

Agkistrodon in Europe (Reptilia: Serpentes: Viperidae)

ROGER CONANT

With 1 figure

Agkistrodon has long been considered as a part of the fauna of Europe but, during the preparation of a monograph on the genus and its allies (GLOYD & CONANT, in prep.) questions arose concerning whether it still occurs on that continent. Has it survived in the areas from which it previously was reported? Have the numerous and varied changes in the boundary between Europe and Asia, which began to appear on maps soon after World War I, resulted in the line being shifted far enough to exclude pit vipers from Europe?

Although the natural distributions of animals are unaffected by man-made political boundaries, it seemed desirable nonetheless to investigate the subject. Two references were of particular interest.

(1) In his "Snakes of Europe", BOULENGER (1913: 264) stated that *Ancistrodon* (= *Agkistrodon*) *halys* was known in Europe from only two arid tracts between the Volga and Ural rivers near the Caspian Sea, viz., the Saltan-Murat Desert and the Induski Hills.

The Saltan-Murat Desert was about two days journey northeast of Krasnoi Jar at the mouth of the Volga, according to STRAUCH (1873: 242), and the map of the region in PALLAS (1776: 575) clearly shows Festung [Fort] Krasnojarsk on the east bank of the Volga close to its mouth. The Induski Hills (or mountains), according to SCHREIBER (1912: 591), are not far from the Fortress Inder-skaja Gorskaya (the Russian town of Inderborskiy), which is on the east bank of the Ural approximately 175 km north of the mouth of that river and near Ozero (lake) Inder.

Although he included no map in his "Snakes of Europe", BOULENGER (1913) evidently considered the Ural River to be part of the continental boundary, because he gave the ranges of *Coluber dione* and *Ancistrodon halys* in European Russia as between the Volga and Ural. His concept of the southern boundary, between the Black and Caspian seas, was evidently the crest of the Caucasus Mountains, inasmuch as he included *Tarbophis iberus* as a component of the European fauna because it was on record from the northern slope of that range. Some of the contemporary atlases, however, such as PERTHES (1908: pl. 7) and REYNOLDS (1914: 77) showed Europe as extending south of the Caucasus to the borders of Persia and Turkey.

(2) The Russian field guide to amphibians and reptiles (BANNIKOV et al. 1977: map 107) indicated a number of localities for *Agkistrodon* north of the Caspian Sea. An inquiry regarding them was addressed to Dr. DAREVSKY, of the Zoological Institute, Academy of Sciences, Leningrad, and he reported that the presence of *Agkistrodon* at Ozero Inder, near the Induski Hills (= Indersky Mountains), is documented by several specimens (ZIL 16206, 16208-16209) in the Leningrad collection, and that it is the only locality in the Ural River Valley supported by material in Russian museums with the exception of Gur'jev (ZIL 16960). (The National Museum of Natural History, Washington, D.C., U.S.A., also has a specimen, USNM 14319, from Gur'jev.) Through an unfortunate oversight, Gur'jev, which is at the mouth of the Ural, was not plotted on map 107 (BANNIKOV et al. 1977).

DAREVSKY stressed that the localities shown in the lower Volga Valley are based on data from the older literature, and that the genus has not been found west of the Volga during the past 100 years. A party of his colleagues searched for it in the area as recently as the summer of 1980, but without success. Thus *Agkistrodon*, in all probability, still occurs in the lower Ural Valley, including the Indersky Mountains, but its survival in the lower Volga Valley is open to doubt or at least is unproved.

The boundary between Europe and Asia, which had long been comparatively stable, underwent a highly confusing series of changes soon after World War I as a result of events occurring in the UdSSR. Dr. E. NICHOLAS ARNOLD, of the British Museum (Natural History), was able to provide an important clue concerning what had happened by appealing to the Royal Geographical Society for an opinion. The reply from that organization (in part), in the words of Dr. ARNOLD, was that "The earliest instance they have of a change is in the Statesman's Year Book for 1926, but they are not clear about the surrounding circumstances. Certainly there was no international agreement, for there is no body that rules on supranational boundaries. It seems that the apparent continental boundary change is really based on internal rearrangement of borders between constituent republics of the UdSSR. This took place in the 1920's but, because the period was so turbulent, it is impossible to say exactly when."

In an effort to trace at least some of the relocations, literally dozens of maps and references in three languages were examined and, from a comparison of these, several interesting facts emerged. It is superfluous to attempt following the detailed peregrinations of the boundary, but a few examples will indicate some of the trends and show how the shifts could have affected the basic question of whether *Agkistrodon* is currently represented in Europe.

One of the first notable changes, at least in the area of immediate concern, occurred when the line was moved from a short distance west of the Ural River to a new one close to the Volga, apparently to make the continental border agree with the western limits of the Kazakhskaya SSR. This alteration may be readily seen in SHEPHERD (1973) by comparing map 167 (Europe, 1871-1914) with map 168 g (Europe in 1929). According to either of these two maps all records for *Agkistrodon* from the Ural Valley would be in Asia.

The conventional boundary along the Ural Mountains was also moved (BETHEL 1957), by the political division of the UdSSR. into European and Asian

segments, with the net result that the Molotov Region, west of the Urals, was then considered as a part of Asia.

The same source gave the southern (land) boundary of Europe as Iran and Turkey in Asia. Drawing the line along the common border of the UdSSR. and Iran, as was done on many maps for decades, would have the effect of placing



Fig. 1. *Agkistrodon halys caraganus*. Mangyshlak Peninsula, east coast of Caspian Sea, Kazakhskaya SSR. — Photo by R. M. BOWERMAN and J. E. WERLER (Houston Zoo).

Agkistrodon in another part of Europe. NIKOL'SKII (1916: 274) described *Ancistrodon halys caucasicus* three years after the publication of the "Snakes of Europe" (BOULENGER 1913), basing the new form on specimens from the Lenkoran District, which occupies the southernmost tip of Russian territory on the western side of the Caspian Sea. It is now known that *Agkistrodon* is well distributed in the Lenkoran area, according to map 107 (inset) in the Russian field guide (BANNIKOV et al. 1977).

Fortunately, the confusion has now apparently come to an end. MONKHOUSE (1965) reported that the Soviet government had accepted the recommendations of a conference of Russian geographers convened in 1958, and that the boundary now follows the base of the eastern slopes of the Ural Mountains and their extension, the Mugodzhar Hills, the Emba River, the northern side of the Caspian Sea, the Kumo-Manychskaya Vpadina (depression), and the Kerchenski

Strait to the Black Sea. As a result, the Urals are now all included in Europe, whereas the Caucasus Mountains are in Asia. ERAMOV (1975) indicated essentially the same boundary by reporting that the commonly accepted border between Europe and Asia passes through the eastern foothills of the Ural Mountains and along the Emba River to the Caspian Sea and along the Kuma and Manych rivers to the mouth of the Don River.

The Emba River lies to the southeast of the Ural, and thus the entire Ural Valley is now considered to be in Europe and with it the localities for *Agkistrodon* that are supported by museum specimens. Placing the line through the Kumo-Manychskaya Depression, well to the north of the Caucasus, means that the populations of *Agkistrodon* in the Lenkoran District are in Asia.

The taxon of this pit viper complex that presumably is still present in the Ural Valley and possibly also in the Volga Valley is *Agkistrodon halys caraganus*, described by EICHWALD in 1831 as *Trigonocephalus caraganus*.

The question of whether *Agkistrodon* still occurs in Europe can be answered in the affirmative, at least for the present.

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My late close friend and colleague, Dr. HOWARD K. GLOYD, encouraged me to pursue the topic with which this contribution is concerned. Place names in the text are spelled as they appear in the references cited or, in other cases (sometimes in parentheses), they are in accordance with those used in the Times Atlas of the World (1971).

S u m m a r y

The pit viper, *Agkistrodon halys caraganus* (EICHWALD), which is documented by specimens in museums in Leningrad and Washington, apparently survives in the valley of the Ural River. It may also survive in the Volga Valley. Many conflicting changes in the political boundary between Europe and Asia have appeared on maps published since World War I, but the Soviet government has ended the confusion by approving the recommendations of Russian geographers made in 1958. The line, which lies entirely within the UdSSR, follows the eastern slopes of the Ural Mountains and their extension, the Mugodzhar Hills, the Emba River, the north shore of the Caspian Sea, the Kumo-Manychskaya Vpadina, and the Kerchenski Strait to the Black Sea. Thus, the Ural and the Volga are considered to be in Europe, and all records for *Agkistrodon* from the valleys of both rivers are also in Europe.

Zusammenfassung

Die Grubenotter *Agkistrodon halys caraganus* (EICHWALD), die durch Sammlungsexemplare in den Museen von Leningrad und Washington belegt ist, kommt vermutlich noch im Tal des Ural wie auch in dem der Wolga vor. Die politische Grenze zwischen Europa und Asien wurde durch die geschichtliche Entwicklung seit dem 1. Weltkrieg kartographisch unterschiedlich dargestellt. Die sowjetische Regierung beendete diese Unklarheiten, indem sie eine im Jahre 1958 von russischen Geographen empfohlene Grenzziehung anerkannte. Diese folgt dem Ostabfall des Ural-Gebirges und dessen Ausläufern, den Mugodzhär-Bergen, dem Emba-Fluß, dem Nordufer des Kaspischen Meeres, dem Kumo-Manychskaya Vpadina und der Kerchenski-Straße zum Schwarzen Meer. Somit gehören Ural und Wolga zu Europa, und alle Nachweise von *Agkistrodon* aus beiden Flußstätern sind zur europäischen Fauna zu zählen.

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Author: ROGER CONANT, Adjunct Professor, Department of Biology, University of New Mexico, Albuquerque, New Mexico, 87131, U.S.A.