

# A Simple Scope



Jack O'Connor scoped his favorite "Number 2" rifle - a Biesen-stocked .270 - with a 4x Leupold.

As rifle scopes become more complicated, you might be better off sticking to the basics

The box on his bench was marked \$39.50. A hefty sum in the days of 15-cent hamburgers. I gave the garage floor a tentative scuff with the toe of my sneaker. “That’s what it’ll cost?”

He shrugged. “Yup.”

The scope would leave me purt’ near broke, as we used to say. Perilously close to flat broke. But it was a step overdue. I dug out two 20-dollar bills. He fished for a couple of quarters. “You’ll need rings.”

Good grief! I’d forgotten! Perhaps sensing he’d pocketed all the paper money between us, the old gunsmith sighed, wiped his glasses, and extracted a dusty cigar box from under the bench. Inside, a jumble of second-hand steel yielded two Weaver Tip-Off rings. Alloy bases for the Mauser were more elusive, their screws even more so. “No charge,” he growled, wiping oil-black hands on his apron.

I grabbed the bright Bushnell box before he could smudge it, snatched up the rifle, pocketed the Weaver parts, thanked him, and hurried out to the old Ford. It coughed to life. I wrestled the column stick into first, already dreaming of big deer tripping along my crosswire.

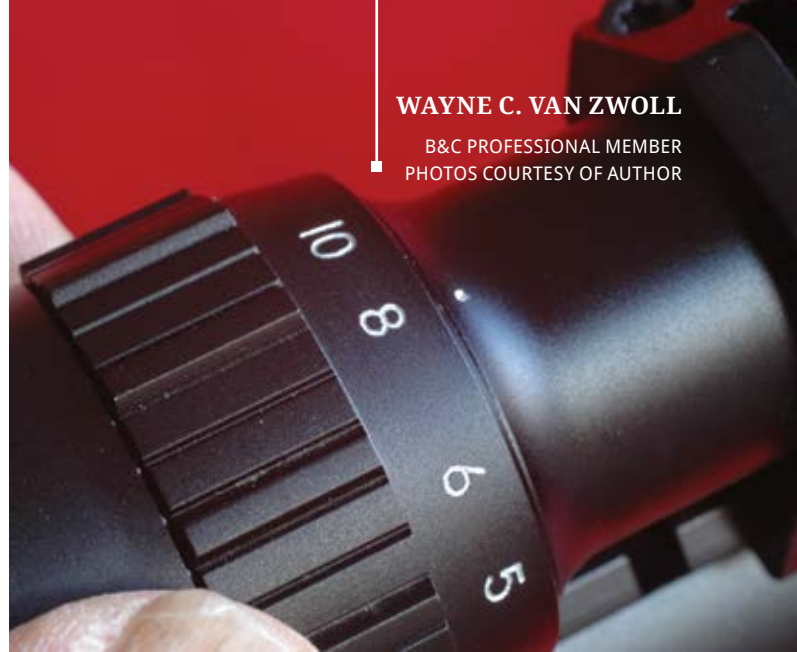
Though Michigan’s whitetails deftly avoided that reticle, I didn’t lose faith. On cold November mornings, under naked oaks or watching shreds of tattered cornstalks shiver in the wind, I’d shoulder the Mauser and pretend there was magic in its 2-1/2-power optic.

A first scope should be like a first date: unforgettable. While mine cost much more than a date, I was certain our relationship would last.

It did. Sort of. If it hadn’t wandered off in an ill-advised trade years ago, I’d happily clamp that eight-ounce scope on any hunting rifle and hie off to the woods, prairies, or alpine steeps. Sadly, such sights are now hard to find.

Thank progress that, by some measures, reached its apogee in rifle sights not long after my first.

Optical sights showed up a couple of centuries after Galileo and Lippershay built telescopes to see stars. Target shooters, then Civil War snipers, squinted at milky images through barrel-length tubes. In 1901 the J. Stevens Tool Co. acquired the Cataract Tool and Optical Co. to make rifle scopes. Three years later, in Germany, Zeiss/Hensoldt prisms brought target images into a short scope. By the late ‘20s, Zeiss owned Hensoldt and was exploring variable power.



Wayne thinks 8x or 9x plenty of power in any hunting scope. No need for a big tube or objective lens!



A 1-1/2-5x at 3x on a Montana rifle downed this Alaskan bear. High magnification can delay your shot!



In 1961 Leupold introduced its Vari-X scope. The Vari-X II, here on a converted Springfield, followed.



A fine lightweight optic easy to mount low, Leupold's 30mm 1-6x has all the power you should need!

## EARLY ADVANCES IN RIFLE SCOPES

Oddly, many new rifle scopes emerged in the U.S. during the Depression. Most wilted at market. A notable exception: Bill Weaver's Model 330, a 3x sight he built in 1930 when he was 24. Its 3/4-inch steel tube had internal windage/elevation (W/E) adjustments. A "grasshopper" mount as imposing as a jumbo paper clip brought the price to \$19—much less than German scopes.

Soon thereafter, Zeiss reduced rampant light loss inside scopes by coating lenses with magnesium fluoride. Grancel Fitz, who famously hunted all species of North American game from the late 1920s into the '50s, used a Griffin & Howe .30-06 with a 2-3/4-power Zeilklein. In 1939 it cost \$36. A decade later, Leupold & Stevens nixed fogging by evacuating air from scopes and sealing in nitrogen.

These optical advances barely nudged scope

prices. In fact, a 4x Unertl fetched \$2 less in 1950 than a comparable 4x Noske had in '39! Mechanical improvements followed. Engineers installed erector pivots at the tube's rear to keep wind and elevation (W&E) adjustments from moving the reticle about in scope fields. Soon all scopes had constantly centered reticles.

At the same time, variable power broke into the market. My 2-1/2-power Bushnell had been one of five scopes in a series. Four were fixed-powers. The next decade belonged to variables. Whoopee! One scope could bring quick hits on whitetails in thickets and, with the twist of a ring, threaten 'chucks across the alfalfa! Beginning in 1961, Leupold's Vari-X 3-9s would upstage Weaver's K4.

In reticles, horsehair, whose weight caused it to break in recoil, acceded to modern materials and new profiles. Leupold's Duplex, a .0012 platinum wire pressed

to .0004 in the center, appeared in 1962. Premier Reticle Ltd., which has sold reticles to many scope-makers, twisted ribbon wire to form a "plex." Other reticles came by way of photo-etching metal foil .0007 thick. Chemicals stripped away all but the desired image. Like T.K. Lee's .008 dot suspended on spider filament, these delicate reticles were very lightweight, so had little inertia and brooked heavy recoil.

Pitiless recoil machines evolved to test reticle strength and scope integrity. A Bushnell technician told me: "We spot-check scopes with a beating that duplicates recoil from a .375 H&H 10,000 times." He added that any flaws soon surface. "A scope that endures a hundred hits is good for thousands."

## THE EVOLUTION (AND WEIGHT) CONTINUES

Had scope development stalled at this point, few hunters would have whined. The improvements that mattered had arrived! Prices had risen but not vaulted. "Status quo" had a pleasant ring.

Not to slight future refinements. By industry claims, one-piece CNC-machined tubes would be 400 percent stronger than tubes predating CNCs. Tighter tolerances on glass surfaces

would yield sharper images, with Swarovski bringing prism faces flat to 1/100,000 mm, light angles within 1-1/2 seconds. Skin-fit of moving parts in variable scopes would all but eliminate point-of-impact shift with power changes. W&E dials machined so shooters could "dial to the distance" would appear on Leupold Vari-X IIIs converted by GreyBull, then on scopes industry-wide. At Meopta, machines worth 1.2 million Euros each would apply multiple lens coatings to enhance brightness across wave lengths. Exterior glass was coated to slip rain.

Alas, variable power buried fixed-power hunting scopes during the 20th century's final decades. The 30mm scope tube began to bully the 1-inch off-stage—as the 1-inch had the 7/8-inch tube of the '40s and '50s. Fast-focus eyepieces were popping up, along with range-finding and illuminated reticles.

"Most of that gadgetry's useless," grouched a white-whiskered companion over a campfire deep in Idaho wilderness. "Scopes should be simple." He picked up my iron-sighted Winchester 71, and snapped it to his shoulder. "Or just plain gone."

He brought to mind a friend who, in his youth, had

worked with Warren Page, at that time *Field & Stream's* shooting editor. "Page told me that when he wrote of hunting with scoped rifles, readers berated him for unsportsmanlike conduct. He answered them civilly. You can't tell a disciple he's wrong, that iron sights will blur as age dims his vision, or that a scope will bring him more humane hits."

These days, rifles furnished with irons are as scarce as hunters who take ethical issue with scopes. But the increasing sophistication and cost of optics begs the question: what's of real value in a scope?

What's not of real value is useless weight. My 2-1/2-power Bushnell weighed little more than an order of fries. Now a Zeiss Victory V8 5-35x60 scales 34 ounces, Leupold's Mark 8 3-1/2-25x56 comes in at 37, and the Swarovski dS at 39. Nightforce lists a 40-ounce 5-25x56 Beast; the Vortex Razor HD 4 1/2-27x56 weighs 3 pounds.

OK. These are extreme examples, outliers with huge objective lenses and 34-, 35-, 36- and 40mm tubes housing oversize components. But scopes of mid-range magnification are getting heavy, too. Burris' 4-16x illuminated Fullfield IV with 30mm tube scales 23 ounces, as much as Lyman's steel 24-inch Super Targetspots once dominant in bullseye and Benchrest matches!

A hunting sight should be lighter. An arbitrary rule: it shouldn't exceed 15 percent of rifle weight. By that standard, an 18-ounce scope is the limit for a 7 1/2-pound rifle, a 14 1/2-ounce scope is all I want on a 6-pound rifle. A heavy scope is a load on the trail; it also elevates the rifle's center of balance. You'll aim most naturally if the rifle lies low between your hands, like a double shotgun. Bulky objective bells mandate tall rings, jacking center of balance still higher.

Big, heavy scopes arrived in lock-step with broader power ranges. Early variables had three-times ranges: top magnification three times the bottom. Roughly with the emergence of 30mm tubes, four-times ranges became popular. Five-, six-, eight-times scopes followed. "Broad ranges force compromises," say optical engineers. "As each lens works harder, more lenses are needed to counter aberrations. Mechanical tolerances figure in too. Lenses in six-times scopes move twice as far as in three-times. Tolerances run to half a thousandth for erector cams. Vignetting increases. Focus and parallax become hard to control."

To no one's surprise, wide-range variables cost more than their forebears. The Balvar 8, a 2-1/2-8x made by Bausch & Lomb from 1955 to '63, sold for \$99.50. It weighed 12 ounces (without the adjustable mount) and had a truly useful power range. Tides of 3-9x scopes followed. The generous field of a 2-1/2-power scope (40 to 45 feet at 100 yards) affords quick aim partly because it almost duplicates what you see with your naked eye. There's no time lost adjusting your vision to a magnified image. It also reveals animals not encompassed by a tighter



ABOVE: A technician completes erector assemblies. The variable scope's power ring engages those spiral slots. BELOW: Left to right, steps in machining a scope tube from a thick-walled blank. CNC machines hold close tolerances.



Even relatively "basic" variable scopes are complex, as evidenced by this cutaway of a 2-7x Kahles.



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field, so you pick the right target and can stay with it for a follow-up shot as the group runs off. A 1-1/2-5x20 Leupold at 2-1/2-power helped me “snap-shoot” a leopard in cover at 30 feet and make offhand shots at deer and elk. Magnification lower than 2-1/2-power has less appeal. I don’t want the rifle’s muzzle popping into view to distract me. Field curvature can also become bothersome.

### SIMPLE IS BEST

A top magnification of 8x or 9x is plenty. Weaver ads of my youth hawked 4x scopes as ideal for “big game in open country,” the K6 as a sight

for “small game at extreme ranges.” I’ve just twice needed higher magnification to kill big game. At 6x, a scope with a 36mm objective provides a 6mm exit pupil, as big as a shaft of light as your eye can use in most conditions. You won’t gain a perceptible edge from a bigger front lens, even at dusk. Hence, I’m sweet on Leupold’s 2-1/2-8x36 and Swarovski’s 3-9x36. Both are trim 11-1/2-ounce sights with 1-inch tubes and top-shelf glass.

Most variable scopes for the U.S. market are built with the reticle in the second (rear) focal plane. It appears one size across the power range and is my choice for hunting. A first-plane reticle “grows and shrinks” as you

change power. It can be hard to see at the low magnification that’s best in cover. At high power it hides small, distant targets—again, just what you don’t need! As they stay the same apparent size relative to the target at all power settings and don’t move with power changes, first-plane reticles appeal to long-range shooters.

While a focus/parallax dial isn’t a basic feature on a hunting scope, it helps you aim. Adjusted for sharp target focus, it nixes parallax error caused by the shift of the target image as you move your eye off the scope’s optical axis. Most scopes without this adjustment are set for zero parallax at 150 yards. At that range, eye position doesn’t matter. At a different distance, however, you must keep your eye on-axis to eliminate error. A focus/parallax dial replaces the adjustable objective (AO) sleeve on the

objective bells of older scopes.

In sum, the essentials in a scope, as in a date worth remembering, are few. Quality matters most.

Last fall, still-hunting along a wooded prairie bottom, I spied the antler of a whitetail buck bedded in brush. Eye on that tine, I eased to my belly and crawled to a rise, where slinging up, I found a slot in the lattice of limbs. My rifle nosed through the grass, the reticle settling on rib. In the minute or so between spotting that deer and sending a bullet, I didn’t once look at my rifle or touch its scope.

A hunting scope should help you aim quickly and accurately without thinking. Its full field must come to eye as you cheek the rifle. Weight that impairs rifle handling and adjustments that pull your focus from the target will only cause you to miss your chance. ■



Short, lightweight, low-power scopes keep the rifle’s balance low between your hands, to point fast.



This scope is too big. Close offhand shooting delivered the buck. No time—or need—to come off 3x!