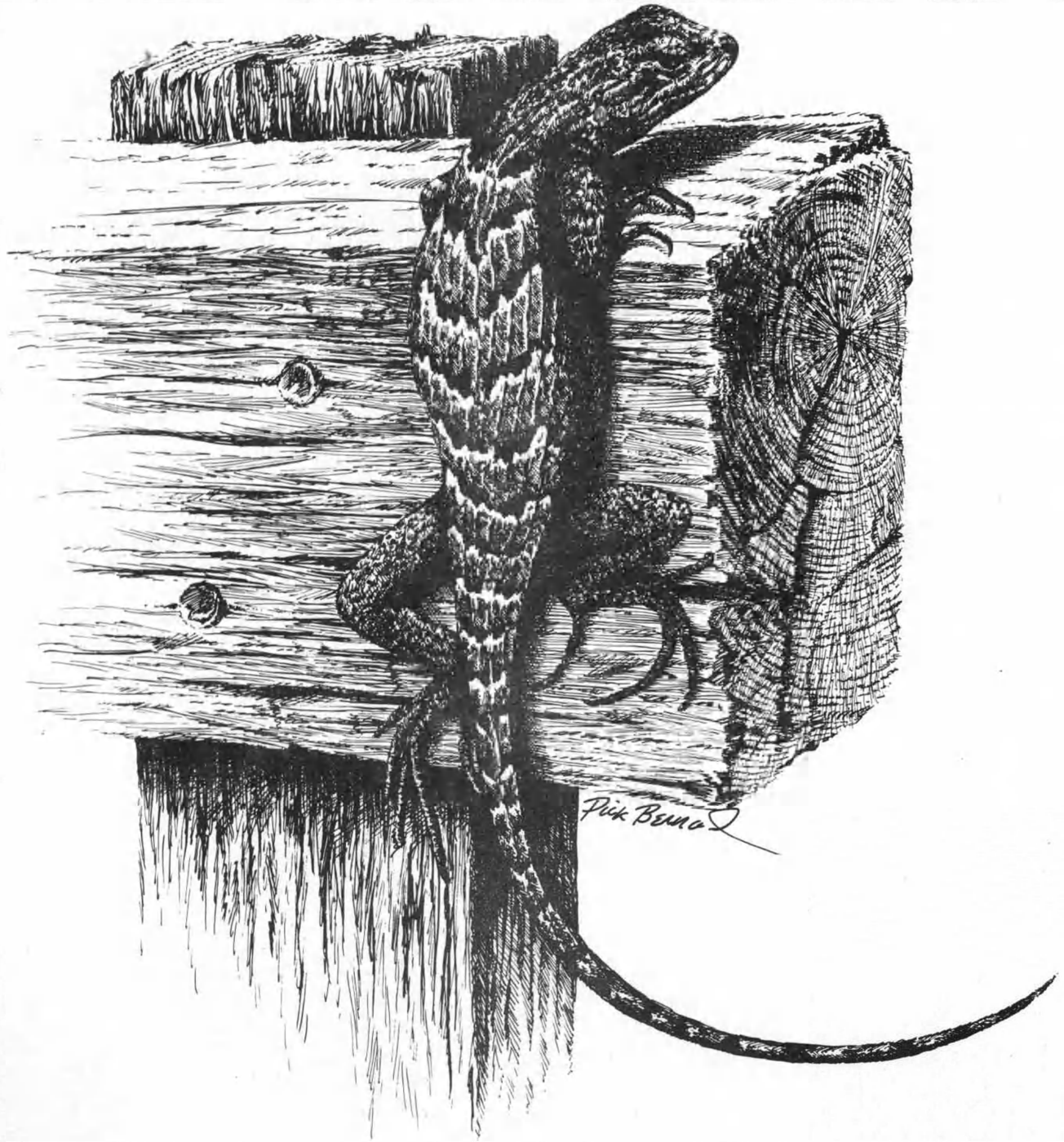


CATESBEIANA



BULLETIN OF THE VIRGINIA HERPETOLOGICAL SOCIETY

VOLUME 5

1985

NUMBER 2

C A T E S B E I A N A

Bulletin of the Virginia Herpetological Society

VOLUME 5

FALL, 1985

No. 2

| | |
|---|---------|
| Fall 1985 Meeting Notice | page 1 |
| Editorial Policy | page 2 |
| The Herpetofauna of Alleghany County, Virginia, Part 2. Class Amphibia, by Richard L. Hoffman. . . | page 3 |
| Tongue Worms (Pentastomida) in a Northern Copperhead (<i>Agkistrodon contortrix mokasen</i> (Daudin)) from the Great Dismal Swamp, Virginia, by Don Schwab . . | page 14 |
| Field Notes. | page 15 |
| Abstracts from Recent Meetings | page 17 |
| Announcements. | page 22 |
| News and Notes | page 22 |
| Virginia Herpetological Survey Booklet | page 24 |
| I'm a Herpetologist and I'm OK | page 25 |
| VaHS 1985 Directory of Members | page 26 |
| Fall 1985 VaHS Society Meeting Information | page 30 |
| VaHS Membership Information. | page 31 |

BULLETIN INFORMATION

Catesbeiana, the Bulletin of the Virginia Herpetological Society, is issued twice a year by the Virginia Herpetological Society. Membership is open to all individuals interested in the study of amphibians and reptiles. Dues are \$5.00 per volume year for adults, \$3.00 for individuals under the age of 18, and \$7.50 for families (one vote is allowed in a family membership). Membership includes one subscription to Catesbeiana. Dues are payable by January 1 of each calendar year. Send checks to Ben Greishaw, VaHS Treasurer, 7622 Hollins Rd., Richmond, VA 23229. Make checks payable to the "Virginia Herpetological Society".

Herpetological societies desiring exchange of publications should send copies of their publications to Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173. Any materials for inclusion in Catesbeiana should also be sent to Dr. Mitchell.

MEETING NOTICE

The Fall meeting of the VaHS will be held on October 5, 1985 at Radford University, Radford, VA. Charles Neal and Richard Hoffman are hosting the meeting. See pages 22 and 30 for complete meeting information.

DUES NOTICE

Dues for 1986 are now payable. You will not receive Catesbeiana unless you pay dues!

Cover: Sceloporus undulatus by Dick Bernard.

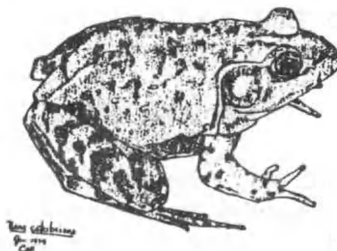
EDITORIAL POLICY

Catesbeiana replaced the formal name of the Bulletin of the Virginia Herpetological Society in 1981 as the publication of the VaHS to reflect the changes in the society's structure. Although the format of the bulletin changed dramatically, its adherence to the central theme of the science of Virginia herpetology has remained firm. Beginning with the editorship of F. J. Tobey (1958-1980) and continuing with D. A. Merkle (1981-1982), the bulletin has published with few exceptions, only scientific information and news on the herps of Virginia. We will maintain that tradition. During several meetings in 1980 and 1981, brief discussions addressed this point. It was agreed that Catesbeiana will publish articles pertaining to herpetology outside of Virginia only if insufficient material is on hand to complete an average size issue (about 18 pages). In this vein, articles pertaining to species found in Virginia will take precedence over those which do not. Rarely, if ever, will articles be reprinted in Catesbeiana after they have been published elsewhere. If someone is unsure whether something he/she has is appropriate, he or she should contact the editor.

Authors may wish to submit articles in final copy-ready form. To maintain consistency, the type is IBM Letter Gothic (with 12 characters per inch), using a carbon ribbon; all margins are 1 inch, leaving the pages unnumbered. Consult the style of articles in this issue for additional information. Please be advised, however, that articles are usually reviewed by at least one officer (past or present) of the VaHS in addition to the editor. All changes must be approved by the author before publication. Thus, manuscripts, in final copy or not, should be submitted well in advance of March or September.

Reprints of articles are not available to authors, however, authors may reprint articles themselves to meet professional needs.

Herpetological artwork is welcomed. If the artwork has been published elsewhere, we will need to obtain copyright before we can use it in an issue. We need drawings and encourage members to send us anything appropriate, especially their own work.



THE HERPETOFAUNA OF ALLEGHANY COUNTY, VIRGINIA

PART 2. CLASS AMPHIBIA

Richard L. Hoffman

Radford University, Radford, Virginia 24142

The first part of a proposed serial account of the amphibians and reptiles known to occur in Alleghany County, Virginia, appeared in this journal, volume 5, no. 1, 1985. It contained a historical review, geographical and environmental data, and other background information pertinent to the region. I continue now with a list of salamanders and anurans personally known to be found within the boundaries of the county. To the extent possible, data on seasonal occurrence and other biological perspectives are included, some necessarily anecdotal owing to the loss of field journals for the period prior to 1955.

My very abbreviated (and certainly very premature) annotated list for the region, published in 1945, was based on observations of scarcely more than one collecting season, yet included no fewer than 19 species of amphibians. I then postulated the eventual discovery of five additional species, and of these, three have indeed been found, plus three others not then suspected as likely candidates. Plethodon c. cinereus of that list was of course a mis-identification of P. hoffmani, but P. cinereus itself has also been found in the county. The present total of 26 species is obviously very close to definitive, as only Ambystoma jeffersonianum, Desmognathus ochrophaeus, and Scaphiopus holbrookii seem plausible additions.

The names used here correspond to the nomenclature in Conant (1975). The taxonomic status of nearly all species seems conclusively settled except in the case of Gyrinophilus and the bilineata group of Eurycea, both taxa badly needing revision. I likewise find it difficult to believe that some name-changing will not occur in Pseudotriton when that genus has been studied electrophoretically.

SALAMANDRIDAE

1. Notophthalmus v. viridescens Rafinesque. Widespread and usually abundant over the county wherever permanent ponds occur: vicinity of Clifton Forge, Griffith, Longdale, Boiling Springs, Potts Mountain bog, with elevations ranging from 1100 to 3600 feet.

A few biological observations may be appended. The red eft stage has been very rarely seen despite the abundance of adults. During 1950 the latter were first observed at the Griffith pond on January 24, a warm day in a mild winter. Dozens of individuals were found, about half of them moulting, with much twisting and turning. One mated pair was seen. Many specimens carried small leeches. On March 27, daytime temperature reached 80° F. and the barometer dropped to 29.50, torrential rains began that night. At Griffith pond newts were very abundant, up to eight per square yard, and many mated pairs were noted. Similar observations were made on April 4, also during rain at night. By April 29 the water level was down and newts, although still numerous, had concluded mating activities. On March 25, 1944, numerous mated

pairs were taken from the city reservoir 3 miles north of Clifton Forge and kept for observation. Mating took place through April 6. The female of one isolated pair deposited about a dozen single eggs on March 29, attaching them to leaves and stems of Elodea in the aquarium. This female was taken March 25 in amplexus. Later that day the male disengaged himself and no further clasping was noted prior or subsequent to the oviposition. By April 6 the eggs had developed to the stage of well-advanced embryos with the shape of a salamander already evident. For unknown reasons the observations were discontinued at this time.

AMBYSTOMATIDAE

2. Ambystoma maculatum (Shaw). Clifton Forge (one mile north, along Smith Creek) and Griffith pond. Breeding activities normally occur in late February and early March, reflecting weather conditions. Four adults were seen in Griffith pond on March 27, 1950, but none clasping and no spermatophores were seen. Cold weather in February and March (the pond frozen) may have delayed breeding that year. North of Clifton Forge, March 24, 1947, mated pairs were found in a boggy seepage area with pools scarcely more than six inches deep.

3. Ambystoma opacum (Gravenhorst). Not included in my 1945 list, this species was first identified and reported in 1947 and has subsequently been found in the larval stage at several localities: Clifton Forge (one mile north), McGraw's Gap, Boiling Springs, all low elevation localities, and one large adult at the Potts Mountain bog, 3600 feet.

The pond in McGraw's Gap is at the base of a talus slope, in sandy alluvium, and is usually dried-up by mid-August. For years I have dug around in the lowest and still damp places in the hope of finding females with eggs awaiting the Fall rains but never with any success. In this pond, larvae usually have grown large hind legs by the end of February, and transformation appears to occur in late May or early June. At the Boiling Springs locality, A. opacum larvae occur in a shaded pond which has developed in an abandoned railway cut leading into a tunnel.

My long-standing preconception of A. opacum as a lowland species which enters the Virginia mountains only along river floodplains was demolished on June 23, 1985, when a large adult (?female) was found under a log at the Potts Mountain bog by Sherry L. Ham, Carl Hoffman, and me. This bog surrounds an elongate-oval pond some 150 feet long in a flat saddle on the crest of Potts Mountain at 3600 ft. ASL (cf. Potts Creek Quadrangle, 75 min. series, USGS), drainage is west into Potts Creek by a largely subterranean course. The pond teems with Notophthalmus viridescens and is used as a breeding site by Rana sylvatica. I had previously visited the bog in searches for Hemidactylium as well as various kinds of insects, failing in the first instance but enjoying considerable success in the second. The boreal affinities of the bog fauna are indicated by the capture there of the tiny ground beetle Bembidion frontale and the dragonfly Aeschna mutata, both at the southernmost known stations in their ranges. I could hardly have been more astonished to find a

narrowmouth toad at such a place. Boiling Springs is only a few miles distant in a straight line, but is at least 2000 feet lower. Not wanting to jeopardize what might be a marginal population of A. opacum, I released the specimen with the anticipation of obtaining some larvae in the 1986 season to substantiate this record.

By what incredible odyssey could earlier populations of A. opacum have made their slow and tedious way up an inhospitable mountainside to an unknown habitat on its crest? Perhaps this is a case of long, relictual, occupation dating back to a post-Pleistocene pluvial period in which this salamander (and perhaps many other herpetian species) were more widespread in semi-rainforest conditions in the central Appalachians.

PLETHODONTIDAE

4. Desmognathus fuscus fuscus (Rafinesque). As elsewhere in its range, the dusky salamander is nearly ubiquitous in Alleghany County, taken from Longdale at the eastern end to Alleghany Mountain on the western, and at elevations from the lowest (1080 feet) to the highest (4000 feet). It prefers small streams and seepage areas, usually leaving the edges of larger and swifter streams to D. monticola. However, along Smith Creek where it flows through Clifton Forge beside my former residence, both of these species used to occur in the same biotope in about equal numbers.

Collections (or observations) have been made in every month of the year (January and February only in a few exceptionally mild winters). Females may be found brooding eggs in small streamside chambers during late July and August. One small cluster collected in McGraw's Gap on August 11, 1945, contained actively moving embryos; these were retained in damp moss and all hatched on August 22.

Populations in the more accessible small streams are subject to heavy predation by bait collectors, as desmognathids are highly esteemed by local fishermen.

5. Desmognathus monticola monticola Dunn. The so-called "seal salamander" is widespread in the county but distinctly more restricted than D. fuscus to larger, cooler, and, one supposes, better oxygenated habitats. Specimens have been taken frequently in the lower reaches of Smith Creek as it passes through Clifton Forge, but further upstream, at McGraw's Gap and beyond, it becomes abundant in the hemlock-shaded rocky stream sides often to the complete exclusion of D. fuscus. In similar habitats it has been found at Longdale, Blue Spring Run, and Falling Springs. I was never so fortunate as to find brooding females.

An adult male from Longdale is illustrated in my 1951 description of D. m. jeffersoni.

6. Desmognathus quadramaculatus (Holbrook). The blackbellied salamander occurs at its northernmost Virginia locality in Shawver's Run, a tiny tributary to Potts Creek which for part of its course follows the Craig-Alleghany county line (cf. Potts Creek quadrangle, 75 min. series, USGS). The first specimens were found July 27, 1946, as the result of a deliberate attempt to

establish the northern limits of the species in the James River drainage. Others have been collected at the same site on later occasions. The stream is swift and rocky, hardly more than two feet in width, shaded along much of its course by rhododendron thickets. All subsequent efforts to locate populations nearer the headwaters, and in the strikingly similar small streams across the drainage divide, have been unsuccessful.

Numerous attempts have been made to locate D. quadramaculatus further north in the Potts Creek drainage system; all so far have been negative. Still, one cannot but hope that better collecting techniques, such as large-scale seining, might be fruitful especially in Blue Spring Run, which to the eye appears an optimal habitat.

My own impression is that this species was until the recent past in the process of actively extending its area to the north and east, an expansion interrupted by the deforestation and cultivation of the last two centuries.

7. Plethodon cinereus cinereus (Green). The reference to this species in my 1945 list was of course based on specimens of P. hoffmani. Later, on January 6, 1950, I located a small colony of bona fide P. cinereus in mixed woods at Sweet Chalybeate Springs, in the extreme southwestern end of Allegheny County and this, to the best of my knowledge, remains the only verified county record for the red-backed salamander. The species should, however, occur also on Potts Mountain where it is common just to the south in Craig County (cf. Highton, 1972, fig. 12, for the apparent distributional lacuna in the area of cinereus centered on Allegheny and Bath counties).

8. Plethodon glutinosus glutinosus (Green). Widespread and abundant over the entire county, most often taken in cool, hemlock-shaded woods along streams and on the western slopes of the ridges; common up to the crest of Big Knob (4070 feet) on Warm Springs Mountain. It generally avoids shale regions and I cannot recall a single instance of sympatry with P. hoffmani.

To the best of my recollection, all of the specimens taken by me in Allegheny County have been of the "brassy-spotted" phase. The white-spotted morph occurs in adjoining Bath and Rockbridge counties, cf. Highton, 1972, fig. 16, and might occur on North Mountain near Longdale.

9. Plethodon hoffmani Highton. This recently-described salamander is not uncommon over the entire county, but seems most abundant in the shale regions just north of Clifton Forge at present invested in a second-growth forest of white oaks and Virginia pine with white pine and mountain laurel along the streams. During the summer this region becomes notably dry and the small streams mostly disappear. P. hoffmani is most often found in the Spring (February-May) and Fall (October-November) months, under flat slabs of shale in loamy soil near streams. It does not show the disposition to inhabit ravine slopes attributed to the closely related P. richmondi in West Virginia.

Elsewhere in the region, hoffmani has been found under rocks at a limestone quarry at Lowmoor (and in sinkholes in both Bath and Craig counties but not, so far, inside the caves per se), and along the crest of Warm Spring Mountain (ca. 3400 feet) about a half-mile southwest of its crossing by Va. Hy. 606 (cf. Covington Quadrangle, 7.5 min. series, USGS). Specimens found here on October 10, 1956 by Dr. Highton and me were under logs on a west-facing shale slope and were much darker ventrally than normal for the species, much resembling individuals found by Highton on Allegheny Mountain in Highland County.

On December 28, 1945 and February 1, 1946, very small specimens (ca. 20 mm S-V) were found north of Clifton Forge in deep leaf beds in narrow ravines, all with very conspicuous narrow reddish dorsal bands.

Generally speaking, P. hoffmani is a placid animal without the inclination to rush for concealment that is so typical of P. glutinosus and other large members of the genus.

The type locality for this species is a ravine bearing off to the right (east) from Va. Hy. 606, less than a quarter-mile beyond the point where it passes under Interstate I-64.

10. Plethodon wehrlei Fowler & Dunn. Rare in the county, so far found at only one locality: Warm Spring Mountain, 3400 ft., about 0.5 miles southwest of Cty. Hy. 606 at the summit (cf. Covington quadrangle, USGS); October 10, 1956, found by Dr. Highton and me in the same biotope as P. hoffmani (under logs on west-facing shale slope).

The scarcity of this species is noteworthy considering its abundance to the north (Alleghany Mountain in Highland County) and south (vicinity of Radford and Blacksburg, Montgomery County). It will be recalled that the species has yet to be discovered at Mountain Lake. The map (Fig. 17) in Dr. Highton's 1972 paper represents clearly this apparent hiatus in a rather thoroughly-collected region.

11. Hemidactylium scutatum (Schlegel). Over the years a large number of sphagnaceous areas, from about one square meter up to the broad margins of large ponds, have been searched diligently for the four-toed salamander. Interestingly, the single specimen thus far located in Alleghany County was not found in such habitat, but under the loose bark of a partly submerged log in the pond at the Boiling Springs railway tunnel. This individual was an adult female brooding a clutch of about 60 eggs, found on March 11, 1951. Embryos were not visible and the eggs may thus have been recently deposited. J. T. Wood (1955: 384) notes that in the vicinity of Williamsburg, Virginia, the egg-laying period of 1951 lasted from February 24th to March 10th. In general, spring activities in Virginia mountains run about four weeks later than in the Coastal Plain, so this instance of near contemporaneity is of some interest. In an earlier paper, Wood (1953) reported an average of 56 eggs per female, which is much in line with my single observation.

Almost certainly this species will be found at the Potts Mountain bog, and perhaps elsewhere in the area, with more careful search.

12. Gyrinophilus porphyriticus (Green), subspecific assignment not feasible at the present. This big salamander is widespread and often found in the larval stages. I have taken adults at Clifton Forge, McGraw's Gap, Richpatch, Alleghany, Big Knob (at 4000 feet) on Warm Springs Mountain, and inside Rumbold's cave near Callaghan.

Some comments on Virginian Gyrinophilus were published by Mittleman (1942), who noted that material seen from Albemarle and Rockingham counties was smaller than the usual run of G. porphyriticus, and this has been also my experience with Alleghany County specimens. The dorsal pattern tends to be more or less reticulate-areolate, in strong contrast to the well-developed chevron pattern that occurs in specimens from the New River basin where, also, really impressive sizes are achieved. I believe that future revisionary studies on this genus will result in an arrangement substantially different from that proposed by Brandon (1966) which appears to me an oversimplification.

On April 21, 1946, I found a strange gyromphid adult in the stream beside my home in Clifton Forge. This animal was considerably more robust than normal, with broader and flatter head and with the vomerine teeth forming a broad continuous curve with the parasphenoids. Needless to say, the locality was searched diligently (=ransacked) on many occasions, both day and night, in the hope of obtaining a second individual. This discovery never occurred and worse, the specimen itself was put into the hands of a friend who was then interested in this genus, and subsequently lost. That nothing remotely like this unusual specimen was ever found before or since strongly suggests the possibility that it was simply an aberrant individual. Yet that a specimen abnormal enough to resemble a different species should survive to robust maturity also seems implausible. Here the mystery rests.

An adult taken in a small spring near the crest of Big Knob (4000 feet) on May 15, 1951, nonchalantly devoured a specimen of P. glutinosus almost half its own size that was confined in the same collecting bag.

13. Pseudotriton ruber ruber (Latreille). Widespread over the county but not so far found at higher elevations (above 3000 feet). Red salamanders often wander far from water during the summer months, but in the Fall (October, early November) are to be found making their way back toward streams and springs.

During the summer of 1946, when I was anxiously searching for more material of the gyromphid noted above, night collecting in Smith Creek beside my home often revealed adults of P. ruber foraging (presumably) on the bottom in water about 12-15 inches in depth.

14. Eurycea bislineata (Green). Widespread and common over the entire county, especially along intermittent streams transversing the shale region north of Clifton Forge. Numerous adults can be found there, under flat bits of shale and in streamside leaf piles especially during the cooler months. The species is occasional in sinkholes and cave entrances but not, so far, found actually inside caves.

The taxonomic status of this population is uncertain, and individuals show a wide range of variability in color pattern. Upon receiving a sample of about a dozen adults from Clifton Forge (all from a single locality), M. B. Mittleman - then preparing his 1949 paper on the races of E. bislineata - expressed the initial reaction (in litt.) that they looked like intergrades of bislineata X cirrigera X wilderiae. When the taxonomy of this species is worked out with biochemical techniques it may be shown that more than one species is masquerading under the name bislineata in western Virginia.

15. Eurycea longicauda longicauda (Green). Clifton Forge, McGraw's Gap, Island Ford Cave, Richpatch, Old Tunnel Cave at Boiling Springs. Most common in limestone areas although not restricted thereto and sometimes found well into the shale belt north of Clifton Forge. Generally I found only one at a time, even with night collecting. On a rich moist slope underlain by limestone 3 miles northwest of Clifton Forge I once (night of May 5, 1950) found six adults vagrant on the surface. Over a dozen were seen (eight collected) on the stream level in Island Ford Cave, 2.2 miles west of Lowmoor on Interstate Hy. 1-64, September 8, 1945.

On the night of June 13, 1945, a recently-transformed specimen (gill rudiments still evident) was collected on the muddy bank of a farm pond 2 miles north of Clifton Forge.

16. Eurycea lucifuga Rafinesque. A single collection only, Blue Spring Run Cave, three large adults taken on the night of May 18, 1950. These were found on fractured limestone outcrop at the entrance of the cave, not inside. Taken home and triumphantly entered in my catalog, these specimens were insecurely put away for later preservation and inevitably escaped during the night. There has been no opportunity to re-visit the site for additional material. Anyone wishing to do so can easily locate the spring itself right beside Va. Rt. 616, 0.5 miles northeast of the small church at the intersection of Rts. 616 and 617 (Cliffdale Church). A recent drive-past showed the site to be heavily posted, making clearance at a nearby residence mandatory. The cave itself is on the steep hillside about 150 feet directly above the spring but, alas, is not easy to find as there is (or was) no well-defined foot path leading to it.

This locality is, I believe, only the third for this species in the James River drainage basin. The highly sporadic records for lucifuga in this part of its range would suggest a contracting post-Pleistocene area with relictual populations persisting in a few suitable places.

BUFONIDAE

With reference to this family in general, it is a sad reflection to recall the relative abundance of toads in the early 1930s as compared with more recent times. When I was a child Clifton Forge was less built-up than today, and breeding sites still occurred within the city limits. Automobiles were a rarity, too. It was normal for small boys to be able to sit on the street corner in residential areas and watch the toads foraging on insects attracted by the overhead street lights. This kind of opportunity no longer exists. Earlier naturalists deplored the same phenomenon as regards the big electric light water bugs (Belostomatidae) which a generation earlier were a common feature in small towns just as toads were in my own experience.

17. Bufo americanus americanus Holbrook. Formerly widespread over the country, now less evident owing to drainage and urbanization of many breeding sites. Breeding occurs in March and early April. Field notes for 1950 record March 27 as the first calling date for B. americanus: an unusually day and falling barometer brought out large numbers of toads and spring peepers in the Longdale-Griffith area east of Clifton Forge (with heavy mortality to both species on the roads). As elsewhere, B. americanus seems to prefer small shallow ponds for mating, often only an inch or two in water depth, and frequently in partially wooded areas.

18. Bufo woodhousei fowleri Hinkley. Also widespread but not common, this toad tends to breed more commonly along backwaters of rivers and larger streams and has been less impacted by urbanization. In 1950 the species was first heard calling on May 10 along the Cowpasture River near Griffith. On May 19, 1945, an adult male was found on Waites Mountain south of Clifton Forge, at an elevation of about 2000 feet and at least a mile from the nearest

water; presumably it had hibernated well up on the mountainside and was making its way down to the distant river. Along the river backwaters one finds the tiny just-transformed juveniles in August. Adults occur sporadically and vagrantly in the summer and fall often far from water. A late breeding congress was noted on June 13, 1945, in a farm pond two miles north of Clifton Forge.

HYLIDAE

19. Acris crepitans crepitans Baird. Abundant in the pond at Griffith and sporadic elsewhere along the Cowpasture River in backwaters, etc., not present in the Jackson River below Covington (as the result of former massive pollution), abundant in pond at Lowmoor (ox-bow pond produced a century ago by railroad construction), also on Potts Creek near Boiling Springs (in pond at end of old railroad tunnel). No locality is higher than 1100 feet. Calling during the summer months, May through July. Several seen at Griffith pond January 24 in the mild winter of 1950.

It is a curious circumstance that this frog, although preferring lentic habitats for breeding, appears to be widespread and very inconspicuous along mountain streams in central and western Virginia (observations in Albemarle, Botetourt, and Rockingham counties). Although I have never seen an Acris along the course of Wilson Creek (2 miles east of Clifton Forge), when this stream was impounded during the construction of Douthat State Park, the new lake had a thriving population of Acris within a few years. One can only speculate on the breeding behavior of these obviously existing lotic populations prior to reservoir construction.

The Boiling Spring locality is probably the inlandmost (upstream) site for A. crepitans in Virginia and is only a few miles from the West Virginia state line. Perhaps future collection in Monroe County along the Potts Creek Valley will establish a record for the species in an unlikely part of that state. I have heard crepitans also at Millboro Springs, Bath County, on the Cowpasture River, and of course it is possible that still more headward localities remain to be established in both Bath and Highland counties.

20. Pseudacris triseriata ferlarum (Baird). Widespread over the county but lately reduced in numbers as this chorus frog is confined to lowland areas more liable to human impact. Many of the largest and most reliable colonies of the mid-1940s no longer exist. In general it breeds contemporaneously with Hyla crucifer and often in the same site, but is still more partial to open fields and roadside drainage ditches. As marshy open fields gradually grow up in pines they are lost to pseudacrids and in many cases I could not verify that the former residents of particular sites ever found a suitable places for migration. Calling records range from February to early April, oviposition normally in March. Eggs seem most often to be attached to grass stems and similar submerged sites, in small clusters.

21. Hyla crucifer crucifer Wied. Essentially widespread throughout the county but more often observed at lower elevations. Breeding in woodland ponds, roadside ditches, and flooded fields, late February to mid-April in most years. Sporadic calling during October during periods of light rain and low pressure. Earlier record: January 24, 1950, at Griffith pond, one

male calling at some distance from water. Two days later a ripe female was found on the trail up Waites Mountain, south of Clifton Forge, at least a half-mile from the nearest water. A month of cold weather postponed activity and no further observations were made until March 27 at Griffith. Numerous males were calling from both the water and emergent vegetation; ovigerous females were found but no clasping pairs. On April 4th, same locality, late at night in steady rain, H. crucifer was still calling. One mated pair seen, and most calling males were in low bushes growing far out in the water; only a few were along the edge or inland. By April 29th the water level was down and no crucifer were seen or heard despite the warm evening and light rainfall.

22. Hyla versicolor versicolor LeConte. Countywide, frequently heard calling throughout the summer months, generally at lower elevations. In climatically normal years the first tentative calls are heard from the end of April to mid-May, breeding activities continue well into June. On June 13, 1945, a large calling congress of H. versicolor, mostly in low bushes, was found around a farm pond two miles north of Clifton Forge, but no pairs in amplexus were noted.

RANIDAE

23. Rana catesbeiana Shaw. Bullfrogs clearly favor larger streams in the Alleghany County region, with voice records for the Cowpasture River at Griffith and Longdale, and the Jackson at Falling Springs. There is no evidence of their occupation of the Griffith pond.

24. Rana clamitans melarota (Rafinesque). Common over the entire county at lower elevations: Clifton Forge, McGraw's Gap, Griffith, Bolling Springs. First calling records for Griffith pond for 1950 are for April 4, none were in voice there on April 29. On June 13, 1945, R. clamitans was very abundant at a farm pond two miles north of Clifton Forge in all sizes from tadpoles to adults, many of the latter were calling. One just-transformed specimen was found. The owners of the property admitted to catching and eating these frogs.

25. Rana palustris LeConte. Pickerel frogs are common throughout the county at lower elevations, typically breeding in ponds but on transforming usually wandering far up small cool rocky streams. I have noted breeding activities only at Griffith pond, where first activity noted was on March 27, 1950: a few males making their characteristic "groaning" call, and a female full of eggs making her way toward the pond. By April 29 calling and clasping were still going on; no other frogs were calling on that date. Very small, just-transformed specimens are first seen during early August, often at some distance from any standing water, suggesting that R. palustris has alternative reproductive strategies and can oviposit in sublotic situations.

26. Rana sylvatica sylvatica LeConte. Not included in my 1945 list, but first found only a few months after its publication. The wood frog is in fact one of the commonest frogs in the region, observed or heard at Clifton Forge, Longdale, McGraw's Gap, Crows, and Potts Mountain. Curiously, never seen or heard at the Griffith pond.

Earliest calling records are for January 29, 1947, one mile north of Clifton Forge along Smith Creek; calling and clasping at the same site and at McGraw's Gap on February 15, 1950, and on February 27, at Crows (large population calling in daylight from roadside ponds).

February 27 observations were made in a small ox-bow pond (ca. 2 by 3 meters, 0.3 m. deep), with four mated pairs seen and some unattached males. Several egg masses noted, some just released (attached around submerged sticks and plant stems), still small and compact, some others swollen to much greater mass. Release of male was noted by a sudden arching of the female's back. In this small population, the males are not only smaller than females but are virtually devoid of pattern, being dark slate gray opposed to the nice brown and tan color of females. Later the same day, the small pond in McGraw's Gap (see account for A. opacum) was visited, and a large (communal) mass of frog eggs was found, roughly enough to fill a bushel basket, anchored to submerged Smilax stems. Most of the embryos were in the gill and tail stage implying a somewhat earlier oviposition. Only a single male was seen at this time. The three preceding days were in the 30°- 50° F range. Several weeks later the weather turned cold and the pond was frozen for a long time without any noticeable detriment to the tadpoles.

In this pond there is extensive predation on hatching wood frog tadpoles by the larvae of Ambystoma opacum.

Large egg masses of R. sylvatica have been found in the Potts Mountain bog pond in March of several years. On June 23, 1985, very small specimens including a few obviously just transformed, were found in the surrounding woods, up to several hundred yards distant from the water. In mid-September, 1948, I dug up an adult from deep leafmold in McGraw's Gap, perhaps in aestivation.

* * *

With this entry the treatment of amphibians is concluded. The third part of the series, intended for the following issue of Catebeiana, will cover the various reptile species and a fourth will present a brief biogeographic synthesis for the entire fauna.

REFERENCES

- Brandon, R. A., 1966. Systematics of the salamander genus Gyrinophilus. Illinois Biol. Monog. 35: 1-86.
- Conant, Roger, 1975. A field guide to reptiles and amphibians of eastern and central North America. Houghton Mifflin Co., Boston xviii + 429 pp.
- Highton, Richard, 1972. Distributional Interactions among eastern North American salamanders of the genus Plethodon, In: P. C. Holt (ed.), The Distributional History of the Biota of the Southern Appalachians. Res. Div. Monog. VPI & SU, no. 4: 138-188.
- Hoffman, Richard L., 1945. Notes on the herpetological fauna of Alleghany County, Virginia. Herpetologica 2(4): 199-205.

Hoffman, Richard L., 1947. Distribution of two salamanders in Virginia. *Herpetologica* 4(2): 67-68.

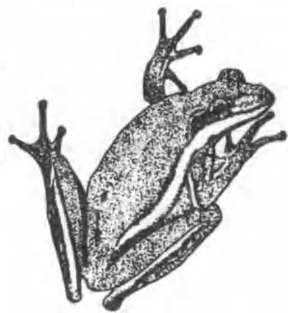
-----, 1951. A new subspecies of salamander from Virginia. *Journ. Elisha Mitchell Sci. Soc.* 67(2): 249-253.

Mittleman, Myron B., 1942. Notes on salamanders of the genus Gyrinophilus. *Proc. New England Zool. Club* 20: 25-42.

-----, 1949. American Caudata. VI. The races of Eurycea bislineata. *Proc. Biol. Soc. Washington* 62: 89-96.

Wood, John T., 1953. Observations on the complements of ova and nesting of the four-toed salamander in Virginia. *Amer. Nat.* 87: 77-86.

-----, 1955. The nesting of the four-toed salamander, Hemidactylium scutatum, in Virginia. *Amer. Midl. Nat.* 53(2): 381-389.



Hyle Ciferres
Feb 1979
CAP

TONGUE WORMS (PENTASTOMIDA) IN A NORTHERN COPPERHEAD
(AGKISTRODON CONTORTRIX MOKASEN (DAUDIN)) FROM THE
GREAT DISMAL SWAMP, VIRGINIA

Don Schwab

Wildlife Biologist, Virginia Commission of Game and Inland Fisheries,
P.O. Box 847, Suffolk, Virginia 23434

While conducting a deer check station at the Big Entry Hunt Club, Chesapeake, Virginia, on October 13, 1984 several hunters brought me a decapitated copperhead. The hunt club is located at the intersection of Portsmouth Ditch and Big Entry Ditch. The snake was killed approximately 0.8 km south of Big Entry Ditch on Portsmouth Ditch.

The specimen was skinned and the stomach and other organs were grossly examined. The stomach contained bits of hair belonging to a field mouse (Microtus). On examining the carcass, two white (apparently segmented) worms were found attached to the musculature of the body cavity. The worms were 60-65 mm long while attached to the muscles and contracted to 25 mm when placed in preservative (99% isopropyl alcohol). Dr. S. J. Zeakes, a parasitologist at Radford University, identified the specimens as tongue worms (Cheng, 1974) of the genus Porocephalus, not true worms.

The specimens were larval males in the VI (migratory) stage of development. The adults of this exclusively parasitic phylum (Pentastomida) live in the lungs of reptiles. The eggs hatch into tiny chigger-like forms which get into alternate (secondary) hosts and grow to a certain stage (personal communication, S. J. Zeakes, via R. L. Hoffman). Once inside the primary host the tongue worm bores out of the stomach and migrates to the lungs, where they mature, feed and reproduce as adults. The adults are similar in appearance to the specimens collected, but larger. The specimens are now in the teaching collection of Radford University.

In searching Wildlife Abstracts (1961-1980) and Wildlife Review (1981 - present) only six papers pertaining to pentastomes could be found by title. Four of these papers concerned species outside North America. The other two papers were concerned with the American alligator (Boyce, et al., 1984) and the western diamondback rattlesnake (Riley, 1981).

Literature Cited

- Boyce, W., P. Cardeilhac, T. Lane, C. Buergelt, and M. King. 1984. Sebekosis in captive alligator hatchlings. *J. Am. Vet. Med. Assoc.* 185:1419-1420.
- Cheng, T. C. 1974. *General Parasitology*. Academic Press, New York.
- Riley, J. 1981. An experimental investigation of the development of Porocephalus crotalus (Pentastomida: Porocephalida) in the western diamondback rattlesnake (Crotalus atrox). *Int. J. Parasitol.* 11:127-131.

FIELD NOTES

This section provides a means of publishing natural history information on Virginia's amphibians and reptiles which does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior and other areas are welcomed. Reports can be on a single species, groups of species or fauna from selected areas, such as a state park or county. The format of the reports is TITLE (species or area), COUNTY and LOCATION, DATE OF OBSERVATION, OBSERVERS, DATA and OBSERVATIONS. Names and addresses of authors should appear one line below the report. Consult published notes or the editor of this section if your information does not readily fit this format.

If the note includes information on geographic distribution, a voucher specimen or color slide should be taken for verification and deposited in a permanent museum or sent to the VaHS. Species identification for observational records should be verified by a second person.

Send records (double spaced, typed) or inquiries to Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, Richmond, VA 23173.

The correct citation format is: Croy, S. 1984. Field notes: Lampropeltis getulus niger. Catesbeiana 4(1):12.

* * * * *

Nerodia erythrogaster (Redbelly Water Snake) and Buteo lineatus (Red-Shouldered Hawk): City of Suffolk, Virginia, Great Dismal Swamp National Wildlife Refuge, 2.25 air miles SSW Magnolia. 3 February 1985. S. K. West and E. G. Tupacz.

On February 3, 1985, Susan K. West and I observed a red-shouldered hawk flying across a side road off Jericho Ditch Lane, about 0.2 km west of the entrance gate. The hawk had a stout-bodied snake approximately 60-70 cm in length in its talons. The snake had a distinctly yellow venter and dark dorsum. Based on the flooded, forested habitat and the general description, the snake was assumed to be a redbelly water snake. The real oddity of the observation was that, although the sky was sunny, the ambient temperature was recorded at only 1-2 C. This observation may indicate that this species may be more active at low ambient temperatures than has been suspected in the past.

Edward G. Tupacz, Department of Biological Sciences, Old Dominion University, Norfolk, VA 23508.

Coluber constrictor constrictor (Northern Black Racer): Sussex County, Virginia, Co. Rt. 604, 1 km. S of US 460 and 5 km west of Wakefield. 7 June 1985. D. Schwab.

Road-killed male black racer. Linzey and Clifford (1981, Snakes of Virginia, Univ. of Virginia Press, Charlottesville) show no records of this species from Sussex County. The specimen will be donated to the Smithsonian Institution via the collection of C. A. Pague, USNM FH 162610).

Don Schwab, Wildlife Biologist, Virginia Commission of Game and Inland Fisheries, P.O. Box 847, Suffolk, VA 23434.

Field Notes Continued

Graptemys geographica (Map Turtle) and Sternotherus minor peltifer (Stripeneck Musk Turtle): Scott County, Virginia, Pendleton Island, Clinch River, 1.25 mi. SW Ft. Blackmore. 12 September 1984. S. Croy.

While assisting a freshwater mollusk and fish survey in the Clinch River around Pendleton Island two adult S. m. peltifer were found walking/swimming along the bottom in two separate slack-water pools. The bottom substrate was mixed small cobbles and silt with numerous tree roots; the water was clear. On the same date an adult G. geographica was found alive in a gill net which had been set the previous day in a large deep-water pool immediately upstream of the island. The weather on this date and preceding days was clear with highs around 75-80 F and lows around 50 F with dense fog in the mornings which dissipated by 1100 AM.

These observations represent the first confirmed occurrences of these species in the Virginia portion of the Clinch River, which, along with the Powell and Holston Rivers, form the upper reaches of the Tennessee River. All specimens were released alive after being photographed. Voucher slides have been deposited with the VaHS.

Steve Croy, The Nature Conservancy - Virginia Natural Heritage Program, Biology Department - Herbarium, VPI & SU, Blacksburg, VA 24061.



ABSTRACTS FROM RECENT MEETINGS

There was a variety of papers presented by VaHS members at recent scientific meetings. Six were presented at the Virginia Academy of Science meetings held at the College of William and Mary, Williamsburg, VA during May 14-17. Eight papers were presented by VaHS members and by others on studies performed in Virginia at the SSAR/HL meetings held at the University of South Florida, Tampa during August 4-8.

Virginia Academy of Science abstracts

REPORT ON AN UNBANDED POPULATION OF NERODIA SIPEDON FROM VIRGINIA.

Walter Bulmer, Department of Biology, Northern Va Cmnty. Col., Annandale, Va 22003. A population of uniformly colored Nerodia sipedon is described from the Potomac River of Va. The range, population, density and habitat are discussed. The selection pressures producing this unbanded population are hypothesized. The snake population studied was found in two large shallow bays in the tidal zone of the Potomac River. The daily and seasonal habits of the snakes were found to be more aquatic than those of adjacent populations of N. sipedon. The bays were sampled to determine the presence of prey and predator species of fish. Observations of activity demonstrate that this population of N. sipedon feeds heavily on fish and is preyed upon by larger fish. The unbanded pattern makes the snakes less observable in the turbid water characteristic of their environment. These factors help determine the high population density of snakes in the bays and select for their lack of pattern. The environment and habits of this population are compared with those of N. sipedon insularum. The similarities suggest a re-evaluation of the selective pressures responsible for the unbanded characteristics of water of water snake populations

SEASONAL ACTIVITY OF THE WOOD TURTLE IN NORTHERN VIRGINIA. John McBreen and Walter Bulmer, Natural Sciences and Math Department, Northern Va Comnty Col., Annandale, Va 22003. Wood Turtle populations were studied in the Nature Conservancy Frazer Reserve on the Potomac River of Fairfax County, Va. Individuals were captured on their return to the stream for hibernation in the Fall, 1984. Each individual was sexed, aged, weighed, photographed, marked and released at the spot of capture. Males appeared in early October in the deeper parts of the stream and were sedintary until hibernation in mid November. Females returned to the stream later than males and Fall mating took place prior to hibernation. Males emerged from hibernation in late March, females in April. Spring mating of aggressive pre-copulatory behavior was not observed. Departure from the stream was complete by May.

Speculation on the disappearance of Wood Turtles from adjacent drainages is hypothesized.

REPTILES AND AMPHIBIANS OF VIRGINIA BOOK: UPDATE 1985.

Joseph C. Mitchell, Dept. of Biology, Univ. of Richmond, VA 23173 and Christopher A. Pague, Dept. of Biol. Sciences, Old Dominion Univ., Norfolk, VA 23508. At the VAS meeting we discussed our progress on the natural history and ecology of Virginia's reptiles and amphibians book on which we started the research in 1979. Since then we have acquired the full support of the Non-Game Species Program of the Virginia Game Commission. Subsequently, we have examined most of the specimens housed in museum and university collections (about 25,000 animals). Each specimen has been verified with respect to identification and many have been examined for data on diet, reproductive condition, morphometrics and phenotypic variation. We have also amassed a large voucher collection to further document and verify the biology of these animals. A group of student employees assists in a variety of ways to assemble and organize the large data sets. The book is scheduled to be written during FY 1987-1988. It will include a complete set of color plates, technical drawings of all larvae and tadpoles, keys, accurate distribution maps and species accounts integrating our original data with information in the literature. Selected species still elude us, as they have historically eluded other researchers; these are discussed briefly.

RELATIONS BETWEEN ANURAN TESTES SIZE AND BODY SIZE WITH COMMENTS ON SEXUAL SELECTION. Christopher A. Pague, Dept. of Biol. Sci., Old Dominion Univ., Norfolk, Va. 23508. The production of vertebrate male gametes has been considered energetically inexpensive relative to reproductive costs incurred by females. Consequently females risk greater energy and fitness loss as a result of a wrong mate-choice decision. Much of modern sexual selection theory assumes an unlimited sperm supply. In an examination of this assumption I investigated the relationship of testes size to body size in 3 species (of three genera) of anurans from southeastern Virginia. Testes size was found to correlate positively with body size in all species. Potential implications of the interrelationships of these parameters are discussed in view of modern sexual selection theory. (Partial funds for this project were provided by the Non-Game Program of the Virginia Commission of Game and Inland Fisheries.)

EPIGENETIC MECHANISMS IN THE DEVELOPMENT OF PIT ORGANS IN SNAKES: ESTABLISHMENT OF HYPOTHESES. Alan H. Savitzky, Dept. of Biol. Sci., Old Dominion Univ., Norfolk, Va. 23508. Infrared receptors known as pit organs occur in two higher taxa of snakes, the Boidae and the Crotalinae. The pit organs, which are innervated by the trigeminal nerve, are important in locating endothermic prey. Concomitant with the presence of the pit organs themselves are modifications of the central nervous system and, in some cases, the skull. Crotalines possess a single large pit organ anterior to each eye. The sister taxon of the crotalines, the Viperinae, lacks any trace of the pit organ system. Within the Boidae some lineages completely lack pit organs, whereas others possess varying configurations of pit organs along the upper and lower lips. Patterns of pit organ distribution are species-specific and often lineage-specific. It is hypothesized that the development of the pit organ is induced by the trigeminal nerve, which is suspected of inducing other integumentary derivatives in vertebrates. Relatively simple changes in the timing of trigeminal growth might account for the size and distribution of the pit organs. Such a hypothesis is amenable to testing by experimental and comparative means.

REPRODUCTIVE CYCLE OF THE NORTHERN COPPERHEAD, *AGKISTRODON CONTORTRIX*, IN VIRGINIA. Scott J. Stahl and Joseph C. Mitchell, Dept. of Biology, Univ. of Richmond, VA 23173. The seasonal reproductive cycle of male and female copperheads were studied via dissections of 90 museum specimens and road-killed animals. Males average significantly larger than females. Monthly samples of testis mass (adjusted for variation in body mass) were minimal in spring samples, exhibited peak masses in August and September and regressed in Oct. Histological analyses revealed concordance between the adjusted testis mass cycle and monthly variation in adjusted seminiferous tubule diameter. Peak spermiogenesis occurred in July and August. Epididymis diameters were larger in late summer and fall than in spring samples. Only 45% of the female sample was mature. Vitellogenic follicles were found only in spring samples and ovulation occurs in late-May to early-June. Parturition typically occurs in Sept. and early-Oct. Litter size was log-normally and positively related to female body size. Variation in body size explains 39% of the variation in log-litter size. Mean litter size was 7.1. (supported by a UR Undergraduate Research grant to SJS and the Non-Game Species Program of the Virginia Game Commission to JCM.)

Hass, Carla Ann

University of Maryland, College Park

GEOGRAPHIC PROTEIN VARIATION IN PLETHODON CINEREUS FROM THE SOUTHERN PART OF ITS RANGE.

Twenty-four protein-coding loci were compared electrophoretically in samples of Plethodon cinereus from 55 populations in the southern part of its range. The data indicate that the species is composed of four groups: (I) in the southern Blue Ridge physiographic province; (II) from the southern Appalachian Plateau, south of the New River, through southwestern Virginia north through the Blue Ridge of Virginia and east into the Piedmont and Coastal Plain of Virginia and North Carolina; (III) from the Coastal Plain of North Carolina through the Coastal Plain, Piedmont and Blue Ridge regions of Virginia and northern Virginia and throughout most of the previously glaciated territory that the species now inhabits, from Illinois and Minnesota to the maritime Provinces of Canada; and (IV) from the Appalachian Plateau north of the New River, and east of the Valley and Ridge physiographic province in Pennsylvania. The formation of these groups probably resulted from the disruption of this salamander's range during the glacial cycles of the Pleistocene. Some of the groups are separated by geographic barriers, while other boundaries are not well defined; yet there is little evidence of gene flow between the groups.

Keen, W. Hubert and Ronald W. Reed

State University of New York, College at Cortland

DIFFERENCES IN USE OF COVER SITE TYPES BY SEXES OF DESMOGNATHUS MONTICOLA

Male and female Desmognathus monticola were tested in field enclosures to determine whether the sexes differed in their preference for two different types of cover sites as day retreats, and to determine whether the sexes showed different specificities for the cover site types in the presence of intruding salamanders. Use of the different cover types ("simple" or "complex") as day retreats depended on sex, with males using the complex more frequently than females. In the presence of intruding salamanders of the same sex, a greater number of male residents occupied the complex site compared to female residents. Correspondence between preferred site before and after introduction of an intruder of the same sex depended on sex, with male residents occupying the preferred site much more often than female residents. In the presence of intruders of the opposite sex, the use of cover site type by residents did not depend on sex. Correspondence between preferred site before and after introduction of an intruder of the opposite sex did not depend on sex. Utilization of cover sites as retreats, and as the presumed bases of territories, does depend on sex, with males selecting and retaining complex cover sites more frequently than females.

Martin, W.H.

Rt. 3, Box 804, Harpers Ferry, W.Va. 25425

PHENOLOGY OF THE TIMBER RATTLESNAKE, CROTALUS HORRIDUS

Seasonal activity is predicted throughout the range of the species by means of a chart based on the movement of the sun's azimuth. Correction factors are used to account for the effects of elevation and longitude. The concept has wide application to other species.

Lovich, Jeffrey E.

University of Georgia, Institute of Ecology

AN ANALYSIS OF AGGRESSIVE BASKING BEHAVIOR IN WILD EASTERN PAINTED TURTLES

Previously published investigations regarding the ecology of eastern painted turtles have not mentioned any evidence of aggressive basking behavior. In this study, intraspecific basking aggression was observed to be a frequent and conspicuous part of the daily activities of wild Chrysemys picta picta in northern Virginia. Agonistic behaviors included: open mouth gestures, biting, and two previously undescribed behaviors; rocking and push-ups. Aggression was most frequent in early August, between 0900-1200 hrs, at water temperatures between 30-32° C, and air temperatures of 25-27° C. Potentially aggressive encounters were avoided by averting faces while basking and moving away from approaching turtles. Aggressive interactions were size specific, but not necessarily sex specific. The rate of aggression increased as basking sites became crowded and movements (emerging/submerging) increased. Interspecific basking aggression was only observed twice and involved C. p. picta and Pseudemys rubriventris. Disparities between the rates of aggression observed in this and previous studies are probably due to differences in the availability of basking sites, population densities and the size of the species in question.

Pague, Christopher A.

Old Dominion University

TESTIS SIZE REDUCTION IN MATED BUFO TERRESTRIS: IMPLICATIONS FOR SEXUAL SELECTION.

Studies of anuran sexual selection have generally assumed that male sperm is not in limited supply. In preliminary studies to determine if sperm depletion can limit male fertilization capabilities, the testes of freshly killed Bufo terrestris were dissected from specimens taken pre- and post-fertilization at the first breeding of 1985. Total testicular weight was found to correlate strongly with snout-vent length and body weight in mated and unmated toads. However, the testicular weights of post-fertilization toads were significantly smaller than those of unmated toads. Testis size and the effects of sperm depletion may have implications for the interpretation of studies on sexual selection. (Partial funding provided by the Virginia Commission of Game and Inland Fisheries' Non-Game Project.)

Pague, C. A., J. C. Mitchell, and R. L. Hoffman

Old Dominion University, University of Richmond, Radford University

THE DISTRIBUTION AND MATING CALLS OF HYLA CHRYSOSCELIS AND H. VERSICOLOR IN VIRGINIA.

The taped vocalizations of 326 Hyla chrysoseleis and H. versicolor from throughout Virginia were analyzed to determine the distributions of each species. Results allowed the mapping of each species' range. Hyla versicolor was found in the Piedmont, Blue Ridge, Great Valley, and the northwest Ridge and Valley Provinces. Hyla chrysoseleis was found allopatrically throughout the Coastal Plain and Tennessee Valley of southwest Virginia. Sympatry occurs in a broad zone of the south-central Piedmont. Recordings revealed nonoverlapping pulse rates for each species. We found significant differences in pulse rates between sympatric and allopatric populations and between populations of H. chrysoseleis in eastern and southwestern Virginia. [Funds were provided by the Virginia Academy of Science (to CAP) and the Virginia Commission of Game and Inland Fisheries Non-Game Project (to JCM).]

Stahl, Scott J. and Joseph C. Mitchell

University of Richmond

REPRODUCTIVE CYCLE OF THE COPPERHEAD, *AGKISTRODON CONTORTRIX*, IN VIRGINIA.

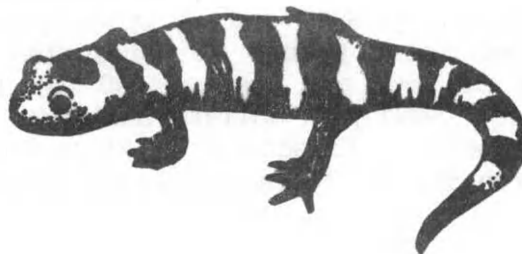
We dissected 90 copperheads from Virginia to determine the relationship of seasonality in testis mass with seminiferous tubule diameter, monthly variation in the spermatogenic cycle, size at maturity, vitellogenic cycle and litter size to body size relationship. Males (\bar{x} SVL = 740.7 mm) averaged significantly larger than females (\bar{x} SVL = 599.2 mm). Males matured at 475 mm SVL. Adjusted monthly samples of testis mass were minimal in spring, increased to peak masses in July and August and regressed through October. Adjusted seminiferous tubule diameter varied concordantly. Recrudescence began in mid-May and peak spermiogenesis occurred in July and August. Spermatozoa migrate to epididymides in August and September. Epididymis diameters were smallest in spring and largest in late-summer. Females mature at 375 mm SVL. Vitellogenesis occurs only in spring, ovulation occurs in late-May to mid-June and parturition occurs in September to early October. Mean litter size was 7.1 (N = 18). Litter size was log-normally related to female SVL. Only 39% of the variation in log-litter size is explained by the variation in female body size. (Supported by UR Undergrad Res. Grant to SJS and VA Non-Game Program funds to JCM.)

Alan H. Savitzky

Old Dominion University

THE ROLE OF DEVELOPMENT IN THE EVOLUTION OF OPHIDIAN PIT ORGANS:
HYPOTHESIZED MECHANISMS

Infrared receptive pit organs have evolved independently in at least two lineages of snakes. Members of the viperid subfamily Crotalinae possess a single pair of pit organs, each of which consists of a membrane suspended between two chambers. Members of the Boidae possess a variable number of labial pits of less elaborate morphology. The arrangement of boid pit organs is lineage-specific, as is the morphology of the individual organs. In both higher taxa the pit organs are innervated by branches of the trigeminal nerve, which has been implicated in the induction of specialized integumentary derivatives in mammals. The independent evolution of complex infrared receptors in snakes suggests that the same developmental processes may be involved in both taxa. That hypothesis leads to a series of predictions that are amenable to test by experimental and comparative techniques. Pit organ development in the Crotalinae is especially suited to studies of organogenesis, whereas the Boidae lend themselves to the study of pattern formation.



ANNOUNCEMENTS

Fall 1985 VaHS Meeting

The fall 1985 meeting of the VaHS will be held at Radford University, Radford, Virginia, on October 5 and is hosted by Dr. Charles Neal and Dr. Richard L. Hoffman. There will be the normal business meeting starting at 10 am with paper sessions in the afternoon (1 pm). See page 30 for additional details and directions.

This is an important meeting. Virtually all officers are at the limits of their terms and we must elect new people to fill the vacancies. If you are interested in active participation in the VaHS, then please attend this meeting. We need your help to keep the society alive.

NCHS Fall Meeting

The 1985 fall meeting of the North Carolina Herpetological Society will be on November 9. Meetings are held at the North Carolina State Museum of Natural History in Raleigh. It's only 3 hours from Richmond! For more information, write Wilson Laney, Secretary, NCHS, 3205 Bedford Ave., Raleigh, NC 27607.

NEWS AND NOTES

Spring 1985 VaHS Meeting

The Spring meeting of the VaHS was held on April 13, 1985 at Old Dominion University in Norfolk. This was the first meeting on the east coast in many years. There were 18 people in attendance. During the short business meeting in the morning minutes of the last meeting were read and approved, as well as the editor's report. New brochures (see pages 31-32) were handed out to solicit new members. The only substantial new business was that the secretary would mail dues reminders to members who have not paid by Jan. 1. The field trip to the Great Dismal Swamp National Wildlife Refuge was successful (13 species were caught, photographed and released) and fun. We thank the Refuge managers for allowing us the privilege of driving to Lake Drummond and other parts of the refuge. Christopher A. Pague made all the arrangements and secured the permit.

The field trip the following day to the pine barrens on Union Camp property south of Franklin was attended by Dr. Bill Dunson and family. They caught 17 species there.

Minnesota Herp. Society Raffle

On Oct. 5, 1985, the Minn. Herp. Soc. will hold a raffle drawing for a patron's edition of "The Turtles of Venezuela" by P. Pritchard and P. Trebbau. This book was recently published by SSAR and is quite good. It contains a set of Trebbau's very well done color plates of Venezuelan turtles. The raffle is open to anyone, member or not, and costs \$1.00 per ticket. You do not have to be there to win either. Send your dollars (made out to the Minnesota Herpetological Society) to Francis J. Frisch, Jr., Minn. Herp. Soc., Bell Museum of Natural History, 10 Church St. SE, Minneapolis, MN 55455-0104.

Misc.

"Amphibian Species of the World", edited by Darrel J. Frost. (\$85.00). This is a checklist and reference book on nomenclature and distribution of all the world's amphibians. Make checks payable to Amphibian Species of the World, Association of Systematics Collections, c/o Museum of Natural History, University of Kansas, Lawrence, KS 66045.

Three books by K.R.G. Welch: "Herpetology of Africa" 1982, \$19.50; "Herpetology of Europe and Southwest Asia" 1983, \$14.50; "Handbook on Maintenance of Reptiles in Captivity" 1985, no price available. The first two books are checklists of the herps along with bibliographies and provide introductions to the literature on these faunas. The last is new but may be of more general interest. Write to Krieger Publishing Co., Inc., P.O. Box 9542, Melbourne, FL 32902-9542.

"Threatened and Endangered Plants and Animals of Maryland", \$13.00 paperback. Available from Maryland Dept. of Natural Resources, Fiscal and Supportive Services Building, Tawes State Office Building, Annapolis, MD 21401-9974.

"Species of Special Concern in Pennsylvania" edited by H.H. Genoways and F.J. Brenner. Special Publication of the Carnegie Museum of Natural History. \$30.00 plus \$3.00 for shipping and handling. This is an excellent book! (JCM). Write to Publications Secretary, Carnegie Museum of Natural History, 4400 Forbes Ave., Pittsburgh, PA 15213.

"The Herpetoculturist". a new journal. For information write to the Reptile Breeding Foundation, PO Box 1450, Picton, Ontario, Canada K0K 2T0. No price was available.

Copies of the 10th Anniversary edition of Notes from NOAH are available for sale at \$3.00 each. This is a collection of stories and anecdotes by a wide array of famous and infamous herpetologists. 92 pages in length. Make checks available to "NOAH". Write NOAH, Dept. of Biology, Case Western Reserve Univ., Cleveland, OH 44106.

"Distribution Maps of Oklahoma Reptiles", by S.M. Secor and C.C. Carpenter. Price \$3.00 first copy, \$2.00 each additional copy. A special publication of the Oklahoma Herp. Soc. containing 57 pages of distribution maps of the 81 known species. Make checks payable to "Jeff Black". Write Jeff Black, Oklahoma Baptist Univ., Shawnee, OK 74801.

Safari Museum Books. PO Box 481, Vermillion, SD 57069.

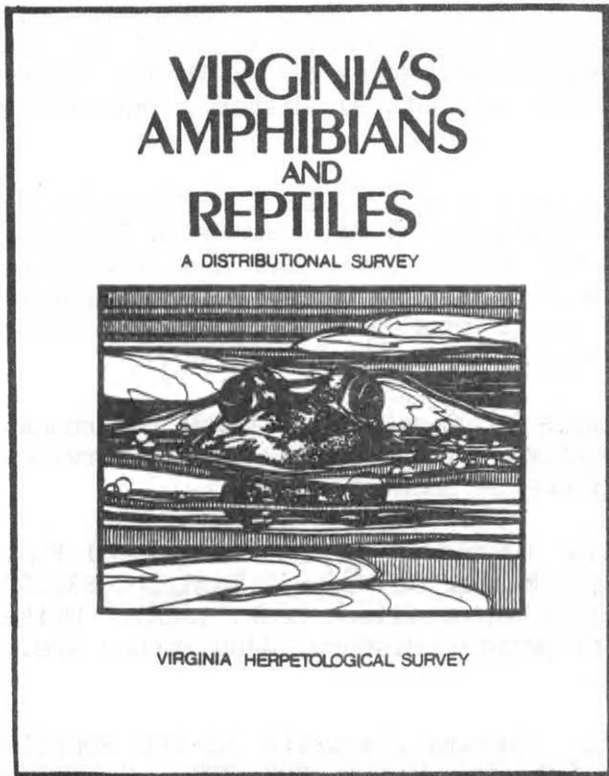
Natural History Books. (\$1 for catalog), Donald E. Hahn, Box 1004, Cottonwood, AZ 86326.

Natural History Books, Doug Kibbe, Box 34, Maryland, NY 12116. (good prices!!)

John Johnson, Natural History Book, R.D. #2, North Bennington, VT 05257.

Herpetological Booksellers, 15 Goodwill Lane, Holbrook, NY 11741.

Pillstrom Tongs, 4617 Free Ferry Rd., Ft. Smith, AR 72903.



VIRGINIA HERPETOLOGICAL SURVEY BOOKLET

A COMPREHENSIVE INVENTORY OF ALL 145 KINDS OF AMPHIBIANS AND REPTILES NATIVE TO THE STATE AND ITS COUNTIES, BASED ON ACTUAL COLLECTING RECORDS. SIZE: 8½" X 11".

THIS 120-PAGE BOOKLET INCLUDES TEXT AND 135 LOCALITY (DOTTED) MAPS. IT FEATURES AN INDEX CROSS-REFERENCED TO CONANT'S 1975 FIELD GUIDE FOR IDENTIFICATION PURPOSES.

IT BRINGS TOGETHER IN ONE PLACE FOR THE FIRST TIME THE EFFORTS OF MANY HUNDREDS OF VIRGINIA HERPETOLOGICAL SOCIETY MEMBERS AND THE RECORDS FROM FIFTY SCIENTIFIC COLLECTIONS IN THE UNITED STATES AND CANADA.

TEXT EXPLAINS SURVEY METHODS USED. SOME HISTORICAL RECORDS AND LITERATURE RECORDS HAVE BEEN INCLUDED. BLACK & WHITE DRAWING.

I ENCLOSE A CHECK/MONEY ORDER FOR _____ COPY (IES) OF THE 120-PAGE BOOKLET "VIRGINIA'S AMPHIBIANS AND REPTILES: A DISTRIBUTIONAL SURVEY." (1985) AT THE PRE-PUBLICATION PRICE OF \$3.00 A COPY.

SEND TO:

----- NAME
 ----- ADDRESS
 ----- POST OFFICE
 ----- STATE ----- ZIP

WRITE CHECK TO: "VIRGINIA HERPETOLOGICAL SURVEY" (OR) "V.H.SURVEY"

RETURN THIS STUB WITH CHECK OR MONEY ORDER TO:

COORDINATOR, V.H. SURVEY
 RT. #1, BOX 381,
 PURCELLVILLE, VA 22132

PRICE AFTER PUBLICATION IS LIKELY TO BE \$5.00 A COPY TO COVER HANDLING.

I'M A HERPETOLOGIST AND I'M OK

by Jeff Beane

I'm a herpetologist and I'm OK.
I herp all night and I sleep all day.
I seek out herps in every way,
And anything else I can find.
I like to peel loose bark off logs.
I like small lizards; I like big frogs.
I like to wade through sphagnum bogs.
I must be out of my mind.

I'm a herpetologist and I'm OK.
I sleep all night and I herp all day.
I herp in April, March, and May,
And any other month of the year.
I cruise all night down rural roads
Even if I don't find nothin' but toads.
The herps I've found would make truck loads
And I drink lots of beer.

I'm a herpetologist and I'm OK.
I herp all night and I drink all day.
I'd fight my way through a Carolina Bay
If there were herps within.
There's people that don't like herps, I hear,
But from them I ain't got nothin' to fear.
When I come around they disappear
Like a coachwhip sheddin' its skin.

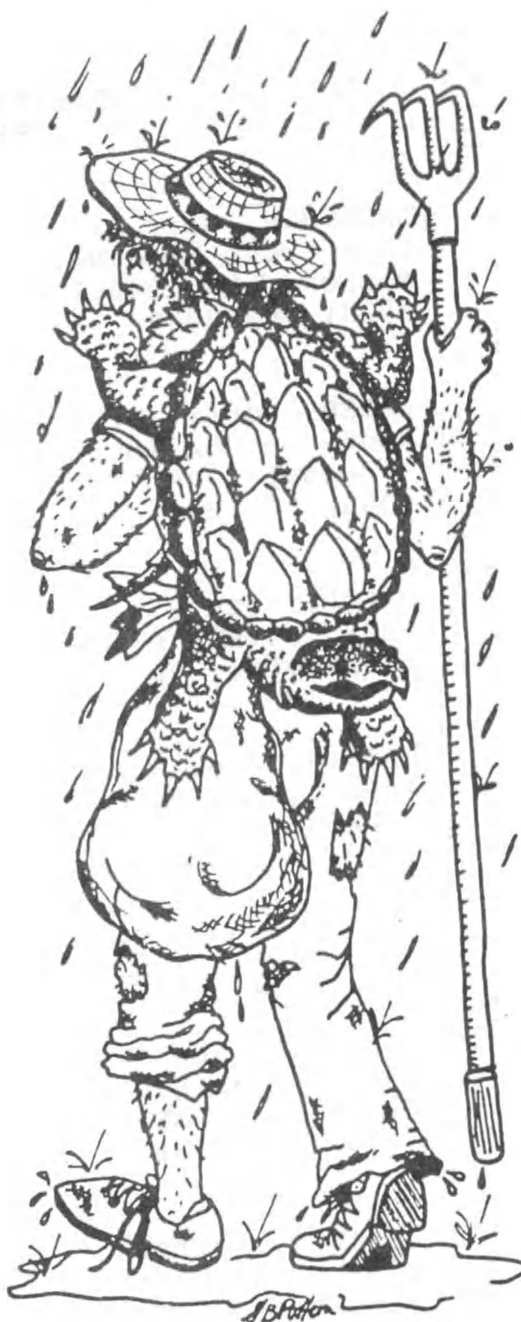
I'm a herpetologist and I'm all right.
I sleep all day and I herp all night.
I roll huge logs with all my might
And grab what lurks beneath.
I like to search through old trash piles.
To find a snake I'd walk twelve miles.
If I find one I'll be all smiles
Even if he's got sharp teeth.

I'm a herpetologist and I'm insane.
I cruise paved roads in the pourin' rain.
I must be out of my twisted brain
But that's all right with me.
I like to turn over boards and rocks.
I like tiny turtles; I like huge crocs.
I've found more herps in city blocks
Than most people ever see.

I'm a herpetologist, a hopeless case.
I'll challenge Cnemidophorus to a race.
Ain't no thrill like the thrill of the chase
Even if they get away.
I look for herps wherever I can find 'em.
Some people are scared of 'em but I don't mind 'em.
If there's any around I'll be close behind 'em
And invite 'em to my house to stay.

I'm a herpetologist and I ain't bad
But kill that snake and I'll get mad.
Some folks' attitudes make me sad
But I don't stay sad for long.
I look for herps all over the place.
I catch 'em and I put 'em in a pillow case.
If you mess with my herps I'll smash your face.
I hope you like this song.

I'm a herpetologist and I pitch fits
If I can't wander 'round borrow pits.
Some people say I musta lost my wits
And a straightjacket's what I need.
I've asked several doctors for a diagnosis.
Told 'em I like to handle glutinosus.
They all said I suffer from severe psychosis.
But I don't pay no heed.



I'm a herpetologist and I get high
If I find a Clemmys muelenbergi.
On the back of my shirt's a Hyla andersoni
And I carry a potato rake.
Herpers are lunatics; so I'm told,
But I'll be a herper until I'm old.
At the end of the rainbow there's a pot of gold
But I'd rather find a rainbow snake.

I'm a herpetologist; I love to herp.
I'd rather chase a lizard than eat maple syrup.
And anyone who wouldn't is an idiotic twerp
And I don't even wanna know 'em.
I'm a herpetologist and I'm OK.
I herp all night and I herp all day.
And if you don't see life that way
Then you need not read this poem.

This poem, and the illustration, first appeared in the October 1984 issue of NC HERPS, the North Carolina Herpetological Society newsletter.

VIRGINIA HERPETOLOGICAL SOCIETY
1985 DIRECTORY OF MEMBERS

ANDERSON, Mary L.
1016 Grove Lane NW
Roanoke, VA 24012
(703) 362-8989

CREWS, Laura (secretary)
412 Dunmore Dr.
Newport News, VA 23602
(804) 874-8943

BADER, Robert N. (president)
Route 2, Box 78
Brookneal, VA 24528
(804) 376-2657

CROY, Steve
Route 2, Box 289
Christiansburg, VA 24073
(703) 382-6247

BAKER, John H.
9006 Captain's Row
Alexandria, VA 22308

DALMAS, Thelma
520 Rainbow Forest Drive
Lynchburg, VA 24502

BAZUIN, John B. Jr.
7495 Little River Tpk. #201
Annandale, VA 22003
(703) 256-5699

DUNSON, William H.
Dept. of Biology
Pennsylvania State Univ.
208 Erwin Muellen
Laboratory
University Park, PA
16802

BISCONTI, Joe
132-35 87th St.
Ozone Park, NY 11417
(718) 738-0746

FELTNER, Jill
310 W. Piccadilly St.
Winchester, VA 22601

BOATNER, Carter
2343 S. Nash Street
Arlington, VA 22202
(703) 521-6010

GEIGER, Mike
534A Shipley St.
Seaford, DE 19973

COLLINS, Joseph T.
Museum of Natural History
University of Kansas
Lawrence, KA 66045
(913) 864-4920

GOTTE, Steve W.
8326 Garfield Ct.
Springfield, VA 22152
(703) 451-4337

CRAIG, Costello M.
Route 5, Box 355
Bedford, VA 24523
(703) 586-1274

GREISHAW, Ben (treasurer)
7622 Hollins Rd.
Richmond, VA 23229
(804) 282-8992

GRIM, David B.
P.O. Box 38
Stephenson, VA 22656
(703) 662-4210

KUNZE, Edna Lynn, Dept.
of Biology, Va. Western
Community College
Box 4195
Roanoke, VA 24015

HOFFMAN, Richard L.
Dept. of Biology
Radford University
Radford, VA 24142
(703) 639-6713 home
731-5397 work

LARSON, Bonnie J.
127 Orleans Circle #4
Norfolk, VA 23509
(804) 623-3914

HOLDREN, H. Reaves III
8355 Willow Ridge Rd.
Roanoke, VA 24019
(703) 362-8451

LAWRENCE, David
4504 Glenn Ridge Rd.
Roanoke, VA 24017
(703) 563-2954

HONEYCUTT, Greg
165 Poplar Dr.
Blue Ridge, VA 24064
(703) 977-0175

LEARNING RESOURCES CENTER
Lord Fairfax Community
College, P.O. Box 47
Middletown, VA 22645
(703) 869-1120

HOOPER, Charles S. III
P.O. Box 523
Crewe, VA 23930

UR/VISR SCIENCE LIBRARY
Science Building
University of Richmond
Richmond, VA 23173

HORD, T.C.
P.O. Box 517
Crescent City, FL 32012

MERRIKEN, George
342 Nansemond St. S.E.
Leesburg, VA 22075

HOWE, Terry
656 Santa Culeta Ct.
Sunnyvale, CA 94086
(408) 734-3378

MITCHELL, Joseph C. (ed.)
Dept. of Biology
University of Richmond
Richmond, VA 23173
(804) 285-6275

KILLIAN, Joella C. & Michael D.
Dept. of Biological Sciences
Mary Washington College
Fredericksburg, VA 22401
(703) 899-4689

MITCHELL, Wendy H. (co-ed.)
1716 Rockwood Rd.
Richmond, VA 23226
(804) 285-0591

KRAKAUER, Tom or
Route 4, Box 565
Troutville, VA 24175

Roanoke Valley Science Museum
1 Market Square
Roanoke, VA 24011
(703) 342-3710

MURRAY, James J.
Dept. of Biology
University of Virginia
Charlottesville, VA 22901

SELL, Jason A.
270 Stonehaven Lane
Blue Ridge, VA 24064
(703) 977-2004

NEAL, Charles
Dept. of Biology
Radford University
Radford, VA 24142

SHENANDOAH NATURAL
HISTORY ASSOCIATION
Route 4, Box 292
Luray, VA 22835
(703) 999-2243

NICOLETTO, Paul
Dept. of Biology
VPI&SU
Blacksburg, VA 24061
(703) 961-5728

SIMONETTI, Ben
36 Knoll Ridge Dr.
Ashville, NC 28804

OGLE, Douglas W.
Route 2, Box 65
Meadowview, VA 24361

SLAGHT, Steven D.
4920 S. Centaurs Ct.
Annandale, VA 22003
(703) 978-7144

PADGETT, Thomas
113 Dane St.
Chesapeake, VA 23323

STUMP, Fred
P.O. Box 422
Rocky Mount, VA 24151
(703) 483-7312

PAGUE, Christopher A. (vice pres.)
Dept. of Biological Sciences
Old Dominion University
Norfolk, VA 23508
(804) 440-4123

TOBEY, Franklin J.
Route 1, Box 381
Purcellville, VA 22132

PIERSON, Tom
13813 Cabernet Court
Chantilly, VA 22021
(703) 378-7405 home
566-7520 work

VANCE, Thomas
Biology Department
Navarro College
Highway 31 West
Corsicana, TX 75110

ROBERTSON, Lynn
Route 1, Box 346
Roanoke, VA 24012
(703) 982-0917

VAUGHN, Barbara
816F Cabell Ave.
Charlottesville, VA
22904

ROBINSON, Scott
3310 Mt. Vernon Ave., #6
Alexandria, VA 22305
(703) 683-4760

WARNY, Peter R.
34 Bridle Path
Port Washington, NY
11050
(516) 883-3573

WHITMAN, Michael R.
803 Thames Dr.
Hampton, VA 23666
(804) 838-5262

GOURLEY, Eugene V.
Dept. of Biology
Radford University
Radford, VA 24142

WILKINSON, Thomas M.
7020 Westbury Rd.
McLean, VA 22101

LIBRARY, VA Highlands Comm. College
PO Box 828
Abingdon, VA 24210

WINDAASSEN, Hans
Route 1, Box 3
Sparrow Bush, NY 12780

MARTIN, W. H. III (Marty)
Rt. 3 Box 804
Harpers Ferry, West VA 25425

WRIGHT, Robert A.S.
5204 Riverside Dr.
Richmond, VA 23225

MCBREEN, John F.
1504 Laurel Hill Rd.
Vienna, VA 22180
(703) 356-1504

or

P.O. Box 9289 LC
Lynchburg College
Lynchburg, VA 24501
(804) 522-9410

MILTON, Thomas H.
Richard Bland College
Petersburg, VA 23805
(804) 732-0111 ext 258

YOUNG, David A.
5316 Hitching Post Ct.
Virginia Beach, VA 23462

SCHWAB, Don
1476 White Marsh Rd.
Suffolk, VA 23234
(804) 934-1577

STAHL, Scott J.
2774 Broad Bay Rd.
Virginia Beach, VA 23451

Addenda

BULMER, Walter
Nat. Sci. & Math. Division
8333 Litter River Tpk.
Northern VA Comm. College
Annondale, VA 23003
(703) 323-3226

VAUGHN, Jere
12131 Brantleigh Pl.
Fairfax Station, VA 22039
(703) 830-3874

CRAIG, Jerry
35 Timberline Dr.
Blue Ridge, VA 24064
(703) 977-0161

GREGORY, Chris
Rt. 2 Box 134
Stuart, VA 24171
(703) 930-2028

ECKERLIN, Ralph P.
Nat. Sci. & Math Division
Northern VA Comm. College
Annondale, VA 23003
(703) 323-3234

MATHEWS, George K., Jr.
524 J. Clyde Morris Blvd.
Newport News, VA 23601
(804) 595-1900

This roster was compiled by Laura Crews, VaHS secretary.

FALL 1985 VAHS SOCIETY MEETING INFORMATION

The fall VaHS meeting will be held on Saturday, October 5, 1985 at Radford University in Radford, Virginia.

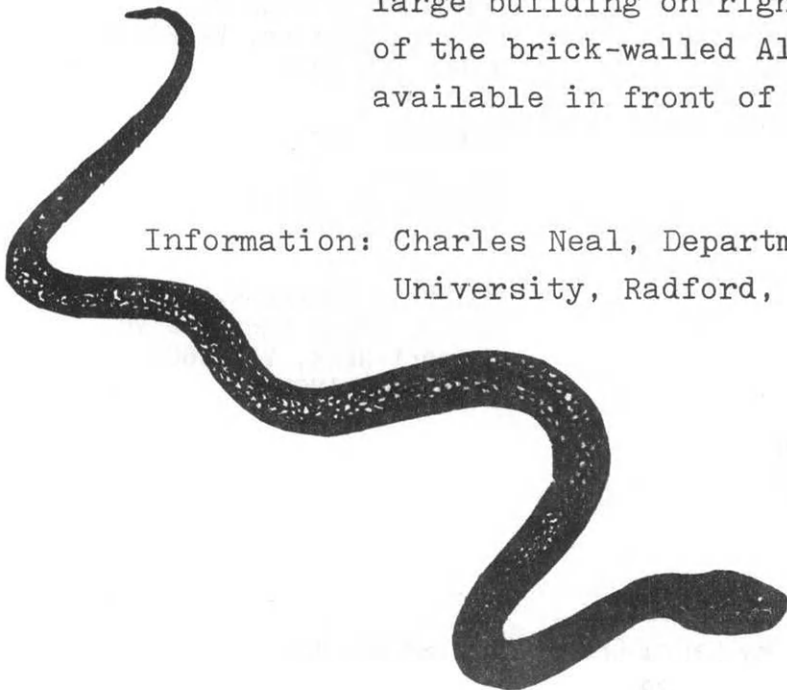
Meeting Place: Curie Hall, Room 33.

Schedule: 9:00 - 10:00 Coffee and donuts
10:00 - 11:30 Business meeting
11:30 - 1:00 Lunch at local restaurants
1:00 - 5:00 Papers

Weather and time permitting a field trip may be scheduled late afternoon or early evening.

Directions: From I-81 take Radford Exit 35, follow sign to Radford, turn right at first stoplight from Tyler Avenue onto Norwood Street. Curie Hall is the third large building on right and is located to the left of the brick-walled Alumni Garden. Parking is available in front of Curie Hall.

Information: Charles Neal, Department of Biology, Radford University, Radford, Virginia 24142, (703 731-5222)

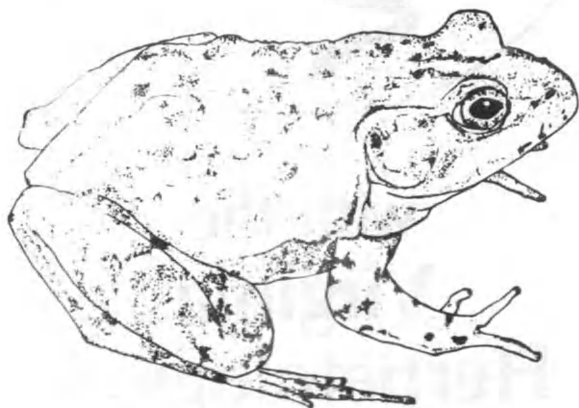


The Virginia Herpetological Society

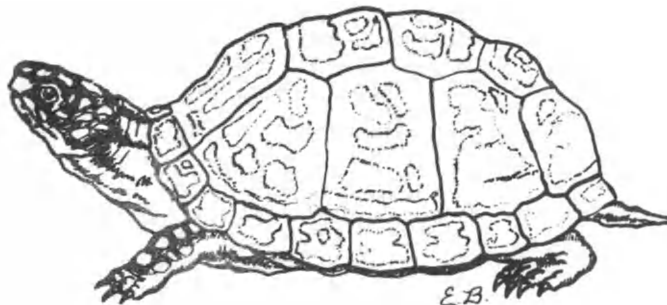
*A society open to everyone
with an interest in the
conservation, study and care
of reptiles and amphibians*

The Virginia Herpetological Society was organized in 1958 to bring together people interested in advancing the knowledge of Virginia's reptiles and amphibians. The VaHS encourages the scientific study of Virginia's herpetofauna and its conservation. Educational activities continue to be important society functions.

Meetings are held twice each year, in Spring and Fall, at different locations throughout the state. The program is open to all members and includes a business meeting and a contributed papers session, during which members present information on their work with reptiles and amphibians, particularly in Virginia. An afternoon field trip usually follows.



The VaHS publishes a bulletin, *CATESBEIANA*, twice each year which contains articles, news and information on various aspects of Virginia herpetology. Members publish field notes and observations, distributional information and suggestions for improving husbandry techniques. Review articles appear occasionally. Material for inclusion should be sent to the editor, Dr. Joseph C. Mitchell, Dept. of Biology, University of Richmond, VA 23173.



Society dues are \$5.00 per year (\$3.00 for members under 18, and \$7.50 for families).

Inquiries should be addressed to the secretary.

Membership can be initiated at meetings. Dues may be paid at that time.

President: Bob Bader, Route 2, Box 78,
Brookneal, VA 24528

Vice President: Christopher A. Pague, Dept.
of Biological Sciences, Old Dominion
University, Norfolk, VA 23508

Treasurer: Ben Greishaw, 7622 Hollins Rd.,
Richmond, VA 23229

Secretary: Laura Crews, 412 Dunmore Dr.,
Newport News, VA 23602

Editor: Dr. Joseph C. Mitchell, Dept. of
Biology, University of Richmond,
Richmond, VA 23173

Advantages of VaHS membership

- Spring meeting with talks, slides, and field trip
- Fall meeting with lectures, film or workshop
- Society bulletin published twice per year
- Extensive research material available
- Awareness of current herpetological events
- Opportunity to meet others who share your interest in herps
- Support of VaHS education and conservation goals



Membership Application

I wish to initiate renew membership in the Virginia Herpetological Society for the year 19_____.

Name _____

Address _____

Phone _____

Dues category: Regular (5.00) Family (7.50) Under 18 (3.00)

Make checks payable to the Virginia Herpetological Society and send to the treasurer.



Virginia
Herpetological
Society



Faint, illegible text, possibly bleed-through from the reverse side of the page.

with the
Virginia
Herpetological
Society



Help make
Herpetology come
alive in Virginia...

