NUMBER 460 SEPTEMBER 16, 1942

OCCASIONAL PAPERS OF THE MUSEUM OF ZOOLOGY

UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN UNIVERSITY OF MICHIGAN PRESS

THE BLACK TOAD OF DEEP SPRINGS VALLEY, INYO COUNTY, CALIFORNIA

BY GEORGE S. MYERS

DEEP Springs Valley is an isolated depression in the desert mountains of northeastern Inyo County, California. It is elongate in form, trending northeast by southwest, about twelve miles long and five miles broad at its widest part. The lowest part of the valley, at its wide southwestern end, is a flat area of about three by five miles, of almost exactly 5,000 feet elevation, although the rest of the gently rising valley floor is also very level. Surrounding Deep Springs, the White and Inyo Mountains rise to heights of 7,000 to 8,000 feet. Westgard Pass, through which one enters the valley from Owens Valley to the west, reaches 7,276 feet, and the top of the pass into the southern arm of Fish Lake Valley, on the east, is at 6,374 feet. The lowest entrance to the valley appears to be the dry, narrow, and now virtually unused Soldier Pass, from the dry northeastern corner of Deep Springs Valley into Eureka Valley on the southeast; the top of this pass appears to be at approximately 5,400 feet.

Like other desert valleys to the east of the Sierra Nevada, Deep Springs is exceedingly dry, and on its floor the vegetation consists of sparse low desert brush (*Chrysothamnus*). The surrounding mountains support growths of juniper and piñon.

The valley has few sources of water. Aside from washes carrying water only during infrequent desert rains, I know of only three. Wyman Creek, the course of which leads into the northern end of the valley, contains a little water, at least in its upper reaches, most of the year, and tiny Antelope Spring, on the west side of the valley, appears to be permanent, but neither of these contributes water to the valley floor, except during exceptionally heavy rains. The chief water source is formed by the Buckhorn or Deep Springs, which flow from the base of the southeastern valley wall just above the sink. These springs issue from the rocks for a distance of a mile or more, but only a few of them have a strong flow. The flow from the more southerly springs forms a marshy area of several acres, the water finally draining down into a shallow lake of alkaline, sulphurous water that sometimes reaches a diameter of a mile or more. There is also a smaller pond of good water between the springs and the lake.[1] The marshy area and the watercourses through it emit a strong sulphurous odor. Much of this is apparently due to sulphur bacteria, but some of the springs themselves must carry sulphur.

This background material is given to indicate the peculiar habitat and restricted range of the *Bufo* now to be described. Discovery of the toad came about in a peculiar way.

Professor G. F. Ferris, of the Stanford Natural History Museum, has visited Deep Springs School, in the north end of the valley, at various times and has taught there. Several years ago he told me that he had once seen small fishes (resembling cyprinodonts) in the streams in the marsh or in the near-by pond, and when Dr. Carl L. Hubbs was planning his investigations of the fishes of the Great Basin I suggested that he collect at Deep Springs. He visited the valley in September, 1934, and found no cyprinodonts, but collected a number of toads in the marsh. I saw these toads in Ann Arbor in 1936 and realized their distinctiveness. I then forgot them until,

[1] This pond now contains carp, according to Hubbs. *Cyprinodon* has recently been introduced into the marshy watercourses by R. R. Miller.

in March of 1937, on returning from one of his trips to the valley, Professor Ferris presented me with a bucket containing five live Deep Springs toads. The appearance of these in life was so remarkable that I wrote at once to Mrs. Gaige, who generously asked me to describe the creature. Later, I visited the valley myself and collected a fine series.

Bufo exsul, new species

DIAGNOSIS.—A localized derivative of *Bufo boreas,* closely similar to *B. b. nelsoni* in its small size, narrow head, and smoothness of skin, but sharply distinguished from *nelsoni,* from all forms of *boreas,* and, indeed, from any other North American *Bufo* by its strange color. The dark dorsal markings of *boreas* have enlarged, fused, and darkened until the upper surfaces are almost entirely a shining lacquer black (deep dull blackish brown in alcohol; grayish black in formalin), the remnants of the light interspaces remaining as irregular, whitish or brownish vermiform markings, and the vertebral line showing as a, frequently greatly interrupted, white or whitish hairline down the middle of the back. The markings of the underside are even more remarkable and diagnostic. The sparse black spots of *boreas boreas* or *boreas nelsoni* have developed into a dense mottling or marbling of black, which appears in life as if made with india ink. Not only are the belly and lower surfaces of the tibiae and tarso-metatarsals heavily marbled, but the throat is usually spotted, and the undersides of the femurs and rump are completely black except for the tubercles, which are white. The tarsal fold is very poorly developed and is almost obsolete in most of the specimens.

HOLOTYPE.—University of Michigan Museum of Zoology No. 83357 (formerly Stanford No. 2191), a very large female, taken at Deep Springs, Deep Springs Valley, Inyo County, California, on March 24, 1937.

PARATYPES.—All from same locality as holotype, ninety-two specimens, as follows: Stanford Nos. 2192–96, same data as holotype.—U.M.M.Z. Nos. 77971–91, Sept. 4, 1934, Dr. and Mrs.

Carl L. Hubbs.—U.M.M.Z. No. 77970 (six young), same data as preceding lot.—Stanford Nos. 2525–64, May 1, 1937, G. F. Ferris, I. L. Wiggins, G. S. Myers.—Stanford Nos. 2570–75, July 24, 1937, R. R. Miller.—Also duplicates originally part of the large Stanford lot collected by Ferris, Wiggins, and Myers, as follows: U. S. Nat. Mus. Nos. 104314–15, Mus. Comp. Zool. Nos. 23056–57, Calif. Acad. Sci. Nos. 71999–72000, Carnegie Mus. Nos. 13038–39, Field Mus. Nos. 28851–52, L. M. Klauber Nos. 29098–99, Mus. Vert. Zool. Nos. 26048–49.

DESCRIPTION OF HOLOTYPE.—Head rather narrow, its width approximately three times in length to vent, with a weak canthal angle. Snout moderately rounded when viewed from above, the eyes projecting somewhat beyond the line of the upper lip. In profile the snout is bluntly rounded but sloping and not vertically truncated, the upper lip being the most anterior point. Nostrils slightly nearer to eye than to tip of upper lip, the distance from the eye equal to internarial space and to interocular space, which is flat. No cranial crests. Loreal region somewhat inclined, slightly concave. Depth of subocular area equals half length of exposed part of eye. Distance from nares to tip of upper lip equals length of exposed part of eye. Tympanum indistinct, its upper posterior border partly obliterated, vertically oval in form, its depth equal to distance from nares to eye, or not quite two-thirds horizontal diameter of orbit. Tympanum close to eye, its distance from latter scarcely equal to the narrower (horizontal) diameter of tympanum. Distance of tympanum from the corner of the mouth (directly below it) equals slightly more than (vertical) depth of tympanum. Parotoid glands moderate, oval to triangular, wider and more distinct posteriorly than anteriorly, where they fade out just before reaching eyes, their length approximately equal to distance from eye to tip of upper lip (snout tip); the glands are much farther apart than their own width and do not descend to the sides very appreciably behind the tympanum.

Arms moderately stout, the fingers entirely free of web. Third finger longest; second and fourth approximately equal,

reaching base of penultimate phalanx of third. First finger equal to or barely surpassing second. Subarticular tubercles single, well developed only at base of each finger. Several small, scattered tubercles on each palm. Two distinct, enlarged palmar tubercles, the outer large and rounded, its highest point toward its distal end, the inner about half the size of the outer and somewhat more convex.

Legs stout and relatively short, the tarso-metatarsal joint reaching middle of tympanum when leg is brought forward, the heels not quite touching when femur and folded tibia are brought to right angles with body. Toes more than half webbed, the web reaching as far as the base of the antepenultimate phalanx of the fourth toe and the penultimate phlanges of the other toes; the webs are not greatly excised. Inner metatarsal tubercle moderate, elongate-oval in form, its end only slightly free and without cutting edge; the tarsal fold running proximally from the tubercle is nearly obsolete and only barely visible. Outer metatarsal tubercle smaller, rather conical and rounded. Subarticular tubercles of toes single but weak.

Entire upper surface remarkably smooth, all the warts present being low and without spines. Upper eyelids and all surfaces of head to behind the eyes perfectly smooth. Arms smooth except for traces of low warts near shoulder. Dorsum with a number of low, smooth, rounded or oval warts, more or less arranged in irregular longitudinal series, of which there are perhaps six (three on each side of back). The warts are inconspicuous, seldom much larger than the tympanum and are usually nearly as far from each other as their own widths. The warts on the sides are similar to those on the back, but are smaller and almost obsolete. They are slightly better developed just behind the ricti. Upper surfaces of femora each with an irregular longitudinal row of warts or glands, smaller than those of the dorsum, and a few scattered smaller ones. Upper surfaces of each of the tibiae smooth, the central section somewhat swollen into one very large, very poorly defined, rather flat, smooth gland or wart; a few small warts distal to

this. Upper surfaces of tarsus and foot smooth. Undersurfaces of body and legs smooth except for the usual aggregation of small low pustules under the rump and neighboring parts of the femora and belly. The skin of the dorsum has been described as smooth. It is, however, broken up on the sides and various other places by a rather coarse, triangular areolation, this representing the creases where the skin folds. The skin between is as smooth as in any *Rana*. The skin is not especially loose and voluminous. More than half the tibia is free of the skin of the groin.

Coloration of dorsum almost entirely deep blackish brown (shining lacquer black in life) marked with an irregular, much broken, coarse network of whitish, the most prominent parts of which are two irregular, broken, longitudinal series near the lateral borders of the dorsum, and an amoeboid patch on each parotoid. The narrow, white vertebral line is very distinct. Upper parts of snout, eyelids, arms, hands, legs, and feet marked similarly with whitish.

The palms and soles are grayish black (deeper in life), with the tubercles light; the undersurfaces of the arms are blackish with light flecks, and the concealed parts of the tibiae and the knees are boldly mottled with black and white. The whole of the tuberculated area under the rump (extending a short distance forward on the abdomen) is solid blackish, the tubercles white. The entire belly, from the tuberculated area forward to the throat, is boldly marbled black and white, the black patches anastomosing and at least equaling the white in

MEASUREMENTS OF HOLOTYPE (IN MM.)

Total length (legs outstretched)	120.0	Length of hind foot (to tip fourth toe)	32.5
Snout, tip to vent	57.5	Spread of hind foot	20.0
Length of head (medially to basis cranii)	15.0	Width of tibia	7.0
Width of head	20.0	Length orbit	7.0
Length of arm (to tip third finger)	33.0	Length of exposed part of eye	5.5
Length of femur (from midline of body)	21.0	Interocular (interorbital)	4.0
Length of tibia	20.5	Depth of tympanum	4.0
		Width of upper eyelid	4.5

area. The throat is mostly dirty grayish white, but is marked by a number of black spots.

REMARKS.—The general coloration varies little throughout the very large series of specimens. Many show variation in the marbling of the undersurfaces, but the entire belly is always well covered with black spots or marbling, and the tuberculated area beneath the rump is always black, with the tubercles white. Only in a few of the smallest specimens (evidently young of the year), more especially in the six young listed under U.M.M.Z. No. 77970, is there any approach to the normal dorsal coloration of the ordinary races of *boreas*. In the five smallest of these the normal grayish ground color is dominant, and the dark spots are discrete entities, but these spots are large and the venters are much more heavily spotted than in *boreas*. Moreover, the largest of the six has already largely assumed the typical dorsal color of *exsul*, and the "seat" in all is typically dark, with white tubercles. It is evident from these and other young in the Stanford series that the dorsal coloration of young of the year is rather similar to that of neighboring races of *boreas*, and that the typical *exsul* color is normally developed by the second year, but it would seem that the black "seat" is present in all but the very young.

Mention should be made of the relation of preservation to color. The upper surfaces and belly mottling of the live toads has been described as "lacquer black." In alcohol fixed specimens that have been kept in alcohol, this color fades a little to a brownish black. Moreover, the black "seat" is, unlike the other body color, evanescent to a degree in the live toad; it fades to a grayish black when the toad is in poor condition, or when etherized. (The plate of the type was taken from the live specimen narcotized with ether.) The "seat" remains dark in alcohol fixed and preserved frogs. Fixing and preservation in formalin, however, even with subsequent transfer to alcohol, fades all the black pigment, especially the "seat," to a dull grayish black, so that comparison of formalin specimens of *exsul* with formalin specimens of adjoining forms of *boreas* gives but little idea of the remarkable and striking

differences seen in the live animals. It is to be noted, however, that formalin fixing of half-grown or adult *exsul* does not bring out the pattern of *boreas* in *exsul;* it merely results in a graying of the whole toad. The Michigan specimens of *exsul* were apparently all formalin fixed and later alcohol preserved, while all of the Stanford series were originally fixed in alcohol.

THE NATURE OF THE POPULATION OF *B. exsul.*—In the late Pleistocene, the whole of the desert area in which Deep Springs Valley is set down was relatively well watered and supported a rather lush vegetation and forests. Since that time progressive aridity has made the region one of the most forbidding in North America, and the amphibian populations, no less than those of the fishes, have managed to exist only in the relatively few and widely separated areas watered by desert springs. The Deep Springs toad has probably been cut off from communication with surrounding populations for a very long time. The high passes into the valley are dry and are as impassable barriers to amphibians as to fishes, even during the infrequent rains. Soldier Pass, into Eureka Valley to the south, is not much higher than the floor of Deep Springs Valley, but it is dry and its southern slope is long, since the floor of Eureka Valley is much lower than that of Deep Springs. Toads might get out, but toads almost certainly would not get in by this pass. Parenthetically, nothing is known of the toads of Eureka Valley, if any exist there.

Bufo exsul is almost an aquatic toad. Few of the many specimens seen (perhaps not 1 per cent) have been out of the water, and they dive and hide under the banks of the sulphurous watercourses in the marsh almost as expertly as a *Rana.* The toads are therefore absolutely restricted to the watercourses and marsh about the springs. None was seen where the water issues from the rocks. The entire habitat is therefore not over a few acres in extent, and I believe I saw, when on the ground, more than half of the entire population, which cannot be over 600 or 700 individuals at any one time.

The uniformity of the population in the remarkable black

and white color, especially when hundreds are seen in the field, is most striking, and their genetic constitution, at least in regard to color, must be fairly uniform. The coloration is not, however, a protective one, since these black and white amphibians were remarkably conspicuous in the short marsh grass and in the little streams. Another population seems to exist across the valley at Antelope Spring, where Ferris recently, he tells me, saw one toad of the same black as that at the main springs, but the Antelope Spring population must be very small indeed.

It has been suggested that the black of *exsul* may have some relation to the sulphurous water inhabited by the toads. This may be true, but at least some of the water in or near the marsh is not sulphurous. It has been mentioned above that the cause of the sulphurous condition may be sulphur bacteria, and the films seen on the bottom and other objects in the water strongly point to this. In any event, to prove the connection between the sulphurous water and the blackness of the toads would require experiments quite beyond my means, in both time and money. Moreover, Antelope Spring, which is said not to be sulphurous, is reported to support black toads. It is my belief that the black is a good genetic character.

It is perfectly plain that *exsul* is the Deep Springs representative of the *boreas* complex, which exists in many forms not yet nomenclaturally recognized at desert springs over much of Nevada and southeastern California. *B. exsul* is, however, a very small, very isolated, and very uniform population of this stock, and it has developed characters quite out of line with the other desert populations.

Comparisons with related stocks.—As I have mentioned above, the toads of Eureka Valley to the south of Deep Springs Valley are unknown, if they exist. I have had for comparison five toads (U.M.M.Z. No. 77967) collected by Dr. and Mrs. Hubbs at Fish Lake, in Fish Lake Valley, Nevada, just east of Deep Springs; four specimens (Stanford Nos. 2197–2200) practically topotypical of *B. boreas nelsoni* Stejneger, collected by Myers and Wales one-half mile east of Beatty, Nye County,

Nevada; an excellent series of twenty adults (Stanford Nos. 2505–24) representing the lower Owens Valley population, collected by Ferris, Wiggins, and Myers in Diaz Lake, at the base of the Alabama Hills, two and nine-tenths miles south of Lone Pine, Inyo County; and a number of specimens from various localities in the higher altitudes of the upper Owens Valley, chiefly from Hot Creek, Mono County, about thirty-nine miles north of Bishop.

The subspecific status of all these four samples is not too clear, and will not be until there is an extensive overhauling of the desert (and western) races of *boreas*. To judge by Linsdale's[2] arrangement of his Nevada toads, an arrangement which I, for one, do not believe to be at all final, the Fish Lake Valley and Hot Creek toads should be *boreas boreas,* while the Beatty examples are without any doubt *boreas nelsoni.*[3] The Diaz Lake toads are much larger than are specimens of *nelsoni;* they approach though they do not nearly reach the size of adult *boreas halophilus* of coastal southern California. They are comparatively well spotted beneath, usually with a few spots on the throat, and some of them (especially No. 2513) approach the coloration, but not the structure, of *B. canorus* Camp. For the present I do not attempt to place these Diaz Lake toads subspecifically, but I have reason to believe that the southern Owens Valley toads will, upon further investigation, be held to represent a distinct race, perhaps more closely related to *canorus* than any of the other races of *boreas.*

The five Fish Lake toads are from 30 to 55 mm. in head and body length. The tarsal fold is rather well developed, and the skin between the warts is rough. One, contrary to Linsdale's findings in his sixteen Fish Lake examples, has only the barest trace of spots on the belly and none on the throat, another has a sparse sprinkling of belly spots and just a trace on the throat, and the other three have the belly and throat well spotted. The largest has, in addition, a tendency toward the black

[2] "Amphibians and Reptiles in Nevada," *Proc. Amer. Acad. Arts and Sci.,* 73 (1940): 203.

[3] I agree fully with Linsdale that *B. boreas nelsoni* should be recognized as a subspecies.

"seat" of *exsul.* Moreover, the dorsal coloration in all is of the common type seen in all races of *boreas,* with no tendency toward the striking black and white pattern of *exsul.*

The upper Owens Valley toads, at least as far south as Laws, Inyo County (Stanford No. 2680), are all rather similar in the general dorsal pattern, in the rough skin between the warts, and in the presence of a strong tarsal fold, but variable in the spotting of the belly and throat. A few even have a tendency to a dark "seat." The adults are much larger than those of the desert races to the east and southeast. They show no approach to *exsul,* and I tentatively identify all of them as *B. boreas boreas.*

The Diaz Lake toads have already been commented upon. They are much smoother than are the northern Owens Valley specimens, not only between the warts but with regard to the warts themselves, though not nearly as smooth as are specimens of *exsul.* The tarsal fold is somewhat more obsolete than in the northern toads, but is much better developed than in *exsul.* The belly and throat spotting is variable, ranging from almost absent (No. 2520) to rather heavy, but always far less than in *exsul.* A black "seat" is never developed, although a few show a slight darkening. In nearly all there is some tendency to obsolete cranial crests, as in most of the races of *boreas,* and, indeed, in most bufos that are commonly described as lacking crests. In this, as in the other characters, they are abundantly distinct from *exsul,* and no intergradation is evident.

The four Beatty specimens of *nelsoni* are, in the general shape and the smoothness of the skin and warts, extremely similar to *exsul.* They are narrower bodied than are the other *boreas* races, although this character is scarcely measurable in *Bufo.* They differ widely from *exsul,* however, in the almost unspotted belly, in the perfectly clear throat, and in the better development of the tarsal fold. In color, there is no approach at all to *exsul.*

I have made numerous measurements of the series of *exsul* and of some of the near-by races of *boreas* in an attempt to

find proportional characters. There appear to be none of any importance. The characterization of *exsul* must, therefore, rest upon its smooth skin and upon its nearly obsolete tarsal fold, which together distinguish it from all forms of *boreas* save *nelsoni* and perhaps the lower Owens Valley toads, and especially upon its several remarkable color characteristics, in which every individual seen (certainly more than one-half of the entire existing population) over the age of a year is uniformly distinctive. If, as I believe, these color characters are genetically controlled, and if no nearer approach to intergradation with surrounding populations than I have found is discovered, *exsul* is, indeed, a species in the usually accepted sense.

THE SYSTEMATIC STATUS OF THE DEEP SPRINGS TOAD.—I have been criticized by one or two of my colleagues for giving full specific rank to *Bufo exsul.* It is pointed out that the toad is merely one of the local races of *boreas* that has developed a peculiar color. I think it will be evident from my diagnosis and discussion that I understand these points fully, and accept them. I wish also to point out the strange similarity of *exsul* to a European toad, *Bufo bufo gredosicola,* recently described from the Sierra de Gredos in Spain by Müller and Hellmich,[4] and given only subspecific rank. The question, however, is purely one of nomenclature and systematic principles and has nothing to do with an understanding of the taxonomy of the problem. As I have recently had occasion to point out in several instances, taxonomy (= systematics) is a study of the nature and evolution of natural populations and has nothing to do with the names given to the categories adopted or to the populations studied. In other words, the really important thing is knowledge of the populations themselves. If we have this, we can then think about terms. But the terms must be uniformly understandable, even though the actual populations considered be of such varying "rank" as to make any system adopted a mere approximation of the truth. Therefore, I can-

[4] L. Müller and W. Hellmich, "Mitteilungenüber der Herpetofauna der iberischen Halbinsel. . . .," *Zool. Anz.,* 112 (1935): 54, Fig. 4.

not see why the old Bairdian system in which a species is a nonintergrading entity (and a subspecies an intergrading one) should be thrown overboard for a system that uses trinomials merely "to show relationship" and thus deserts the only real standard ever had for the recognition of species. If the criterion of nonintergradation is discarded, what peg is there left, other than individual opinion, on which to hang the term species? Even the Germanic *Rassenkreis* enthusiasts, who recently "discovered" the essential facts about subspecific and specific chains that have long been known and recognized in this country and to whom may be ascribed much of the systematic nonconformism now sweeping some of our less securely anchored ornithologists, have been unable to supply a definable peg to substitute for the one they are attempting to knock down.

Bufo exsul does not intergrade with any of the races of *boreas* in several interrelated color characters. I am, therefore, giving it full specific rank. If any of my colleagues desires to reduce it to subspecific rank, he may do so very easily. But to do so he must either prove an intergradation that my specimens do not show or differ profoundly from me in an understanding of the term species.

Exsul, an "exile" or "castaway," which *Bufo exsul* certainly is.

NOTE.—*Bufo exsul* has perhaps the most restricted range and the fewest living representatives of any known amphibian. It is a queer and interesting relict, and it is to be hoped that herpetological collectors will not too greatly reduce the population. The Natural History Museum of Stanford University is ready to supply reputable institutions really needing specimens with material from its relatively large series. It is also to be hoped that the proprietors of the Deep Springs School will not endanger the existence of this strange creature by the introduction of bullfrogs or other predators into its small territory, a reprehensible type of destruction that has become all too common in desert spring areas of the Southwest.

PLATE I

Bufo exsul, new species.

FIG. 1. Dorsal view of holotype.

FIG. 2. Ventral view of holotype.

Photographed by Dietrich Bodenstein from the live specimen, narcotized.

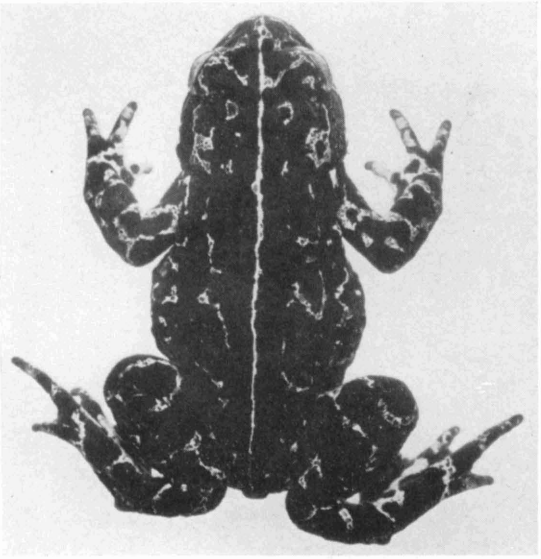

FIG. 1

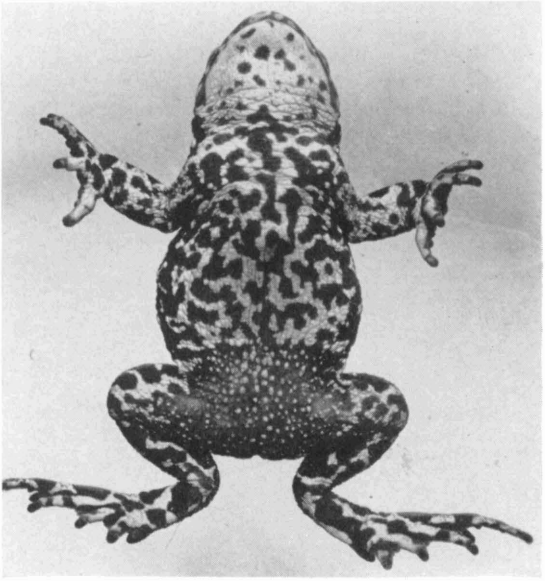

FIG. 2

PLATE II

FIG. 1. Deep Springs and other toads, dorsal view (Stanford collection). Left to right, above: Nos. 2199, 2200, *Bufo boreas nelsoni,* one-half mile east of Beatty, Nye Co., Nevada; Nos. 2520, 2518, *B. boreas* subsp., Diaz Lake, two and nine-tenths miles south of Lone Pine, Owens Valley, California. Below, a typical series of *Bufo exsul,* left to right, Nos. 2525, 2196, 2545, 2192. Photographed by Dietrich Bodenstein, from alcohol fixed and preserved specimens.

FIG. 2. Ventral views of the same toads shown in Figure 1, in the same left to right arrangement. The Deep Springs specimens were selected to show the greatest possible variation of adults in ventral markings. Photographed by Dietrich Bodenstein.

FIG. 3. Adult specimens of *Bufo exsul, B. boreas boreas,* and *B. boreas halophilus,* to show relative size and color differences (Stanford collection). Left to right: No. 3603, *B. b. halophilus,* Los Angeles River, at Los Veliz Avenue bridge, Los Angeles, Calif.; No. 3605, *B. b. boreas,* Convict Creek, Mono Co., Calif.; No. 2525, *B. exsul,* Deep Springs. Photographed by Dietrich Bodenstein, from alcohol fixed and preserved toads.

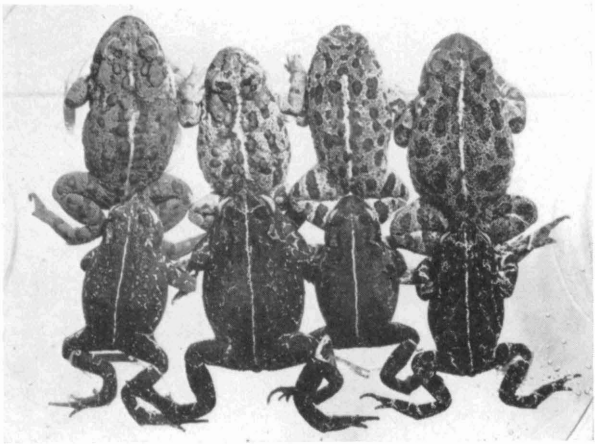

FIG. 1

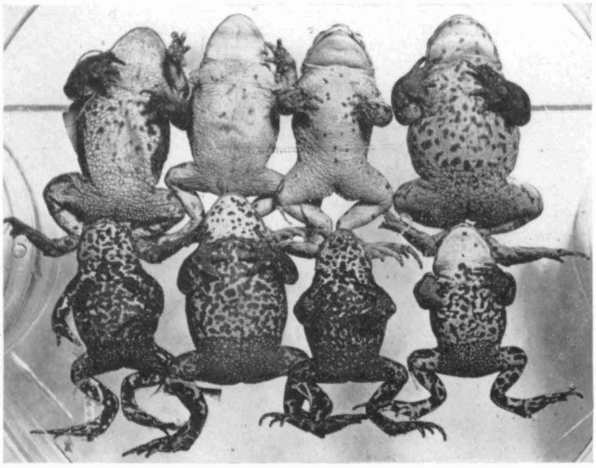

FIG. 2

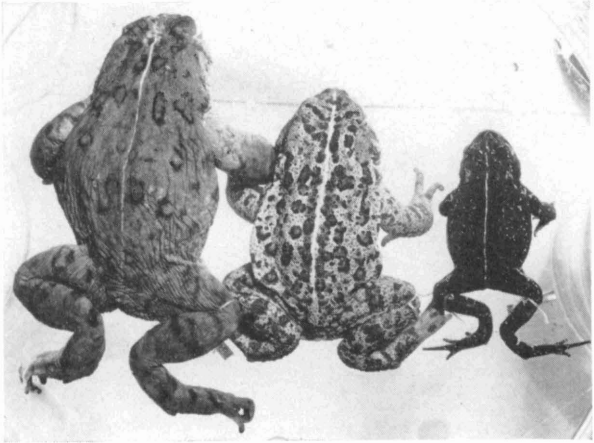

FIG. 3

George S. Myers

PLATE III

Habitat of *Bufo exsul*. Part of the marsh at Deep Springs, photographed by Ira L. Wiggins, on May 1, 1937.