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spicules, 1 mm. long and 1 to 3 long, delicate reddish-brown fugacious spines, 1 to 2 mm. in length and sheathed at their tips only, and 2 to 3 delicate, fugacious, shorter, lighter colored unsheathed bristles beside; seeds white, typical of the group, and 3 mm. in diameter.

This species belongs to the *Op. arborescens* group. The type is preserved under my inventory No. 8152, which was grown from cuttings secured near Torreon, Mexico, September 24, 1905.

***Opuntia spinotecta* sp. nov.**

An arborescent, divaricately branched, cylindrical jointed species, 2½ m. high, with trunks 10 to 12 cm. in diameter, commonly compactly, but in age openly branched, and having thick fusiform, tuberous roots; joints variable, but mostly 10 to 15 cm. long, but often 40 cm. in length, somewhat clavate, the tubercles 1 cm. high, with upper crest half the length of the lower and a darker green line surrounding the entire tubercle; areoles occupying upper crest of tubercles, broadly obovate, 3 to 4 mm. long, tawny, turning to dirty gray or black, but with new tawny wool appearing in upper part of areole for two years or more; leaves cylindrical, subulate, cuspidate, 1 cm. long; spicules white, not conspicuous on either joint or fruit; spines 3 to 6, mostly 4, the upper central the longest, about 3 cm. long and loosely sheathed, the lower lateral ones losing their sheathes early, flesh-colored or brown, with white papery sheathes; flowers purple; fruit obovate to subglobose, yellowish-green, persistent.

The type bears my inventory No. 9859, collected at Durango, Mexico, September, 1909. The description was drawn mainly in the type locality. The plant has been in cultivation since the date of collection.

***Opuntia valida* sp. nov.**

An erect to ascending, widely radiating branched species, with main limbs ascending or horizontal, and sometimes resting on edge under cultivation, but mostly erect to ascending in natural habitat, 1 m. in height and 2 m. in spread of branch; joints obovate, large, thick, glaucous, slightly blue-green, very broadly pointed or rounded above, commonly 25 by 32 cm. or again 25 by 27 cm., 1 joint on plants in cultivation, 30 by 42 cm. which is unusual; areoles very large, ovate, 8 mm. long on sides of joints and on edges subcircular, 9 to 11 mm. in diameter, at first brown, turning almost black, finally gray, the wool prominent, mostly elevated 1 or 2 mm. above surface of joint especially on the edges, spicules scattered, not numerous, from 2 mm. long on sides to 1 cm. long on edges of joints, commonly only about 25, increasing in age, but always scattered through entire areole, although at first appearing on its upper half, stout and faintly annular; spines bright deep reddish-brown at base, fading gradually to a semi-translucent bone-like tip, and in age becoming gray, flattened on upper side, faintly annular, sometimes slightly twisted, diverging in all directions, 2 to 5 strongly

diverging centrals, 2 to 6 cm. long and 2 to 5 weaker, very much shorter, recurved ones below; flowers yellow; fruit reddish-purple.

The type is preserved under my collection No. 9194, prepared from cultivated specimens at San Antonio, Texas, which were grown from cuttings secured in the vicinity of San Antonio, New Mexico, in 1908.

***Opuntia brachyclada* sp. nov.**

A low, caespitose species, seldom attaining a height of over 12 to 15 cm., in nature only about 10 cm., but often forming dense masses 50 or more cm. in diameter; joints exceedingly variable, slightly to decidedly flattened or at times almost perfectly terete, narrowly obovate to cylindrical, $2\frac{1}{2}$ by 10 cm. or often 26 by 130 mm. or even as low as 12 by 30 mm., sometimes one on top of the other and 2 or 3 joints high, but usually new joints appear a little below on outside of outer joints of the clump, glaucous, bluish-green, young joints reddish tinged; leaves small, conical, cuspidate, greenish red, about 2 mm. long; areoles subcircular, 3 mm. in diameter, and 10 to 16 mm. apart, spicules light-brown, changing to a dirty brown, at first surrounded by a narrow gray zone of wool, which is later obliterated, the tuft, therefore, occupying the entire areole except the very narrow wool zone, commonly 2 mm. in length, and numerous; spines absent; flowers purple; fruit small, subglobose, 1 to $1\frac{1}{2}$ cm. in diameter, yellow or with a blush of red on one side.

The spicules are as described above in the type specimen, but they may range in color from dirty-yellow to deep brownish-red as is true of the entire group. The type is preserved under my collection No. 10,768, and occurs commonly in the mountain valleys above San Bernardino, California.

***Opuntia chaetocarpa* sp. nov.**

A tall, arborescent, open branched species, 2 to 3 m. high, and having a spread of branch about the same dimensions, with us now about 1 m. high and fruiting sparingly after, being set from cuttings June 1, 1912; joints obovate, glossy-dark-green, smooth to the touch, raised, tubercular at areoles the first season, but nearly smooth after that, measuring 14 by 27 cm. for early spring joints, which are fruiting now; areoles small, oval to ovate or obovate, becoming subcircular in age, at first 2 to 3 mm. long, later 2 to 3 mm. in diameter, brown; leaves circular in sections, subulate, cuspidate, mostly slightly recurved, 3 to 4 mm. long, spicules at first scarcely visible, but at 1 year of age form a compact tuft, 3 to 6 mm. long in upper part of areole, and increasing still further in age; spines white, at first single, erect, and about 2 cm. long, at 1 year of age, 2 or 3 divergent or erect, and 1 often 5 cm. long and others shorter, flattened, twisted; flowers greenish with tinge of red in bud, light yellow when opened, filaments greenish, style white with a scarcely noticeable tinge of red, stigma white, 6-parted; ovary obovate with deep conical pit at apex, prominent tubercles and 1 to 2 spines in each upper areole; fruit red, pyriform, edible, but of small size.