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time in the State this last season. A number of plants were found growing on the edge of a field in Ozaukee County. It probably came in clover seed. It is a member of the borage family and a low-growing plant. The leaves are covered with coarse stiff hairs and the flowers are small and bright blue. It is not likely to become a dangerous weed.

The rough-fruited cinquefoil (*Potentilla recta*) was collected in Dane and Door Counties several years ago. Now it is common in parts of Waukesha County. The plant is upright in habit. The leaves are distinctly digitately five to seven parted and the lemon yellow flowers are rather showy. Bugleweed (*Ajuga reptans*) was first collected on the shore of Pine Lake in Waukesha County in 1909. It is becoming abundant in various parts of the county and has also been collected in Milwaukee County. It is a member of the mint family. The blue flowers are borne in a leafy spike.

Some years ago the field cress (*Lepidium campestre*) was collected in Dane County. In 1924 a few plants were found growing along the electric railway near Calhoun in Waukesha County. Later in the year numerous plants were observed on a right-of-way near Pewaukee in the same county. It is a relative of the common black mustard and is likely to become a pest.

A TWO-HEADED BULL SNAKE

By T. E. B. Pope[25]

On August 4th, 1925, there was brought to the Museum, for identification and temporary exhibit, a small alcoholic specimen of a two-headed snake measuring seventeen and three-quarter inches in length. The specimen was received through Mr. T. E. Breihan of Milwaukee, who stated that he had collected it at Sylvan Grove, Kansas, in the summer of 1902.

Examination of the specimen (figure 152) discloses that it is a young Bull snake (*Pituophis sayi* (Schlegel)). Detailed structural characteristics, such as the number and arrangements of the dorsal head plates, show it to closely resemble and probably be the *Pityophis sayi bellona* (Baird and Girard) described by Cope.[26] The cephalic plates of both heads are similar in number and arrangement and there is a small anterior frontal plate between the four prefrontals and the frontal plate as shown in figure 207 for *P. sayi bellona* B. & G. in Cope. There is also some slight difference in the shape of the prefrontals from those of the figure mentioned, but it more closely resembles that figure than the figures of the other speimens of *Pityophis sayi* and its varieties shown by Cope. Inasmuch, however, as figure 207 of Cope, cited,

[25]Curator of Lower Zoology, Milwaukee Public Museum.
[26]Cope, E. D., "The Crocodilians, Lizards, and Snakes of North America," U. S. National Museum, Rept. for 1898, p. 872, fig. 207, Washington, 1900.

appears to have been based upon a specimen or specimens collected in the Southwest and this two-headed specimen was collected in Kansas, its scientific status appears interesting. Stejneger and Barbour[27] list *Pituophis sayi* (Schlegel) as having a range from Texas to Minnesota but no mention is made of *P. sayi bellona* B. & G. under this or other western species. It is quite probable, therefore, that the specimen under consideration is but a variety of the ordinary *Pituophis sayi*, regardless of its head-plates and other minor structural features.

The subject of two-headed snakes, or, in fact, of any abnormality

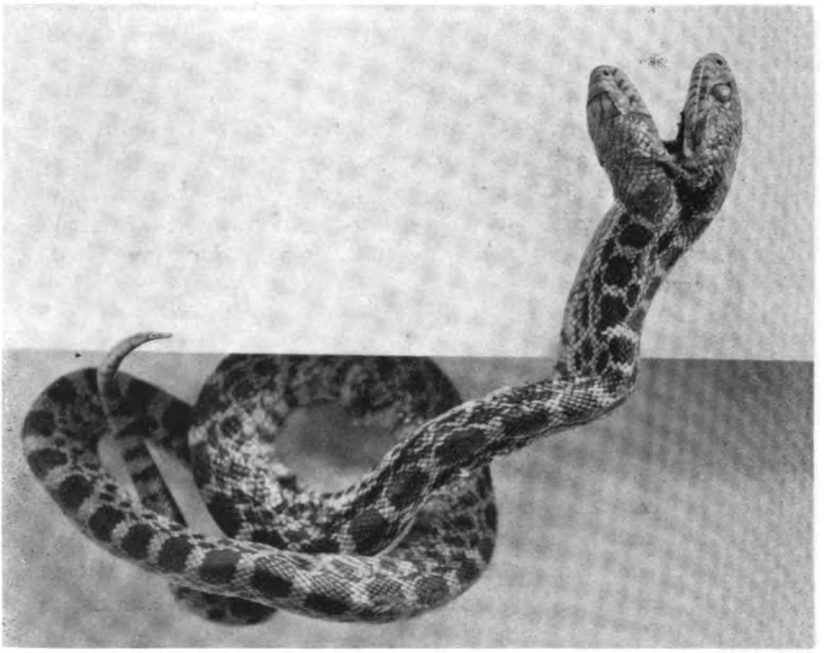

Fig. 152.—Two-headed Bull snake, dorsal view.

of structure in animals, is always of interest to both laymen and trained investigators. Such an occurrence always excites attention and is generally regarded by the average person as a "rarity" even though scientific records contain an abundance of authenticated instances. Then, too, there are relatively few scientists who have such instances come under their personal observation.

A review of the more available literature on the subject of two-headed snakes, shows that such an abnormality is not as uncommon a phenomenon of the reptile world as is generally supposed. Johnson in an article entitled "Axial Bifurcation in Snakes,"[28] gives descriptions

[27]Steineger, Leonard and Barbour, Thomas—"A Checklist of North American Amphibians and Reptiles," p. 86, Cambridge, 1917.
[28]Trans. Wis. Acad. Sci. Arts and Letters, vol. 13, pp. 523-536, 1901.

of thirteen specific cases, illustrations of them by ordinary photographs and Roentgen rays (skiagraphs), a recapitulation of others previously described, and a concluding general treatment on this abnormality. In his table of authenticated instances he lists published records dating back to Aldrovandi in 1640, and in his bibliography includes references to the publications of various authorities up to 1896. So it appears that Redi in 1684, Lacepede in 1789, Mitchell in 1826, and others of like fame, described two-headed snakes prior to the thirteen instances recorded by Johnson. Then subsequent to 1901 we find an article by B. T. B. Hyde, entitled "Two-headed Snakes—A Not Uncommon Phenomenon of the Reptile World"[28] and in 1926 another by Afranio Do Amaral on "Bicephalia Em Ophidios."[29] The latter article cites nine instances or specimens involving six species that came to his attention between 1922 and 1924.

As to the species of snakes in which this abnormality of double-headedness has been reported, the authorities just cited include the following forms that occur north of Mexico in addition to a number of extra-territorial species not here given. The author of the publication in which the species is mentioned, is given after the technical name of the species he uses, also the number of specific cases mentioned by the author if more than one.

Hog-nose Snake (*Heterodon contortrix*) Hyde.
Hog-nose Snake (*Heterodon simus*) Johnson.
Black Snake (*Bascanium constrictor*) Johnson (5).
(*Coluber constrictor*) Hyde.
Fox Snake (*Elaphe vulpina*) Do Amaral.
Western Bull Snake (*Pityophis catenifer*) Johnson.
Bull Snake (*Pityophis sayi*) Johnson-Hyde.
King Snake (*Ophiobolus getulus*) Johnson (2).
(*Lampropeltis getulus*) Hyde-Do Amaral.
Milk Snake (*Lampropeltis triangulum*) Johnson. (This is the same specimen figured and described in both Hyde and Do Amaral).
Water Snake (*Tropidonotus fasciata sipedon*) Johnson (4).
(*Natrix sipedon sipedon*) Do Amaral (2).
Water Snake (*Tropidonotus natrix*) Johnson (2).
Water Snake (*Tropidonotus fasciata fasciata*) Johnson.
Garter Snake (*Eutainia sirtalis*) Johnson (2).
Garter Snake (*Eutainia elegans lineolata*) Johnson.
Garter Snake (*Thamnophis radix*) Hyde.
Copperhead (*Agkistrodon mokasen*) Hyde.
Cotton-mouth Moccasin (*Ancistrodon piscivorus*) Johnson.
Rattlesnake (*Crotalus sp. ?*) Hyde.

According to the above tabulation, we would find that the Water

[28] Jour. Am. Mus. Nat. Hist., vol. XXV, pp. 185-187, 1925.
[29] Revista do Museu Paulista, tomo XV, pp. 95-101, 1926.

Snakes (*Natrix sp.*) appear to lead in the frequency in which the phenomenon occurs, there being no less than nine specific cases mentioned in the publications of these three writers. The Black Snake (*Coluber constrictor constrictor*) was mentioned in six different cases and the Garter Snakes (*Thamnophis sp.*) in four instances. This order of frequency is the same as that given by Johnson[21], and yet Hyde, in his article, quotes Prof. J. E. Guthrie of Iowa State College, as stating, "It is interesting to know that the Copperhead seems to contribute more

Fig. 153.—Two-headed Bull snake, ventral view.

than its share of double-headed specimens, if one may judge from records made." Hyde follows up such a statement with, "Professor Guthrie goes on to say that there are only two instances of double-headedness in snakes that have come under his personal observation: the one a Bull snake embryo, the other a Plains Garter embryo (*Thamnophis radix*)." The tabulation of records, taken from the three publications here considered, include only the one case of Copperhead described by Hyde. The writer of this article does not have available the literature and records upon which Prof. Guthrie has based his state-

[21]Op. cit. p. 532.

ment. Johnson says, "One must expect more of these abnormalities to be found in those species native to regions where most attention is paid to the fauna and also in the most abundant species". And again, "Yet after making these corrections, it is probable that this axial bifurcation is more frequent in some species than in others."

It may be said that there is found a great variation among the authenticated cases of axial abnormality. The majority of cases simply represent cephalic bifurcation (two heads) only, such as the specimen of Bull snake under discussion, the nine cases enumerated by Do Amaral and the thirteen cases described by Johnson. Johnson, however, cites three instances where both cephalic and caudal bifurcation (two heads and two tails) occurred. These were described by Wyman[22] and Mitchell[23]. The specimen described by Wyman, *Tropidonotus fasciata sipedon*, possessed in the middle of the body a double vertebral column and a double set of ribs. Two of the three double-headed snakes, described by Mitchell, not only had a double tail but had three eyes. These two specimens were of the same brood of Black snake (*Bascanium constrictor*) as the third double-headed specimen lacking caudal bifurcation.

Finally, we find very great variation in the degree of bifurcation among these abnormal snakes. A glance at figure 153 shows that our specimen of Bull snake has the two heads joined together just behind the angle of the jaw, there being one fold of skin connecting the lower jaws for one-half of their length and another fold running diagonally from the angle of one jaw to the posterior base of the skull of the other. Where the vertebrae unite to form the single vertebral column is probably within one inch of the heads. Redi, in 1684[24], described a specimen where the spinal cord was double to the middle of the back. This specimen possesses double oesophagi, lungs, stomachs, hearts and livers, but with one intestine and a single set of genital organs. Then on the other extreme we find cases where the two skulls are in organic fusion, as in the embryo Copperhead figured in Hyde or in a Black snake (*Bascanium constrictor*) belonging to the Buffalo Society of Natural Sciences and figured in Johnson[25].

If we should go further in our study of anomalous specimens, we would find other varying factors such as the angle of bifurcation, the angle of cephalic plane, the relative size of divisions (where one head or tail division is longer or shorter than the other), the internal anatomy, etc. These we will pass over.

One of the most interesting inquiries, however, if not the most common one, is as to the behavior of a two-headed snake. Unfortunately, reliable observations as to living specimens are so few that we have little data. The average specimen appears to have been killed before obser-

[22]Proc. Boston Soc. Nat. Hist., vol. IX, p. 193, 1862.
[23]Am. Jour. Science, vol. X, p. 48, 1826.
[24]Osserv—int. agli, anim, vienti, etc., p. 2, tav. 1, 1778.
[25]Op. cit., fig. 2, 2a, plate XXXII.

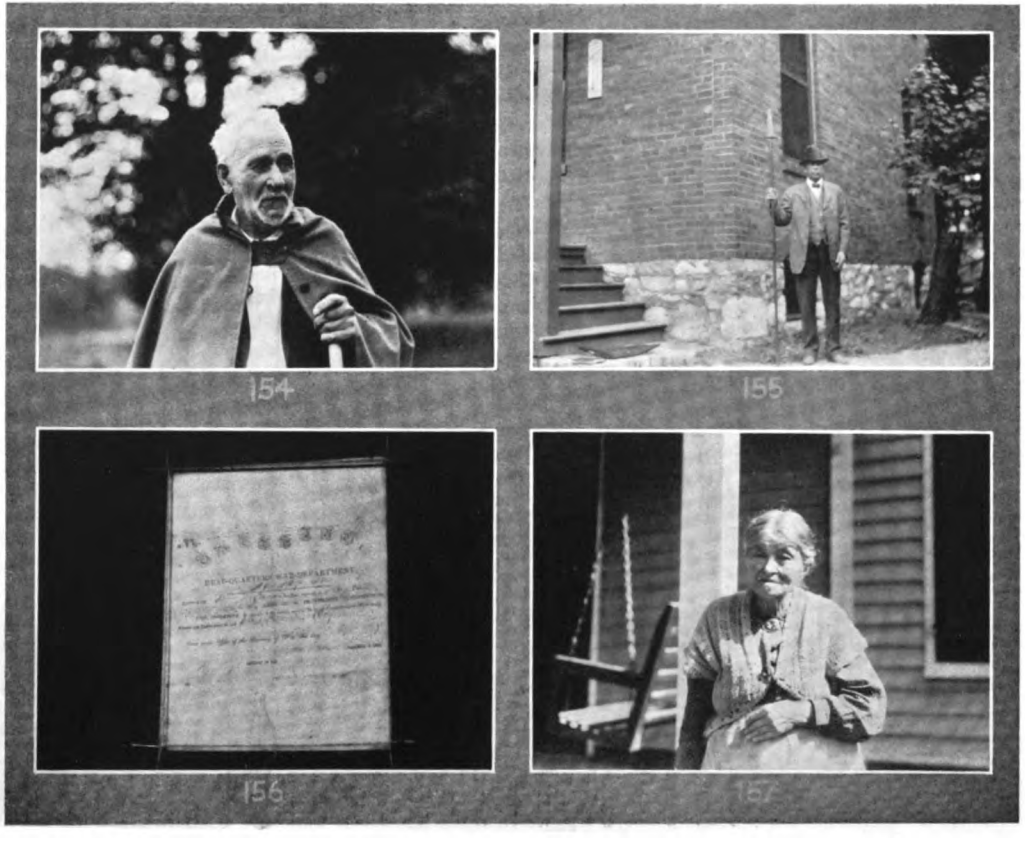

Fig. 154.—Mr. Charles H. Conklin of the Jefferson Guards.
Fig. 155.—Mr. W. B. Packette with a John Brown pike.
Fig. 156.—Captain's commission of William H. Leeman in Provisional Army.
Fig. 157.—Mrs. E. C. Crim, "Mother of the V. M. I."

vations were made or was in an embryonic condition. The capture and captivity of a two-headed Milk snake (*Lampropeltis triangulum*) is most entertainingly told by Mr. Raymond L. Ditmars in Hyde's article. In this account Mr. Ditmars says, "The snake grew more rapidly than usual, apparently due to the fact that each head seemed always hungry. In order that there might not be a congestion where the oesophagi joined, one head was fed at a time, a card being placed between the heads so that one would not know the other was having a satisfying meal; otherwise each brain decided it wanted the morsel and the food was rent asunder."

VISITS WITH NOTABLE PEOPLE IN THE SHENANDOAH VALLEY

By R. S. Corwin[a]

While stationed in the Shenandoah Valley, a party from the Museum had the rare pleasure of meeting several elderly people who had participated in prominent events of the Civil War. Two of these interesting personages live in the attractive City of Charles Town, West Virginia, and are associated with memories of the John Brown Raid at Harpers Ferry in 1859. Of them, the older is Mr. Charles H. Conklin, sole surviving member of the one-time celebrated company of Virginia State Militia, the Jefferson Guards. As a member of this company, Mr. Conklin assisted in the capture of John Brown and performed guard duty during the trial and imprisonment of the famous abolitionists. The other gentleman, Mr. W. B. Packette, did not engage actively in the capture of the raiders, but has become the possessor of many intimate relics of the affair.

When visited in May, Mr. Conklin, whose portrait is shown in figure 154, 87 years of age, was still active, although making use of a walking-stick. The meeting occurred at his residence "Mordington," formerly the mansion of Charles Washington, for whom the city is named. To his eager listeners, he calmly narrated the part he had taken in the dramatic seizure and trial.

Early in the morning of October 17th, 1859, word came to Charles Town that abolitionists had seized the arsenal at Harpers Ferry, eight miles away, and that an uprising of the slaves was threatened. On receiving this startling news, Mr. Conklin, then a young man of 21, had fallen in with his company of militia, the Jefferson Guards, and had marched with them to Harpers Ferry. It was this company which wrested from John Brown's men the bridge over the Potomac, and thus made impossible their escape back into Maryland.

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