

arise from basal strawberry-like leaves. They set so much seed that bloom can be retarded on parent plants if all are allowed to mature.

Linaria 'Canon J. Went' reproduces itself profusely. The narrow, grey green leaves are a fine foil for the pink miniature snapdragon flowers carried at the tips.

It is a revelation to see what nature brings easily into the garden by "Population Explosion".

TAXONOMY

Ferns Cultivated in California

BLECHNUM

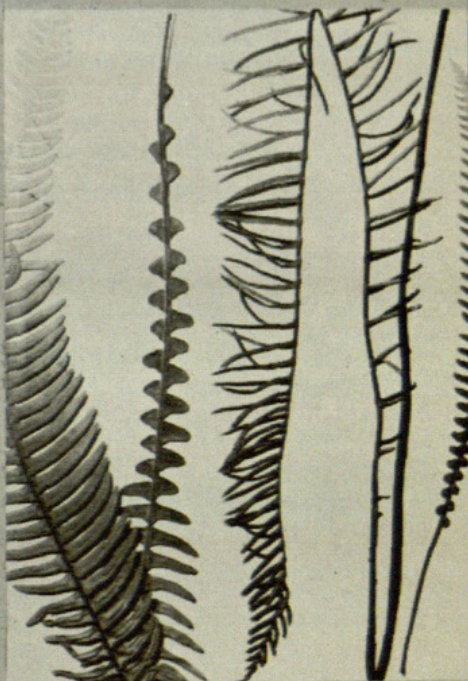
BARBARA JOE

The availability of several fine species of *Blechnum* in the trade has renewed interest in this handsome group of ferns. Some kinds produce fronds which are red or reddish-pink when they are young, further enhancing their ornamental attractiveness. In the trade, a few species are known under the synonym *Lomaria*. The large species, which are considered miniature tree ferns, have proven to be of easy culture and sometimes a welcome change from the usual foliage plants. These subarborescent species, *B. brasiliense*, *B. gibbum* and forms of both, bear their fronds in a circular crown, making interesting accent plants in tubs or containers. *B. gibbum* is reported to have withstood light frost. However, the winter appearance of the foliage, even without frost, leaves much to be desired, except near the coastal areas. One of the varieties of *B. gibbum*, known in the trade under the misapplied name of *B. Moorei*, is superior to the species in that the foliage remains green and attractive throughout the winter months. *B. brasiliense* responds to cooler temperature much as does *B. gibbum*. Because of the more compact nature of the undulate form of *B. brasiliense*, it is less apt to show foliage disfiguration, and is recommended over the species.

Of the smaller species, *B. occidentale* sends out new plantlets at the end of its creeping rhizome and is very useful in borders or background plantings. It is a robust, rapid grower, tolerant of heavier soil and drier conditions than other species. Strong indirect sunlight or direct sunlight along the coastal areas is endured. The ordinary winters of the coastal areas as far north as San Francisco permit maintenance of satisfactory plants so long as some protection is provided. Frost may cause the foliage to brown or become deciduous.

Common in the wilds of the northern part of California is the hardy Deer Fern, *B. spicant*, which forms clumps of tufted foliage from the short-creeping, then erect rhizome. Deer browse on this fern during the summer months. The Deer Fern is raised with some difficulty in the southern part of the state, and never attains the lushness and size of those in the north. All other cultivated species, however, are moderate to quick in growth and present no unusual problems in cultivation. They may be generally said to prefer temperatures of 65 F. or more with lower temperatures correspondingly reducing the amount of new growth and attractiveness of the foliage.

Top row, left to right: *Blechnum gibbum*, habit; *B. gibbum*, frond; *B. moorei*, frond. Middle row, left to right: *B. gibbum*, unnamed variant, habit; *B. gibbum*, frond of unnamed variant; *B. spicant*, frond. Bottom row, left to right: *B. unilaterale*, frond; *B. brasiliense* cv. 'Crispum', frond; *B. brasiliense* cv. 'Crispum', habit. Photos by author.



The Blechnums are propagated by spores. *B. occidentale* and *B. spicant* are also easily propagated by divisions. Established clumps of the latter are the usual manner in which this fern is furnished to the nurseries. Subarborescent species occasionally produce new crowns of foliage on the trunk or near the base. If these crowns are carefully removed with a portion of the stem attached, it is possible, but not without difficulty, to start new plants with the off-shoots.

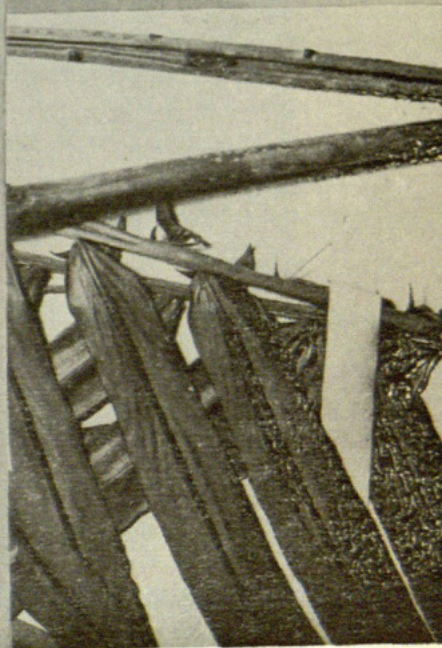
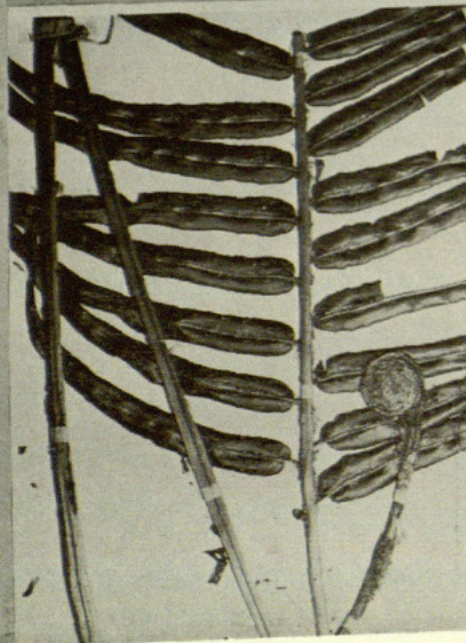
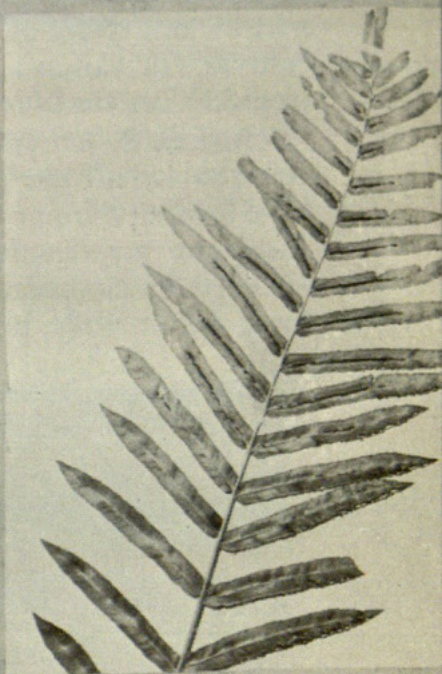
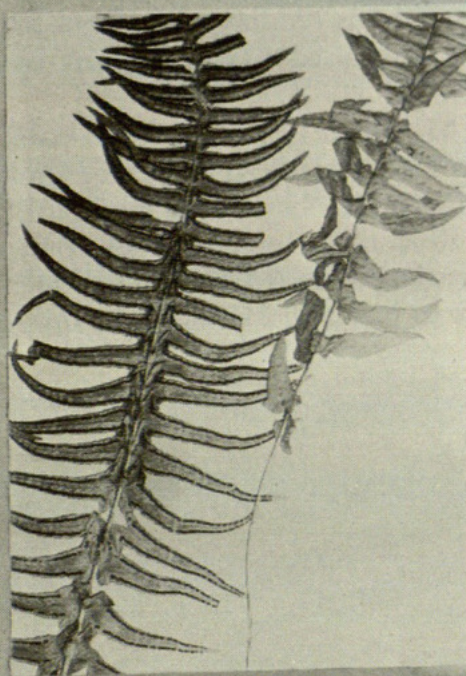
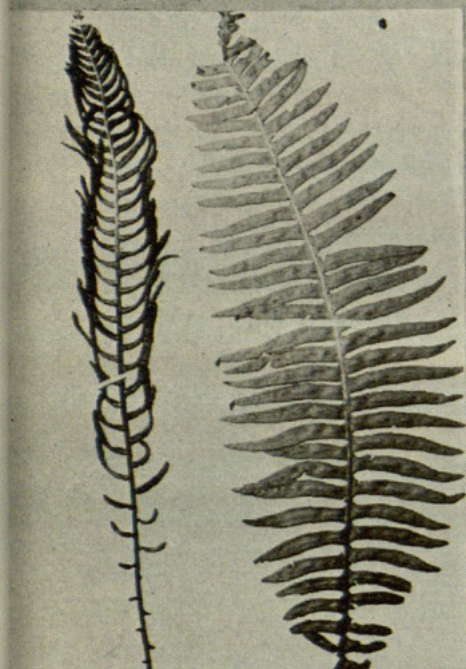
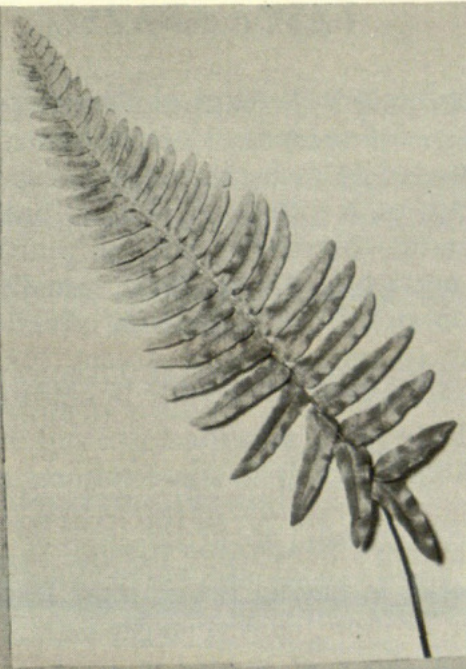
The Blechnums are typified as terrestrial or subarborescent ferns with a rather coarse and stiff habit. The fronds are usually arranged in a circular pattern. The rhizome is creeping to erect or trunk-like. The scales on the rhizome and often on the tips are linear and harsh. Some species have contracted fertile fronds. The fronds are usually deeply pinnatifid or pinnate, herbaceous in texture, and smooth. The margins are entire or serrate. The veins are free, forked and subparallel. The long linear sori are continuous along each side of the midvein. Each is covered with a flap-like indusium, which is long and linear in shape, parallel to and opening toward the midrib. The two hundred species of this group are largely distributed in the southern hemisphere with some in the tropics of the northern hemisphere, and one species, *B. spicant*, is the North Temperate Zone.

Species which have contracted fertile fronds were formerly placed in the genus *Lomaria*. This separating character has recently not been considered significant because some species have been found to have varying degrees of contraction.

The following is a key to the species known to be cultivated in California:

- A. Fertile fronds reduced or contracted.
 - B. Sterile fronds oblong, elliptic to oblong oblanceolate, 5 in. or more wide; small tree fern. *B. gibbum*
 - BB. Sterile fronds lanceolate, not more than 5 in. wide, generally less; not a small tree fern. *B. spicant*
 - AA. Fertile fronds the same as the sterile.
 - B. Fronds pinnatifid or with the lowest pinnae free.
 - C. Fronds lanceolate, 1½ to 3 in. wide, not a tree fern, Rare in cultivation. *B. unilaterale*
 - CC. Fronds oblong-lanceolate, 1 ft. or more wide; subarborescent. *B. brasiliense*
 - BB. Fronds simply pinnate in lower half or more. *B. occidentale*
- Blechnum brasiliense* Desv. Subarborescent; trunk stout, 1 ft. or more high, the scales dark brown, densely covering the crown; stipe short, stout, densely scaly; fronds erect, to 3 ft. long, to 1 ft. or more wide, pinnatifid, oblong-lanceolate, narrowing downwards very gradually; pinnae usually gradually tapering to the apex, finely toothed, the upper ones 4-6 in. long, ½ in. wide, the lower ones connected, shorter and blunter; texture leathery, both surfaces naked; veins free; sori close to midrib. Brazil and Peru. To 4 ft. Semi-hardy to tender. Shade. Accent, suitable in containers.
- cv. *crispum* (*B. corvadense* var. *crispum*). A form with undulate margins, crowded pinnae and smaller fronds which are red when young. More commonly cultivated than the species, the foliage remaining in good condition throughout the winter in coastal areas.
- Blechnum gibbum* (Lab.) Mett., (*Lomaria gibba* Lab.). Small tree fern; trunk to 3 ft., covered with black scales; leaf stalk and lower half of the midrib scaly; sterile fronds

Top row, left to right: *Blechnum occidentale*, habit; *B. occidentale*, frond; *B. fraxineum*, frond. Middle row, left to right: *B. discolor*, frond; *B. auriculatum*, frond; *B. servulatum*, frond. Bottom row, left to right: *B. fluviatile*, portion of frond; *B. lineatum*, frond; *B. orientale*, frond. Photos by author.



spreading almost horizontally, 2-3 ft. long, oblong elliptic, pinnatifid almost to the midrib; sterile pinnae many, 4-6 in. long, $\frac{1}{4}$ - $\frac{3}{8}$ in. wide, tapering to a bluntish point, the bases dilated and connected to each other, the lower pinnae gradually shorter, the lowest distal and free from each other and usually broadly attached to the midrib; margins entire or finely serrate especially near the pinnae tip; texture herbaceous to leathery; fertile pinnae contracted, 4-6 in. long, usually $\frac{1}{8}$ in. wide, in cultivation frequently but slightly contracted. N. Caledonia, Aneiteum, Isle of Pines in South Pacific. To 4 ft. Semi-hardy to tender. Shade. Accent, suitable in containers. Subject to fungi, best to avoid overhead watering. Variable in cultivation.

cv. *platypteris* Hort. A large rapid growing form with many erect fertile fronds bearing sterile spores. Appears infrequently in spore cultures of the species.

Plants erroneously passing as *B. moorei* in the local trade are a distinctive cultivar of *B. gibbum*, which to the author's knowledge has not been given a proper name. It is distinguished from the species in having fewer, more leathery, erect fronds with fewer pinnae; pinnae wider $\frac{3}{8}$ in. or more, conspicuously serrate, the lower pinnae frequently sessile to almost stalked; apex of pinnae in younger fronds rounded; leaf stalk, midrib, and costae of young fronds reddish-pink. Semi-hardy. Evergreen. Spores of this cultivar (or variety) were introduced from Germany by Mr. A. W. Roberts of Subtropical Gardens Nursery.

The true *B. moorei* C. Chr. which is not known in local cultivation has the leaf stalk equal to or half the length of the blade, the apex of the pinnae frequently truncate or bifid bearing a fringe of cilia and the base of each pinna slightly lobed on the lower side.

Blechnum occidentale L. Rhizome creeping underground, forming new plants at the apex, crown clothed with scales; stipe 6-12 in. long, erect, scaly below; fronds 9-18 in. long, 4-8 in. wide, pinnate to pinnatifid with 12-24 linear pinnae on each side; pinnae



Blechnum brasiliense, frond.

Blechnum capense, frond.

Photos by author.

3-6 in. long, $\frac{3}{8}$ - $\frac{3}{4}$ in. wide, narrowed gradually to a bluntish point, the upper pinnae broadly joined to the rachis, connected to each other then gradually becoming distal below, the lower pinnae truncate, cordate, or sometimes eared at the base, often 1 in. apart, and the lowest pair deflexed, but much smaller than those above; texture leathery. American from Mexico and W. Indies southwards to Chile and south Brazil. To 1½ ft. Semi-hardy, deciduous when frosted. Tolerant of strong light, heavy and drier soils; robust, of easy culture. Border or background.

An unnamed cultivar is occasionally found having a stiffer, stricter habit, and more red color than the species. It is not as robust.

Blechnum spicant (L.) Roth, (*Lomaria spicant* (L.) Desv.). Tufted ferns; rhizome stout, scaly; fronds pinnatifid, dimorphic, the sterile fronds to 3½ ft. long, to 5 in. wide, nearly sessile or on stipes 2-3 in. long, the blade pinnatifid to the midrib, lanceolate to linear in outline, narrowed gradually below, the pinnae many, closely placed, oblong or oblong-linear, often falcate, the apex obtuse to acute; fertile fronds taller, more erect, the stipes to 9 in. long, dark and polished, the pinnae less crowded, very narrow-linear, sessile by dilated base, sporangia covering the backs of pinnae. Northern hemisphere. To 3½ ft. Hardy. Shade. Not well adapted to southern California.

Blechnum unilaterale Swartz. Rhizome slender creeping, then erect; fronds to 2 ft. long, to 3 in. wide, lanceolate, pinnate at base, pinnatifid upwards; pinnae numerous, spreading, linear, $\frac{3}{4}$ -1 in. long, the lower distant, small, broader than long, irregularly triangular, the margins entire or nearly so. Tropical America. Known in cultivation only from a single plant at Jungle Garden Nursery, Culver City, California.

CTENITIS

A modest fern often overlooked in the garden, *Ctenitis pentangularis*, is one of the many introduced from New Zealand. It has no common name but the botanical name is informative. *Ctenitis* means comb-like, referring to the form of the pinnae and *pentangularis* means five-angles, alluding to the outline of the frond.

Compact clumps of this fern are generally found tucked along a border, more than often obscured by some larger plant. The lacy broad fronds are fairly tolerant of irregular watering, and fortunately are not relished by slugs and snails. Though this plant is slow in growth, it does not seem to be particular about soil or fertilizer. However, ferns which are fertilized are much improved in having a deeper color, larger fronds, and more rapid growth. Prize specimens may also be grown in pots or containers. In southern California it is considered a semi-hardy species, having withstood temperatures to 32°F. Colder conditions, possibly to 26°F. for short periods, may also be endured. Propagation is by spores and easily by divisions. Today it is rarely found in the nursery trade, commercial growers preferring plants with more rapid growth and tropical effect.

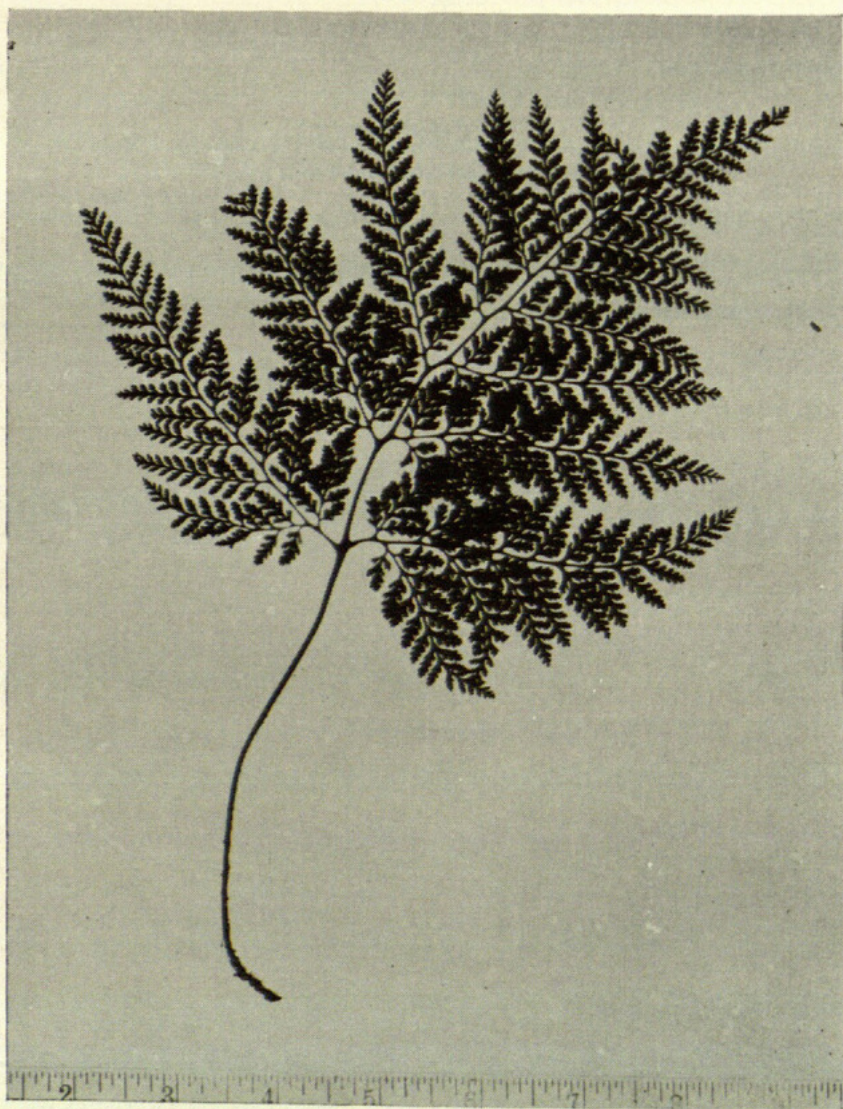
The 120 species of *Ctenitis* existing in the tropics may be recognized from others by the following characteristics. They are medium size to large ferns with short creeping to erect rhizomes which are covered with a dense mass of soft scales. The fronds are usually amply divided and broad at the base. The bases of the upper pinnae extend down the midrib as a narrow leafy portion known as the wing. The texture is herbaceous. The midribs of the pinnae do not have raised edges. Along the midribs of the frond and pinnae are some scales and many matted soft woolly jointed hairs. These hairs are more conspicuous on the upper surface and are a light color when young or a rusty color when old or dried. The veins are free, simple or forked. The sori are round and small, formed on the backs of the veins. A round kidney-shaped indusium is usually present. *Ctenitis* species were formerly grouped under *Dryopteris*.

Two species are reported to be cultivated in United States, but only the following is known in California.

Ctenitis pentangularis (Coe.) Alston, *Dryopteris decomposita* of New Zealand authors. Fronds triangular, tripinnate, to 2 ft. long, to 1 ft. wide, hairy, the lobes obtuse at the apex; indusium present. To about 2½ ft. tall, usually less. Shade. Semi-hardy. Evergreen. Growth rate slow. New Zealand. Confused with *C. decomposita* (R.Br.) Copel. which is also reported to be cultivated. *C. decomposita* is native to Australia and differs in being larger, with the segments acute at the apex and with fewer teeth on the sides of the lobes.

The presence of a round kidney-shaped indusium in *Ctenitis* as well as other genera may cause some confusion. *Ctenitis* may be distinguished from the firm textured *Dryopteris* by the presence of hairs on the main veins, and by the absence of a raised edge on the costae. *Thelypteris* species have hairs, but the hairs are single celled; the fronds are narrow rather than broad at the base. *Tectaria* species are coarsely cut and have netted veins.

Alston, A.H.G. 1955 A New Cobination in *Ctenitis*. American Fern Journal 45:160.



Ctenitis pentangularis, frond. Photo by author.



Hoshizaki, Barbara Joe. 1961. "Ferns cultivated in California: blechnum." *Lasca leaves* 11(Winter 1961), 8–14.

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