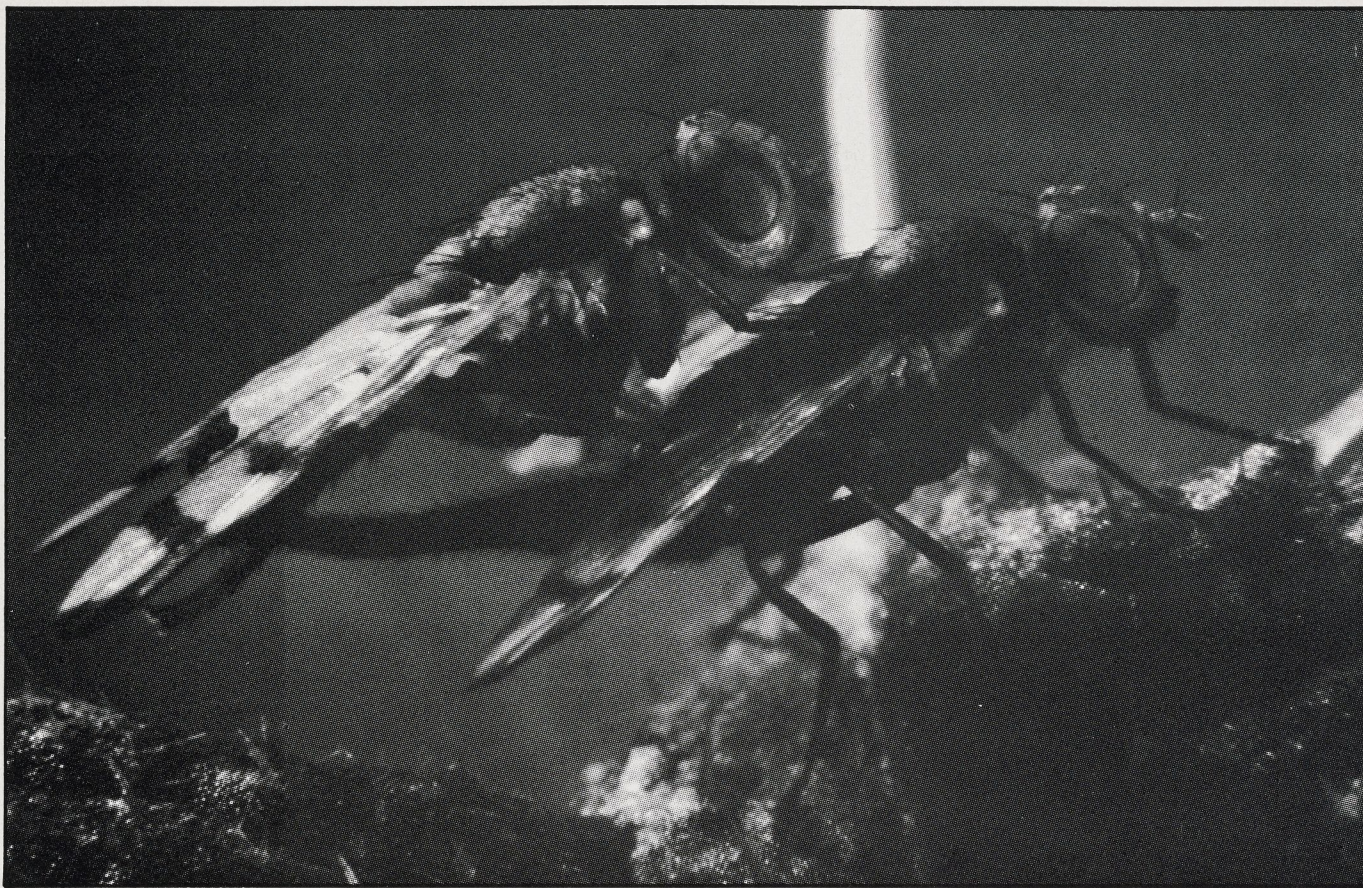
If your decision is to take insects in the field the amount of equipment you need is minimal. An SLR with a set of auto extension tubes and a medium telephoto lens, such as a 135mm, will suffice. Carrying a 100mm macro lens means that you could dispense with the extension tubes.

The reason for choosing a telephoto is that your minimum focusing distance will be far greater than a standard lens. It's true that the magnification will not be as great but an insect is far more likely to tolerate you staring at it from 18 inches than two.

Tripods are a waste of time too as by the time you have got it set up the subject will have flown.

Flash is the only other piece of equipment that is occasionally of use, but once again there is the problem of fall off of light with distance which we

continued over



Trypetid flies taken on a Pentax ME with 50mm Macro lens. 68mm of extension tube used in conjunction with 20 dioptre supplementary lens.
Photo by N. Callow



Salticus scenicus and prey shot with 50mm Macro lens. 68mm of extension tube was used in conjunction with 20 dioptre supplementary lens.
Photo by N. Callow

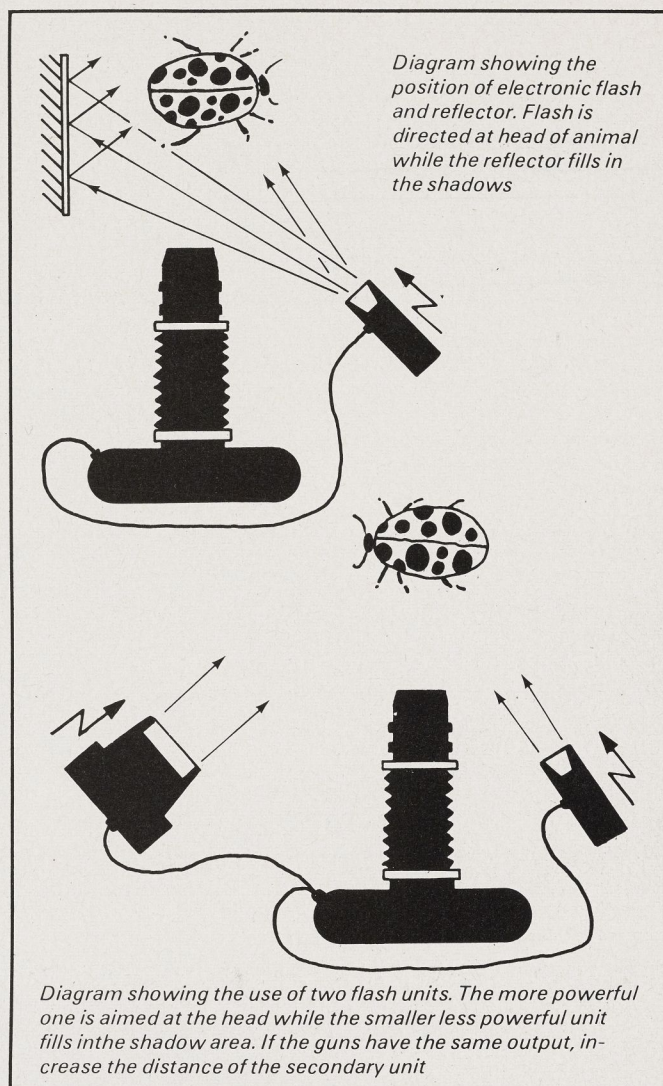


Large Marsh Grasshopper taken with 100mm Macro lens at f22
Photo by J. Mason

looked at in the flower section. Hand holding by available light is the order of the day.

Having got your equipment together

the time has come to start stalking your insect, but before you start, decide on what reproduction ratio you are likely to require and fit the appropriate tube.



Having found your subject it is unlikely that you will then have time to start chopping and changing your equipment.

Having found your insect move in towards it with a slow continuous action firing the shutter as it comes into focus. You will need a great deal of patience and the occasional piece of luck to get that 'out of the ordinary' shot.

Spending time observing insects before you start your photography will also help ease the problems created by a haphazard approach. Many insects are territorial in their life styles often favouring a particular flight path or plant for feeding.

Spiders are easier to capture on film because they are far more static. Early in the morning when the dew is still on their webs is the ideal time. If you're a late riser you could always cheat and spray the web with a plant mist spray.

In this type of work the stress is usually on working as quickly as possible, therefore if you are using flash as your main light source there is no

continued over

Reproduction ratio	Aperture			
	5.6	8	11	16
0.1	41	59	81	117
0.2	14	16	22	32
0.33	4.5	6.4	8.8	12.8
0.5	2.2	3.2	4.4	6.4
0.66	1.7	2	3.3	4
1	0.8	1.1	1.5	2.1
1.5	0.41	0.6	0.8	1.2
2	0.28	0.4	0.55	0.8
3	0.16	0.25	0.32	0.47

Depths of field for a given reproduction ratio and aperture. Note how the depth of field is doubled each time the aperture is closed by two stops. Results given in mm

Film speed	Guide Numbers										
50 ASA	8	10	12	14	16	18	20	22	24	26	28
25 ASA	5.6	7	8.4	9.8	11.2	12.6	14	15.4	16.8	18.2	19.6
100 ASA	11.2	14	16.8	19.6	22.4	25.2	28	30.8	33.6	36.4	39.2
160 ASA	13.6	17	20.4	23.8	27.2	30.6	34	37.4	40.8	44.2	47.6
400 ASA	16	20	24	28	32	36	40	44	48	52	56

The power of a flashgun is indicated by its Guide Number (GN). Throughout this feature we have quoted the GN in metres for a film speed of ASA50. To calculate a guide number for a given film speed you must multiply the flash distance (in metres) by the f stop in use:

$$GN = \text{Flash to subject distance (m)} \times f \text{ stop}$$

If you know the GN for a given film speed (GN_a) it is possible to calculate the corresponding GN for an alternative film speed GN_b :

$$GN_b = GN_a \times \sqrt{\frac{b}{a}}$$

For example, if the GN of a flash unit is 20 for 50ASA film then the GN for a 400ASA film will be:

$$GN = 20 \times \sqrt{\frac{400}{50}} = 20 \times \sqrt{8} = 20 \times 2.8 = 56$$

This table should make conversions at a glance simple

FOR APERTURE f/16									
G.N. R.	8	10	12	14	16	18	20	22	24
0.1	46	56	68	80	91	102	113	126	136
0.2	42	51	63	73	83	93	104	115	125
0.3	38	47	58	68	77	86	96	106	115
0.4	35	44	53	63	71	80	89	97	107
0.5	33	41	50	59	67	75	83	92	100
0.6	31	38	47	55	63	70	78	86	93
0.7	29	36	44	52	59	66	73	82	87
0.8	27	34	41	49	56	62	69	78	83
0.9	26	32	39	46	52	59	65	74	79
1	25	31	37	44	50	56	62	69	75
1.2	23	28	34	40	46	51	57	63	68
1.4	21	26	31	36	42	47	52	57	63
1.6	19	24	29	33	39	43	48	53	58
1.8	18	22	27	30	36	40	45	50	54
2	16	20	25	28	33	37	42	47	50
2.5	14	18	21	25	29	32	36	40	43
3	12	15	19	22	25	28	31	35	37
3.5	11	14	17	19	22	24	28	30	33
4	10	13	15	17	20	22	25	27	30

Once you have worked out the Guide Number for your own particular flash unit it is possible to accurately work out the flash to subject distance for a given reproduction ratio:

$$\text{Flash distance} = \frac{GN \times 100}{\text{aperture} \times (\text{rep. ratio} + 1)}$$

Results are given in cm

time to start arranging your lighting once the insect is in focus.

It is well worthwhile purchasing one of those flash brackets which screw into the base of the camera with an attachment for flash unit on the end of it. Ensure that this bracket is fixed slightly forward and at an angle in order to give you the best possible lighting position. A slightly lower powered unit on the other side will also help to fill-in the shadow areas.

Tests must be made before you start so that the best flash positions can be set and check that everything is rigidly fixed so that you move as a single rock steady unit.

Photographing insects indoors is a generally more rewarding and relaxing occupation, possibly requiring more skill but probably reaping greater rewards.

The smaller the area you work in the easier it is to capture hyper-active in-

sects that scurry off at the earliest opportunity.

Set up a small area containing some bark or moss and the type of food that your subject likes. It doesn't need to be elaborate as you will only be photographing a very small area. Coloured backgrounds can be set up behind to fill in any unsightly gaps.

Once again, electronic flash is preferable to photofloods which tend to get hot, upsetting many insects.

If you are keeping your subject in a centrally heated house then spray its container daily especially if it lives in a damp habitat.

Heather Angel in her book, mentions the use of a 'loose box' for photographing flying insects. This consists of an open ended cellophane tube in which is set up the twigs and leaves plus the insect. The camera is then set up and focused and once the insect has settled the box is gently lifted off leaving you with a clear shot.

As with flowers, any coloured background should tone in with your subject, blues, greens and browns being the obvious choice.

Lighting is quite naturally varied, either front, side or back lighting being suitable depending on the type of animal. Hairy caterpillars are particularly dramatic with rear lighting but generally speaking best results will be obtained by positioning your primary flash to one side and filling in the shadows with either a secondary low-powered unit or a reflector of some description.

Finally, it is good to constantly remind yourself that the welfare of your subject depends entirely upon you. Make sure it has enough food (take a sample of the plant on which you found it) and don't forget to keep its environment damp if it needs it.

Once you have finished your photographic session try and return it to the exact area in which it was captured.