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Erethizon dorsatum. By Charles A. Woods

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Erethizon F. Cuvier, 1822

E[rethizon]. F. Cuvier, 1822:432. Type species *Hystrix dorsata* Linnaeus, 1758. "In the first reference the name is given as a subgenus, but used as a genus. It seems to be only a French name, except on p. 432, where it is abbreviated ('E. dorsatum')" (Palmer, 1904:269).

CONTEXT AND CONTENT. Order Rodentia, Suborder Hystricognatha, Family Erethizontidae. Four genera, all confined to the New World, are usually recognized in the family. The genus *Erethizon* includes only one living species, *E. dorsatum*.

Erethizon dorsatum (Linnaeus, 1758)

American Porcupine

Hystrix dorsata Linnaeus, 1758:57. Type locality eastern Canada.

Erethizon epixanthus Brandt, 1835:390. Type locality California.

CONTEXT AND CONTENT. Context noted above. Seven subspecies are recognized as follows:

E. d. bruneri Swenk, 1916:117. Type locality, 3 mi. E Mitchell, Scotts Bluff Co., Nebraska.
E. d. couesi Mearns, 1897:723. Type locality, Fort Whipple, Yavapai Co., Arizona.
E. d. dorsatum (Linnaeus, 1758:57), see above.
E. d. epixanthium Brandt, 1835:390, see above.
E. d. myops Merriam, 1900:27. Type locality, Portage Bay, Alaska.
E. d. nigrescens J. A. Allen, 1903:558. Type locality, Shesley River, British Columbia.
E. d. picinum Bangs, 1900:37. Type locality, L'Anse au Loup, Strait of Belle Isle, Labrador.

DIAGNOSIS AND GENERAL CHARACTERS. The genus contains one living species. The body is moderately large, stout, with the upper parts completely covered with long quills. The legs and tail are short. The tail is covered with spines and is not prehensile. The feet are heavy and have naked soles. There are four clawed toes on the front feet, and five clawed toes on the hind feet. The hystricognathous angular process, prominent post-condyloid process on the mandible, and open pterygoid fossa easily separate this species from any other mammal native to the United States and Canada (but not south of northern Mexico). The rows of upper cheekteeth converge anteriad. The dental formula is i 1/1, c 0/0, p 1/1, m 3/3, total 20. The incisors are deeply pigmented (dull yellow to deep orange). The rostrum is short and broad with a prominent large infraorbital foramen. The apex of the nasofrontal suture projects posteriad. Measurements (in millimeters) in published reports range from: head and body 645 to 1030; tail 145 to 300; hind foot 75 to 91; ear from notch 25 to 42; weight is 3.5 to 18 kg (although rarely approaching 18 kg); skull length 93 to 112; and skull width 62 to 79. The skull of *E. dorsatum* is shown in figure 1.

DISTRIBUTION. Porcupines are widespread in much of Canada and the United States and are found in some parts of northern Mexico (Jones and Genoways, 1968). Their range includes habitats varying from northern forests to open tundra, rangelands, and deserts (figure 2). Because of their food habits, porcupines seem to be confined to vegetated riparian habitats in most places where they occupy areas away from forests, although Reynolds (1957) noted the presence of porcupines in desert-shrub habitats in Arizona. Changes in human distribution and land use have led to reduction in the range of the porcupine in some areas and expansion in others (Spencer, 1946; Roth, 1957; Blair, 1958). There is an excellent discussion of the distribution of the porcupine in Hall and Kelson (1959).

FOSSIL RECORD. Porcupine teeth similar to those of *Erethizon* are known from the Deseadan Oligocene of Argentina, establishing the presence of Erethizontidae at the very beginning of rodent history in South America (Landry, 1957; Wood and Patterson, 1959). The oldest known member of the Erethizontidae is *Protosteiromys*. The genus *Erethizon* does not appear until much later, however. The genus may have originated in South America and immigrated northward from there, or it may have originated in North America. *Erethizon bathygnathum* was described from deposits of Owyhee County,

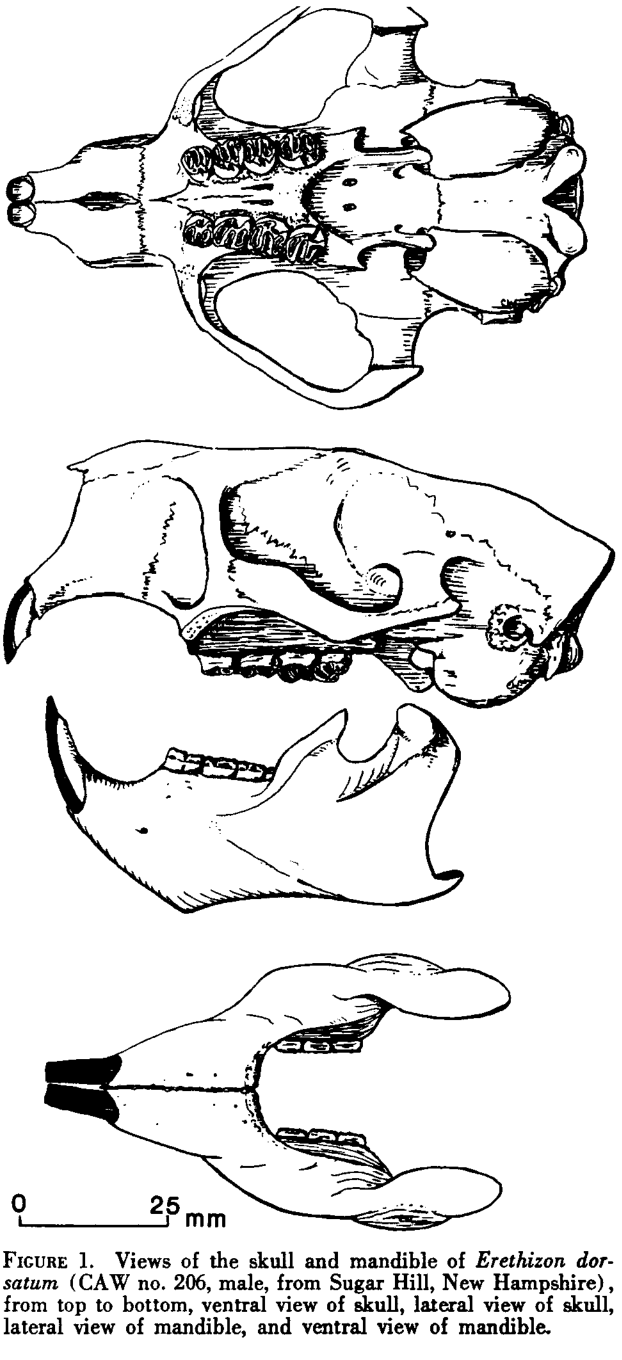

FIGURE 1. Views of the skull and mandible of *Erethizon dorsatum* (CAW no. 206, male, from Sugar Hill, New Hampshire), from top to bottom, ventral view of skull, lateral view of skull, lateral view of mandible, and ventral view of mandible.

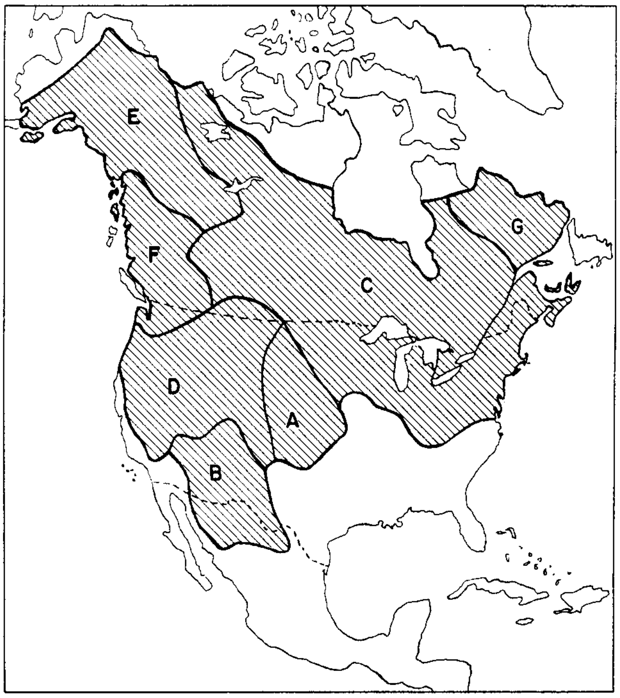

FIGURE 2. The geographic range of *Erethizon dorsatum* and its subspecies: A, *E. d. bruneri*; B, *E. d. couesi*; C, *E. d. dorsatum*; D, *E. d. epixanthum*; E, *E. d. myops*; F, *E. d. nigrescens*; and G, *E. d. picinum*. Adapted from Hall and Kelson, 1959, and Jones and Genoways, 1968.

Idaho (Wilson, 1935). Wilson considered these deposits to be late Pliocene or early Pleistocene in age, but Hibbard and Mooser (1963) referred to them as early Pleistocene. The earliest record of *Erethizon dorsatum* is from middle Pleistocene material (Irvingtonian) along the banks of Arroyo del Cedazo near Aguascalientes, Mexico (Hibbard and Mooser, 1963). White (1968), however, considered both Wilson's (1935) *Erethizon bathygnathum* and the specimen referred by Hibbard and Mooser (1963) to *Erethizon dorsatum* to be members of the genus *Coendou*. White (1968, 1970) judged that *Coendou* is ancestral to *Erethizon* and that the transition took place during the Pleistocene in North America, beginning before the early Kansan (Irvingtonian) and being completed by the late Illinoian (Rancholabrean). White's (1968, 1970) specific name *E. brachignathum* is incorrect and should be *E. bathygnathum* to conform to the usage of Wilson (1935).

Good Pleistocene examples of *Erethizon dorsatum* are reported in the Conard Fissure fauna of northwestern Arkansas (Illinoian and/or Sangamonian in age) and the Melbourne beds of Florida (Martin, 1958; White, 1970).

FORM. The pelage of the porcupine is composed of quills, hair, and underfur. The quills may be up to 75 mm long, 2 mm in diameter and exceed 30,000 in number (Hall, 1946; Spencer, 1950*a*). There are no quills on the undersurface of the body. Each quill is yellowish white with a tip that varies from brown to black. Po-Chedley and Shadle (1955) described the growth patterns of the quills in considerable detail. The quills grow in groups 2 to 5 mm apart, and occur in transverse rows across the body. The longest quills are on the rump, the shortest on the cheeks. Quills are replaced after being lost or pulled out, with the replacement beginning in 10 to 42 days (Po-Chedley and Shadle, 1955). Initial growth is at the rate of .5 mm per day, and growth may continue for a period of 2 to 8 months (Costello, 1966). Whitney (1931) reported that not all quills are barbed. In winter, underfur may outgrow and conceal the quills. Young animals tend to be darker than adults and their pelage resembles the winter coat of adult animals (Goodwin, 1935). Animals usually molt during summer (Costello, 1966) and the underfur becomes absent or short (Hall, 1946). The color of hair of the eastern subspecies is more variable than that of other races, ranging from coal black to albino (Dodge, 1967). Anderson and Rand (1943) indicated that there is considerable geographic variation in the color of the hair throughout the range of this mammal.

Porcupines have mediocre vision, especially at distances, but have excellent senses of hearing and smell. Lende and Woolsey (1956) reported that the somatic sensory and motor areas of the brain are well developed, whereas auditory and visual centers are less well developed. Curtis and Kozicky (1944), Jackson (1961), and Costello (1966) indicated that porcupines often locate food by using their sense of smell. *Erethizon* has a gut in excess of 8.5 m in length, 46% of which is small intestine (Starrett, 1967). There is a large and functionally important cecum (Dodge, 1967). The size of adult animals varies regionally, northern populations tend to be larger than those to the south. The myology of *Erethizon* differs in a number of important characteristics from other New World hystricognaths (Woods, 1972). Ray (1958) reported that the second and third cervical vertebrae are fused in adults. The vertebrae vary in number, the number of thoracolumbars ranging from 19 to 23 (Sutton, 1972). White (1970) indicated that in the pes of *Erethizon* there is a prehallux and an accessory navicular, but that they are not nearly as well developed as in *Coendou*. Sutton (1972) illustrated and discussed the pes of *Erethizon*, and referred to the two bones mentioned by White as sesamoids, preferring not to give them a specific name. Hibbard and Mooser (1963:246) reported, after studying the dentitions in 37 pairs of lower jaws, that *Erethizon dorsatum* "is probably one of the most variable rodents in North America." In addition to the above references, the anatomy of *Erethizon* is mentioned by Parsons (1894), Tullberg (1899), Struthers (1930), Ballard (1937), Swena and Ashley (1956), Dathe (1963), Gupta (1966), Ahlberg (1969), and Bugge (1971).

FUNCTION. The normal body temperature has been reported as 37.5° C (range of 36° to 38.2° for 28 animals, Irving and Krog, 1954) and 41.2° C (Dodge, 1967). The porcupine has a large liver, which may function in storing vitamins and other substances for use during the long winter diet of cambium and phloem (Costello, 1966). The animal also has a large cecum, which may be of use during periods of poor diet. In the cecum many short-chain volatile fatty acids are produced by fermentation and these can be absorbed directly into the bloodstream (Johnson and McBee, 1967). The intestine has a culture of bacteria which is capable of decomposing cellulose (Balows and Jennison, 1949). The animal may eat 430 g of food per day (Starrett, 1967). It voids three times per day, producing a total of approximately 180 fecal pellets (Shapiro, 1949). Dodge (1967) reported that the body temperature drops as much as 5° C when the ambient temperature falls to near -18° C (0° F). He suggested that this may be a special adaptation to cold, and may be the reason why porcupines remain in one position in trees for several days during periods of cold weather. Irving *et al.* (1955) investigated the metabolic rate, critical temperatures, and respiratory quotients of Alaskan porcupines in both winter and summer months. They observed that the animals were able to regulate their body temperatures, even at extremely low temperatures (-50° C in winter, -30° C in summer). The authors reported a lower critical temperature in summer acclimated animals of 7° C, whereas in winter acclimated animals it falls to -12° C. They also reported that the animals were able to gain weight rapidly. Musacchia *et al.* (1955) reported on the hematological characteristics of Canadian populations.

The longevity of the porcupine in the wild is unknown. Shadle (1951) and Burge (1966) indicated a maximum of at least 10 years for captive animals, and Brander (1971) reported a free-living specimen as being at least 10.1 years old and still alive. The average weekly growth of the incisor teeth was approximately 1.5 mm with 315 mm of incisor teeth being worn away per year (Shadle *et al.*, 1944). They also reported that males have a higher extrusive growth rate than do females, and that the lower incisors grow more rapidly than the uppers. The higher extrusive growth rate of the incisors of the male may be associated with the habit of chattering his teeth when disturbed (Shadle *et al.*, 1944).

ONTOGENY AND REPRODUCTION. Most studies indicate that porcupines mate during the autumn or early winter. Testes of males descend into the scrotal pouches during late August and September (Dodge, 1967). Spermatogenesis reaches its highest level during October (Dodge). Courtship is elaborate and there is much vocalization (Shadle, 1946, 1951, 1952; Shadle *et al.*, 1946). A copulation plug is formed (Shadle, 1956) and vaginal casts indicate the possibility that the female may be polyestrous (Burge, 1966). Dodge (1967) indicated that the female is seasonally polyestrous and will recycle in 25 to 30 days if fertilization does not occur at the time of the first ovulation. This recycling may continue into late January in New England and perhaps explains the high fecundity rate of porcupines. There is some evidence that ovulation and implantation alternate from side to side, but Dodge did not find this to be the case in the animals he studied. Copulation occurs via the usual rear mount method of most rodents. Heat lasts for 8 to 12 hours (Dodge, 1967). The female becomes sexually mature at about a year and a half, and continues to reproduce throughout her lifetime (Shadle, 1952; Costello, 1966). Gestation lasts from 205 to 217 days (average 210, Shadle, 1948, 1950, 1951), the reports by Struthers (1928) and Asdell (1964) of a 16-week gestation period being incorrect. There is usually only a single young, but there are isolated records in the literature of more than one (Costello, 1966). The young is generally born in April, May, or June, and is precocious. Weight at birth ranges from 340 to 640 g (Shadle and Ploss, 1943; Peterson, 1966; Starrett, 1967). The quills are soft and well formed at birth, and harden within an hour (Tyron, 1947). The eyes are open, and there are well developed incisors, deciduous fourth premolars, and first molars in each toothrow (Sutton, 1972). Some molariform teeth are above the gums (Dodge, 1967). Sutton presented information on the time of eruption of the various teeth. The young are quite capable of climbing and assuming normal defensive posture soon after birth (Cahalane, 1961). Tyron (1947) presented a table of weight gain of a young porcupine. The young nurses for several months in the laboratory (Shadle, 1951), but apparently for a much shorter time in the wild (Costello, 1966). The young can survive on vegetation within a week or two after birth (Dodge, 1967). Most authors report that there are four pairs of mammae, two pectoral and two abdominal, however Hall (1946) reported only three pairs. The female does not take elaborate care of the young, but infant mortality is apparently quite low. The young gain weight initially at the rate of 450 g per month (Starrett, 1967) and remain close to the mother. There is a photo of a newborn in Spencer (1950*a*). The photo is of an albino, which according to Costello occurs at the rate of 1 in 50,000, but Dodge (1967) indicated that albinism may be considerably more common. The female reproductive tract was described by Dodge (1967) and the male tract by Mirand and Shadle (1953). Mossman and Judas (1949) discussed the ovary in some detail and noted the unilateral persistence of accessory corpora lutea that are developed from atretic follicles at the time of estrus and early pregnancy. Struthers (1941) discussed the prenatal development of pancreatic and extra-hepatic ducts, and (1927) also commented on the prenatal skull. Perrotta (1959) described the fetal membranes of this species.

ECOLOGY. Seton (1928) suggested that the home range of the porcupine is quite restricted; summer range is larger than winter range. Schoonmaker (1938*a*) observed a restricted winter range made apparent by deeply worn paths in the snow, the animal ranged 1.2 km from his den in May. Shapiro (1949) reported a winter feeding area in New York State of 5.4 hectares (13.3 acres). Marshall *et al.* (1962) reported summer ranges during a 30-day period of 13 and 14.6 hectares in a study in which they used biotelemetry. Dodge (1967) reported that the average distance between a winter den site and the point of capture in summer was 1500 m, this calculation based on six recaptures of the same individual. Animals show very little aggressiveness and do not defend a territory. However, Dodge (1967) does report that they will defend their feeding trees and Starrett (1967) mentioned that porcupines urinate in paths, near dens, and at the base of trees. Occasionally, paired animals may be found in the same tree (Dodge, 1967).

There are some indications of population cycles, with perhaps 10 years between the end of one decline and the beginning of another growth phase (Spencer, 1964). Peaks of cycles are 12 to 20 years apart. Densities vary depending on the point in the cycle, degree of predation and disturbance, and suitability of habitat. Reported densities are three to 15 per square mile (1.2 to 5.8 per km^2) in Arizona (Taylor, 1935), two per square mile (.77 per km^2) in upper Michigan (Golley, 1957), 7 per square mile (2.7 per km^2) in New Brunswick (Reeks, 1942), 10 to 14 per square mile (3.9 to 5.9 per km^2) in Maine (Curtis, 1944), 1 per 53 acres (4.7 per km^2) in New York (Shapiro, 1949), and one per 26 acres (9.5 per km^2) in Wisconsin (Kelker, 1943).

There is a major shift in the food habits of the animal between winter and summer months (Dodge, 1967). There are some indications of local wanderings and migrations (Costello, 1966). There are a few reported mass migrations. In western areas, where different habitats are close to one another, some migration does occur. Gabrielson (1928) reported short migrations in Oregon. Taylor (1935) reported an extensive mass migration in northern Montana. The animals travel close to the ground and prefer to remain in dense cover whenever they move about (Curtis and Kozicky, 1944). Jackson (1961) reported that porcupines often follow old trails and animal runways. Porcupines prefer habitats of mixed hardwood-softwood composition (Shapiro, 1949). In open regions of the West, they will move along draws and bushy stream bottoms (Bailey, 1926). Curtis and Kozicky (1944) and Dodge (1967) gave methods of handling, trapping, and tracking porcupines in the wild.

The main predators of porcupines are man and the fisher (Cook and Hamilton, 1957). Other animals reported to prey upon *Erethizon* are marten, mink, wolverine, ermine, weasel, red fox, coyote, wolf, dog, bear, mountain lion, lynx, bobcat, eagle, and great horned owl (Merriam, 1884; Keller, 1937; Schoonmaker, 1938*b*; MacGregor, 1942; Curtis and Kozicky, 1944; de Vos, 1953; Quick, 1953; Jackson, 1961; Costello, 1966; Peterson, 1966; Starrett, 1967). There are reports that quills are not lethal to the major predators of the porcupine, especially the fisher (Schoonmaker, 1938*b*; Quick, 1953); however, there are also reports in the literature of predators being killed by quills (de Vos, 1953). Various problems associated with porcupine quills are discussed by Shadle (1947, 1955*a*, 1955*b*), Shadle and Po-Chedley (1949) and Marshak (1952). Other dangers to porcupines are fire, automobiles, and falling out of trees (Stoner, 1940; Marshall, 1951).

The major parasites of the porcupine are listed below:

flea	*Ceratophyllus wickhami*
porcupine louse	*Trichodectes setosus* (especially in winter)
ticks	*Ixodes cookei* (especially in summer) *Dermacentor andersoni*
mites	*Sarcoptes scabei* (causes mange)
roundworms	*Dipetalonema arbuta* *Dirofilaria subdermata* *Molinema diacantha* *Wellcomia evoluta* *Wellcomia evaginata*
flatworms	*Monoecocestus americanus* *Monoecocestus variabilis* *Cittotaenia pectinata*
tongue worm	*Porocephalus* sp.

Discussions of porcupine parasites may be found in Jellison, 1933; Highby, 1943; Curtis and Kozicky, 1944; Freeman, 1949, 1952; Shapiro, 1949; Payne and O'Meara, 1958; Jackson, 1961; Dodge, 1967; and Starrett, 1967. According to Dodge, none of the endoparasites adversely affects the host. Fecal pellets of the porcupine often include eggs and parts of nematodes and cestodes.

Sex ratios in populations tend to favor females over males (Dodge, 1967). Dodge further stated that porcupines show an age-weight correlation that is useful in aging the animals, and presented aging techniques using both weight and wear patterns of the molar teeth.

BEHAVIOR. The porcupine is solitary for most of the year, but in winter several animals occasionally may share a den. Dodge (1967) reported as many as 100 animals in a ledgy area of 4 to 5 acres (2 ha) in western Massachusetts, and six animals in various parts of an abandoned house in New Hampshire. Such situations are probably unusual, however. The den is usually a cave, log, or hollow tree. It is not defended and may be used by several animals on a rotating basis (Shapiro, 1949). It is often marked by great piles of fecal pellets (Cahalane, 1961). A bedding area is not constructed from soft materials as it is by many other rodents (Costello, 1966). When no den is available, the animal may spend the winter in a "station" tree (Curtis and Kozicky, 1944), usually of hemlock or white spruce. Porcupines will defend their winter feeding trees from other animals (Dodge, 1967). Marshall *et al.* (1962) reported that porcupines often climb trees during the summer to avoid insects.

Animals often return to the same trees to feed, thereby usually damaging these trees (Shapiro, 1949; Shadle, 1950). This may tend to reduce the number of trees damaged. During the winter months their diet consists mainly of the inner bark of trees and of evergreen needles. The species it most prefers varies regionally, but appears to be the hemlock in most of the Northeast, the sugar maple in New England, the white pine in the Great Lakes region, and the yellow pine in the West (Curtis and Kozicky, 1944; Cahalane, 1961; Costello, 1966). During the summer months, the diet is much more varied and includes roots, stems, leaves, berries, catkins, seeds, flowers, nuts, water plants, and grass. Food sources are listed by Merriam, 1884; Murie, 1926; Seton, 1928; Schoonmaker, 1930; Taylor, 1935; Curtis and Kozicky, 1944; Batchelder, 1948; Rudolf, 1949; Shapiro, 1949; Cahalane, 1961; Jackson, 1961; Martin *et al.*, 1961; Walker, 1964; Costello, 1966; Peterson, 1966; Dodge, 1967. Murie (1926) reported porcupines feeding on mud and sand in river bottoms, presumably to obtain minerals for their diet. The animals will eat cultivated crops upon occasion (Gabrielson, 1928; Costello, 1966).

The economic status of the porcupine is often debated. Common types of damage include injury to forest trees (Curtis and Kozicky, 1944), injury to orchards (Henderson and Craig, 1932), crop damage in summer (Bailey, 1926; Gabrielson, 1928), gnawed holes in auto tires (Cook and Hamilton, 1957), gnawed holes in plastic tubing used to collect maple sap (Dodge, 1967), damage to wood around camps and summer homes (Jackson, 1961), injury to domestic animals (Shufeldt, 1921), and perhaps transmittal of diseases such as tularemia (Kuhns *et al.*, 1953) and tick fever (Burgdorfer, 1959). The tradition of considering the porcupine to be a pest goes back as far as Josselyn (1672:16) who noted that the animal is "a very angry creature and dangerous, shooting a whole shower of quills with rowse at their enemies, which are of that nature, that whenever they stick in the flesh, they will work through in a short time if not prevented by pulling them out." The porcupine, of course, does not shoot its quills, but it sometimes is a pest due to its habits. The damage, however, is usually minor. Shapiro (1949) reported the cost of damage to be 35 cents per acre (87 cents per ha) in the forests of the Adirondack Mountains. Curtis (1941, 1944) reported damage of 45 cents to $1.10 per acre ($2.72 per ha) in Colorado and 11.5¢ to 36¢ per acre in Maine. Most authors agree that damage is usually not significant enough to warrant wholesale control programs or bounties, and that the danger to other wildlife is too high to justify poisoning campaigns. However, the animal can become a local pest, in which case control by shooting is probably the best method. Where appropriate, a good way to control porcupine numbers is to manage for a moderate population of the fisher (Cook and Hamilton, 1957). Other unusual forms of "damage" reported include the eating of aluminum keetles(Scott, 1941), bottles (Preston, 1948), and wooden steering wheels (Wyman, 1923). Other economic aspects of porcupines are discussed by Curtis (1946), Spencer (1948, 1950*b*), Wright (1951), Pulling (1954), Lawrence (1957), Faulkner and Dodge (1962), Pringle (1964), and Dodge and Canutt (1969).

The "voice" of the porcupine has been mentioned by a number of authors. The sounds produced by the animals have been described as moans, whines, grunts, coughs, sniffs, squeeks, mews, chatters, shrieks, "deahp," snorts, barks, "caou," sobs, owl-like hoo, hoos, shrill screeches (Murie, 1926; Batchelder, 1930, 1948; Saunders, 1932; Seton, 1932; Walker, 1964; Dodge, 1967.). A "child-like quality" was reported by Batchelder (1930), Wade (1931) and Seton (1932). Saunders (1932) reports a long wail that could be heard at a distance of 200 m.

Porcupines are reported to be intelligent and capable of learning rapidly (Costello, 1966), despite an appearance to the contrary. They have good memories, and make interesting pets. Sackett (1913) discussed the learning processes of the porcupine. They do not like water, but will swim and have been observed crossing small bodies of water (Shufeldt, 1921; Cahalane, 1961). The animals do not hibernate, and are active throughout the year. They rarely are active when the temperature is below -18° C, but Irving *et al.* (1955) reported seeing active animals at -30° C in central Alaska. They have occasionally been reported as active during the day, but are usually nocturnal. The types of "play" are described by Shadle (1944). Ways to keep porcupines in captivity are discussed in Shadle (1950), Moore (1954), Crandall (1964), and Dodge (1967).

GENETICS. Benirschke (1968) studied the chromosomes of eight specimens from Vermont and New Hampshire and reported a diploid chromosome number of 42. Thirty-four of the 40 autosomes are metacentric or submetacentric. The diploid number of the porcupine is unusual in comparison with that of other New World hystricognaths. Of the hystricognathous rodents so far investigated only *Myocastor coypus* and *Ctenomys latro* have a diploid count of 42 (Fredga, 1966; Tsigalidou, Simotas, and Fasoulas, 1966; Wurster, Snapper, and Benirschke, 1971).

The sex chromosomes of *Erethizon* are also unusual. Benirschke reported that the X chromosome is nearly twice the usual size for rodents. It is submetacentric and possesses a pericentric euchromatic segment. The Y chromosome is also large and has an euchromatic short arm.

In contrast to the study done by Benirschke, Makino (1953*a*, 1953*b*) reported a diploid chromosome number for *Erethizon* of 34. He did not comment on any unusual condition of the X or Y chromosome, other than the large size of the X chromosome (1953*b*).

REMARKS. Recent classifications tend to follow the ideas of Wood (1950, 1955) in including the New World porcupines in the suborder Caviomorpha. The genus *Erethizon* shares many unusual morphological characteristics with Old World rodents that are similarly hystricognathous (Parsons, 1894; Tullberg, 1899; Landry, 1957; Woods, 1972). Also, *Erethizon* differs strongly in many ways from the other New World hystricognaths (Vanzolini and Guimaraes, 1955; Moody and Doniger, 1956; Perrotta, 1959; Wood and Patterson, 1959; Woods, 1972). These observations and those of Bugge (1971) tend to support the idea of a suborder Hystricognatha (Woods, 1972), which includes both New and Old World hystricognathous forms. The relationship could be the result of a possible transatlantic rafting of a common ancestor. However, a more probable explanation is that both New and Old World forms are descended from a widely distributed hystricognathous subgroup of paramyid rodents. This idea was stated by Woods (1972) and evidence of a hystricognathous fossil rodent from the Eocene of Texas is presented by Wood (1972). *Erethizon* is best considered, therefore, as a member of the suborder Hystricognatha.

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