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C. R. Worth, Editor
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THE HARDY CACTI

CLAUDE A. BARR, *Smithwick, S. D.*

AMONG the relatively few members of the multitudinous cactus family that have moved out from the hypothetical low warm desert place of origin into high mountain altitudes or to northern climates the midget prickly pear, *Opuntia fragilis,* doubtless makes the strongest bid for the title of "Great Adventurer." On one of Mrs. J. Norman Henry's expeditions, as you may recall, this species was found and photographed in flower in far northwestern British Columbia. How did this scion of the warm desert get way up there? Well, if it travelled "on foot" doubtless it didn't make all that distance since the recession of the last great ice sheet. Let us propose—botanical heresy or not—that *Opuntia fragilis* could have hooked a ride.

Ha! The thought prompts an investigation. Here on the plains of southwestern South Dakota I have neighbored with this ubiquitous bum for all of half a century, have given it many a hitch on my shoes or other clothing, and never once have I examined closely its mechanism for going places on borrowed motive power. *Fragilis,* it seems, is "fragile" by gift of nature for the very purpose of travelling. The new terminal joints maintain for a full year a very tenuous attachment to the older stem. A very light sidewise push breaks them off, a direct pull on one of the numerous spines a like effect.

From the winter garden I bring into strong light and to the offices of a hand lens a detached terminal joint. "Red nosed and red ribbed" it is and doubtless fitted for a sojourn in Alaska if need be, for certainly now and again during the ages it has been subjected to fifty degrees below, here on the northern plains. The amusing "ribs" of the specimen in hand are the very irregular corrugations resulting from advanced shriveling of the inner tissues of the plant in its adjustment for the season of cold. Under the microscope the spines are seen to be stiff and sharp enough to penetrate shoe leather with casual contact, and are found to be well furnished with almost invisible processes, hardly backward pointing prongs, apparently, but projections that serve equally well to make extraction difficult.

Mr. Fragilis chuckles and demands, "Let's go." . . . It would be a simple matter for a fleet footed deer or a lumbering bear to acquire such a travelling companion, and many miles might be covered before the cactus, attached to

hide or tangled in hair, would be dislodged. Thus *fragilis* may readily have travelled farther and farther toward the pole.

Many cacti have hooked spines or prickles or their equivalent which serve as tickets for a ride if by chance a portion of the plant is broken off. The "jumping cholla" of Arizona with its effective grappling hooks and easy leave-taking of the outer joints does not really jump, though it seems to attach itself all too readily if one approaches it off guard. How else could its painful spines penetrate so deeply? But like most of the fragile ones it has kept to its own warm southwest.

Other cacti if broken or uprooted may travel briefly by means of the spines, or may be scattered by hooves or the wind, and the prickly pears notably have the faculty of striking root wherever they touch ground. Otherwise cacti have the same means of dispersal as other plant forms, spreading growth, scattering of seeds by wind and water, and transporting by animals and birds. The attractive little ball cactus, *Neobessya missouriensis,* ripens its fruits of dull crimson to brilliant scarlet, filled with small black seeds, toward spring, and during the northward migration of the birds the fruits disappear in short order. Conceivably these seeds have been carried as far as the limits of *Opuntia fragilis.* Yet the accredited range of neobessya stops short of the Canadian border. *Fragilis,* then, must have had something else, a greater ability to adjust or possibly some eons of handicap.

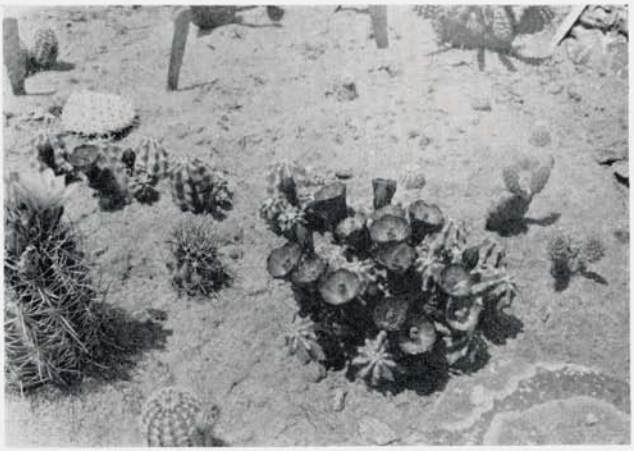
Best known of the northern ranging prickly pears is *Opuntia compressa,* the common kind of New England and Ontario and south to North Carolina and Arkansas. Thin padded and yellow blossomed over most of its range, it runs into many variations which are accorded varietal names by various botanists, who perennially disagree as to the importance of the distinctions. Somewhat similar but with fleshier joints or sections is *Opuntia humifusa.* This one, held to be properly a form of *compressa* by some, stoutly maintained as a distinct species by others, ranges over the west central portion of the United States. It is distinguished in its appeal to the gardener's eye in frequent individuals in the west by patches of crimson at the base of its large crystalline deep yellow petals.

Other northern cacti include the prickly pear, *Opuntia polycantha,* always conspicuously spiny but otherwise endlessly varied, mainly yellow flowered, and the ball or cylinder types, *Coryphantha vivipara* which crowns itself with pink to carmine-purple blossoms, *Neobessya missouriensis* with similar flowers of light yellow to pale orange, *Echinocereus viridiflorus* which carries its glossy green-tinted yellow blossoms on the ribs, and *Pediocactus simpsonii* displaying its charms in pale to rich pink in a corona. The coryphantha along with *Opuntia fragilis* and *O. polycantha* are very common in the drier southern portions of Canada. Pediocactus has travelled to near the Canadian line in Washington, while *E. viridiflorus* has advanced well into the Black Hills in South Dakota.

As the species extended their habitats northward they adapted their breathing pores to divest their large growing season moisture content rapidly at the approach of the cold months. By retaining only the minimum of water they protect their cell structure from frost rupture. This in brief is the mechanism of hardiness. Conversely, while the northern and high altitude kinds have fitted themselves to meet the exigencies of frigid winters, the warm desert kinds have effectively restricted their transpiration of moisture to meet the necessities of existence under extreme heat and low moisture availability. So while the non-hardy ones retain too much moisture to endure the stress of freezing, the hardy ones have been found unable to retain enough moisture when brought back and subjected to the extreme dessication of desert summers.

Photos by
Claude A. Barr.

The red-centered
Opuntia humifusa.



Scarlet flowered
Echinocereus triglochidiatus, Sclerocactus whipplei (left),
E. reichenbachii
(foreground).

Opuntia fragilis

However, the cold climate gardener who is fascinated by the novelty and beauty of cacti that may be cultivated out of doors is not restricted to the northern ranging species. Kinds that dwell anywhere on the high plains of Colorado, New Mexico, the Texas Panhandle and certain other areas have much hardiness, and adventurers from among such desert species as *Opuntia basilaris*, the beaver tail, have climbed sufficiently high into the neighboring mountains to acquire hardy equipment.

A friend who has experimented widely with cacti in New Jersey as a hobby, and who now in his California garden has gathered around a thousand species and forms, has for some years been providing selected plants for hardiness tests in South Dakota. It is his custom to explore widely through several states each season, and as well as to meet other cactus lovers and to exchange plants. Rare and odd forms and colors of plant and blossom that make for garden value come within the scope of his interests. He has been generous in passing on many of his top finds. By such good fortune my garden has gained unique and beautiful specimens that would otherwise have been obtainable. It has been a keen delight to grow successfully many of these treasures and to learn to believe that others of rare worth remain to be uncovered by diligent search in nature's well sequestered warehouses.

Cactus hunting is an exciting diversion where plants are numerous. One late May I drove from "cactus slope to cactus flat," scanning the vegetation in the extensive pastures of the neighboring "cow country." Dozens and dozens of individuals or patches of *O. polycantha* were in full bloom, mile on mile. Across the denser stands progress was at a snail's pace with frequent stops. Suddenly a spot of deep yellow blazed like a torch fifty yards ahead. Nothing comparable in eye reach, the eye returned unerringly to that one intense signal, among the many lesser lights. Good luck in a find was heightened when at close range the three inch satiny blossoms, some seventy of them in the three or four foot circle, were seen to have large and equally brilliant basal blotches of crimson. Centering each gaudy flower the deep green stigma knob—distinguishing character of *polycantha* and its close relatives—poised like a toe dancer amid the swirl of golden anthers and red filaments. It was the most flashing climax of many a cactus hunt.

Other explorers have found *polycanthas* with blossoms of carmine. My collection has two of them, one from the former D. M. Andrews Nursery of Boulder, Colo., the other an exchange from Trinidad, Colo. Both are vibrant in color. Variation in growth habit and blossom color within most species is the rule, cactus fanciers as well as systematists have found. I am advised to look for all-red blossoms in *fragilis*. They have been reported from Arizona, where *O. fragilis* still dwells at 5400 to 7000 ft. In evaluating finds one must know the color of the fresh flower, for in the withering stage they often take on strange and sometimes much wanted tones, pink salmon, apricot or deep crimson, though they may have been but plain yellow of indifferent tone when fresh.

For more detail about certain species from the gardener's viewpoint: *O fragilis* is a little thing with joints rather ovoid, often nearly as thick as wide, one to one and a half inches long, green, slightly glaucous with a moisture-retaining coat of wax, fiercely spiny. The flower is two inches wide, light yellow with tinges of red or brown. *O. humifusa* has joints or pads four or five inches long, three or four wide. Areoles, from which the spine clusters arise, are rather widely spaced, a ready means of distinguishing that species from polycantha. The blossoms are large, sometimes four inches wide, bright yellow, sometimes with the lower portion of the petals toning to orange, the stamens yellow, pistil knob yellow-green. When the base of the petals is red of any shade, filaments

are also red, making a striking show. *O. polycantha* is strikingly varied in every feature. Spine clusters cover the entire joint in rather closely set areoles, the spines being less than an inch to a full two inches long in rare individuals. Spine color runs from a nondescript light brown to pinkish bay or strong red-bay, usually darker toward the tip, or rarely almost pure white or amber. After a year of age all tend toward a grizzly gray. Stem color, usually somewhat glaucous, in winter may turn purplish or occasionally a fairly bright mauve-red. Their winter phase is often quite attractive. Flowering time of the native opuntias and ball kinds in this latitude is May and June.

Coryphantha vivipara is a ball with longish nipple-like processes in place of ribs. Usually less than two inches in diameter, not counting spine length which is short, at the largest it may be four inches wide and five or more tall. The flowers of numerous narrow petals, pink to brilliant carmine or vaguely purplish, as much as an inch and a half across, upon the crown of the plant, come about mid-June. In the southern reaches of its range is a form or variety called *aggregata,* which from a single original root forms clumps or mats of many stems. This I have seen in Oklahoma covering a space of twenty-four inches. But if I have the true variety, it seems less inclined to proliferate in this environment.

Neobesseya missouriensis is much like *coryphantha* in habit but flatter, with rather soft whitish spines that may be readily handled. Flowers are like those of its cousin, somewhat smaller light yellow or pale orange. This plant has a large underground projection which shrinks for wintering until it draws the upper parts of the plant almost to ground level. Toward spring the bead-like fruits delight the gardener with their bright beauty. *N. similis,* of Colorado and south, appears much the same but readily forms clumps or mounds of twenty to thirty small stems.

Echinocereus viridiflorus is a ribbed cylinder type usually less than two inches wide and three high, but it may attain three in width and four or five in height. Mostly the stems grow singly or two or three together, though in one habitat I know are found clumps of a dozen or so. Blossoms borne on the ribs are flat bowl shaped, an inch or more across, glossy bright yellow with a greenish tinge.

Pediocactus simpsonii in the high Colorado mountains has a low, almost flat form called *minor,* well covered with spines. It stayed with me briefly, I do not remember why. Its delicate pink blossoms came very early in May. Critical gardeners who have grown the "minor" form for long do not believe it distinct from the more usual type which is globular to cylindrical, the wider rib nubs holding the spine clusters farther apart. This form, received from Washington, where it may attain a height of ten inches, was astonishingly different in appearance. Some of my plants weighed a pound, against the ounce of the others. Blossoms were a good pink.

Every cactus fan who wants color must seek for *Echinocereus triglochidiatus* —brief plant with an "all day" name—in either the type or its several varieties, familiarly known as king's crown. They tend to build clumps of many wide-ribbed stems a few inches high, or as much as twenty-four in the type which may or may not be hardy. Blossoms are borne very freely, an inch to an inch and a half wide, a pure dazzling scarlet, sometimes shading toward the base to a concentration of pigment that hints of brown. Among the lower and definitely hardy varieties is *melanacanthus,* also known as *E. coccineus,* of Colorado, southeast and southwest and adjoining states. From Colorado, again, I have a variety *inermis,* which means spineless. Entirely spineless it is, equally beautiful in flower, less beautiful in its spinelessness according to one's taste, perhaps, but

valuable for its different appearance.

Echinocereus fendleri is a wide ribbed "hedgehog" which may build a cluster of a few low stems. It has been quite hardy here. Blossoms are cornucopia shaped, a somewhat translucent purple. *E. baileyi* and *E. reichenbachii* are hedgehogs of similar blossom form to *fendleri,* the one light purple, the other lavender to deeper reddish lavender. They have many ribs, many spine clusters, with the short spines laid flat against the circumference of the stems so as largely to obscure it, an attractive pattern. *Baileyi* may or may not be hardy. Its home is mainly the Wichita mountains of southwestern Oklahoma, hills of 1800 feet or so. One plant given me in Oklahoma dropped out of sight on the trip, a second, a seed grown plant from the Gates Gardens in California, did not survive one winter. Possibly it should have been kept indoors one winter, or its dessication tended with more care. *Reichenbachii* from the bluffs of the Arkansas River in Colorado, and south, is dependable. One of my specimens is now eighteen years old. It is single stemmed but sometimes puts out branches near the base. From Gates also I had on his recommendation *Echinocereus albispinus,* not mentioned in my references. It has wintered here twice. It is much like *reichenbachii* except that the spines are pure white and therefore very showy. A visitor remarked, "That is beautiful without any flowers." It had flowered wonderfully in translucent lavender and it now has four or five short branches closely crowded on the sunny side.

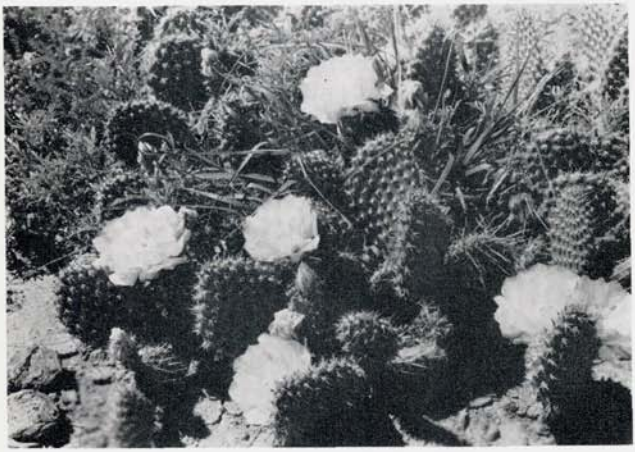
Sclerocactus whipplei, sometimes called *Echinocactus,* is a fishhook type. Several of these were obtained from its home on the high mesas in southwest Colorado. They have wintered perfectly once and flowered. The largest is about four inches wide, five tall. It may reach six inches, so it is said. Wide ribbed, ornamentally spined, flowers of crystalline purple, the principal spines are conspicuously thick, flattened, laterally ribbed and curved at the end like a fishhook, obviously for a purpose!

Possibly this should end the list of ball and cylinder types, but there is another fascinating species, *Homalocephalus texensis,* that may have sufficient hardiness if it can be found high enough up within the Texas Panhandle which is within its given range. My one specimen was sent me from the vicinity of Lubbock, down off the escarpment of the Great Plains, a climate somewhat milder, and it was destroyed by freezing here. It was four inches wide, an inch and a half high, with broad ribs narrowing and converging at the center, a marvel of symmetry and beautiful spine pattern. It is said to grow to twelve inches wide, as much as six high. The flower is described as two inches or more long, bell shaped, scarlet with orange below, pink to nearly white above.

Native to the western slope in Colorado is *Opuntia rhodantha,* of high appeal for its wide and lovely blossoms, shades of carmine and pink mainly, though they may be yellow. Variable, it may bear strong spines or none and the stem color may be a slightly glaucous green, or more gray partly from the effect of spines. One of my plants, discovered by my California friend, has nearly black spines and a deep purple pad color in winter. *Opuntia rutila* is carmine flowered mostly. It is often passed by botanists as a mere form or even left unmentioned, but the gardener drawn by variety in plant form and fine color is under no such compulsion. My prize specimen is outstanding in habit, typically upright until the weight of new growth forces the older stems to lie on the ground. Joints are an inch and a quarter wide, four inches long, relatively small that is, so that though the plant grows rapidly it does not soon occupy much space.

Among prickly pears especially valuable for color and minimum space requirements is *Opuntia pollardii,* found to be hardy here over six or more winters though it hails from Mississippi. Its bright green circular pads are two inches

Echinocereus reichenbachii



Opuntia polycantha—pure yellow.

Echinocereus viridiflorus in fruit.

wide or little more and it grows slowly. Its blossoms, freely borne, are of like width, with crimson-scarlet petal base in fine balance to the outer yellow portion.

An intriguing kind, *Opuntia basilaris* var. *humistrata* from high in the San Bernardino Mountains of California, one year gave me the finest thrill of an entire gardening season. Its blossoms were a veritable symphony of crystalline carmine with subtle tintings of purple, translucent pinkish bay filaments and glowing golden anthers and the cream stigma knob typical of the species. This kind is adapted to shrivel well when dry and is hardy well below zero. It has small joints and in my too close planting soon the coarse and bullying *O. phaeacantha* overran and nearly smothered it. It is now coming back. Several other more or less hardy forms of *basilaris* I have and one of them consistently flowers in the more usual plainer, light cerise-carmine. For a yellow flowered prickly pear *O. aurea* claims a high rating. Its tone of golden yellow is pure and rich throughout. It has been perfectly hardy and flowers freely. *Aurea* keeps well to a small area, the joints being relatively small. It is almost as free of spines as the completely spineless *basilaris*.

O. phaeacantha's chief claim to attention is the large size of its pads, five inches up to seven. The flower is typically yellow. Salmon pink or richer ones are known. It is sometimes called tulip cactus because the petals turn rather upward. Proportionately the flower is small, about two inches wide. Only three of many *phaeacanthas* tested have been reliably hardy.

Along with *O. compressa* there are a number of hardy prickly pears, species or varieties, *engelmannii, hystricina, macrorrhiza, tortispina,* and others which to the average person are just "other yellow flowered flat stemmed cacti." Apathy toward them is marked. Several of these, however, and also *phaeacantha, pollardii* and *humifusa* have fruits of deep beautiful red when ripe that last for some weeks.

Where the cactus garden is large enough for a show specimen there is a cholla, the cylindrical stemmed *Opuntia imbricata,* a "tree" cactus. It is met with in Colorado from Pike's Peak south on dry plains and may be seen at the roadside at Greenhorn, a few miles south of Pueblo. In another South Dakota garden this kind has attained a height of forty-four inches and more in spread. It flowers freely, rather small blossoms of carmine, and has shown no injury after twenty-seven degrees below zero. This tree has flowered for me only when twenty inches or more tall. Some others of the cholla tribe may be hardy. *Opuntia davisii* and *O. leptocaulis* are reported from the Panhandle of Texas. A slender stemmed one from high country in Arizona is now under test.

On the problem of handling the plants much acquaintance breeds respect rather than fear. Let us recall that a cactus does not "jump" and that it is up to the friendly admirer to maintain a precautionary distance. Besides the spines whose most obvious function is painful piercing, the glochids must be guarded against too. They can be very irritating. Some are so small as to be difficult to see. When handling numbers of plants it is well to keep magnifying glass and tweezers handy. A depilatory wax has been suggested for removal of the glochids. The strong spines, often barbed—if one insists on getting stuck—are to be pulled out immediately however intense the hurt at the time. There is no prolonged injury except when a portion of a spine is broken off in the flesh, an infrequent misfortune.

The roots sometimes make a convenient handle for plants. In a pinch one or more spines may be used to hold a plant in position, but not without risk, and the stoutest gloves are not a sure safeguard. Two flat sticks manipulated like chopsticks are somewhat effective, and are best when hinged so as to aid a more rigid position. Preferred is a tool on the order of a giant sugar tongs. By chance I found on the market a gadget called a doughnut lifter that is most

useful. A coiled spring in the hinge opens the jaws to four inches, ample for gripping most plants. The jaws are scalloped spoon-shaped and with due care a plant or cutting may be grasped and held firmly in any necessary operation. Little attention need be paid to the spines, for they are seldom injured by bending sidewise. This tool reduces handling risk almost to zero.

Even though six species of cacti are native in my own area, growing them in the garden with maximum success involves more consideration and care than merely placing them in the ground, it seems. As with nature's lavish and carefree distribution of seeds wherein one or two plants or none represent the scattering of a hundred or a thousand seeds, doubtless in the cactus world the plants that achieve their normal destiny are the survivors from much larger numbers whose lot was cast on ground too "stony" for subsistence. In the garden where one or but a few of a kind are grown, thought must be given to just the right environment.

My early efforts with cacti at once presented object lessons. But then, drawing the right conclusions from them was a slow process. A case in point was one of my prized red flowered *polycanthas*. Planted in the basic soil of the garden, a heavy gumbo indeed, but apparently identical with that just beyond the garden wall, in which prickly pears are frequent, it did little more than exist, grew and flowered not at all. Whether the year were wet or dry all the several plants performed to pattern. After a time they were moved to a sand bed in which cuttings had done well, four inches of sand above the heavy soil, with a good slope. Response was astonishing. Growth and bloom came freely. Later a further improvement was tried, a layer of gravel, an inch of half-decayed plant refuse, then four inches of sand with a modicum of clay and humus, the mineral rich gumbo still in reach of deeper roots. With the better food supply the plants took on a thriftier appearance and flowered well.

Most kinds in my collection have now been tried in such footing. All have thrived, yet the conviction has grown that some of the ball types would relish a still better menu. Some in their chosen places in the wild appear happier than here. So I suspect that my plants need a larger volume of the fairly rich, compact loam or sand-clay mixture they often grow in, so that their not so deeply foraging feeder roots may find good sustenance in easy reach. It is readily noted that these kinds when set in lean sand remain definitely resentful and inactive when compared with better fed specimens.

Offering me my first real instruction, Mr. Jacob Sass, of iris fame, had built up a bed, ten inches deep, of lime encrusted bank gravel and sand, with the addition of one part of good soil in ten. In it he grew twenty species "not supposed to be hardy." Though the formula seemed extreme I have come to know that it is effective. It includes main elements of successful culture, as drainage, food supply—provided one understands that in such proportion the good soil should be very good—and lime which is a more necessary factor in cactus economy than with most leafy plants.

Half that depth of bed is effective if the surface and the subsoil below are sloping and drainage is assured. Since most gardening is done in regions of more rainfall than the native haunts of the cacti, drainage is not to be discounted. Not only is an inescapable surplus of moisture often fatal but the plants need a frequent taste of their accustomed dry conditions. Bear in mind that the plants in the growing time become turgid with water which they retain habitually against long periods of drought, that late summer and fall are normally inactive or dormant times, and that in preparation for winter much moisture must be expended.

A few tips: For the hardy cacti much sun is essential. Drip from trees is

detrimental. A small increment of charcoal is a safeguard against any acid condition that may develop. In planting it is strongly recommended that the roots be removed, excepting one or more small stubs to aid in holding the plant in position. It has been found that the plants reestablish themselves sooner if forced to grow a new set of roots. Cuttings and plants with trimmed roots are to be kept in dry shade for some days for healing and callousing. Although in constructing the bed the upper four inches should be allotted most of the good soil, clean sand is used in setting the plants. New roots strike well in it. Since roots do not start in a completely dry medium, a little cautious watering may be needed. In very hot and dry weather lath shade is a benefit until the plants are rooted. A light surfacing of hard gravel or stone chips helps prevent washing and reflects light to aid the plants in drying off after rains. Finally, cacti appear in a natural setting among rocks.

The names used here are hardly to be found in one reference book, but are believed to be those in most common use. Most are simple binomials, as befits proud and self-respecting which need not depend on tracing relationships all the way back to "The Conqueror."

TWO WONDERS

ELIZABETH LAWRENCE, *Charlotte, N. C.*

IT IS A WONDER to me that you can spend your life searching out plants, and then come across things you never heard of, and can't find in the books. Two or three years ago I saw *Cyanthodes colensoi* in Mr. Starker's catalogue, and sent for it to see what it is like, although I didn't expect it to stay with me. This genus comes from New Zealand and Australia, and plants from that part of the world seldom thrive with me; so I didn't expect it to live through the winter, and, when spring found it still there, I didn't expect it to live through the summer. But it still grows, or rather stays—I don't think it has grown much, in the crevice of the garden steps. Mr. Starker describes it as "an upright shrublet, with small blue-grey leaves, pink at the tips of the branches. Small creamy flowers in clusters are sweet scented and succeeded by rose-red berries". The plant is something like a tiny Persian candytuft, but so far I have seen no flowers or fruit. The only cultural hint Mr. Starker gives is that it wants sun. From its looks, I should say that it would like a less dry and starved soil than I have given it, and perhaps like some of the other species it wants peat.

My other wonder is that such a good shrub as *Indigofera decora* should go unsung. Mr. Bean describes it as a charming dwarf shrub that Fortune found growing in the gardens of Shanghai, the standards of the flowers white marked with crimson, the wings pink. After a long search I recently found it listed by the Brimfield Gardens. The form I have is the variety *alba,* with pure white flowers, forty to sixty to a slender raceme. The white flowers, the pale green calyces, the slender stems and fine compound foliage, all make a delightfully cool and fresh pattern. In my garden this species blooms early in May, but I suspect that it is summer-flowering in Connecticut. I think it would have to be used with caution in the choice parts of the rock garden, for it suckers and makes a very thick mat; but it is a charming summer groundcover, although it is cut back to the ground in winter.

My indigofera came to me from Mr. Epstein in exchange for the promise of *Zenobia pulverulenta.* I got the best of the bargain, for the plants I sent for Zenobia turned out to be Rhaphiolepsis!

PROJECT BIG POND

NELL LEE GOSLING, *White Pigeon, Michigan*

WE HAVE UNDERTAKEN dozens of "projects" during the twenty-three years that have passed since we left Shaker Heights, Ohio, to make our home on this southern Michigan farm. There has been "Project Pine Trees", which has continued for many years, at the rate of five hundred or so evergreen seedlings planted each year on the sandy worked out acres. One year we concentrated on "Project Big Rock Garden", the next on "Wild Flower Garden" or "Highpath", and most recently "Alpine Plantings", numbers 1, 2 and 3. Many major and minor projects have been undertaken through the years, but one of our earliest and most rewarding was "Project Big Pond".

When we built our house we decided not to place it on the top of the hill, where the old farmhouse had been. Instead we turned its back to the highway and put it halfway down the slope, with a six foot concrete wall on the brow of the hill to shut out the noise of traffic. This was a bit unorthodox for the Thirties, as was our view looking north and west over some fifteen acres of marsh. Even today we sometimes hear the comments, "Going by on the road we never knew there was a house back there," and "Isn't it too bad you have all that marsh between you and Klinger Lake?"

There are two kinds of marsh in this part of Michigan. One is covered with a deep spongy layer of sphagnum moss and a dense growth of blueberries, both high and low (*Vaccinium angustifolium* and *V. corymbosum*) with many *Ilex verticillata* scattered throughout to brighten the winters with their brilliant red berries. The other might more accurately be called a wet meadow, and ours is of that type. It is open and sunny, and grasses, ferns and flowers make a thick mat of vegetation. Years of grazing had broken much of the surface, but one could walk over most of it by stepping from hummock to hummock, except at the foot of the hill, about two hundred feet from the house, where countless springs bubbled up, turning this area into quagmire.

Here our artesian well poured forth its barrel-a-minute of fine cold spring water, and here in years past the farmers' cows, that had pastured in the meadow for over a hundred years, had frequently become mired up to their necks. This necessitated their being pulled out bodily by a chain and a team of horses. The whole area was reputed to be full of quicksand, but I never heard of any cow disappearing permanently. Out beyond the quagmire a lazy stream wound down through the meadow to Klinger Lake, but the area between the hill and the stream was impassable.

There was quite an agricultural demand for the marl dug from marshes such as ours, so that it was not difficult to find a man with the right equipment to dig out a pond. For one entire summer our ears were deafened by the coughing and roaring of his engine, as he brought out load after load of dripping black muck. His idea of a pond was a perfect rectangle, but by constant pressure we prevailed on him to create little coves along an irregular shore line, which would have a more natural look. When autumn came the quagmire was gone and in its place was a pond covering about two acres and some four feet deep. At this point the gray-white marl gave us a solid bottom. It also produced a very high alkaline content in the rich muck which had been spread along the shore to make a "shelf" a hundred feet wide of comparatively dry land at the foot of the hill.

The artesian well was now separated from the pond by this shelf of muck, three or four feet deep, so that a drainage canal was required. To add interest,

we made it into a streamlet flowing through small pools and over miniature waterfalls.

The pond forms a semi-circle to the north and west, a hundred feet wide in some parts and several times that in others. Our small sons were delighted that we left three islands, one for each of them. John Island was picked by our flock of gray geese as their special domain, and each spring they came forth with flotillas of adorable chartreuse-colored goslings, only to have them killed, one by one, by snapping turtles or mink that inhabited the pond. Peter Island has two large trees on it: one a maple that turns a brilliant red in September, weeks before any other tree is colored, and the other our only native beech tree, a gnarled, sprawling one that has never grown very large, but makes a lovely splash of yellow in October. David Island is covered with elderberry bushes and is noted chiefly as the favorite sunning place of turtles.

Now that the meadow was no longer grazed, it was soon covered with native wild flowers that staged an amazing come-back after years of being eaten. Most of them are tall and weedy, or are tiny frail things nearly lost in the marsh grass. Only a few seem important enough to bother to identify, yet they provide masses of color, from the senecios in April right through to the goldenrod and asters in October and make a pleasing background for the choicer plants.

Spring is ushered in by the skunk cabbage (*Symplocarpus foetidus*), followed by clumps of glossy yellow marsh marigolds (*Caltha palustris*). Soon the iris (*Iris versicolor*) are in bloom. Year round large beds of watercress supply us with their spicy sprigs in every shallow cove where springs bubble up, but the forget-me-not (*Myosotis palustris*) is not so demanding as to location, and gives a lovely sprinkle of blue to the entire shore all summer. At the water's edge are the bog-bean (*Menyanthes trifolia*) with its fringy white blossoms, the dull rose red of the water avens (*Geum rivale*), and later on the white spikes of arrowhead (*Sagittaria latifolia*).

In midsummer the meadow becomes rose-magenta from masses of that invasive foreigner, *Lythrum salicaria,* and soon after that, jewel weed (*Impatiens capensis*) takes over, with *Lobelia syphilitica* for a lovely blue and orange contrast. The cardinal flower (*Lobelia cardinalis*) looks its brilliant best when surrounded by the white turtlehead (*Chelone glabra*), but the meadow flowers never really clash. The button-bush (*Cephalanthus occidentalis*) gives late summer interest with its round white balls, and sets off to advantage clumps of bottle gentian (*Gentiana andrewsii*).

What delighted us most of all was the appearance of the tiny white orchids known as ladies' tresses (*Spiranthes cernua*), of grass of parnassus (*Parnassia glauca*), so charming with green and white striped petals combined with an unusual arrangement of stamens, and best of all the arrival of the rare and most delicately lovely fringed gentian (*Gentiana crinita*). At first there were only a few, so that we equipped our friends with rubber boots and took them far out into the meadow to see these treasures, but year after year we have collected the seed and distributed it, giving special attention to the area bordering the big pond and the winding stream.

Now one of our favorite pastimes is paddling the canoe around the shore line, which we have found is the best way to view the treasures of our meadow. Eager grandchildren give us a chance to indulge ourselves in frequent canoe trips, though their interest lies more often in wild life than in flowers or in seed scattering. Turtles plop off into the water when we come near, and muskrats swim by on their way to their igloos on the banks of the pond. A water snake suns himself at the foot of the cat-tails, while dozens of red-winged blackbirds

quarrel in the reeds above. A kingfisher dives for his prey, while many sorts and sizes of fish streak past in the clear spring water.

Even more fascinating than this close-up of our pond and meadow is the ever-changing view seen from nearly every room in the house. In summer the Great Blue Heron struts along the bank of the pond at dawn, and wisps of mist rise from the meadow beyond. In autumn the wild ducks drop in on their way south, and the poison sumac (*Rhus vernix*) splashes the meadow with brilliant orange reds. A winter morning hoarfrost, sparkling in the sun, turns our meadow into a fairyland, and long before we dare even think of the coming of spring, the red osier dogwood (*Cornus stolonifera*) glows a brighter crimson. Year round, the first rays of the morning sun light up the pale trunks of the cottonwoods (*Populus deltoides*) on the knoll at the northwest edge.

The sunny slope in front of the house, with its shelf of pond edge, became the site of many more projects as the years went by. An important one was the creation of mixed borders and perennial beds on the formerly pastured hillside. We made a path along the near shore of the pond, and introduced many moisture loving plants to hold the banks. *Iris pseudacorus* and *I. siberica* do an excellent job at water level, and the Japanese iris (*I. kaempferi*) are gorgeous here in July despite their reputed dislike of lime. *Saxifraga peltata* and bergenia have proved strong bank supporters, as have such shrubs as *Hamamelis verna* and *H. mollis*. Many varieties of trollius, geum, astilbe, thalictrum and hellebore do splendidly here, but nothing adds as much in color and interest as the collection of bog primroses. From the early *Primula denticulata* and *PP. cashmeriana, rosea grandiflora* and the auriculas on into the summer with the lovely candelabras *PP. japonica, pulverulenta, bulleyana, beesiana, helodoxa* and *sikkimensis,* these are our greatest joys. They seed happily and never give us any worry about their permanence.

It is hard to imagine life without the big pond. The play lawn runs down to it at the further end, and many flotillas of ships are launched there by the grandchildren, who also fish from the high bank by the willow tree. After dark they love to go down with flashlights to look for the tiny shrill peepers with their balloon throats, where they sit on the low-hanging branches. The frog and bird population is tremendous and noisy. Since the springs keep the shores thawed, even in the coldest weather, there is always a place for birds and animals to drink. I feel sure that countless wildlife neighbors join the Gosling family, young and old, in saying that "Big Pond" is our most successful project.

TIPS FOR THE SOUTHERN ROCK GARDEN

LEONARD J. UTTAL, *Madison Heights, Va.*

THE DIXIE ROCK GARDENER is a pioneer, as most published information and most commercial material are for the North. He must determine from meagre sources and stubborn trial which procedures and plants are best for the Magnolia Belt. He has a splendid opportunity to contribute to knowledge. Thousands of plants potentially suitable for southern rock gardens lie untried. Hundreds of these may grow wild in his immediate counties, and some may prove hardy enough for northern use.

The following are a few tips that I have learned, which are of help in reducing failures and extending the list of plants I have been able to enjoy in rock gardening, first on the sterile sands of subtropical Florida, and now on the hot hard clay of the Virginia Piedmont.

Plants are remarkably adaptable entities. Consider the true alpines from frigid summits: although grown in northern gardens, they are still far removed from their native habitats. There is no reason why some of these may not be grown in the middle and lower South, with a certain amount of "babying", though they may not last as long as they would farther north. In Florida, some may be used as annuals, the Iceland poppy, for example.

Every southern rock gardener ought to have a shelter for his new and "on trial" plants. This should be erected over a bed of good, well-drained, light loam. Here in Virginia, I have built mine of old screen doors. It could be made of lath or sheet screening, or palm fronds where available, or tree boughs—anything, so long as the top is removable in sections. New plants are hardened by gradually exposing to the summer sun by gradual removal of the top. Seeds are handled nicely in such a structure.

It is a mistake to plunge newly received plants into hard ground, without expecting considerable loss. I put my new plants into containers—flower pots, or tin cans with punched bottom drainage. These container-bound plants are started off in the shelter and gradually hardened off as described above. In the containers, the plants make a dense root ball which slides readily out of the can at transplanting time, without shock to the plants. Plants in containers are readily kept track of, and may receive individual attention as they require. If plants must be set in the open ground, it is best to order for early fall delivery. Plants a year old still may not be fully acclimated to the summer, and certain plants of northern origin may always be sensitive to the southern sun in summer. Scraps of metal screening are ideal to shade these plants.

It is really not heat which is so hard on the plants, but drought. Keep the plants well-watered and dapple-shaded, and they will laugh at the 90°-plus temperatures.

In the winter, mulch after the first hard freeze. Year's end is a good time for this chore, for then an abundance of evergreen boughs from abandoned Christmas trees is generally available, and nothing is better.

Choose a north or east exposure for your southern rock garden. In the South, the native flora on the north-facing slope of a deep ravine, a few hundred feet in elevation, has much in common with that high up on the mountains. Inside the ravine, in midsummer, it is often as cool and pleasant as on a mountaintop. Conversely, on the south-facing slope the flora is often thin and barren, with plants characteristic of dry and open places. And it is blazing hot! Consider this when you plan the slope of your Dixie rock garden. If you can, provide shade of such light-leaved trees as locust or pecan, the more the better.

The natural southern soil is often either extremely sandy, or hard and clayey. Work it into a light loam, *not too rich* if you want to avoid excessive foliation at the expense of flowers.

For the plant material, don't confine yourself to the true alpines. Many plants from warmer climates are quite at home amidst rocks. It might be better, considering your latitude, to aim for a subtropical effect. I am in the market right now of some hardy palms of dwarf type (saw palmetto, European fan palm) for this purpose, as these palms have withstood temperatures close to zero. South Africa is a land rich in flowers for rock gardens: gerberas and gazanias, both daisies, stapelia, the starfish flower, moraea, the African iris, and many others. We should try many of the smaller-flowering conservatory plants, such as the blue marguerite, *Agathea caelestis,* with exquisite blue asters on wiry stems after the manner of *Aster alpinus,* but really much prettier; another blue flower from the islands of the Arabian Sea, *Exacum affine; Ruellia mako-*

yana, carmine pink with purple foliage, quite unlike our native ruellias; cuphaeas, strobilanthus, achimenes, rechsteineria.

But draw especially on your own nearby woodland and field flowers. Many low plants of the genus Phlox are available, as well as one or more of the big lavender petunia-like ruellias. An opuntia cactus is likely to grow somewhere near you. The blue twin-flower (What may this be? Ed.) about a foot high, with black-spotted blue flowers in twins in the leaf-axils, is a southeastern coastal species which few people know, but which is wonderful in cultivation. Another acanthaceous plant, *Stenandrium floridanum* (I don't know a common name for it), grows on the Florida pinelands. Out of deep green, glossy smooth oval leaves in a rosette grows a short spike of deep pink flowers with a dark-bordered white eye, a little like a phlox. It is but one of many plants native to Florida, about which little is generally known regarding their cultivation, and which I suspect will prove hardy far north of their native country.

I have purposely couched this article in general terms. In the future, I hope to write more on specific plants for southern rock gardens.

TRICYRTIS HIRTA ALBA

GRACE F. DOWBRIDGE, *Springvale, Maine*

SEVERAL YEARS AGO I received a seed packet of *Tricyrtis hirta alba* from the Seed Exchange, donated by our member in Japan. The name "toad lily" did not sound too promising, but the description of the flowers as being spotted with purple and black explained it. This white variety proved to have none of the spotting, however, and is probably preferable for gardens. The flowers proved to be very different and interesting. It grew easily from seed—in fact many plants appeared the following spring as well, and are apparently perfectly hardy to our winters.

It is a member of the huge Lily family, and its light green clasping leaves strongly resemble those of the smilacenas and polygonatums. It also has similar creeping rootstocks and appears likely to colonize in the same way. I believe it is a plant of the woodlands of Japan.

I had no idea of its time of bloom and was very much surprised to find the first bud developing in September. The first year, only one bud appeared at the top of the plant, some eight inches tall, but in following years the stems have shot up to two feet and more, with the many buds in every leaf axil. The open flower is an upright creamy bell in effect, although actually the six divisions are distinct to the base, three of them ending in lobes and showing bright golden "chevrons" of color just above the center of the bell. As the flower matures the petals spread to show the very odd cluster of long-stalked pistil and stamens, and it is most interesting to watch these as they ripen.

The only fault of this plant in Maine is its very late season of bloom in October when frosts are so apt to brown the flowers. However, they will stand light frosts without damage. A happy and healthy clump in full bloom will surely make an excellent "conversation piece" for late fall garden visitors. (In central New York this plant seems impervious to the extremes of weather that are fatal to many plants, and likes heavy rich soil, suited to primulas and gentians, in full sun to half-shade, with abundant moisture. Ed.)

ONE MAN'S FAMILY

GEORGE SCHENK, *Bothell, Washington*

ON EASTER SUNDAY last there were perhaps a thousand persons milling about a show of alpine plants assembled at the University of Washington Arboretum. The crowd was at least as colorful and varied as the collection of plants.

There were small boys up from terrorizing the frogs in the lily pond. Do you know that those boys became angelic and rapturous over a *Crassula sarcocaulis?* "It's just like a tree shrunk down," one of them said wonderingly to his buddy.

There was a sourdough, a one time trapper from Alaska. He looked over the flowering loiseleuria and the berrying *Vaccinium vitis-idaea.* The Indians likes them berries with red meat," he remembered. "Sure is good to see 'em again."

There was a couple with a heavy Swiss accent. The wife gave a little outcry when she spied the star-blue flames of *Gentiana verna.* She looked as if she could have embraced those dear friends of her former life.

There was a group of Japanese-Americans who dropped English and took up their old language in their absorption at finding *Dicentra peregrina pusilla.* The Queen of the Japanese Alps gazed back at them from a rocky throne.

There was a lady of exceeding years, perhaps approaching one hundred, who came supported on either arm by a couple who were of an age that her own children might have been. The eldest lady bent closely over each of the twenty-five boxes of plants and seemed to rest her eyes on every one of the three hundred twenty-five species of plants grouped within the boxes. She seemed to be trying to fix their colors and patterns in little stitches on the tapestry of her memory.

There was a Seattle surgeon. "I was crossing from Port Angeles just now on the ferry, when I read the note in the paper. I'm certainly glad I came. In half an hour I've obtained the good feeling that I try to get by taking several days off."

The best thing about this show was that it seemed to generate a lot of happiness all around. I got the most fun out of it. It was my show, you see, and I consider it to be one of the most rewarding things that I have done.

It began several months before, when Dr. Kruckeberg of the University of Washington and of the American Rock Garden Society suggested to me that I give a one man show for the Seattle chapter of the ARGS at our meeting on the Thursday evening before Easter. I accepted the challenge.

I designed and had made assorted boxes of one inch cedar. Then I found that they were impossibly heavy when filled with soil and topped with rocks. Ground sedge peat was the answer, a quarter the weight of soil.

During the month before the show I worked madly almost every afternoon and every Saturday and Sunday, grouping the plants within the boxes to illustrate various types of alpine gardening, or trying to find continuity and arrangement in the colors and foliages of three hundred twenty-five species of plants. I had aimed for five hundred, but found I had not time enough.

In each box I tried to bring together plants that I have found can actually be grown together, without bringing about that consequence in which the weaker fledglings are pushed from the nest, until in the end their remains just one fat, fratricidal bird.

These are some of the boxes that turned out best:

An interlacing of sub-shrubs of the peat-loving persuasion, gaylussacia, gaultherias, leiophyllum, vacciniums, andromedas—coppery-bright foliage.

Que Chin Studio

Pinus parviflora with *Pieris japonica pygmaea, Pleioblastus pygmaeus, Tsusiophyllum tanakae,* and other treasures—see page 50.

A desert terrain—pebbly sand; spiky and whitened sagebrush wood; opuntias and *Neobessya missouriensis* in fruit; spiny, silvery *Teucrium subspinosum* repeating the pattern of the sagebrush wood; *Thymus nitidus,* the wiry-branched shrub which holds back the ash slides of Etna.

Another sand box upon which *Leucocrinum montanum,* the sand lily, showed its collar and no more—a collar short-pointed and pale yellow, which lengthens slowly into blades and darkens slowly to green, a head of hyacinthine petals, white and fragrant—leucocrinum in the company of *Anacyclus atlanticus* (the true plant which goes underground in summer), whose branches of gray dissected foliage sprawl flat against the sand and turn up at the tips to balance, as steadily as the fingertips of a juggler, the huge bowl-like daisies, white above and red below.

A box without flowers, and yet one of the most richly colored—of raoulias, gray, gold and green, intergrowing with sempervivums at their season of reddish variance, and accented with bluish, gray-greenish *Abies lasiocarpa,* three years old yet miniature specimens collected from a Cascade summit.

Forest miniatures, thread-stemmed and lace-foliaged, with flowers as melting and diffused in their tints as the sunlight itself filtering through the trees: *Lithophragma parviflora,* in its not at all parviflowered Columbia Gorge form, *Thalictrum kiusianum, Dicentra cucullaria*—with *Menziesia ciliicalyx* climbing above them in thin jets of green and descending in clusters of hanging bells of soft plum tone, half fruit, half flower, and with alpine dodecatheons making lesser

fountains here and there.

A woodland of mossy log, of epimediums and of *Dicentra oregana,* the pure flower of purple-tipped ivory, and not the blushing accident of this and *D. eximea* which travels around the world claiming the name of its Oregonian parent; all of these canopied over by *Acer palmatum atropurpureum dissectum,* that beloved antique which furnishes the garden as stylishly today as it did a hundred years ago, the thing having an adaptable kind of beauty that lends itself to all the passing fashions of landscape design, and in so doing transcends them.

Several boxes of high alpine crevice and moor plants—cassiopes, campanulas, Lohbrunner's warmly carmine selection of *Douglasia laevigata,* erigerons, drabas, lewisias, gentians—the raucous and exciting confusion of hot colors that mountain tops make in glorious innocence.

A seascape in which the sea-greens of paronychia and frankenia washed about eroded and lichened stone islands.

A Japanese garden, a miniature of a miniature, with material in it so rare that I gloat every time I think of it. The feature was a bonsai of *Pinus parviflora,* Shikoku Island form, so incredibly alive after travelling one month by sea from Japan, with its roots washed clean of soil. I owe its survival to Brian Mulligan, Director of our Seattle Arboretum and a Vice-President of the ARGS. He suggested that since pines lack roothairs and are dependent upon certain soil organisms which inhabit the vicinity of their roots and make their food available to them, soil brought from about the roots of growing pines might prove a life charge. It worked.

Other material in this garden included *Pieris japonica pygmaea,* which forms a foot high mound of closely fitting foliage after a large number of years; *Pleioblastus pygmaeus,* a bamboo of three or four inches; *Tsusiophyllum tanakae,* a member of the Heath clan, which tries to be the smallest of all Obtusum rhododendrons, and fails in that the twinning and tubular white flowers are not quite like any rhododendron flower, and in that the body of the shrub is too implausibly small to carry off the deception; clonal forms of *Selaginella involvens* which demonstrate that the Japanese have not overlooked the possibilities of the most obscure and humble plants of their islands, and have managed to draw from each of them things curious, things wonderful; *Enkianthus perulatus compactus,* old and gnarled, and exactly three and a half inches high; and some unbelievable dwarfs of nandina, four years old and no higher than your finger is long. Half-inch *Shortia uniflora compacta* and quarter-inch *Viola yakushima* peek from the stones, but are hardly visible in the photograph which accompanies this article. I have named the shrubs in the order in which they appear, from left to right, in the photograph. The ancient pine, fourteen inches high, will serve as a scale.

I am grateful to Mrs. Conner Gray, Mrs. A. P. Renton, Dr. T. Rokujo, and Mrs. M. J. Williams for the gift of plants which enriched my show, and to Mr. Harold Miller who drove from Pine Lake to photograph the show for me.

After the Thursday night showing for the Rock Garden Society, after the members had shown their kindness and interest and had departed, Dr. Kruckeberg and I closed up the clubhouse. We snapped off the lights at the doorway and stopped for a last look. A bright moon touched the stones and flowers. "Now stay just as you are," he pronounced in mock incantation. "I expect that tiny mountain pixies will come out, dance about on the stones, and trample things," he said.

Perhaps it is a belief in magic, or at least a hankering after things magical, that attracts us all to alpine plants. Their magical charm is that they seem too fragile vessels to hold a thing so eager to escape as life.

1961 ANNUAL MEMBERS' MEETING

THIS YEAR OUR ANNUAL MEMBERS' MEETING will be held on Saturday, May 20, at the home and garden of Mr. and Mrs. Walter F. Winkler, at 27 Old Woods Road in Saddle River, New Jersey. The garden contains many dwarf rhododendrons some of which are from their own hybridization, dwarf conifers, rock and bog garden, and a profusion of native wild flowers and ferns placed in surroundings resembling their native haunts.

The program will begin at 10:30 A.M. Roam through the gardens until 12:30 P.M., at which time we shall have lunch followed by a short members' meeting and the election of officers, and the usual plant sale. Thereafter you may visit the gardens again. If they are in flower at the time, we shall try to arrange a visit to a nearby neighbor's place where there is a station of *Cypripedium acaule* (pink lady-slippers) neighboring in the hundreds.

No annual meeting would be complete without our annual plant sale. We hope to conduct the sale in a more orderly fashion this year. Please label each plant and indicate thereon a reasonable price. The donor's name may be exhibited with his or her plants. If it were not for the plant sales and other means of raising funds outside of annual dues we should certainly be compelled to increase the membership fee. So please be generous.

At last year's Members' Meeting it was voted that members should bring their lunch, rather than spend so much time in restaurants, which are not always located conveniently to the meeting place. Please bring a box lunch. The Winklers will provide coffee and tea. The meeting is exclusively for members of the society. Will you please notify the undersigned if you intend to come, so that our hosts may know how many to expect and may make arrangements accordingly.

NO FURTHER NOTICE OF THE MEETING WILL BE GIVEN.

Directions for Reaching Old Woods Road.

From New York City and Long Island across George Washington Bridge and follow route 4 to route 17 and north (right) on 17, passing a double set of traffic lights (Linwood Avenue); continue on 17 approximately ¼ mile to the first sign reading "Saddle River (this is East Saddle River Road); follow for approximately one mile to Old Woods Road; turn right on Old Woods Road for about ¼ mile to Number 27 on the left.

From upstate New York, Westchester County and New England, use the New York State Thruway to Exit 14A into Garden State Parkway; on that to Linwood Avenue Exit 166, west on Linwood Avenue to route 17, thence as above to Old Woods Road.

From western New Jersey, Pennsylvania and points west and south, use the New Jersey Turnpike Exit 10 into Garden State Parkway, and exit 165 into Ridgewood Avenue, west to route 17, turning right for approximately one mile to the first Saddle River sign, thence as above.

E. L. TOTTEN, *Secretary*

REMINDERS FROM YOUR SECRETARY

Notice for the renewal of memberships expiring April 1 were mailed you in the middle of February. I trust that a second notice will not be necessary.

When ordering books it would prove most helpful should you indicate the title, author, and name of the publisher.

SEED RAISING WITH POLYETHYLENE, 1960

WILLIAM J. R. ADAMSEN, *Ossining, New York*

RAISING PLANTS FROM SEED is one of the many interesting (my wife says, "frustrating") aspects of rock gardening. The January, 1958, ARGS *Bulletin* devoted to propagation methods for rock plants alludes to a method of sowing lily seeds in plastic bags, refrigerating them for a month (stratification) and thereby achieving germination. So, also, does your editor describe his "jar" method in that issue. The "jar" method interested me to the point that I tried it, and with good success. For those who do not recall the article or did not have an opportunity to read it, the method was substantially as follows: 75% peat and 25% sand were mixed and packed into fruit jars within an inch of the top of the jar. They were then watered repeatedly, until the saturation point of the peat mixture had been passed, with an antibiotic solution (Vancide 51) to prevent damping off. The excess solution was drained by turning the jars upside down and the seeds were then scattered on top, and the jars placed in a 32° F refrigerator(or other cold place) for a month or so before being put outside, or in a cool cellar to await germination.

My results, similar to those experienced by Dr. Worth, were favorable although personally I had very little successful experience to compare it with. But certain items such as gentians and saxifrages which are slow to appear and very fragile when they do show up, did very well by this method. My chief complaint was that I was unable to keep up with the required transplanting from the jars, as so many seedlings appeared simultaneously. Yet for many, quick transplanting was necessary in order that the seedlings should have adequate sunlight. The fruit jars could not be put in direct sunlight owing to the tendency of infra-red rays to "heat up" the jar. But many plants such as our westerners, penstemons and erigerons in particular, seem to require strong sunlight.

The following seed-sowing year I used both glass jars and pots completely enclosed in plastic tied with a rubber band. This was done haphazardly, with no attempt to evaluate statistically the results by the jar method as compared with the pot-in-plastic. Through neglect, or possibly necessity, it was discovered that certain species could be left hermetically enclosed in their jars and pots with no apparent ill effects. *Ramonda myconi* was left thus three years and planted directly into the garden with no ill effects or losses. Other more common plants, campanulas I believe, were knocked out of the pot at the end of the summer season, whence they were also put directly into the garden with no trouble.

I wonder what this year holds for me. This article is being started in April. At the moment of writing I am far above Detroit on my way to Chicago, obliged to leave my germinated and germinating seedlings for three weeks while on a business trip. How will they fare in their plastic bags?

June 8—I have retained the earlier portion of this article much as it was written, since memories of what took place at a particular time often fade into distortion. On my return from the above three weeks' trip the seedlings were generally in good condition, but continued weekend trips, one being the ARGS weekend annual meeting, have started to take their toll. Some of the seedlings in certain pots have died, principally from too much light and from overcrowding. I have lost one-third of a pot of *Saxifraga hostii* (an easy plant) from mold developed out of humid conditions. I am certain that this would not have occurred if the seeds had been planted more thinly or if there had been less germination. On the other hand if these seedlings had been raised in open frames, attrition

would probably have been even greater, though less noticeable. Usually the depredations of slugs, wood lice, cut worms and rain pass unobserved by the cultivator.

One question I am often asked is, "Are the plants raised in this way as hardy as those raised in the usual way?" The answer is "No," but it does not take long for them to become acclimatized. Lacking a cold frame I have usually planted the seedlings directly in the rock garden, using a marker to avoid pulling the seedlings out later as "weeds." In the long run woody-stemmed plants are the better for early transplanting, and certain plants such as astragulus can be handled in this way only. Winter losses of the small plants have not been heavy, heavy mulching or covering having helped, but recognition of the young plants in spring is necessary.

Another question pops to mind. Is the extra work attached to preparing pots as compared with large flats worth while? After seeing, in June, the rows of good seedlings in Doretta Klaber's garden (see January, 1958, *Bulletin* for her method), I too wonder. But overall I believe the flexibility of adaptation of the individual pots to their required environment will be justified. Seeds do not all germinate simultaneously or require the same amount of sunlight. An additional advantage of sowing in individual pots is that these may be retained over to the next year or the year following if they have not germinated. The more difficult species, as is well known, require retention for several years awaiting germination. Androsace species for example rarely germinate the first year unless the seed is extremely fresh. But it is very difficult to keep a large flat or frame over to the following year and be able to recognize the appearance of some recalcitrant seedling after the new crop has been put in—and the earlier label perhaps lost.

To sum up, the cloche method, whether glass fruit jar or plastic enclosed pot, is probably not necessary for the easier species, but seems to offer definite advantages for the more difficult. I detect an insinuation to that effect by your editor in the July, 1960, issue.

CONTRASTS IN THE SIERRA NEVADAS

MARGARET WILLIAMS, *Reno, Nevada*

A FASCINATING mid-July day can be spent on the southeastern slopes of Mt. Rose in the Sierra Nevadas. A narrow road leads from the summit of the main highway (about 8900 ft. elevation) to the top of a nearby peak (10,200 ft.). This is a private road and prior permission must be secured to travel it. It is a road of contrasts—spring and summer rush into bloom together along it. Snow may be found in shaded patches under the pine trees along the way. Lake Tahoe sparkles far below to the west. To the east the valleys shimmer in the summer's heat. Each turn in the road brings new vistas and new surprises. Patches of blue lupine on dry slopes alternate with yellow mimulus in wet spots. Any place you would care to stop and investigate would yield many other flowers not so numerous or colorful, but all equally interesting.

At about 9500 ft. elevation, a stream-fed meadow lake lies to the left of the road. A dripping bank of rosy pink *Dodecatheon alpinum* arrests the eye. To the right of the road, the dry hillside is dotted with the yellow flowers of *Oenothera xylocarpa*. From this point, one can easily climb to the top of Mt. Rose (10,800 ft.). Mt. Rose is the highest point in this area, and the plants

found there above timber line are quite different from those in this meadow and from those found at the end of our road on the sister peak. However, this discussion will be limited to the two plants whose seed was sent in to the 1961 Seed Exchange, although other plants would doubtless be more interesting to the explorer.

Dodecatheon alpinum is the most common shooting star in our area and grows in profusion in very moist locations at various elevations. According to Sampson Clay, "in spite of its promising name, it is not one of the most outstanding species." However, a field of it in full bloom is very showy. The scape is usually about eight inches tall and bears three nodding flowers.

Oenothera xylocarpa is a much more interesting plant and is much rarer as well. The red-dotted leaves form a rosette about eight inches across on the ground. Each oblanceolate leaf is deeply gashed into uneven lobes, of which the terminal one is the largest. The flowers are stemless, the floral tubes arise directly out of the ground and are a little over an inch long. The flowers are vespertine; in the full sun they remain open until about ten o'clock in the morning. In the shade they can be found still blooming several hours later. The bright yellow petals age salmon red and are attractive even in this stage. The plant has a thick tap root, but several small plants did not seem to resent transplanting to my city garden. The hillside where these plants grew received very little summer rain and no other moisture until the first snow fell in mid-October.

The seed was gathered in mid-August. The shooting stars had gone completely to seed, but both flowers and seed were found on the evening primroses. The fruit of the latter is quite woody and swollen in the middle. The seeds are borne partly underground and seem to be ejected by the pod twisting and splitting as the seeds ripen.

THREE CHILEAN PLANTS

MADALENE MODIC, *Sewickley, Pennsylvania*

IN THE SPRING OF 1960 I received three packets of seed from Santiago, Chile: *Lavauxia mutica, Aster eriophorum,* and *Chaetanthera* sp., an annual.

The chaetanthera was enchanting, dwarf and slender, with small gray leaves and many small daisy-like flowers with maroon centers. I lost many plants by coddling. The few I put in full sun and in poor soil did well, but others, planted where it was moist, died, while those in shade did not bloom.

Aster eriophorum has soft gray leaves and sends its buds out away from the plant on long stems. There the buds sit, blinking at the morning sun, in a soft shade of pink. By noon they are wide open and white.

Lavauxia mutica should be planted on a hillside, as its home is on the mountain slopes of the Andes. The Chileans call it "the lost handkerchiefs," for the huge blossoms of white or pink look for all the world as though someone had dropped a handkerchief. The early growth of this plant makes one think of a dandelion. Then it, too, sends its buds out on long stems so that they will not be crowded. In the morning, and only in the morning, can one enjoy this lovely flower, which opens up as a large cup made of delicate silk. The hot noonday sun causes it to fold, and in a day or two the parent plant is drawing it back close to the base, where the seed pods form. When spring comes again, they will burst and scatter their seeds.

REPORT OF THE NORTHWEST UNIT FOR THE YEAR 1960

FLORENCE FREE, *Seattle, Washington*

I FACE THE TASK of trying to give you a picture of our whole year's activities in one report. To create for you the picture of events which may be a year old is no small task, but I will try, and certainly hope that I meet with some success for we have had a wonderful year and I would not like to slight any part of it.

In September, 1959 we elected the following officers:

Dr. A. R. Kruckeberg, *Regional Chairman*
Mrs. Joseph Daniels, *Vice Chairman in Charge of Program*
Mrs. J. D. Barksdale, *Hostess Chairman*
Mrs. Chester Chatfield, *Secretary-Treasurer*
Mrs. Alonzo Free, *Corresponding Secretary*

Dr. Kruckeberg not only accepted the responsibility of being our chairman, but he also took the chairmanship of the Seed Exchange for a second year. Of course, during the "Big Rush" he was assisted in this work by a faithful group of fellow members, but the work went on for weeks and months when Dr. Kruckeberg and Mrs. Kruckeberg attempted to handle it by themselves. I think we in the Northwest Unit have gained a real appreciation of the amount of work that someone does out of the kindness of his heart so that we may all have the pleasure of raising things from seed.

The officers were installed the following month when we met at the Student Union Building on the University of Washington Campus for our yearly banquet and "Slides by Members." Eighty were present, which attests to the popularity of this event. The reason? When fine photographers with similar interests meet and show ten of the best slides each has taken during the past year, it makes for fine entertainment.

We also saw a beautiful motion picture, "Wilderness Alps of the Stehekin." This film shows an alpine area about a two hour's drive from where we were meeting. At that time, its beauty was threatened with destruction through exploitation. I am happy to report that during the past year this area has been made a "Wilderness Area" and we can look forward to always having this beauty spot at our back door.

The last meeting in 1959 took us into the pleasures of plant collecting through photography when Mrs. Mulligan, Mrs. Daniels, Mrs. English, Dr. Kruckeberg and Mr. Witt brought us a program which they called, "Summer Highlights."

There is an increasing interest in the northwest in the art of bonsai. Many of its principles apply to the handling of alpine trees which are often used in our gardens. So in January we asked the authority, Mr. Kelly Nishitani, to give us a lecture and demonstration. He worked partly on trees which were brought by members. We came away not only with increased knowledge, but some of us came away with the beginnings of a fine bonsai.

It is always a treat when one of our members shares his enthusiasm and special knowledge with us. Mr. McClanahan did this when he talked to us on "Hellebores, Their Culture and Place in the Rock Garden." They are one of the delights in the February garden scene in Seattle and Mr. McClanahan has an unusually fine display of them. He has written an article on them for the BULLETIN during the past year.

An item of business this evening: we voted to send $35.00 to the American Horticultural Council to be used in support of the United States horticultural exhibit at Floriade.

In March we had our annual plant sale. We made fifty cents short of two hundred dollars, which should tell the story of a very successful plant sale.

When I speak of the difficulty of trying to describe to you our year's activities, I think I come to the most difficult part when I attempt to tell you about our April program. That was the month that George Schenk brought us "One Man's Alpine Show." In thirty six planter boxes, (that is my best guess of the number after this lapse of time, but it may have been more; he is in Europe and there is no way of checking), in these boxes he created woodland, alpine or desert scenes. There was nothing "newly planted" in the appearance of these boxes; each plant had the appearance of being perfectly established. Yet he had taken them out of his garden just for this program. The plant associations were very carefully thought out and the arrangement was most artistic, but the beauty was only incidental. His purpose was to show us rock garden material that he considered very satisfactory or very interesting. There were many rare things, but there were also boxes made up of our own native plant material. It is beyond me to tell you about all the exciting plants that he introduced to us. I hope he will write an article for the BULLETIN someday describing them.

This was far too fine a program to be enjoyed by our group alone. Mr. Schenk was prevailed upon to leave his display at the Arboretum Clubhouse for the next three days and the public was invited to view it. It may surprise you to hear that Mr. Schenk, in spite of his extensive knowledge, is not a man bowed by the years, but is a young man with decades ahead of him in which to pursue his hobby.

The Northwest Unit has become too large to meet in homes as a rule, but our next meeting was at the home of one of our members, Dr. C. L. Hitchcock, who is head of the Botany Department at the University of Washington. His garden is full of interest to botanists and to landscape architects alike, and we were invited to come early to enjoy the garden. Mr. Alton DuFlon, who handles a camera like an artist, entertained us later with a showing of some of the slides he has taken on his many excursions into alpine areas.

I am sorry to say that I missed the next program, so I can only tell you that I hear that everyone enjoyed Prof. Frank C. Brockman's talk on "Plants and Trees of Mt. Rainier" very much.

As I write this, gusts of wind and rain are tearing autumn tinted leaves from swaying branches. It is nice to think back to brilliant July, time of picnics, when our group made a trip to Sunrise Park on Mt. Rainier. From there we walked up Burrough's Mountain, home of much that's best in northwest arctic-alpine flora. Our collecting had to be done with a camera as we were in a national park, but the shutter bugs had a field day. We found a plethora of such things as *Lupinus Lyallii, Pedicularis contorta, Veronica Cusickii, Aster alpigenus, Silene acaulis,* (on northern exposures), and saxifrages and arenarias galore. We came home that evening full of the satisfaction and weariness induced by a day in the thin air and fierce light of high places. Carl English had arranged this day for us.

Mrs. Daniels, our program chairman, with scarcely a meeting missed, had managed to slip in a trip to Japan and Kashmir between her duties. She was back in September to introduce her friend, Mrs. Angus Malloy, who showed us "Pictures of Alaska." This was followed by a group of slides which Dr. Kruckeberg, who has a five year grant to study the flora of serpentine areas, took last

summer in the Wenatchee Mountains. Typical plants of this serpentine area were *Cheilanthes siliquosa, Polystichum Lemmoni* and *Achillea lanulosa.*

So we have come full circle. That evening we elected officers, and at our annual banquet a month later we installed the following:

Dr. A. R. Kruckeberg, *Regional Chairman*
Mrs. Brian O. Mulligan, *Vice Chairman in Charge of Program*
Mrs. Rodney B. Allen, *Hostess Chairman*
Mrs. Chester Chatfield, *Secretary-Treasurer*
Mrs. Alonzo Free, *Corresponding Secretary*

Next month those of us who, like myself, know nothing about mushrooms are going to get a chance to learn something when Dr. Daniel E. Stuntz gives us a talk on them.

NOTES ON COLLECTED SEEDS – II

C. R. WORTH, *Ithaca, N. Y.*

Space limitations in the January *Bulletin* made it necessary to cut off these notes in the middle of a discussion of the polemoniums. Comments on the other species of which seed was sent to the exchange follow. Through oversight on the part of both Mr. Harkness and the editor, the phlox were not included in the Seed List; we hope that they were sent out as extras.

P. foliosissimum should perhaps have another name, for here again is a group on whose divisions taxonomists disagree, and I took the easy course of the "lumper". The form we collected makes a mound a foot and a half high and often much more across of conventional leaves, topped by flattish clusters of rather large flowers of very deep blue. Like most of the whorled-leaflet kinds, it protests being disturbed by exuding a powerful skunk fragrance, to which Jack objected vociferously. It is a quite showy plant, and will certainly be an easy one in ordinary soil, with preferably a bit of light shade.

Primula parryi seed was rather green when harvested, and perhaps should not have been distributed; yet twice I have sown extremely green seed of western species and have had fair germination. Even if this seed germinates, you probably won't be able to grow the plant, although it does fairly well in a few Scottish gardens.

Pulsatilla hirsutissima is of course the western version of the Pasque flower; seed was collected from plants in granitic alpine meadows.

Ranunculus sp. #197 is a high alpine, from limestone, with broad leaves notched at the ends and four inch stems with yellow flowers. I fear that it is one of the less impressive species.

Rydbergia (*Hymenoxys*) *grandiflora* recently has been praised by Chester Strong in these pages. It is a high alpine growing here and there, usually in isolated specimens, in well-drained meadows. Seed germinates readily, and several eastern gardeners seem to have been successful with it, contrary to expectations. The true leaves are at first grasslike, and not until the second season (here, at least) did they begin to "branch" into their usual pinnatifid form. They are still glabrous, and it remains to be seen whether they will eventually wrap themselves in wool. I suspect that they are short-lived plants, possibly monocarpic, and I have never noted an unflowered seedling in the wild.

Sieversia ciliata, also praised by Mr. Strong, arouses in me no great enthusiasm. It grows in alpine and subalpine meadows, in a variety of soils, with moderate moisture.

Silene petersoni makes a small tuft of rather narrow leaves on the high limestone screes, and bears a handsome pink flower an inch or more across on a stem of three inches. In many attempts, I have never grown it to the flowering stage.

Tanacetum compactum is a dense mat of dead-white leaves, cut fine as lace, and above them on flour-dredged two inch stems, small golden knobs. It is a scarce endemic of dry limestone slides near the summit of Charleston Peak in southern Nevada, an extremely handsome foliage plant which looks as though it would be intolerant of less austere conditions. Yet a couple of fragments reestablished without turning a hair, and after two months of assorted eastern weather look perfectly content. The story next spring may be quite different, but the tansy is certainly far from an "impossible" plant.

Townsendia grandiflora was simultaneously in flower and in ripe seed, on the eastern slope of the Laramie Range, at perhaps 7,000 feet, in granitic soil. The white daisies, about one and a half inches across, were produced plentifully on plants about three inches high.

T. montana, pictured in the April, 1960, *Bulletin,* grew on the same flat mountaintop as *Aquilegia scopulorum* and *Silene petersoni,* in almost pure lime rubble, but discreetly remained considerably farther back from the cliff-edges than did the other plants mentioned.

T. parryi, as if in competition with its tiny brother, chose to grow near *Aquilegia jonesii,* but only near the top of steep slopes. I cannot recall having met it on other than limestone mountains, but it occasionally descends to rather low elevations. All the townsendias are likely to prove biennial or monocarpic under garden conditions, and not all seedlings will reach maturity, but they are well worth the moderate effort involved in growing them.

Viorna sp. is an herbaceous clematis growing three or four feet high, and then flopping over, on sunny limestone slopes at the lower limit of the alpine zone; I cannot recall ever having seen it in bloom. This type of clematis seems to be little appreciated, yet it makes an excellent border plant, long-lived and flowering in midsummer.

BOOK REVIEWS

The Biologist's Handbook of Pronunciations. Edmund C. Jaeger, D. Sc. xvi + 317 pages, illustrated. Springfield, Ill.: Charles C. Thomas, 1960. $6.75.

The pronunciation of Latin scientific names is quite as baffling to the person with a strong background in the language, who has been taught to use the "Latin" or "Continental" pronunciation, as to the one to whom all Latin is Greek. Botanists and gardeners are often at variance with one another, in spite of the efforts of such writers as L. H. Bailey, in the *Standard Cyclopedia of Horticulture,* P. H. Rydberg in *Flora of the Rocky Mountains,* and Lawrence D. Hills in *The Propagation of Alpine Plants.* Of these, Hills perhaps comes off best, but his glossary is limited to specific names, leaving the reader to cope with the far more tricky problem of generic ones, which are often Greek or Latinized Greek, Russian—or what have you.

Dr. Jaeger, the distinguished botanist, makes his effort to standardize the pronunciation of scientific words (including some English ones), in a small and easily handled volume listing some nine thousand of the more commonly used terms, with pronunciation and, for adjectives and some nouns, the English

meaning. In the Preface he writes, "Acceptable pronunciation of each word is indicated, by its division into parts (not necessarily syllables), by means of hyphens, by accent, and by diacritical marks". A few pages farther on, "In dividing a word into syllables, a single consonant is joined to the vowel which follows it". Then one finds: "aboral (ab-o'-ral); "Abronia (a-bro'-ni-a)"; and in succession, "cinnamomeus (sin-a-mo'-me-us)" and "cinnamominus (sin-a-mom'-in-us)". In general, when a single consonant stands between two vowels, the author links it with the first. Two successive consonants are treated more consistently and successfully. One hopes that this defect will be corrected in later editions.

If the user will bear in mind (yet how many read prefaces?) the correctly stated rule for syllabification, the book can be of the greatest value in improving his pronunciation of Latin names, for a random sample of words indicates that vowel quantities and accents are correctly given. One hopes that rock gardeners will consult this work, and that they will discard "semperveevum" and "i-zoon" in favor of "sempervivum" and "a-i-zo-on".

With the reservation indicated, the book can be recommended to all who endeavor to pronounce plant names correctly.

Gardens of Western Europe. Frederick G. Meyer, Editor. 96 pages, illustrated. New York: Brooklyn Botanic Garden, 1960. $1.00

Of timely interest to those who contemplate attending the Rock Garden Plant Conference is this latest in the Handbook series. The outstanding gardens of fifteen European countries are surveyed, sometimes briefly, often in considerable detail. Those of the British Isles have been omitted entirely, because of lack of space, but perhaps a future number will discuss them.

Of special interest are the extended accounts of some really noteworthy gardens in Spain and Portugal, probably unknown to most readers of garden literature and overlooked by visitors to those countries. Along the more frequented tourist routes, all the more famous gardens, and many less known ones, are mentioned, with comment on the chief attractions of each. Private as well as public gardens are included, but without indication of whether there is an admission fee.

The many handsome illustrations will be of much help to the tourist in deciding which, of the multitude of possibilities, will have most appeal to him. A map is included for the benefit of the non-geographically minded.

A list of famous nurseries, with indication of their specialties, concludes the volume. The rock gardener may well protest that not a single alpine nursery is mentioned; surely those of Correvon and Sündermann, though possibly (since their founders are no longer with us) they may have passed their prime, are of sufficient international fame to merit inclusion.

My Wilderness: The Pacific West. William O. Douglas. Illustrated by Francis Lee Jaques. Garden City, L. I.,: Doubleday. 1960. $4.95.

Justice Douglas has written his book primarily, it appears, as an appeal for the preservation, for generations to come, of the few remaining wilderness areas in the western mountains. He presents a convincing thesis, against which there would appear to be no contrary argument. Aside from this important contribution to the cause of conservation, the book has much of interest to all nature lovers.

Justice Douglas has an amazing knowledge and a deep appreciation of the

mountains, their rocks, flora and fauna. His constant references to the mountain flowers and to the positions in which he found them cannot but have special interest to all lovers of alpine plants. Bird lovers too, fishermen, sportsmen, all will find grist for their mills.

The wilderness areas to which the reader is taken are among the most remote and inaccessible in the country, little known and less written of: the Brooks Range in northern Alaska; beaches of the Olympic Peninsula, the Glacier Peak, Goose Prairie, and Goat Rocks, the Olympics and Mt. Adams, all in Washington; the Wallowas and Hart Mountain, in Oregon; the Middle Fork of the Salmon River in Idaho; and the High Sierra in California. At the end of each chapter one longs for one more glimpse, a few more details, of the wonderland he has just described. Again and again the lyric beauty of the writing is interrupted by diatribes against the prime despoilers of the wilderness: sheep, lumbermen, road builders and tourists who must travel by car to spots that should be left inviolate—and above all, the Forest Service, which has the power to prevent desecration of the primitive country, and uses it, in the Justice's opinion, unwisely. Yet never does he state clearly how those who share with him a love of the wilderness can act to halt the devastation which grows greater every year.

It is a great book by a great man.

—DORETTA KLABER

The Oxford Book of Wild Flowers. Edited by S. Ary and M. Gregory, illustrated by B. E. Nicholson. New York: Oxford University Press, 1961. $7.50.

Designed to help the botanically uninformed person identify the more familiar plants of the British countryside, this book relies solely upon the process of matching a living plant with an illustration. Plants are grouped according to color of flower; on one page are colored drawings of perhaps six species, on the opposite one comments upon (not descriptions of) the same set of species, with occasional mention of related kinds. The method seems to be a successful one, for this reviewer could at a glance place in the right genus, at least, various dull composites whose names he had never bothered to ascertain. 550 species are illustrated in color, and about 30 more in black and white. A very brief glossary and short essays on the naming and classification of plants, on flower families and on plant ecology complete the volume. Of more than casual interest are the ink drawings of sixteen deciduous trees in both summer and winter aspects.

Many of the species illustrated are not among American wild plants, either native or introduced, and few of our own natives are included. Its use for identification of plants growing in this country is in consequence decidedly limited; but for those interested in British plants, it offers acquaintance with a number of kinds which we have until now known by name only, with but slight idea of their actual appearance.

Most of the drawings are good, but there are a few, such as those of *Armeria maritima* and *Saponaria officinalis,* where the reviewer could not recognize the plants from the pictures. In at least two or three cases the coloring is inadequate. But these are minor faults in an otherwise excellent and fascinating work.

Biological Control of Plant Pests. Cynthia Westcott, editor. 96 pages, illustrated. New York: Brooklyn Botanic Garden, 1960. $1.00.

Intended neither for casual reading nor as a compendium of "do it yourself" methods, this Handbook, one of the most serious of the entire set, offers a fairly comprehensive survey of the problem, and methods available to date, of controlling plant pests by other than chemical means. The articles are well-

written and informative, the illustrations superb. It should be required reading for every gardener and amateur biologist—and for professional ones as well, if their specialty is in another field.

The Rock Gardener's Bedside Book. 156 pages, bound in stiff boards with a four-color plate on the front cover. London: The Alpine Garden Society, 1960.

A selection of the best of thirty years of the Society's *Bulletins.* Six "staves": Of Rock Gardens, Scree, Alpine Lawns and Cattle Troughs, Cultivation, Among the Hills, Some Alpine Plants, In Lighter Vein, A Diversity of Creatures. Delightful reading, this has been published in honor of the Third International Rock Garden Plant Conference. —"G. B."

Gardens in Winter. Elizabeth Lawrence. 218 pages, illustrated. New York: Harper and Brothers. 1961. $4.50.

This is not another "how to do it" book, but one to enjoy reading as one of the altogether too rare examples of good modern garden literature. Miss Lawrence has produced an unusual combination, of information about early and late flowering plants acquired by personal experience and that of her many gardening friends, and of quotations from a large number of the early garden book classics. Far from being a "pot boiler," it is the product of a prodigious amount of experience and research. Even more than Miss Lawrence's earlier work, "The Little Bulbs," it has a distinctive personal style reminding one of that of Reginald Farrer and Gertrude Jekyll. Some idea of the extent of its coverage is indicated by an index which occupies twenty-one closely spaced columns. It is well illustrated by the drawings of Caroline Dorman, author of "Flowers Native to the Deep South." —"G. B."

Penstemon Nomenclature. Ralph W. Bennett. 52 pages. Arlington, Va.: American Penstemon Society, 1960.

This mimeographed booklet lists all currently valid names in the genus Penstemon, grouped according to their classification by sections. A second list follows, containing all names used in the literature during the past forty years with their current status, and reference to their use in a selected bibliography. The compilation has been done very carefully, and should clarify the status of many names appearing in the older regional floras.

The Genus Penstemon *in New Mexico.* Gladys T. Nisbet and R. C. Jackson. 60 pages, illustrated. University of Kansas Science Bulletin, Vol. XLI, No. 5. 1960.

The volumes on plants of New Mexico by Wooten and Standley, and Tidestrom and Kettell, are by no means adequate, while the studies of *Penstemon* by Pennell and by Keck, both at present incomplete, cover only a portion of the species which occur in that state.

The present work, started by Mrs. Nisbet in 1938, is the result of careful and exhaustive study in both field and herbarium. It comprises a key to all species known to occur in the state, detailed descriptions and lists of specimens examined, chromosome numbers of most species, and ninety line drawings and photographs. As the authors have been in frequent communication with Dr. Keck, it seems safe to assume that the viewpoint is in agreement with that of the leading authority on the genus.

This is a fine piece of work which should be of great value to anyone interested in the New Mexican flora.

SALMAGUNDI

FOR BETTER OR WORSE, the past winter will be long remembered by residents of the eastern seaboard. From Long Island Kurt Baasch wrote, before the February 4 storm, "For once we have enough snow." Enough or too much? Certainly too much for human beings and their activities, but how about the plants? Are alpines happy for once, or will they be smothered under the drifts? The natural home of many is upon cliffs where snow cannot cling. It has been our experience that plant losses are often greater after a winter of deep snow than after one of inadequate covering. We hope that many readers will report to the *Bulletin* regarding the fate of plants in their gardens.

Here, more than two hundred miles inland, we have escaped most of the coastal storms, and snowfall has been below normal; the only heavy accumulations have been fourteen inches on New Year's morning, and twenty-six (or thirty, or forty, depending on who makes the report) on February 4. In fact, during January some farmers were obliged to haul water for their stock—a not infrequent occurrence in late summer, but utterly without precedent in midwinter. Perhaps we must expect some plant losses caused by inadequate soil moisture.

* * * * * *

On a more cheerful note, shortly after the April *Bulletin* reaches you, some (we hope many) of our members will be on their way to the British Isles to attend the Third International Rock Garden Plant Conference. A brief report of this, the most important event in the world of rock gardening, will probably appear in the July number. Full details, including the text of all papers presented, will be in the Report of the Conference, which will be sent members of the Scottish Rock Garden Club in place of the autumn *Journal,* and members of the Alpine Garden Society as substitute for both the September and December *Bulletins.* On the basis of the Reports of the past two Conferences, this will be a "mine of information," and those fortunate enough to belong to both organizations will probably delight in sharing the spare copy with friends. Every serious rock gardener will want a copy to enjoy permanently, however, and should become a member of at least one of the societies in time to be certain of receiving the report.

* * * * * *

Mrs. J. F. Jezik, 5136 Raymond St., Seattle 18, Washington, is attempting to gather a comprehensive collection of *Fritillaria* and *Cheilanthes.* Anyone possessing, or able to obtain, the rarer species (especially American ones) is requested to contact her.

* * * * * *

The Alpine Garden Society has prepared a "bedside book" of selections from past numbers of their *Bulletin.* The possessor of a complete file will of course find nothing new in the book, but few of us are that fortunate. The cost is insignificant, the pleasure will be immense; better order a copy now.

* * * * * *

From time to time, it is requested that the *Bulletin* include a series of "articles for beginners." We are all in favor of this, but are unable to decide what those who place themselves in the novice class would like. The recent books by Doretta Klaber and E. B. Anderson, for example (and these should be in the possession of every rock gardener, new or experienced) supply answers to most of the questions which come to mind. Will the "beginners" please drop us a line suggesting topics of interest to them? We shall then try to find someone of experience to write an article on each of the subjects proposed.

BACK VOLUMES OF THE BULLETIN

We have for sale an accumulation of back volumes and individual numbers of the BULLETIN. The available material is listed below.

VOLUME 1 (6 issues) $5.00 (limited supply)
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