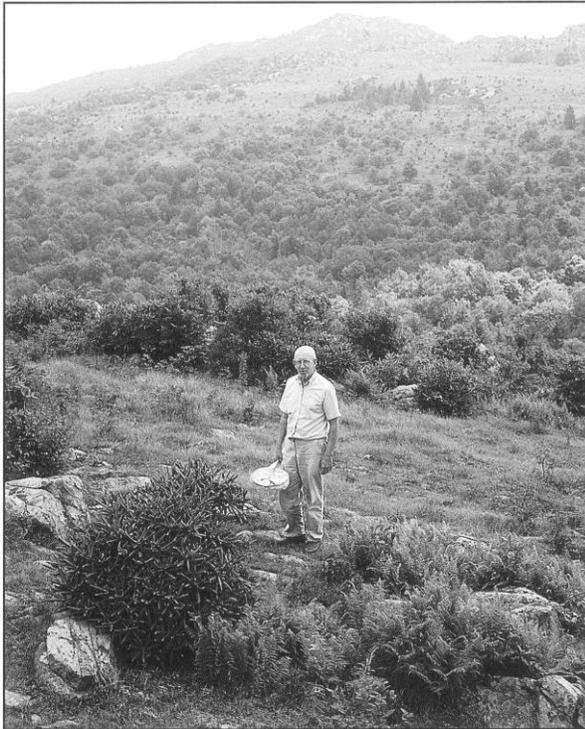


## Essays by Richard Hoffman

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The High Country: Biologically Unique<sup>1</sup>

by Richard L. Hoffman



Author collecting insects on Wilburn Ridge in Grayson Highlands State Park. Photo by Patti Dalton.

In the Asiatic country of Indonesia, in the volcanic island chain lying to the east of Java, two small islands called Bali and Lombok are separated by a narrow passage of about 25 miles wide. On a clear day you can stand on one and see the other. To naturalists, this narrow strait is one of the most remarkable places in the world because it separates two major groupings of animal life. The butterflies, snails, millipeds, reptiles, birds, and mammals of Bali are like those of mainland Asia, while their counterparts on Lombok are shared with the great southern island of Australia. It is almost unbelievable that such differences can occur virtually in contact.

<sup>1</sup>Originally published (with an additional photo) in the Spring 1995 issue of *Virginia Explorer* (volume 11, number 2, pages 16-18). Reprinted with permission of the Virginia Museum of Natural History, Martinsville, VA. (The photo on page 86 was not included in the original article).

So who would believe my next statement, that one can find nearly as dramatic a biotic contrast right here in Virginia, and by driving not 25 miles, but just 10? Where do we have such differences in plant and animal life? Between Norfolk and the Eastern Shore? Between the Dismal Swamp and Cape Henry? No, on all counts! One can easily see the truth of my assertion in an easy drive of about two hours, starting at Abingdon and going east on U.S. 58. If you are a naturalist stocked with the right expertise, you probably will understand what is to come without following this narrative. If not, let my words guide your eyes as we proceed.

Abingdon lies in the central low plateau of Washington, Smyth, and Wythe counties. When driving southwest on Interstate 81 one sees tall mountains running parallel, both to the north and south. The elevation at Abingdon is about 2,000 feet above sea level, and its climate is like that of Danville. There are other similarities with the Virginia Piedmont that appear climate-related. Sweetgum is common nearby along the North Fork Holston River, mud salamanders live in the springs, and narrowmouth toads have been found not far away. Persimmon, which does not exist in the Blue Ridge or the New River Valley, shows up again as a common tree. Collectively, many plants and animals in this region are adapted to hot summers and mild winters, and are the common species one finds in Alabama or at South Boston.

On the way east from Abingdon on U.S. 58, the road crosses the Middle Fork of the Holston River, one of the headwaters of the Tennessee River system. That system brings into Virginia our richest faunas of turtles, crayfish, mollusks, and fishes, all having originated in the Mississippi River basin. We may pass in silence over the Holston, in memory of its former wealth of unionid mussels, decimated in recent decades by upstream pollution.

From Damascus, the road clings to the course of Laurel Creek through a sinuous valley of spectacular rhododendron stands, rock outcrops, and waterfalls, gaining altitude as it goes. U.S. 58 then makes an abrupt turn to the right, on its long way eastward. We part its company to continue directly ahead, following a broader and flatter intermontane valley at nearly 4,000 feet, skirting the western base of the two great mountains, Whitetop and Mount Rogers. This is a settled and farmed country, green and well-watered, with a totally different aspect than that seen at Abingdon.

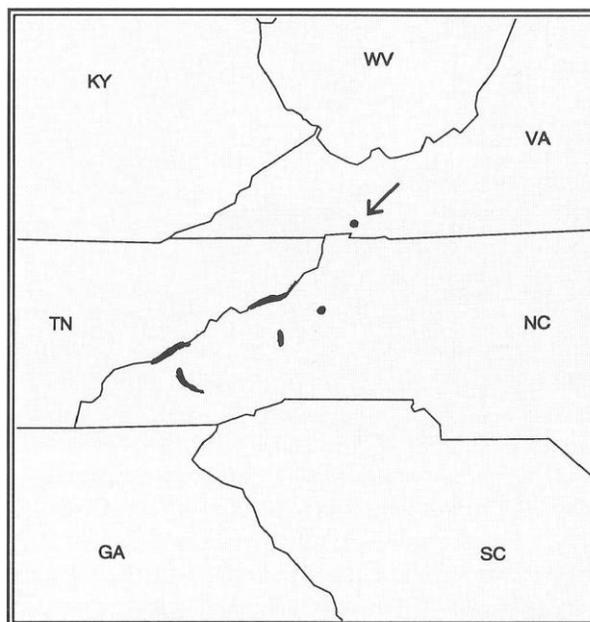
Our pleasant paved road continues toward Troutdale, past the campgrounds and other amenities provided by the National Recreation Area. At

Konnarock we turn onto State Route 600, and immediately commence an uphill grade of about four miles. One's eardrums "pop" in response to the decreasing atmospheric pressure. In a short time, we arrive at a broad open meadow called Elk Garden Ridge, the pass between Mount Rogers and Whitetop. The Appalachian Trail crosses the road here, and the Forest Service has provided a spacious parking lot for the convenience of hikers, which we are about to become. The elevation is about 4,800 feet and if the weather is clear, one can easily see the dark-green fir-capped dome of Rogers and a world of blue-gray ranges overlapping off to the distant east.

From this point the Appalachian Trail passes through a rustic stile and continues on its way toward Maine. If we follow it for only a few miles, the forest changes perceptibly: first a broad belt of native buckeye with its singular five-parted leaves. In May the ground is carpeted with fringed phacelia, a native of the high southern Blue Ridge. It occurs no further north in Virginia, and no lower than about 5,000 feet. Still farther on the buckeye merges into beech woods, with a seasoning of red spruce and striped maple. Occasional breaks in the forest permit views southward into the high country of North Carolina toward Boone. The horizon is dominated by Three-top Mountain, Trout Knob, and a dozen others reaching up at least a mile. It is difficult to imagine that in the early part of this century, today's quiet trail was a busy logging railroad, hauling away the boles of centuries-old red spruce. As recently as the late 1940s, one could find the sites of old sawmills and rusting heaps of machinery being slowly recycled by natural forces.

In another mile or two the trail becomes more precipitous and enters the dark green forest of Fraser fir. Although related to the more northern relatives, Fraser fir is a species endemic to the highest mountains of the southern Appalachians (*see illustration above*). It occurs nowhere else in Virginia than at this soft crown on the last 200 vertical feet in the Commonwealth. At its highest point (nearly flat and a little disappointing for it), one can find a survey marker, where the state peaks out at 5,729 feet above the Chesapeake.

Besides the pervasive fir, what else occurs in such exalted surroundings? In the summer, the ground is carpeted with the northern wood sorrel, a creeping plant notable for the delicate red-veined white petals of its strawberry-like flowers. This plant likes high country: it ranges from the Great Smokies north through the Appalachians to Canada, Alaska, and northern Eurasia. I have found it growing under spruce in the Austrian Alps, where the plant communities looked identical to those I know in the highest Appalachians. It is therefore something of a shock to discover that Alpine animals



Map of the southern Appalachian region, showing the present distribution (dark spots) of Fraser fir. Mount Rogers is indicated by the arrow. The species is a climatic relict, isolated on mountains about 5,000 feet above sea level by gradual warming trends over the past 17,000 years. Map by John Anderson.

lack such counterparts in our mountains: the millipeds and salamanders are totally different! The Fraser fir provides a home for the northern flying squirrel, another animal widespread across northern North America in evergreen forests that occurs far to the south atop the highest Appalachian peaks.

Only a few hours ago we were ten miles to the west, and nearly a mile lower, yet what a difference in the natural communities! It is easy to realize that climate makes the difference, and that elevation changes the climate. Going upward lowers the average daily and annual temperature, and shortens the growing season. The beeches on Mount Rogers don't begin to bud until early June. What makes the high country around Mount Rogers so interesting biologically, and unique within the state, is the climatic stratification that results from the elevation.

Several major distributional patterns can be defined for the region. They include:

- 1) Southern Appalachian high-altitude endemics that reach their northernmost extent. Besides the fir and fringed phacelia, numerous millipeds, beetles, and especially salamanders make up this component. One delight of the evergreen forest is the discovery, under moss or stone, of the elegant gold-flecked Weller's

salamander, or the diminutive Pygmy salamander with its dorsal pattern of neat herringbone markings. Of similar range, but preferring lower elevations, are the aquatic shovel-nosed salamander that inhabits a few streams draining the northern slopes of Rogers and Whitetop, and the aptly named umbrella-leaf that displays its spectacular foliage in springs and seeps northward almost as far as Troutdale.

2) Canadian (even Eurasian) species that, like red spruce, northern flying squirrel, and wood sorrel, island-hop southward at ever-increasing elevations as far as the Smokies. In Virginia they rarely occur below 4,000 feet.

3) At moderate elevations (2,000-4,000 feet) one finds a multitude of southern Appalachian plants and animals that extend farther northward. Some follow the Blue Ridge nearly to Roanoke; others cross over northwest into the Alleghanies toward Tazewell or Bluefield.

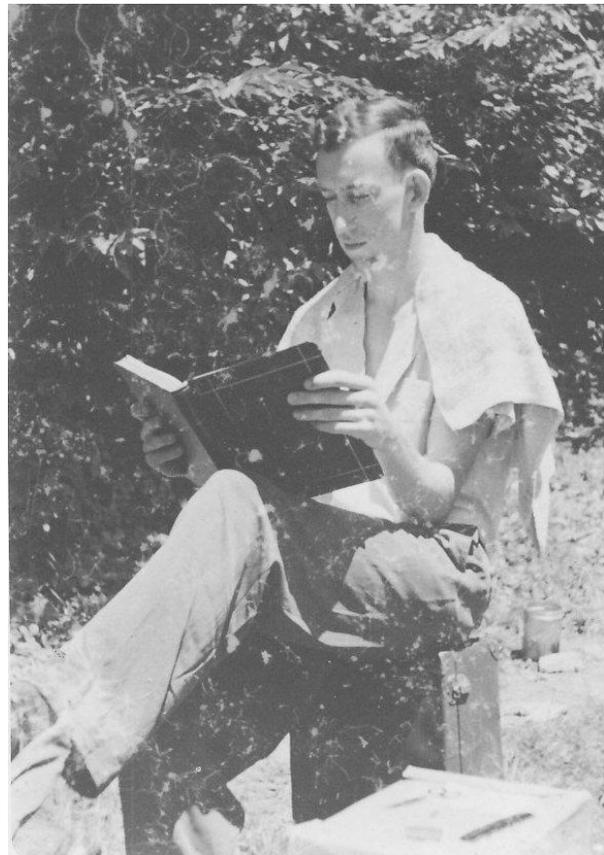
4) Also at moderate elevations are organisms whose loyalty is still to cooler climates, but range from north Georgia into New England or Canada. Many of these are widespread in the mountains of western Virginia, preferring cool ravines or north-facing slopes of the ridges.

Well, has my point been made? At the top of Rogers, at rest in the moss while kinglets fidget in the nearby firs, we are surrounded by plant and animal species making up a community more similar to that of Quebec than to anything elsewhere in Virginia. Virtually none of them occur around Abingdon, easily visible from the open fields on Whitetop. Correspondingly, the plants and animals of the Holston Valley have far more in common with those of Tuscaloosa or Atlanta. The differences are on a scale comparable to those mentioned for the East Indies. To summarize: the distribution of land organisms is controlled by climate, which in turns is determined by latitude or elevation. End of lesson.

One needn't be a trained biologist to appreciate what I've tried to describe. Get in your car some fine day and see for yourself. For those who prefer to enjoy nature in comfort, a good road runs to the very top of Whitetop, and the scenery alone is worth a drive from Norfolk. Flatlanders should go in May, when the woods have leafed out fully, to experience completely the sensation of turning back the calendar. At the elevation of Galax and Hillsville, many trees will only be starting to leaf, and at Grayson Highlands State Park, you're back into March – all on the same day.

I routinely offer up two small prayers of thanks. First, that the boundary with North Carolina was started where it was. Had Colonel Byrd started his survey of the line just ten miles further up the coast, Virginia would have no Mount Rogers, which is arguably the most beautiful place in the state, as well as one of the most biologically significant. Second, gratitude that the region is under the protection of the National Recreation Area, which will preserve those attributes for the enjoyment of future generations.

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Richard L. Hoffman in the field at Mount Rogers, Virginia, 1947 (photo provided by Richard L. Hoffman).