

AN ANNOTATED CHECK LIST OF THE AMPHIBIANS AND REPTILES OF TENNESSEE¹

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In 1936, while the writer was attending George Peabody College for Teachers, it was suggested by Dr. Jesse M. Shaver that a study of the frogs and salamanders of Tennessee be conducted as a partial fulfillment of the requirements for the degree Master of Science.

The guidance and many kindnesses which Dr. Shaver bestowed on his students served to inspire the writer's interest in herpetology and resulted in the selection of this subject as a life time avocation.

Although sufficient material was collected and compiled by 1937 to fulfill the requirements for the thesis, the scope of the study was enlarged to include snakes, lizards and turtles and the collecting of data has continued to the present date. In the plan of the study special attention was given to the taxonomy, distribution, life history, habitat preference and food habits of these creatures.

The State of Tennessee is composed of seven major physiographic provinces: (1) Mississippi Flood Plains, (2) Plateau Slope of West Tennessee, (3) Highland Rim, (4) Central Basin, (5) Cumberland Plateau, (6) Valley of East Tennessee and (7) Unaka Range. The diversity of the topography with the resulting ranges of elevation and the variations of climate which are found in these seven major provinces provides a wide variety of habitat types that support a correspondingly large number of species of amphibians and reptiles.

The total number of species of amphibians and reptiles that were reported native to Tennessee was 154, of which number the writer has collected and identified 124. The number of species by orders which are included in this list follows. The numbers in parenthesis represent the species collected and identified by the writer. The amphibians included 48 (39) salamanders, 21 (18) frogs; the number of reptiles was 22 (18) turtles, 9 (2) lizards, and 54 (47) snakes.

Although several contributions (see bibliography) to the herpetology of Tennessee have been published, Malcolm V. Parker contributed the largest number of papers. Two of these (1937, 1939) were concerned with the herpetology of Reelfoot

¹The collection of part of this data was made possible by (1) a grant from the Tennessee Academy of Science, (2) as a biologist and herpetologist on a summer stream survey crew of the Tennessee Game and Fish Division in 1939-40-41 (Gentry, 1941), (3) and as a biologist for the Tennessee Game and Fish Commission. The writer expresses his appreciation to the agencies which made these opportunities possible.

Lake and vicinity; another paper (1948) on the herpetology of West Tennessee reported the collection of 78 species from 15 counties. Endsley (1954) collected 60 species from 7 West Tennessee counties; however, most of these species were collected in one county (Chester).

Field trips have been made in many counties and one or more species of amphibians and reptiles were observed or collected in about 93 counties of the state. The most successful time for field trips was found to be in the spring; collecting at night also was very successful. Furthermore, very large numbers of specimens that had been killed by cars were collected on the highways.

The check list was prepared from the notes of the writer and from available published material and is arranged according to the order of Schmidt's (1953) edition of "A Check List of North American Amphibians and Reptiles." The only common names included are those by which the species are known to the public in Tennessee.

To a herpetologist it is surprising that so few people are aware of the number of different species of amphibians and reptiles that exist in nature. In Tennessee the salamanders are known as waterdogs, spring lizards or ground puppies. Most people may recognize the following species: snapping turtle, soft-shelled turtle, box terrapin, water turtle (known as water terrapin), fence lizard and scorpion (blue-tailed skink). Generally, people are very conscious of the existence of the three poisonous snakes, rattlesnake, copperhead and cotton mouth and many recognize the black snake, garter snake, water snake, chicken snake and the spreading adder (hog-nosed snake).

The writer wishes to express his gratitude to Dr. A. H. Wright, Dr. E. R. Dunn, Dr. A. R. Cahn, Dr. Roger Conant, Dr. Norman Hartweg, Dr. Willis King and Dr. Archie Carr for identifying and verifying the specimens which were submitted to them for examination.

CLASS AMPHIBIA¹

CRYPTOBRANCHIDAE

Cryptobranchus alleganiensis alleganiensis Daudin. Water dog. The water dog is common in the Cumberland and Tennessee River systems but not in the western tributaries of the Tennessee River. It apparently prefers the small rivers that have rocky stream beds and the Harpeth, Tellico, Little, Elk, Nolichucky and Sequatchie rivers are typical streams for these creatures. Very few of them are found in lakes, and numbers were found dead in one reservoir after impoundment. The largest known Tennessee specimen was collected in East Tennessee and may be seen in the U. S. Smoky Mountain National Park Museum at Gatlinburg. Fishermen believe that they are poisonous.

¹The amphibians and reptiles, especially the amphibians, offer a convenient and economical source of material for the classroom since it is not too difficult to collect them.

PROTEIDAE

Necturus maculosus maculosus Rafinesque. Water dog. This animal is common in large rivers and most impoundments and seldom is found in smaller streams. Many are caught by fishermen during the spring fishing season.

Necturus beyeri Viosca. Not identified by the writer. Collected from streams in the eastern part of the State and described by Viosca.

SIRENIDAE

Siren intermedia nettingi Goin. The sirens are fairly common in West Tennessee but are seldom seen by man except during the construction of ponds, ditches and excavation work in or near low areas. Several were found in Davidson County by workmen on an earth moving project in 1938. A colony was observed over a period of five years in a small isolated wood pond near Paris in Henry County.

AMBYSTOMIDAE

Ambystoma jeffersonianum Green. One larval form was collected in Hardeman County. It is also reported in Tennessee by Bishop (1943).

Ambystoma maculatum Shaw. Ground puppy. This salamander is common throughout the state, except in the sandy flats of West Tennessee. Most specimens are collected from ponds in forested areas during the breeding season of from about January 15 to March 15. Ninety to 125 eggs are deposited in firm jelly-like masses and attached to twigs and small bushes 10 to 18 inches under the surface of the water. Egg-laying seldom occurs in ponds which are subject to flooding or which have permanent fish populations.

Ambystoma opacum Gravenhurst. Ground puppy. This animal is rather common in West Tennessee and has been collected from several stations throughout the State. Lots of from 75 to 125 eggs are deposited in small covered depressions on the dry borders of ponds. The egg laying season which is short, begins about October 10. The females remain with the eggs and the larvae do not emerge from the eggs until the nests are covered by water. This salamander is regarded as an excellent catfish bait by many fishermen.

Ambystoma talpoideum (Holbrook). There are only a few known records for this species in the state. Specimens have been collected in Henry and Overton Counties which extends the range eastward over 200 miles. The eggs are deposited in small ponds in the months of January and February.

Ambystoma texanum (Matthes). Ground puppy. Several of these salamanders were collected in Montgomery County which extends its known range from West Tennessee where it is fairly common. The pliable jelly-like masses usually contain 20 to 40 eggs and are deposited in small ponds from December to February.

Ambystoma tigrinum tigrinum Green. Ground puppy. This species is common in West and Middle Tennessee but has been collected in Knox County. Its habitat is on or near farming lands. The deposition of eggs in ponds begins in December and continues into February, but some eggs have been collected as early as November 11th. The mobile jelly-like masses usually contain from 40 to 80 eggs and are deposited on twigs about 15 inches below the water surface. Specimens up to 10½ inches in length have been collected.

SALAMANDRIDAE

Diemictylus viridescens viridescens Rafinesque. Water newt or spring lizard. This newt is widely distributed throughout the state but intergrades with *Diemictylus viridescens louisianensis* in the western part. These salamanders usually are found in old ponds, particularly in forested areas, but are common in many of the Cumberland Plateau streams. Several hun-

dred of these creatures often are found in one small pond but they are stunted when over-population occurs. Generally, the largest salamanders are found in ponds in which living water plants are present. Eggs are deposited in the early spring. Several neotonic individuals have been collected from a small limestone pond in Rutherford County.

Diemictylus vividescens louisianensis Wolterstorff. This salamander has been collected in West Tennessee but the distribution is limited because of suitable habitats. It was collected in Hardeman and Haywood Counties.

AMPHIUMIDAE

Amphiuma means tridactylum Cuvier. Lampers Eel. This unusual creature is common in the sloughs and swamp areas of West Tennessee, and is believed to be poisonous by many people. A few have been observed killed on the highways following heavy rains. Some are caught on baited hooks by the fishermen.

PLETHODONTIDAE¹

DESMOGNATHINAE

Desmognathinae fuscus fuscus Rafinesque. Spring lizard. The distribution of this salamander is state wide (except at very high altitudes) in springs and along the borders of small cool branches under moss, stones, logs, dead leaves and debris. It will submerge to escape capture. These animals are often used as bait by trout fishermen.

Desmognathus ochrophaeus carolinensis Dunn. This slender creature is found in the Smoky Mountain range of East Tennessee. It is common in damp areas under small logs, bark and stones. Some specimens with red cheeks were collected near Newfound Gap in the Smoky Mountain Park, Blount County.

— *Desmognathus ocoee* Nicholls. This species was collected in Polk County and described by Nicholls (1949). None have been collected by the writer.

Desmognathus monticola monticola Dunn. These salamanders are found in the mountain ranges of East Tennessee in and along the edges of small streams but seldom occur in springs where *Desmognathus f. fuscus* is abundant.

Desmognathus quadramaculatus Holbrook. This stout-bodied salamander is not only the largest but also the most aquatic of the *Desmognathus* species. It, too, is a Smoky Mountain species and is found in and along the larger mountain streams of East Tennessee.

Desmognathus wrighti King. Specimens have been collected only from the highest elevations of the Smoky Mountains under stones and debris. Several were collected near Newfound Gap, Sevier County. It is probably the smallest of the *Desmognathus* species.

Leurognathus marmorata marmorata Moore. This is an aquatic salamander and is found in the cold streams of the Smoky Mountains.

Leurognathus marmorata intermedia Pope. None of these salamanders were collected by the writer. Several specimens were collected in the Smoky Mountain National Park by King (1941).

PLETHODONTINAE

Plethodon cinereus cinereus Green. A considerable number of these species have been collected in Middle and East Tennessee. It is a terrestrial salamander and is found under rocks and dead timber in hilly forested areas.

Plethodon dorsalis Cope. This salamander is common in hilly forested areas from West Tennessee to the foothills of the Smoky Mountains and is

¹The species of this group of salamanders are known as spring lizards by most people.

very abundant in the cedar glades. It may be collected under flat stones, fallen timber, and debris on rather dry soil.

Plethodon glutinosus glutinosus Green. This is one of the most common and widely distributed of the salamanders. Most specimens were collected under decaying logs in wooded areas.

Plethodon glutinosus grobmani Allen and Ncill. This species, reported by Sinclair (1950), was collected in Shelby County. None have been identified by the writer although he has collected *Plethodon glutinosus* from this county.

Plethodon jordani jordani Blatchley. This species is common in the higher altitudes of the Smoky Mountains, generally under fallen timber in well-drained forested areas.

Plethodon jordani metcalfi Brimley. The heavily forested slopes of the Smoky Mountains provide favorable habitats for this species. It is found under fallen timber, debris and stones in dry areas but at higher elevations than *Plethodon g. glutinosus*.

Plethodon welleri Walker. Three specimens were collected in Johnson County by Hoffman (1953). No specimens were collected or identified by the writer.

Plethodon yonahlossee Dunn. Apparently the now extinct chestnut forests were the preferred habitats of these salamanders. The few specimens collected came from the lower slopes of the Smoky Mountains in which the chestnut trees once thrived.

Hemidactylium scutatum Schlegel. The distribution of this salamander probably is limited by its nesting habits since the eggs are deposited in moss or root masses that are situated a few inches above the water level of ponds or swampy areas. The females remain with the eggs. Nests of eggs and females have been observed in February and March. Specimens were collected from the following counties: Robertson, Franklin, Cumberland, Johnson, Putnam and Overton.

Gyrinophilus porphyriticus porphyriticus Green. The herpetologists have named this species the purple salamander because of its coloration. It is a rather large animal and is reasonably common in the Cumberland Plateau; however, specimens were collected in Hamblen and Johnson Counties. All collections by the writer were found in cold springs.

Gyrinophilus danielsi danielsi Bishop. This species was found at higher altitudes of the Smoky Mountains in cold springs.

Gyrinophilus danielsi dummi Mittleman and Jopson. The range of this salamander, as shown by Bishop (1943), includes the southern part of the Smoky Mountains in East Tennessee. However, it is found in lower altitudes than *Gyrinophilus d. danielsi*. The writer has collected *Gyrinophilus danielsi* in this range but did not identify them to sub-species.

Pseudotriton montanus montanus Baird. This species is fairly common in the foothills of mountainous areas and in the lower elevations of Middle and East Tennessee. None were collected in springs or branches. Specimens were collected in Davidson, Unicoi and Hamblen Counties.

Pseudotriton montanus diastictus Bishop. Only one specimen was collected and it was found in a swampy wooded area under a decaying log in Macon County.

Pseudotriton ruber ruber Sonnini. This species is rather common in the state except at high elevations. Most specimens were found under rocks, boards, and fallen timber, in the vicinity of springs.

Pseudotriton ruber schencki Brimley. All specimens were collected at high elevations of the East Tennessee mountain ranges in Sullivan, Johnson and Monroe Counties.

Pseudotriton ruber nitidus Dunn. A few specimens were collected from higher elevations of the Smoky Mountain range.

Pseudotriton ruber vioscai Bishop. Although several specimens of *Pseudotriton r. ruber* have been collected in a number of West Tennessee counties, none were identified by the author as *Pseudotriton r. vioscai*. One specimen from Henderson County was identified by Sinclair (1950) as *Pseudotriton r. vioscai*.

Aneides aeneus Cope and Packard. This salamander has a greenish mottled coloration which resembles that of the lichens which are common on the rock faces of sandstone cliffs. They are common in crevices of outcropping Pennsylvania sandstone of the Cumberland Plateau, especially in the Pottsville sandstone formations and were found to be endemic to these sandstone formations. According to Gordon (1952) there were only eight locality records of this species for Tennessee, however, these salamanders were found to be common in all of the counties in which the sandstone outcroppings occur.

Although these salamanders were collected (or observed) from many different stations, only 3 were found on trees. They were found also in limestone crevices at 2 stations. The writer's observations indicate that the trees and limestone crevices were secondary habitats only during favorable weather, since the trees were located near sandstone cliffs and the limestone formations were capped with sandstone. Specimens have been observed in every month of the year. Over a period of 10 years on occasional trips of a sandstone crevice at Ozone Falls, Cumberland County, from 1 to 7 salamanders were present on all but 4 of these trips. The failure to find salamanders on these four occasions probably was due to the occurrence of heavy rainfall or extremely cold weather. These salamanders are seldom found in crevices which are very wide vertically and a flashlight is usually necessary for daytime collecting.

Eurycea bislineata bislineata Green. This species is rather aquatic in its habits and has been collected in most sections of the state but is not as abundant in West Tennessee. Specimens may be collected in or out of cool streams. The eggs are white in appearance and often are attached to underwater plants. The larvae are very abundant in many small streams.

Eurycea bislineata vivicola Mittleman. This salamander was reported from Middle Tennessee by Sinclair (1950) but has not been identified by the writer.

Eurycea bislineata wilderae Dunn. These small salamanders are common in the Smoky Mountains. They are often found under the bark of dead trees in forested areas.

Eurycea bislineata cirrigera Green. This species was found to be common in Middle Tennessee along small streams in wooded areas.

Eurycea longicauda longicauda Green. The range of this salamander extends to the high elevations of the mountains and to the lowlands of the western part of the state. Although it is not too difficult to locate specimens, only a few were found at any one collecting station. Most of the specimens collected were found under undecayed planks, slabs and logs, whereas most of the other terrestrial salamanders were collected under decaying timber.

Eurycea longicauda guttolineata Holbrook. None of these salamanders have been collected east of the Tennessee River but are very common in the low swampy areas westward.

Eurycea longicauda pernix Mittleman. According to Schmidt (1953) its range extends into West Tennessee but none have been collected or identified by the writer. Barr (1952) also collected this salamander in two Middle Tennessee counties.

Eurycea lucifuga Rafinesque. The distribution of this salamander coincides with the limestone rock formations and it is especially abundant in areas where caves are common. None have been collected in West Tennessee. One or more specimens may be found in most caves near the entrances.

ORDER SALIENTIA

PELOBATIDAE

Scaphiophus holbrooki holbrooki Harlan. Although scattered collection records indicate that this frog is rare, actually it is rather common and collecting success is limited and determined both by the weather and the habits of the frog. Most of the specimens observed or collected were found in low areas that became temporary ponds after warm-weather thunderstorms. A few of these frogs have been found in damp basements and flower pits. Others have been plowed up by farmers. One or more of these frogs were found in Lake, Carroll, Lawrence, Davidson, Lewis, Lincoln and Putnam counties.

BUFONIDAE

Bufo terrestris americanus Holbrook. Toadfrog. Although this toad is common throughout the state, it is not too common in the lowlands and apparently thrives in uplands and mountainous country. The breeding season usually begins in early March. A large preserved female collected from the Smoky Mountains completely filled a pint jar.

Bufo terrestris terrestris Bonnaterre. Special efforts have been made to collect this toad in Tennessee because of a Tennessee record by Rhoads (1895). None have been found and its occurrence in the state is not likely because the nearest known record (Wright, 1949) is about 100 miles from the state line. Several specimens were collected in Alabama about 200 miles south of the Tennessee line by the writer.

Bufo woodhousei fowleri Hinckley. Toadfrog. This rather noisy toad is very common throughout the state except at higher elevations of the Smoky Mountains. The males begin singing (?) in April when the weather warms up to about 75° Fahrenheit.

HYLIDAE

Acris gryllus gryllus (Le Conte). In Wright's Handbook of Frogs and Toads (1949) the range of this frog forms a border along the Atlantic and Gulf coasts. Parker (1949) reported both species of *Acris* from West Tennessee. This species was not collected by the writer.

Acris gryllus crepitans Baird. This small active frog is common throughout the state in ponds and marshes but is not common in streams. They are found near the edges of the water and generally leap in the water to escape capture, but usually swim back to the edge of the water and cling to grass stems, etc. These frogs are active during the daytime and their clicking-like calls may be heard at times throughout the summer in the daytime and at night.

Hyla cinerea cinerea Schneider. Treefrog. This rather large bright green colored frog is found in the larger swampy areas of West Tennessee. It is especially common at Reelfoot Lake and begins to call when the temperature rises to about 80° Fahrenheit. However, a number of these frogs were found in Warren County, 6 miles east of McMinnville and 200 miles east of the nearest known record (Wright, 1949) for this species. This particular section of Warren County is dotted with sinks many of which form small temporary lakes during the spring rains.

Hyla crucifer crucifer Wied. Treefrog. Although this is a very small frog the loudness of its call is unusual in comparison to its size. The choruses of their sharp whistling calls dominate the countryside in the early spring. They congregate around bogs, swamps, and ponds in or near wooded areas and they are very common except at high altitudes.

Hyla phaeocrypta phaeocrypta Cope. Treefrog. The call of this frog is very similar to that of certain bird calls and its calls may be heard in late afternoons and at night during the warmer summer months. The distribution of this species apparently is limited to the larger swamps of Tennessee.

Specimens have been collected or identified by their calls in Lake, Obion, Weakley, Hardeman, Carroll and Benton Counties. The writer believes that the name of this species should be changed back to its original name "Hyla avivoca."

— *Hyla squirella* Sonnini and Latreille. No specimens were collected by the writer, although many observations were made in an effort to locate this species in Tennessee. According to Wright (1949), it should be in West Tennessee and along the eastern shores of the Tennessee River.

Hyla versicolor versicolor Le Conte. Treefrog. This treefrog is also very common in Tennessee except in the higher elevations. This is one of the few amphibians which is recognized by the general public. It appears in late spring and its calls often are heard preceding a thunderstorm. The egg-laying season continues through the warm summer months and the eggs are deposited in thin films on the surface of small pools in forested areas.

Pseudacris brachyphona Cope. This small frog is common in the Pennsylvania sandstone area of the Cumberland Mountains and its range is similar to that of the salamander *Aneides aeneus* which is endemic to the Cumberland Mountains. It is found in shallow ditches and ponds during the breeding season which occurs in the early spring. All of these frogs were collected in the Cumberland Mountains with the exception of a few specimens that were taken in Johnson and Monroe Counties. These records extend the known range in Tennessee from the Kentucky line to Alabama and verifies the prediction of Dr. A. H. Wright (1949) who states in his Handbook of Frogs that it must be in Tennessee.

— *Pseudacris nigrita feriarum* Baird. This species was not identified by the writer but was reported by King (1939) in the Smoky Mountain National Park up to elevations of about 2,500 feet.

— *Pseudacris nigrita triseriata* Wied. These small frogs are exceedingly common throughout the state and the range extends to that of *Pseudacris n. feriarum* which begins at the foothills of the Smoky Mountains. Their choruses of calls begin in late winter and the breeding season usually ends by the middle of March. However, their calls have been heard occasionally during all of the winter months.

MICROHYLIDAE

Microhyla carolinensis carolinensis Holbrook. These frogs are difficult to collect because of their secretive nature; they hide under logs, planks and debris. During the breeding season they locate themselves in shallow water where there is an abundance of plant material with their brownish colored narrow heads barely projecting above the surface of the water. They have short legs and fat bodies but are reasonably active. They have been observed from May through September. The collecting records are based on specimens or the calls of these frogs. Specimens were observed or collected in Shelby, Hardeman, Henry, Henderson, Benton, Carroll, Campbell, Coffee, Davidson, Dickson, Humphreys and Blount Counties. It is evident from these scattered locations that the distribution of this frog should be statewide.

RANIDAE

Rana areolata circulosa Rice. This is another frog that is difficult to collect. It is seldom found except during the breeding season or when land is being cultivated. None have been collected east of the Tennessee River and specimens were collected or observed in Carroll, Henry, Tipton and Shelby Counties. It is common in most of West Tennessee in flat sandy or semi-swampy areas.

Rana catesbeiana Shaw. Bullfrog. The bullfrog is very common throughout the state except in the higher elevations of the Smoky Mountains. Its calls are heard from about May until late summer and the eggs usually are deposited in May or June as a thin film on the surface of the water, anchored to twigs and plants. About 50% of the tadpoles transform the

first year in the lower elevations. The crawfish is apparently the favorite food of the bullfrog as evident by the examination of the contents of many stomachs. Few bullfrogs are produced in farm ponds where balanced populations of largemouth bass occur because the tadpoles are eaten by these bass. However, most streams in Tennessee produce considerable numbers of frogs because the smallmouth bass seldom feed on the tadpoles and the largemouth is not too common in these cool streams. The sale of frogs taken from Tennessee waters is illegal. There is also a closed season in April and May and a daily bag limit of ten during the open season.

Rana clamitans Latreille. Bullfrog. The distribution of this frog is about as extensive as that of the bullfrog, *Rana c. catesbiana* but it seems to prefer ponds and streams in forested areas. Eggs deposited as a thin film on the water have been observed from June to August.

Rana sylvatica sylvatica Le Conte. The known range of this frog is in the Smoky Mountains. However, the writer has found it in several counties outside the Smoky Mountain range and over 200 miles westward. It was collected in the following counties: Carter, Davidson, Campbell, Cocke, Dickson, Greene, Johnson, Monroe, Macon, Overton, Putnam, Robertson, Sevier and Unicoi.

Rana pipiens pipiens Schreber. Grass frog. This frog is very common in Tennessee and evidently intergrades with *Rana pipiens sphenoccephala* particularly in Middle Tennessee. It can be collected along the borders of almost any bog, swamp or stream that are near meadows and cleared lands.

Rana pipiens sphenoccephala Cope. Grass frog. It is difficult to distinguish between this species and *Rana p. pipiens* in Tennessee, however, Wright (1949), gives its range as West Tennessee. It is very common in this section of the state. The calls of both *Rana pipiens* subspecies have been heard as late as October.

Rana palustris Le Conte. Bullfrog. This frog is found in cooler areas that approach the habitat preference of *Rana s. sylvatica*. It is found along smallmouth bass streams and in ponds that are located in wooded areas. Eggs are usually deposited in late February and March. It was found to be rather common in the state except in West Tennessee.

(To be Continued)

NEWS OF TENNESSEE SCIENCE

(Continued from Page 167)

Because of the growing concern over the apathetic attitude to religion developed by students as they study science, the Danforth Foundation will sponsor for the third year a seminar workshop on "The Teaching of the Natural Sciences in Relation to Religious Concepts." The sessions will be from July 10 through 23, 1955 on the campus of The Pennsylvania State University. Dr. William G. Pollard, distinguished physicist and executive director of the Oak Ridge Institute for Nuclear Studies again will be one of the Seminar leaders and lecturers.

Dr. A. W. Kuchler, Professor of Geography at the University of Kansas, will be a visiting professor in the Departments of Biology and Geography, at East Tennessee State College, Johnson City, during the 1955 summer quarter. Dr. Kuchler will teach two graduate courses in plant geography and an undergraduate course in European geography.