

29. *Tinnunculus sparverius* (L.).  
Exceedingly abundant.  
No. 2. February 19.  
No. 106. ♀ ad. March 19.
30. *Chamæpelia passerina* (L.).  
Common; iris orange.  
No. 85. ♀ ad. March 14.  
No. 115. March 20.
31. *Engyptila verreauxi* (Bp.).  
Common; iris yellow; legs red.  
No. 114. ♀ ad. March 19.
32. *Geotrygon costaricensis* Lawr.  
Presented by Dr. Van Patten, of San José.  
No. 135. March 25.
33. *Butorides virescens* (L.).  
One specimen. Said to be common.  
No. 100. Guv. March, 15.

In closing this list, justice requires an acknowledgment of the efficient aid of Sr. Don José Zeledon, who left nothing undone in the way of cheerful and painstaking assistance and genuine hospitality. Indeed, whatever of success has attended my trip to Costa Rica is due largely to his thoughtful generosity.

C. N.

**BRIEF DESCRIPTIONS OF FOSSIL PLANTS, CHIEFLY TERTIARY,  
FROM WESTERN NORTH AMERICA.**

**BY J. S. NEWBERRY.**

The following brief characterizations of fossil plants from the West are supplementary to the descriptions issued in the "Notes on Our Later Extinct Floras", published in the Annals of the Lyceum of Natural History of New York, 1868. Fuller descriptions, with figures of all the species enumerated in both series, with others yet to be added, will soon appear in a volume which is to form one of the Reports of the United States Geological Survey. Most of the fossil plants here enumerated were collected by Dr. F. V. Hayden, but a large number have also been obtained by Prof. Thos. Condon, State geologist of Oregon, by Prof. J. J. Stevenson and his assistant, Mr. I. C. Russell, and by others whose names are indicated in connection with their contributions.

Most of the originals of these descriptions will be placed in the National Museum and the annotated catalogue now issued finds an appropriate place in the Proceedings of the Museum.

J. S. NEWBERRY.

COLUMBIA COLLEGE, NEW YORK,

August 15, 1882.

1. *EQUISETUM OREGONENSE*, n. sp.

Stem robust, 3 centimeters wide; longitudinal flutings numerous, about 24 in a half-circumference; joints 5 centimeters distant; teeth triangular, short.

*Formation and locality.*—Miocene? Tertiary beds, Currant Creek, Oregon. Collected by Prof. Thos. Condon.

2. *LASTREA (GONIOPTERIS) KNIGHTIANA*, n. sp.

Fronde large, tripinnate; pinnae linear, 2 centimeters wide, 14 to 16 centimeters long; pinnules diverging at a large angle, united for two-thirds of their length, upper third free, pointed and curved upward; venation clear and exact, midrib reaching the extremity of the pinnule; the lateral nerves about ten on either side, parallel, curved upward.

*Formation and locality.*—Tertiary strata, Currant Creek, Oregon, where it occurs matted together in masses. Collected by Prof. Thomas Condon.

3. *ACROSTICHUM HESPERIUM*, n. sp.

Fronde large, pinnate; pinnae linear,  $1\frac{1}{2}$  to 2 inches wide, 6 to 12 inches long, rounded at remote extremity, those in lower part of frond rounded or wedge-shaped at base, those above united by the entire base to the rachis and with each other; rachis of frond and midrib of pinnae strong, smooth, somewhat sinuous; nervation reticulated, lateral nerves numerous, diverging from the midrib at an acute angle, anastomosing to form elongated six-angled areoles; fructification unknown.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming. Collected by Dr. C. A. White.

4. *PTERIS ELEGANS*, n. sp.

Pinnae linear, 25 millimeters wide; nervation remarkably strong and uniform; lateral nerves springing from the midrib at an angle of  $45^\circ$ , simple, strong, parallel from midrib to margin.

*Formation and locality.*—Tertiary strata, Currant Creek, Oregon. Collected by Prof. Thomas Condon.

5. *PTERIS RUSSELLII*, n. sp.

Fronde large, pinnate; pinnae crowded, linear in outline, narrow, long-pointed above, attached to rachis by entire base; decurrent; length 16 to 20 centimeters; width 10 millimeters; margins undulate, irregularly-toothed; nervation fine, but distinct; branches leaving midrib at an angle of about  $45^\circ$ , all twice or three times forked.

*Formation and locality.*—Laramie Group, Vermejo Cañon, N. Mex. Collected by Mr. I. C. Russell.

6. *PECOPTERIS (PHIEGOPTERIS) SEPULTA*, n. sp.

Fronde small, delicate, pinnate; lower pinnae straight; broadly linear in outline, rounded above, attached to rachis, by the whole breadth of

base; margins strongly lobed by the confluent pinnules, 1 centimeter wide by 5 centimeters long; upper pinnules crowded, conical in outline, gently curved upward, with waved or lobate margins; pinnules united by one-third of their length, oblong, obtuse; basal ones on lower side round, on the upper side flabellate, both attached by all their lower margin to the rachis of the frond; nervation strong and wavy, consisting of one many-branched nerve stem in each pinnule, each branch once or twice forked; fructification unknown.

*Formation and locality.*—Eocene Tertiary strata, Green River, Wyoming. Collected by Dr. C. A. White.

7. *SEQUOIA SPINOSA*, n. sp.

Branches slender, foliage open, rigid: leaves narrow, acute (aeicular), arched upward, appressed or spreading; spirally divergent; staminate flowers in slender terminal aments 2 inches long, two lines wide, anthers few, under peltate connective scales; cones ovate or subcylindrical, composed of rhomboidal or square peltate scales.

*Formation and locality.*—Cook's Inlet, Alaska. Collected by Captain Howard, U. S. N.

8. *SABAL POWELLII*, n. sp.

Leaves of medium size, 4 or 5 feet in diameter, petiole smooth, unarmed, terminating above in a rounded or angular area, from which the folds diverge; beneath concavely narrowing to form a spike 3 to 4 inches in length; rays about fifty, radiating from the end of the petiole, perhaps sixty in the entire leaf, compressed to acute wedges where they issue from the petiole, strongly angled and attaining a maximum width of about 1 inch; nerves fine, about twelve stronger ones on each side of the keel, with finer intermediate ones too obscure for enumeration.

*Formation and locality.*—Eocene strata, Green River Station, Wyoming.

9. *MANNICARIA HAYDENI*, n. sp.

Frond large; leaves primately plicated, folds  $1\frac{1}{2}$  centimeters in width above, slightly narrowed below; flat or gently arched, smooth, springing from the midrib at an angle of  $25^\circ$  above,  $30^\circ$  below (in the specimens figured); folds attached to the midrib obliquely by the entire width and to each other by their entire length (?); the nervation fine, uniform (?), parallel.

*Formation and locality.*—Eocene strata, Green River Station, Wyoming. Collected by Dr. F. V. Hayden.

10. *QUERCUS GRACILIS*, n. sp.

Leaves narrow, lanceolate, long-pointed, acute, wedge-shaped at the base; margins set with remote, low, acute teeth; nervation regular and fine; nerve branches 15 to 20 on each side, curved gently upward, and terminating in the marginal teeth.

*Formation and locality.*—Laramie group, Point of Rocks, Wyoming.

11. *QUERCUS CONSIMILIS*, n. sp.

Leaves petioled, lanceolate, acuminate, wedge-shaped or rounded at base, where they are often unequal; margins usually dentate, occasionally only undulate, sometimes entire below, denticulate above; teeth acute, often spinous, sometimes short and closely appressed; nervation fine and regular; lateral nerves slender, parallel, generally arched upward, below; where margin is entire, camptodrome, above, craspedodrome, the branches terminate in the marginal teeth; tertiary nervation consisting of minute branches connecting the lateral nerves either directly or anastomosing, with fine quadrangular net-work filling the intervals. Fruit ovoid; when mature 2 centimeters in length by 15 millimeters in breadth; cupule scaly, covering nearly half of the glans.

*Formation and locality*.—Miocene ? strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

12. *QUERCUS SIMPLEX*, n. sp.

Leaves lanceolate, long-pointed, narrowed, and slightly rounded at the base; margins entire; nervation fine and regular.

*Formation and locality*.—Miocene ? strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

13. *QUERCUS CASTANOPSIS*, n. sp.

Leaves oblong-elliptical, rounded at the base; nervation regular; midrib straight, branches parallel, simple, terminating in the principal teeth of the margin; margin doubly dentate, the larger teeth receiving the extremities of the nerve branches, and each carrying a minor denticle; upper surface smooth; texture of the leaf coriaceous.

*Formation and locality*.—Argillaceous limestone, Yellowstone River. Collected by S. M. Rothhammer.

14. *QUERCUS PAUCIDENTATA*, n. sp.

Leaves oblanceolate, 6 inches in length by  $1\frac{1}{2}$  in breadth, narrowed to the base, sometimes unsymmetrical, long-pointed, and acute at the summit; margins entire below, coarsely toothed above; nervation strong and regular, about ten branches on each side of the midrib, which curve upward, festooned below, terminating in the teeth above.

*Formation and locality*.—Miocene ? Tertiary, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

15. *QUERCUS LAURIFOLIA*, n. sp.

Leaves petioled, lanceolate, 6 inches in length by  $1\frac{1}{2}$  inches in width, equally narrowed to the point and petiole; margins entire, or faintly toothed, or undulate; nervation regular; midrib strong, straight, lateral branches, about ten pairs, arching gently upward, terminating in the margins.

*Formation and locality*.—Burned shales, over lignite beds, Fort Berthold, Dakota. Collected by S. M. Rothhammer, on the expedition of General Alfred Sully, U. S. A.

## 16. QUERCUS DUBIA, n. sp.

Leaf ovoid in outline, unsymmetrical; margins strongly and remotely toothed; teeth subacute or obtuse; nervation delicate; midrib flexuous; lateral branches, about six on a side, somewhat waved, branched, and interlocking, and terminating in the marginal denticles; surface smooth, consistence probably somewhat coriaceous.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Collected by Dr. Hayden.

## 17. QUERCUS SULLYI, n. sp.

Leaves ovate, pointed, wedge-shaped, or rounded at the base; margins set remotely or closely, with acute, spiny-pointed teeth; nervation strong, somewhat flexuous; lower pair of lateral nerves giving off numerous branches, middle and upper pairs simple below, forked at the summit.

*Formation and locality.*—Burned shales over lignite beds, Fort Berthold, Dakota. Collected by S. M. Rothhammer, on the expedition of General Alfred Sully, U. S. A.

## 18. QUERCUS CASTANOIDES, n. sp.

Leaf linear-lanceolate, acute, 6 inches long by 1 inch broad; margins remotely and somewhat irregularly set with coarse, in some cases spinous, teeth; nervation strong; midrib straight, sharply defined; lateral branches unequally spaced, simple, forked near the extremity, terminating in the marginal denticles.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming. Collected by Dr. C. A. White.

## 19. POPULUS POLYMORPHA, n. sp.

Leaves petioled, ovate, rounded or slightly wedge-shaped at the base, acute or blunt-pointed at the summit; margin coarsely and irregularly crenate, dentate, or crenate-dentate; nervation strongly marked, pinnate; in the more elongated forms, about eight branches on each side of the midrib given off at an acute angle; in the broader forms the lower nerves issue at nearly a right angle; the upper ones at an angle larger than in the preceding form.

*Formation and locality.*—Tertiary strata, Bridge Creek, Oregon. Professor Condon.

## 20. POPULUS ROTUNDIFOLIA, n. sp.

Leaves of small size, rarely more than an inch in diameter, approximately circular in outline, either quite round or transversely or longitudinally elliptical; slightly wedge-shaped at the base, and decurrent on the long petiole; basal margin entire; upper half of leaf coarsely crenate, dentate, and usually short pointed at the summit; nervation

flabellate, consisting of a median and two principal lateral nerves, which give off numerous branches.

*Formation and locality.*—Tertiary strata, Yellowstone River, Wyoming. Collected by Dr. Hayden.

21. JUGLANS DENTATA, n. sp.

Leaves large and relatively broad, 7 inches long by 2½ inches wide; short petioled; rounded, narrowed or unsymmetrical at base, marked with remote, appressed, somewhat coarse, teeth; nervation distinct and regular; midrib straight, strong; lateral nerves about 12 pairs on each side, arched upward, much curved toward the extremities, deflected along the margin, finally terminating below in the marginal teeth, above, camptodrome; tertiary nervation forming a complicated and irregular but sharply defined net-work.

*Formation and locality.*—Eocene strata, Green River Station, Wyoming. Collected by Dr. C. A. White.

22. JUGLANS OCCIDENTALIS, n. sp.

Leaves somewhat variable in form and size, from 3 to 8 inches in length and 1 to 2 inches in width, but generally 6 inches long by 1½ inches wide, broad-lanceolate in outline, widest in the middle, summit acute, base rounded, often unsymmetrical; margins entire; nervation delicate; midrib straight; lateral nerves, about twenty on each side, gently curved upward, the lower ones branched and anastomosing near their extremities, the upper simple and terminating in the margins; tertiary nervation very delicate, or obscure from being buried in the parenchyma of the leaf, forming an open and irregular network. Fruit small, elongated, somewhat prismatic; divisions of the envelope lenticular in outline, narrow, thin.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming. Collected by Dr. C. A. White.

23. CRATEGUS FLAVESCENS, n. sp.

Leaves small, about 1 inch in length and breadth; lobed; lobes rounded and bearing a few teeth or crenulations; the summit of the leaf trilobed, with two lateral lobes below on either side.

*Formation and locality.*—Miocene? Tertiary, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

24. ULMUS SPECIOSA, n. sp.

Leaves 4 to 6 inches in length by 2 inches in width; petioled, long-ovoid, or elliptical in outline, pointed at summit; margins coarsely and doubly serrate; nervation strong, regular, 15 to 20 parallel branches on either side of the midrib. Fruit large, 27 centimeters in diameter, sub-circular, emarginate.

*Formation and locality.*—Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

25. *ULMUS GRANDIFOLIA*, n. sp.

Leaves large, 16 centimeters long by 8 centimeters wide, ovate, often unsymmetrical; nervation strong, regular; midrib straight; lateral nerves, about thirteen on each side, strong and simple, except at summit, where they give off numerous branches; margins sometimes entire at base, but oftener simply serrate-dentate throughout.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Dr. Hayden.

26. *PLANERA VARIABILIS*, n. sp.

Leaves lanceolate to broad ovate; usually unsymmetrical, petioled; summit acute, sometimes long-pointed; base rounded or wedge-shaped; margins coarsely crenulate-dentate, or serrate, with remote, appressed teeth; midrib straight, strong; lateral nerves delicate, frequently alternating stronger and finer, gently arched upward, terminating in the teeth of the border; the finer intermediate ones sometimes fading out before reaching the margin.

*Formation and locality.*—Eocene Tertiary, Green River Station, Wyoming. Collected by Dr. C. A. White.

27. *PLANERA NERVOSA*, n. sp.

Leaves ovate or lanceolate, pointed, wedge-shaped, or rounded at the base, petioled; margins set with coarse, appressed teeth; nervation strong, crowded, regular; lateral nerves simple, parallel, terminating in the teeth of the margins.

*Formation and locality.*—Eocene Tertiary strata, Green River, Wyoming. Collected by Dr. C. A. White.

28. *PLANERA CRENATA*, n. sp.

Leaves oblong, ovate; short petioled, 5 centimeters long by 25 millimeters wide; base rounded; summit blunt pointed; margins coarsely crenate; nervation simple, delicate, six simple branches on each side of the midrib terminating in the crenations of the margin.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Collected by Dr. Hayden.

29. *BETULA ANGUSTIFOLIA*, n. sp.

Leaves petioled, oblong-lanceolate, 3 inches long by 1 inch wide; wedge-shaped or slightly rounded at the base, acuminate at summit; margins finely serrate below, coarsely and doubly serrate above; nerves slender, about eight branches on each side of the midrib.

*Formation and locality.*—Miocene ? Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

30. *BETULA HETERODONTA*, n. sp.

Leaf 2 to 4 inches in length, long petioled, ovate, acuminate, rounded at the base; margins coarsely and irregularly serrate, the prin-

cipal denticles receiving the terminations of the nerve branches; the sinuses between these sometimes plain, sometimes set with a few small teeth; nervation delicate, about 8 branches given off from each side of the midrib.

*Formation and locality.*—Miocene? Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

31. *ALNUS ALASKANA*, n. sp.

Leaf large, oblong-ovoid, acuminate, rounded, or slightly heart-shaped at base; nervation crowded, 16 to 18 branches on each side of the midrib; margins set with very numerous, small, uniform, acute teeth.

*Formation and locality.*—Tertiary strata, Kootzanoo Archipelago, latitude  $57^{\circ} 35'$ , longitude  $134^{\circ} 19'$ , Alaska Territory. Collected by U. S. steamer Saginaw, February 18, 1869.

32. *ALNUS GRANDIFLORA*, n. sp.

Leaves 4 to 5 inches in length by 3 inches in width; ovate; rounded or wedge-shaped at the base; blunt pointed at the summit; margins coarsely dentate; nervation strong, crowded; 12 or more parallel branches on either side of the midrib, the intervals between these crossed by numerous parallel, mostly straight nervules, dividing the surface into oblong, quadrangular areoles.

*Formation and locality.*—Tertiary strata, Cook's Inlet, Alaska. Collected by Captain Howard, U. S. N.

33. *PLATANUS ASPERA*, n. sp.

Leaves attaining a diameter of 1 foot or more; petioled; rounded at the base more or less; three-lobed, sometimes nearly ovoid; nervation strong, about 9 branches on each side of the midrib; margins deeply, and often compoundly, toothed.

*Formation and locality.*—Miocene? Tertiary, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

34. *FRAXINUS INTEGRIFOLIA*, n. sp.

Leaves short-petioled or sessile; lanceolate; broadest near the base, which is abruptly narrowed and wedge-shaped; summit narrowed, extremity rounded; margins entire; nervation reticulate, camptodrome; lateral branches connected in elegant festoons near the margins; intervals filled with net-work of roundish, polygonal meshes.

*Formation and locality.*—Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

35. *PRUNUS VARIABILIS*, n. sp.

Leaves short-petioled, very variable in form; lanceolate or broadly lance-ovate, 2 to 3 inches long by 1 to 2 inches wide; acuminate at the summit, wedge-shaped at base; margins thickly set with minute, acute, appressed teeth.



*Formation and locality.*—Tertiary strata, Cook's Inlet, Alaska. Collected by Captain Howard, U. S. N.

36. *ILEX MICROPHYLLA*, n. sp.

Leaves small, short-petioled, ovate, slightly decurrent on the petiole, abruptly pointed above, often unsymmetrical; margins set with 3 to 5 spiny teeth on each side; nervation distinct, but open, about 4 pairs of branches springing from each side of the midrib, arching upward, terminating in the teeth of the margin; tertiary nervation consisting of a coarse, irregular reticulation.

*Formation and locality.*—Tertiary strata, near Fort Union, Dakota. (Dr. Hayden.)

37. *CELTIS RUGOSA*, n. sp.

Leaf long-ovoid to lanceolate, rounded and slightly heart-shaped at the base, long-pointed at summit, 7 to 12 centimeters long by 3 to 5 centimeters wide; margins set with coarse, obtuse teeth, undulate or rarely entire; nervation strong, flexuous; midrib undulate; lateral branches about six on each side, branching and interlocking near the margins; tertiary nervation transverse, parallel, strong.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Collected by Dr. Hayden.

38. *CELTIS PARVIFOLIA*, n. sp.

Leaves small; oblong-ovate in outline; rounded and unsymmetrical at the base, pointed at the summit; margins, except at the base, coarsely dentate; nervation sparse; two principal branches on each side of the midrib, one pair springing from the base and throwing off branchlets, another strong pair issuing from the midrib at the middle of the leaf, other delicate branches given off near the summit.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. (Dr. Hayden.)

39. *CERCIS BOREALIS*, n. sp.

Leaves small, orbicular, or roundish ovate; blunt pointed, cordate at the base; margins entire; nervation delicate; midrib flexuous, about three lateral branches on each side, the basal pair throwing off several branchlets on the lower side and reaching to or above the middle of the leaf.

*Formation and locality.*—Tertiary beds, valley of the Yellowstone River, Wyoming. Associated with *Platanus Raynoldsii*, N, *Rhamnus parvifolius*, N, and *Aristolochia crassifolia*, N. (Dr. Hayden.)

40. *FRAXINUS AFFINIS*, n. sp.

Leaves petioled, lanceolate, long pointed, attenuate at base; margins coarsely and irregularly toothed at and above the middle.

*Formation and locality.*—Miocene (?) Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thomas Condon.

41. RHAMNUS PARVIFOLIUS, n. sp.

Leaves short-petioled, 2 to 3 inches long, elliptical or obovate, rounded at the summit, narrowed to the petiole below; margins dentate, except at base; teeth coarse, acute, appressed near the summit; nervation uniform, rather open, six to seven branches on each side of the midrib.

*Formation and locality.*—Tertiary strata, associated with *Platanus Reynoldsii*, &c., valley of Yellowstone River, Wyoming. Collected by Dr. Hayden.

42. LAURUS ACUMINATA, n. sp.

Leaves about 40 millimeters in length by 16 millimeters wide; long-ovate or ovate-lanceolate in outline, rounded at the base, long-pointed, acuminate at summit; nervation camptodrome; midrib straight, strong, about five pairs of lateral nerves, strongly arched upward, forming festoons near the margin; the lower pair opposite strongest, and reaching the middle of the leaf; secondary nervation open, forming irregular, chiefly quadrangular spaces, filled with minute uniform areoles.

*Formation and locality.*—Yellowstone Valley, Wyoming. Collected by Dr. Hayden.

43. VIBURNUM GRANDIDENTATUM, n. sp.

Leaves ovate (?) long-pointed, very coarsely dentate, with triangular teeth; nervation fine, lateral branches terminating in the marginal teeth; the lower pair reaching above the middle of the leaf and throwing off branchlets, which enter the marginal denticles.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Collected by Dr. Hayden.

44. VIBURNUM CUNEATUM, n. sp.

Leaves petioled, long-obovate, 10 centimeters or more in length by 4 centimeters in width; margins entire below the middle, above, set with coarse subacute or acute teeth; nervation strong, simple; midrib straight, giving off at an acute angle 7 or 8 simple, strong nerve branches on either side, which terminate in the teeth of the margin.

*Formation and locality.*—Tertiary beds, Tongue River, Wyoming. Collected by Dr. Hayden.

45. VIBURNUM PAUCIDENTATUM, n. sp.

Leaves petioled; 4 inches long by 1½ inches wide; ovate-lanceolate, pointed; narrowed and slightly rounded at base; margins below the middle entire, above bearing three large obtuse teeth; nervation strong, simple; midrib straight, about 4 strong, simple branches on either side of the midrib, issuing at an acute angle, the lowest terminating in a rounded tooth in the middle of the leaf, the others in the three large teeth above.

*Formation and locality.*—Tertiary rocks, valley of Tongue River, Wyoming. Collected by Dr. Hayden.

46. *FICUS ALASKANA*, n. sp.

Leaves large, reaching 8 to 10 inches in length and breadth; trilobed, generally unsymmetrical; lobes pointed, usually obtuse; margins entire or locally undulate; nervation strong, conspicuously reticulate; principal nerves, three, giving off branches, which divide near the margins, sometimes connecting in festoons, sometimes craspedodrome; tertiary nervation forming a coarse net-work of usually oblong meshes filled with a fine polygonal reticulation; upper surface of the leaf smooth and polished, lower roughened by the reticulation of the nerves.

*Formation and locality.*—Tertiary strata, Cook's Inlet and Admiralty Inlet, Alaska. Collected by Captain Howard, U. S. N.

47. *FICUS MEMBRANACEA*, n. sp.

Leaves sessile, 4 to 6 inches in length, by  $2\frac{1}{2}$  to  $3\frac{1}{2}$  in width; ovate, abruptly and usually blunt pointed, narrowed to the base, generally unsymmetrical, margin entire, nervation delicate, open, camptodrome; 10 or more branches given off on either side of the midrib, curving upward, and forming a festoon near the margin.

*Formation and locality.*—Tertiary strata, Cook's Inlet, Alaska. Collected by Captain Howard.

48. *FICUS CONDONI*, n. sp.

Leaves large, sometimes nearly 2 feet in length, three to five lobed, slightly decurrent, and the petiole sometimes stipulate; margins entire, or gently undulate; nervation very strongly marked and closely reticulate, roughening the surface, camptodrome, but nerve branches sometimes terminating in the margins of the middle lobe.

*Formation and locality.*—Tertiary beds, Bridge Creek, Oregon. Collected by Prof. Thos. Condon.

49. *FICUS (PROTOFICUS) NERVOSA*, n. sp.

Leaves large, 8 to 10 inches in length by 5 inches wide, oval in outline, pointed at the summit, rounded at the base; nervation crowded, remarkably exact and regular; midrib strong and straight, 12 or more branches on either side, nearly equidistant, simple, strongly arched upward, forming a festoon along the margin; tertiary nervation consisting of numerous nearly simple and straight cross-bars, connecting the secondary branches at right-angles, and short nervules running off from the midrib at right-angles; margins entire.

*Formation and locality.*—Light grey sandstone, Laramie Group, Evanston, Utah.

50. *PROTOFICUS INEQUALIS*, n. sp.

Leaves 4 to 5 inches long, by 3 inches wide; oval, pointed at the summit, narrowed and rounded at the unsymmetrical base; margins entire

or in part undulate; nervation strongly defined but open; about 7 branches on each side of the midrib, the lower two or three giving off branches below, the upper simple, arched upward, terminating in the margin, the intervals between the branches spanned by numerous, generally simple, tertiary nerves.

*Formation and locality.*—Tertiary strata, Tongue River, Wyoming. Collected by Dr. Hayden.

51. *VITIS ROTUNDIFOLIA*, n. sp.

Leaf broadly rounded or sub-triangular in outline, cordate at the base, and with an acute point at the summit, and at the extremity of each of the angles; intermediate portions of the margin coarsely and bluntly toothed; strongly three-nerved; tertiary nervation distinct and flexuous.

*Formation and locality.*—Tertiary strata, Admiralty Inlet, Alaska. Captain Howard, U. S. N.

52. *MAGNOLIA ROTUNDIFOLIA*, n. sp.

Leaves petioled, large (8 inches in length by 6 inches in width), round-ovate in outline, rounded or blunt-pointed above and slightly wedge-shaped below; margins entire; nervation open and delicate; 4 to 6 lateral branches given off from the midrib at remote and irregular distances, curving gently upward, and forming festoons near the margin.

*Formation and locality.*—Laramie group; Fisher's Peak, New Mexico. Collected by Dr. Hayden.

53. *MAGNOLIA ANGUSTIFOLIA*, n. sp.

*Magnolia attenuata.* Web. Lesq. Tert. Flor., p. 250. Pl. XLV. Fig. 6.

Leaves petioled, 1 foot or more in length, by 2 to 3 inches wide in the middle; lanceolate, pointed above, gradually narrowed to the base; margins entire; nervation sparse; midrib straight, lateral nerves few, thin, gently arched, camptodrome.

*Formation and locality.*—Laramie group, Fisher's Peak, N. Mex.

54. *ZIZYPHUS LONGIFOLIA*, n. sp.

Leaves four to seven inches long by six to twelve lines wide; lanceolate, long-pointed, wedge-shaped at base and long-petioled; margins waved, or more or less distinctly toothed; midrib well defined from base to summit; basal pair of lateral nerves approaching closely to the margin near the middle of the leaf, then curving gently inward, and anastomosing with the higher lateral nerves, of which there are three or more set alternately and curving upward, forming a festoon near the margin; tertiary nerves very finely reticulated.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming. Collected by Dr. C. A. White.

55. *ARALIA MACROPHYLLA*, n. sp.

Leaves large, long-petioled, palmately five parted from the middle upward, divisions conical in outline, sometimes entire, often remotely

occasionally coarsely toothed; nervation strong and regular; the midribs of the divisions strong and straight, those from the second lateral lobes springing from near the bases of the first lateral lobes; secondary nerves numerous, distinct, curved gently upward; where the margins are entire, partially camptodrome, where dentate, terminating in the teeth; tertiary nerves anastomosing to form quadrangular and very numerous areoles.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming. Collected by Dr. C. A. White.

56. *BRASENIA ANTIQUA*, n. sp.

Stems long, flexuous, cylindrical (now flattened), smooth, many times branched toward summit, bearing pedunculate spheroidal capitula consisting of numerous club-shaped pods.

*Formation and locality.*—Eocene Tertiary, Green River, Wyoming.

57. *CABOMBA GRACILIS*, n. sp.

Stem slender, smooth; submerged leaves, set at intervals of half an inch to an inch apart on the stem, opposite dichotomously and frequently branched, segments narrowly linear, or filiform, flattened, smooth, truncated, scarcely distinguishable from the stems and leaves of *C. Caroliniana*.

*Formation and locality.*—Tertiary strata, Fort Union, Dakota. Collected by Dr. Hayden.

58. *CABOMBA GRANDIS*, n. sp.

Stems smooth, originally cylindrical, now flattened; leaves opposite, many times dichotomously forked, spreading 4 to 6 inches long; segments flat, 2 to 3 millimeters wide, smooth, truncated or slightly rounded at the extremities. Resembles *C. gracilis* in all respects, but very much larger.

*Formation and locality.*—Tertiary strata, Fort Union, Dakota. Collected by Dr. Hayden.

59. *BERBERIS SIMPLEX*, n. sp.

Leaves pinnate with three or more pairs of leaflets: leaflets ovoid, rounded or emarginate at base, acute, with two to four large spiny teeth on each side.

*Formation and locality.*—Tertiary strata, Bridge Creek, Oregon. Collected by Prof. Thos. Condon.

60. *CARPOLITHUS SPINOSUS*, n. sp.

Fruit enclosed in an exocarp composed of three elliptical or lentiform segments, furrowed along the middle line of the dorsum and bristling with erect, acute spines 6 to 8 millimeters long; peduncle cylindrical, strong, 1 inch or more in length.

*Formation and locality.*—Upper Cretaceous? North branch of Purgatory River, New Mexico. Collected by Mr. I. C. Russell.