

PENNSYLVANIA, Elk Lake, June 28, 1922, G. E. Young, Comm. L. O. Overholts (68555).

TENNESSEE, Knoxville, May 27, 1934 (67781), and June 7, 1935 (70371) P. R. Miller.

WEST VIRGINIA, Rainelle, Sept. 20, 1928, W. A. Archer (U. S. Dept. Agr. and West Va., Agr. Exp. Sta. Plant Disease Survey 3033, labelled *Gleosporium saccharinum* E. & E.).

WISCONSIN, Madison, Univ. Drive, June, 1894, labelled *Gleosporium saccharinum* E. & E.

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ANTHROPOLOGY.—*Aconite arrow poison in the Old and New World.*¹ ROBERT F. HEIZER, University of California. (Communicated by HENRY B. COLLINS, JR.)

This short discussion is intended primarily to call attention to the distribution of the use of various species of *Aconitum* plants for arrow poison, and to indicate the possible significance of these occurrences. *Aconitum* is a genus of plants belonging to the Ranunculaceae, the buttercup family, embracing about 60 species. Aconite contains quantities of an alkaloid, pseudoaconitine, a very deadly poison. The pharmacology and toxicology of aconite are not dealt with here. Santesson (1936) and Lewin (1923) have much data on these.

H. B. Collins (1937, pp. 280, 345, 373-378) and F. de Laguna (1934, pp. 217-220) present evidence indicating an Asiatic-American culture connection *via* the Aleutian islands, basing their conclusion on the distribution of such elements as the oval stone lamp, roof entrance, labret, refuge island, notched and grooved stones, stone with hole, hunter's lamp with ring, bone arrowhead with blade but no barbs, etc. For the most part these elements seem to be explainable as having an American provenience, the Asiatic littoral being the recipient. The occurrence of the use of the extract of pounded aconite

¹ Received May 13, 1938.

roots for poisoning weapon points may be another of these Asiatic-American elements—the distribution map would indicate the tenability of this interpretation since the practice is unknown among the Asiatics north of Kamchatka and the Eskimo north of the Alaskan Peninsula.

The following presentation is in the order of the numbers on the distribution map.

1. *Kodiak Island*.—Sauer (1802, p. 177) gives a very specific account of the use of pounded aconite roots for poison among the Koniag. He says:

They [the Koniag] also use poison to their arrows, and the Aconite is the drug adopted for this purpose. Selecting the roots of such plants as grow alone, these roots are dried and pounded, or grated; water is then poured upon them, and they are kept in a warm place till fermented: when in this state, the men anoint the points of their arrows, or lances, which makes the wound that may be inflicted mortal.

Sauer also states (p. 180) that sea lion are hunted with poisoned arrows. He remarks (p. 181) that:

Whales are in amazing numbers about the straits of the islands, and in the vicinity of Kodiak; the natives pursue them in their small boats, and kill numbers with a poisoned slate-pointed lance.²

2. *Aleutian Islands*.—It is not known whether the Aleuts used aconite to poison their weapon points. They hunted whales, however, in the Kodiak fashion, with a detachable slate lance head. Miss Margaret Lantis tells me that her Aleut informants from the island of Atka remembered that in former times a deadly plant poison was made from the juice of roots. The possibility is that aconite was used, yet we cannot be sure. I am indebted to Mr. H. B. Collins for calling my attention to the following references. Petroff (1884, pp. 154–155), translating from Veniaminof, says of the Aleuts:

The pursuit of whales was encumbered with many observances and superstitions. The spear-heads used in hunting the whale were greased with human fat, or portions of human bodies were tied to them, obtained from corpses found in burial caves, or portions of a widow's garments, or some poisoned roots or weed. . . . Then, taking with him a companion, he proceeded to the shore where he presumed the whale had lodged, and if

² Associated, particularly on Kodiak, with actual whale hunting by means of a poisoned slate lance head was a great complex of observances, ceremonials and taboos regarding whalers and whaling. Lisiansky (1814, p. 174) describes a magical substance, or we might say, a ceremonial poison. He states that: "These bodies [of deceased whalers] are said by some to be stolen, from the idea that the possession of them conduces to render the fishing season prosperous; and by others, that a juice or fat is extracted from them, into which if an arrow be dipped, the whale, when wounded by it, dies the sooner." Weyer (1932, p. 309) describes the same thing, using de Laguna's information from Athabascan informants of Cook Inlet who knew of Koniag whaling. Weyer believes this to be a fetish substance and not an actual poison. Miss Lantis is now publishing a full account of the whale cult in the northern hemisphere which has further data on this aspect.

the animal was dead he commenced at once to cut out the place where the death-wound had been inflicted.

For hunting the sea-otter such poisoned spears were not used . . .

Dall (1877, p. 75) gives an incomplete note which would lead one to believe that the Aleuts knew the use of poison:

The later whale harpoons were always slate-tipped, the modern Aleuts ascribing some poisonous quality to that stone, which they assert will invariably kill the whale in a few days, providing the slate-tip remains in the wound, even if the dart has penetrated but slightly.

3. *Kamchatka*.—The Kamchadal use a poison made from the expressed roots of plants. Krasheninnikov (1764, pp. 92–93) says:

The zgate [footnote reads: *Anemonoides et ranunculus*] must not be omitted, whose dreadful qualities are but too well known in all this part of the world. They anoint the points of their darts and arrows with the juice which is squeezed from the roots of this plant, and the wounds which they give are incurable unless the poison be sucked out. This is certainly the only method, and, if this be neglected, the wound immediately turns blue and swells, and in two days the patient dies. The very largest whales, when they have received a slight wound from such a poisoned weapon, cannot bear the sea for any considerable time; but throwing themselves on the shore, expire most miserably, with terrible groans and bellowing.

The Kamchadal shoot sea lions, when they are found asleep at sea, with poisoned arrows. Death follows in 24 hours (Krasheninnikov 1764, p. 121). Kamchadal arrows, about four feet long, tipped with flint or bone and poisoned, are used for war. The person wounded by such an arrow dies in about 24 hours, unless the poison is sucked out, the only remedy known (Ibid. p. 202). Lewin (1923 pp. 174–75) identifies this as *Anenome ranunculoides* L., and notes that it is a rather weak poison. His statement that a root poison of *Cicuta virosa* was used is also an alternative. Although this is not aconite, I feel that the Kamchadal use is so similar in other respects, that this is not a very important difference. Their whaling lance is apparently the detachable slate pointed variety noted for the Aleut and Koniag. It is of interest to note that the Kamchadal, like the Aleut, Koniag and northern Ainu all poisoned their whaling lance heads.

4. *Sakhalin Island*.—The Ainu of this island, according to Lewin (1923, p. 173) used aconite roots for arrow poison, particularly in the southern section about Karafuto.

5. *Kurile Islands*.—Krasheninnikov (1764) states that:

. . . poisonous herbs, whose roots are yellow as saffron and as thick as rhubarb, and are well known to the inhabitants of the first *Kurilskoy* island, for they [?] formerly bought them from the natives of those islands, and used to poison their arrows with the juice.

He further states (p. 138) that the *Kuriles* throw poisoned darts to kill whales. Lewin (1923, p. 173) says that apparently aconite poison was known

in the Kurile islands. These people, at least in the southern islands, were Ainu.

6. *Yezo Island*.—There are numerous accounts of the use of aconite arrow poison among the Ainu. Lewin (1923, pp. 170–173) notes that the roots were collected in summer and dried till fall in the shade. The roots were then ground fine between two stones. The poison could be used immediately or sometimes was mixed with fat and buried in the earth for several days, whereupon it assumed a red-brown color. Another method of preparation was to take the pulverized and dried aconite roots, mix tobacco and Capsicum in water and fox gall all together. This was sometimes, though, not always buried in the ground for a few days. Arrows were dipped in fir resin and then the poison was laid on. The poison would remain fresh and potent for about five months. Von Siebold (1878) describes Ainu arrows poisoned with aconite and used for deer and bear hunting. Aldridge (1876) reports on the Ainu use, saying:

The root [of *Aconitum ferox* or *A. japonicum*] is prepared by maceration and pounding till it forms a pulp: this is mixed with other ingredients . . . and the resulting mass is buried for a time in the earth.

These poisoned arrows were used for hunting bears. There is, Eldridge claims, no antidote known. The flesh surrounding the wound is cut away.

I can find no certain evidence that the Ainu hunted whales regularly with poisoned lances. Kishinouye (1911, pl. 27, fig. 105) illustrates a carved bone, depicting what is presumably an ancient Ainu whale hunt.

7, 8. *Southwest China (Yunnan and Szechwan)*.—Handel-Mazetti (1927, p. 73) describes the use of the roots of *Aconitum delavayi* by the Nahsi near Chungtien in northwest Yunnan, for poisoning arrowpoints. These are shot at bears. The flesh around the wound is quickly cut out. Lewin (1923, p. 169) notes the use of *Aconitum ferox* on the Lan-Tsan Kiang in western Yunnan and Szechwan. The poison is applied to crossbow arrows; spears and knives are not poisoned. Santesson (1936, pp. 12–14) gives further evidence from Handel-Mazetti's specimens. Davies (1909, pp. 392–393) mentions aconite arrow poison among the Lahu; Metford (1935, pp. 137–138) for the Lisu; Clarke (1911, pp. 124–125) and Davies (1909, pp. 370–371) for the Miao; and Baber (1882, p. 39) for the Lolo.

9. *Assam*.—Lewin (1923) notes the use of *Aconitum ferox* in eastern and southeastern Assam. Waddell (1895, p. 57) describes arrows poisoned with aconite roots used in warfare and for large game by the Akas of the hill country north of the Brahmaputra.

10. *Bhutan*.—Lewin (1923, pp. 45, 47.)

11. *Sikkim*.—Lewin (1923, p. 44) notes the use of *Aconitum ferox* among the Lepcha (Rong).

12. *Nepal*.—Lewin (1923, pp. 44, 47) describes the use of *Aconitum napellus* Eldridge (1876, p. 80) lists *A. ferox* as used by the Gurkhas.

13. *Padam*.—Lewin (1923, pp. 45–47) records the use of arrow poison of

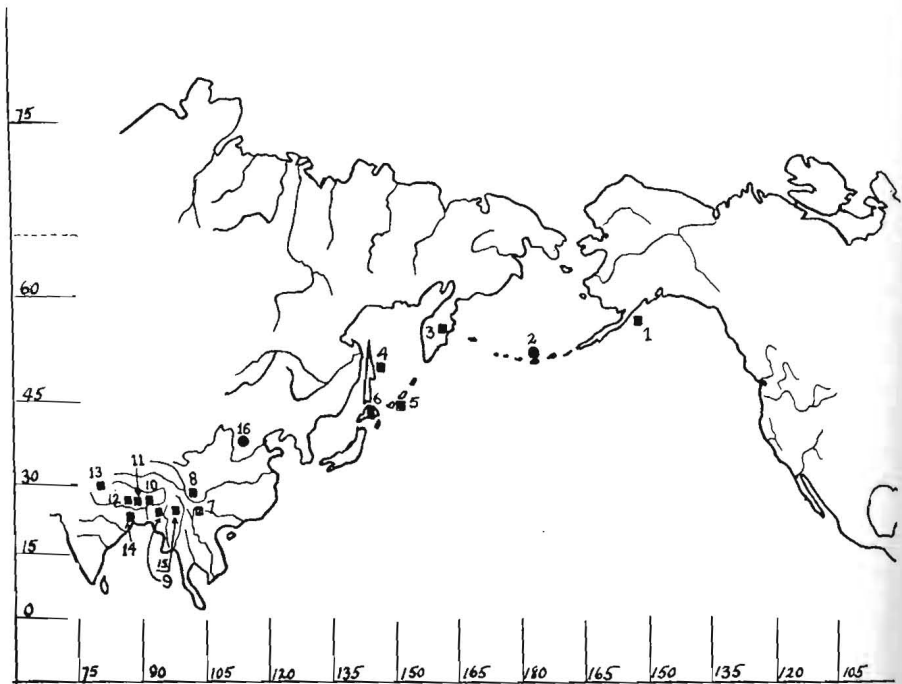


Fig. 1.—Showing distribution of the use of aconite arrow poison. Numbers refer to areas described in the text. ■ Present. ● Reported, or location indefinite.

the Abor on the Dibong river, near the source of the Brahmaputra. The plant used is *Aconitum ferox*.

14. *Orissa*.—The Khond (Khand, Kodu, Ku) use *Aconitum ferox* for poisoning their arrows according to Lewin (1923, p. 44).

15. *Burma*.—Santesson (1936, pp. 5–12) gives excellent information on the use of aconite arrow poison in this region. Lewin (1923, p. 53) notes the use of *Aconitum ferox* among the Katschin of northern Burma.

16. *North China*.—Eldridge (1876, p. 81) cites an account of the use of *Aconitum japonicum* in northern China for arrow poison. He, as well as I, could find no further reference to the location, preparation, etc. of this. Lewin (1923, p. 169) mentions seven kinds of arrow poisons in Chinese antiquity.

The distribution of various species of *Aconitum* whose roots are used as arrow poison is fairly continuous. It is regrettable that there are not more specific data on the Aleut, yet a fair presumption may be raised that they too used aconite. The Kamchadal occurrence is so nearly comparable to the Ainu and Kurilian in use and preparation that a connection can hardly be doubted. The bare mention of aconite poison in northern China is to be accepted with caution.

Lewin (1923, pp. 23–27) gives evidence of the former use of aconite poison

in Europe. He also states (p. 175) that the Koryak, Yukaghir and Chukchi use arrow poisons, but does not state what these poisons are. Lewin also thinks it "Wholly unproven and more than improbable is the statement that the Koryak use an aconite extract for arrow poison."

Weyer (1932, p. 330) states that the Eskimo have developed no processes for deriving poisons useful in hunting or fighting. Lewin (1923, p. 409) is definite in stating that the Eskimo do not have poison for weapons, and, furthermore, is certain that they did *not* use aconite.

In view of the above evidence, I suggest that the use of weapon poison made from the roots of various *Aconitum* species seems to have a distributional center in the Himalaya region, extending from there northeasterly to Yezo, Sakhalin and Kurile Islands of Kamchatka and with a further extension across the Aleutian islands to Kodiak. In the light of the present evidence I suggest that here is another cultural element common to Asia and America,³ and that in this case the route of transmission was *via* Aleutian chain to America from Asia.

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³ Plant poisons are rather rare or not fully reported in North America. Teit, H. J. (*The Thompson Indians of British Columbia*. Am. Mus. of Nat. Hist. Memoirs 2 (4): 263, 1900.) notes the use of arrow poison made of the juice of the flowers of some species of *Ranunculus*. Hoffman, W. J. (*Poisoned arrows*. Amer. Anthropol. o.s. 4: 70, 1891.) states that the Pit River Indians use arrow poison of dogs liver mixed with the juice of the wild parsnip. Kelly, I. T. (*Ethnography of the Surprise Valley Paiute*. Univ. of Calif. Publ. in Amer. Arch. and Ethnol. 31: 145, 1932.) states that an arrow would be stuck into the root of the wild parsnip to poison the tip. These few instances do not to me seem comparable to the plant poison described in this paper.

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