The country of Chile is a very long, narrow strip extending along South America’s Pacific coast from 17°30’ to 55°59’ S. latitude, a distance of 4,265 km (2,650 miles). With a low coastal range, interior valleys, and the mighty Andes, it mirrors in many respects the Pacific coast of North America, from its desert north reminiscent of Baja California to the frigid, windswept island of Tierra del Fuego, which reminded me of Kodiak Island in Alaska. Hence the title of this article, “Tours,” for each region of Chile calls for a particular plan to see the best of its flora. Geophytes – bulbs, tubers, and corms – are present in most of these regions, from the amaryllids of the north to the terrestrial orchids of the far south. Here are a few notes, by region. Chile is divided into administrative regions designated by roman numerals, running north to south.

In planning trips to Chile, I’ve been greatly helped by the book series Flora nativa de valor ornamental, by Paulina Riedemann, Gustavo Aldunate, and Sebastián Teillier. For each region, there is a thick, detailed

Jane McGary, an originating member of PBS, has traveled extensively in South America, and is fluent in Spanish. She is well-known for her extensive knowledge of geophytes and grows many uncommon ones. A third article to complete this series on her travels in Chile will be published in a future Bulb Garden. All photos in both articles are by Jane McGary.
Iris laevigata, the Water Iris — Dan Fetty

PBS member Dan Fetty is Vice President of the Central Virginia Iris Society, and Vice President of American Iris Society, Region IV. He collects species iris and has provided the photos for this article.

*Iris laevigata* is the most water dependent species of iris and all experts, including our Dr. Waddick (Dr. James Waddick, a PBS member) here, agree it must be grown in aquatic situations. The species gives its name to the entire series of water-loving irises, the Laevigatae, which includes our familiar *I. virginica* and *I. versicolor*.

*Iris laevigata* is native from Russia east of Lake Baikal throughout the vast Siberian swamps and into China. It is believed to have been introduced into Japan as a gift from the Chinese Emperor to his Japanese counterpart. For centuries it was cherished in China and Japan, where special forms were much beloved and subject to poetic odes and silk paintings. It was "discovered" by the west about 1770 when Pallas (Peter Simon Pallas, Prussian zoologist and botanist) found forms in swamps near Lake Baikal. Plants from this area were named ‘laevigata’ (smooth) by Fredrich Ernst Ludwig von Fischer in 1837.

There was great confusion with this species and the Japanese iris, *Iris ensata*. *Iris laevigata* was exhibited as ‘ensata’, winning awards, and it was thought that the lovely Kaempheri-type Japanese irises were crosses between the two species. The greatest irisarian of them all, W. R. Dykes, soon set the record straight in a series of lectures and in articles to various horticultural magazines. Dykes knew *I. laevigata* grew and thrived in the ditches at Kew Gardens in England, so he had plenty of material to study. He tried crossing *I. laevigata* with *I. ensata* but the cross failed, ruling out hybrids. Dykes pointed out that the Japanese iris, *I. ensata*, always has ribbed leaves, sometimes to a heavy degree, the blooms are in the red-purple spectrum, and the seeds are thin papery discs. In comparison, *I. laevigata* has smooth leaves without ribbing, flowers in the blue-purple spectrum, and the seeds are shiny cubicals similar to other members of the Laevigatae.

**Growing from seed:** This year I received seed from the exchanges in March. I planted them in whatever pots were left over, about 12 seeds per 5- or 6-inch (12-13 cm) pot. Use a good potting mix, and plant the reddish seeds just like you plant marigold or zinnia seeds (just covered with mix). I put chicken wire covers over the tops of the pots, mainly to stop squirrels, just lined the pots up and left them in the driveway. In a period of three weeks in April (in Virginia where I live), both lots of seeds germinated, as did dozens of other iris species. Honestly, it's just that simple.

You may pot the seeds in October and leave over winter, with germination in spring as well. As soon as the plants were large enough they were planted in one-gallon (3-4 L) pots and put into trays or troughs of water, up to the rim of the pot, or in the case of the smaller pots, submerged. By October the seedlings were full size, 24 inches (.6 m) or so, and growing multiple fans, or increases.

In most iris, this signals maturation and the plant now has a rhizome and has set flower buds. Indeed, the beautiful wild Russian form pictured...
guide to the plants and their cultivation, and a slim volume *Rutas y senderos* (‘roads and trails’) describing good places to view many species. If you can somehow acquire these books, do: I bought them at Chilean bookstores specializing in academic works, and I’ve seen one volume listed on amazon.uk.

**Zona Norte: The arid north**

First, let’s visit the northwestern region. (The northeast comprises high mountains and plateaus, of interest for birds and volcanic features, but lacking floral diversity.) The primary consideration in planning this visit is whether the preceding year features the sea and weather phenomenon El Niño (ENSO), which brings rain to a coastal region where, in dry years, the plants subsist on marine fog (*camanchaca*). Many of the geophytes don’t even emerge unless triggered by rainfall. Their season is spring, late August through October, and you have to watch the precipitation reports throughout the preceding months before making your decision around the beginning of July. Californians are familiar with their own flowering desert, and Chileans anticipate the *desierto florido*. The observations below apply to rain years.

The northernmost point I’ve explored is around the village of Paposo (Region II), just north of the small town of Taltal, where lodging is available. You may find the small *Alstroemeria graminea*, remarkably an annual. A small tuber lies beneath *Dioscorea fastigiata*, a desert yam with thick, shiny leaves. Beside rocky drainages I saw *Leucocoryne appendiculata*, the northernmost member of this popular Chilean genus. Oxalis fanciers can marvel at *Oxalis gigantea*, a tall, shrubby plant of the coastal plains, which can grow over 2 meters (6 1/2 feet). Closer to the ground, there are many *Oxalis* species, rather difficult to distinguish, but I thought *O. bulbocastanum* quite pretty. A star of this area is *Rhodophiala laeta*, a short-stemmed but showy species. *Tigridia philippiana*, with white flowers, is reported from here, but I never found it. *Zephyra elegans* (Tecophileaceae) can bloom in great masses, the flowers ranging from pure white to sky...
blue. I was fortunate once to find *Zephyra compacta*, growing in deep beach sand. While searching for the geophytes, you’ll enjoy a fine range of annuals and fascinating shrubs.

Parque National Pan de Azúcar (Region III) is a large coastal preserve just north of the town of Chañaral. Much visited for the desierto florido, especially cacti, it’s not well supplied with geophytes, but *Rhodophiala laeta* and *Alstroemeria graminea* are also here, and some *Oxalis* spp. *Leucocoryne coronata* (syn. *Pabellonia incrassata*), reminiscent of a *Narcissus* with its white corolla and gold corona, grows here and to the south. There is *Alstroemeria violacea*, an elegant purple flower.

From Ruta 5 (the main north-south highway) to the small coastal town of Carrizal Bajo one drives through Parque Nacional Llanos de Chal-le. Explore a broad dry riverbed near the road to find *Alstroemeria kingii*, a tiny yellow-flowered species that looks like an annual but isn’t. The park is the main site for the narrow endemic formerly called *Leontochir ovallei*, now, I believe, placed in either *Alstroemeria* or *Bomarea*. This is a spectacular plant, with big leafy stems emerging here and there in talus and bearing clusters of brilliantly shining red flowers. It is a protected species, and the park’s visitor center will direct you to a fine monitored site, though you may notice it while hiking up canyons else-where. You can buy souvenirs depicting it at the visitor center. You may also find tall-stemmed *Rhodophiala phycelloides* with nearly tubular red flowers, a true hummingbird plant. Right on the coast north of Carrizal Bajo is a fine stand of yellow *Rhodophiala bagnoldii*.

Continuing south, you reach the town of Huasco, one of my favorites. Its attraction is the “Huasco dunes,” a formation of very high, stabilized sand dunes reached on an unpaved road that runs south opposite the turnoff to the suburb of Huasco Bajo (4x4 recommended, and don’t think you can find the other end; “un buen conductor de jeep no tendrá problemas”). A seasonal river runs through a narrow valley between the coastal hills and the dunes formed by blowing sand east of the watercourse. The hills are covered with annuals, especially the lovely blue *Nolana*, and with *Zephyra elegans*. The dunes host stately *Rhodophiala ananuca* in its full color range from pure white to rich peach-pink. With them grows the narrow endemic *Alstroemeria werdermannii* with strongly crinkled leaves, and across the valley is *Alstroemeria philippii*, a large, beautifully marked flower.

A very special destination for botanists is Parque Nacional Fray Jorge, on the coast near the city of Ovalle. It is a relict floral assemblage featuring many plants common much farther south, believed to have survived here as tectonic movements slid its peninsula to the north over millions of years. About 10 hectares in extent, it comprises two distinct portions: an arid one featuring tall cacti, and the relict forest itself. A ranger is usually present to discuss the latter area. The best geophyte-viewing, however, is on...
the access road to the park gate, with lovely variants of *Leucocoryne purpurea*. The park is not open every day, so check its website for the schedule.

On one trip I was accompanied by a geologist, who wanted to see a particular place in the Andean foothills, so we drove there, and I noticed a road to the south that would take us back to the town of Illapel, near Ruta 5. A couple of fords and some one-lane encounters with buses later, we stumbled on Reserva Nacional Las Chinchillas, an easy drive from Illapel, and now a favorite stop. Devoted to the preservation of the Chilean chinchilla (a species distinct from the familiar one raised for fur), it has a visitor center with a clever little zoo, a picnic area, interesting birds, and a loop trail with plenty of good plants. Some of the trees are labeled. The bulb star is *Placea amoena*, a large, showy, deep pink amaryllid and narrow endemic, which grows near the high point of the trail.

As you continue south on Ruta 5 toward the big cities, stop often to enjoy flowering geophytes. You may find *Alstroemeria leporina*, and you’ll surely see various forms of *Alstroemeria magnifica*. Pale blue *Leucocoryne coquimbensis* is common – and quite growable too.

The next time a “good” El Niño forms, make your plans for the Southern Hemisphere’s flowering desert. As you drive up and down Ruta 5 (part of the Panamerican Highway) and turn off to the sea or the Andean foothills, you will have a botanical experience that has few equals in the world.

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**Chile, Part 1 cont’d**

here bloomed the next spring after germinating. **Care and culture:** A master irisarian once told me "plants can't read", so don't necessarily believe what you read. Differing climates, temperatures and so many other factors weigh in on successful culture. I am going to relate my successful experiences, although they may be contrary to what you read or were told.

Plants received bare root in the spring or fall are planted in one- or two-gallon pots and the pots are inserted in troughs or tubs of water that can pretty much cover the pot. I like to mix soil using minerally top soil, peat or sphagnum and compost. Mix some organic acidic granules in the mix. I top dress with cypress mulch (also acidic). During the growing season shots of both Miracle-Gro or Mira-cid or similar fertilizers are beneficial. Calcium is not fatal to *Iris laevigata* as it is to the Japanese irises.

By late fall, prepare your irises for winter. Remove all dead or yellowing foliage and top off the pots if needed with additional compost. My eleven cultivars ran the gamut of dormancy. Evergreen types didn’t stop growing all winter. Semi-evergreen types had green shoots at ground level, and dormant ones disappeared from view. These categories are meaningless as all forms are winter hardy and soon catch up to each other in spring. The flower scapes start in late spring, and in warm climates some are virtually ever-blooming. The only insects I've seen on the blooms seem to be flies. They love sunning on the flat blooms of some cultivars. Pollination is easy; pull a stamen with tweezers and rub the fluffy pollen over the stigmatic slit under the style arms. Seed capsules are strong, and in the wild need much time to dis-integrate. The large shiny reddish seeds are easily harvested and saved.

**Vegetative reproduction:** This iris is easily propagated in the fall when the new season's roots and shoots start to grow. Divide the whole pot, or just a piece which can be as little as one well-rooted fan. Repot with soil enriched with organic fertilizer granules, and put back into pond or trench. At one spring convention auction, a single fan potted in the fall not only had a flower stalk, but was blooming on auction day!

**Modern cultivars:** I really love Perry's ‘Mottled Beauty’. Perry ran a successful water garden for many years and did not introduce any plant unless it was easy to grow and floriferous. This is exactly
how this exotic spotted lovely grows. ‘Royal Cartwheel’ is a huge six falls type. ‘Lakeside Beauty’ looks like a waterlily; it starts out purple and fades to white. One of the most popular cultivars of recent years is Chad Harris’s ‘Blue Rivulets’. This gorgeous huge bloom has large drooping white falls with blue veining running down as if it were a waterfall flowing down a cliff.

Here are some companion plants: *Typha minima* (Baby cattails); variegated *Typha* species and cultivars; and Wave™ petunias. I place the petunia stems in the ponds and they bloom and bloom; however, because petunias are members of the poisonous Solanaceae, they may be dangerous to pond life. I don't know.
Iris laviegata cont’d

Bibliography:

The World of Irises (American Iris Society)
Iris of China Dr. James Waddick and Zhas Yu-Tang

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(Editor: The Pacific Bulb Society website has an excellent number of photographs of species iris and a number of hybrids, which makes a good starting point for those interested in trying out new species and varieties. Don’t forget the bulb and seed exchange which often has them available.)

Geophyte Tours in Chile, Part 2:
The Central Region
by Jane McGary

Part 1 of this article dealt with the rich geophytic flora of northern Chile. For Part 2, we start around Santiago and travel south to the “Sur de Chile,” or Lake District, with frequent excursions into the Andes east of the central valley, and an occasional look at the Pacific coast. Chile is such a narrow country that almost any road into the Andes will take you to wonderful alpine plants in a few hours.

During a stay in Santiago you can drive up to several ski areas such as Farellones and La Parva, and up Cañon Maipo to the southeast. The ski areas have been extensively developed since I first went there in the mid-1990s, with the expected environmental degradation and, sadly, grazing. However, access is easy, and this past January we came upon a mass flowering of Rhodophiala rhodolirion (syn. Rhodolirium montanum) on the ski slopes; an amaryllid, it is not grazed.

On another trip in early November, we saw the large and beautiful Placea ornata on the serpentine road up into the mountains, growing in scrub; I think it was at about number 17 of the switchbacks. Common here is Alstroemeria umbellata, a compact plant with attractive foliage and mid-pink. You may see three tuberous Tropaeolum species: the familiar T. polyphyllum with clear yellow flowers, T. rhomboideum more a pale orange, and my favorite, T. sessilifolium, with widely expanded flowers and emerging foliage that reminds one of a Sempervivum.

Visiting some of the numerous parks and preserves within an easy drive of Santiago, you can view smaller-flowered Tropaeolum species such as violet T. azureum, yellow T. brachyceras, and red T. tricolor. The latter two are frequently grown in our gardens and are hardy to at least 20° F (-7° C).

Like the northern region, the central zone boasts many species of Alstroemeria. Alstroemeria angustifolia is one of the less showy ones in light pink, but it’s hardy for me outdoors near Portland, Oregon. So are the area’s subspecies of the familiar Alstroemeria ligut: subsp. simsii with rather narrow, deep scarlet flowers, and subsp. incarnata, a really beautiful bright pink one that grew well in my former garden but failed to survive the move.

A visit to the popular tourist town of Algarrobo, on the coast south of Valparaiso, will reward you with Alstroemeria hookeri, a very short but showy

Below: Alstroemeria ligut ssp. simsii.
The best populations of *R. andicola* that I’ve visited have been among scattered *Araucaria* trees, a most picturesque species; it flowers well in my bulb house but I haven’t tried it outdoors. The Algarrobo area is also a good place to see several species of *Coneanthera* (Tecophilaceae) with their small, sharply reflexed flowers – growable, but fleeting. *Calydorea xiphioides*, another little blue bulb, is here too. You might even find *Oziroe arida*, with numerous small white flowers; it’s been in my bulb house forever, but it’s a bit forgettable. Along the roadside, keep an eye out for the deep blue of *Pasinthea coerulaea* (Anthericaceae), which is not really a bulb but has a spreading, geophytic root system.

You might also encounter *Alstroemeria pulchra* and *A. revoluta*; the latter has sharply reflexed tepals and can be seen at a place we just recently discovered, the Termas del Flaco, where I recommend a night at the delightful Hostal de Amistad. *A. revoluta* got into some potting soil as a stray seed and has made itself at home in my “liliaceous border”, in utterly inappropriate conditions. High in the mountains you’re likely to spot *A. exserens*, a short-growing plant with deep pink flowers.

Many PBS members are especially interested in *Rhodophiala*. I’ve seen *R. advena* growing in gardens and on roadsides in the foothills of the Central Valley, and *R. phycelloides* with narrower flowers in a couple of the lower-elevation national reserves; both are bright red. Higher in the Andes grow *R. andicola*, whose magenta flowers have dark throat markings, and *R. araucana* and *R. montana*, both yellow-flowered, as well as *R. rhodolirion* mentioned above (it can be pink or white with red markings).
PACIFIC BULB SOCIETY
Conference Call Board Meeting

Present: President and Editor Robin Hansen, Secretary Kathryn Andersen, Treasurer Arnold Trachtenberg, Directors Jane McGary, Lee Paulsen, Luminita Vollmer, and Johannes-Ulrich Urban

President Hansen called the meeting to order at 12:08 p.m. EDT.

Minutes of May 17 2020 Meeting: The minutes were approved as distributed.

Treasurer’s Report: Trachtenberg reported a UBS balance of $34,092.30. He has sent out checks to the Mary Sue Ittner Award winners, and they have been cashed. Our accountant recommended that our Agent of Record be a citizen of the state in which PBS was incorporated. Trachtenberg reported a $100 donation received from Danny Vermeeren of Belgium and said that we have seen a flurry of new EU members possibly due to the announcement of the European Union BX. No outstanding liabilities at this time.

Membership: McGary reported a membership of 350 - 262 domestic and 88 outside the U.S. New members who join after October 1 receive three months free.

Hippeastrum Book: The book was sent back to Bolivia in ready to publish form. An assistant sent a new version which is much better than the first one. Tanya Harvey will work with this version. We can establish a price and charge a fee for downloading.

The Bulb Garden: Hansen expects to send the latest issue to Trachtenberg within the next week.

Mauro Peixoto: Contact has again been made with Mauro Peixoto in Brazil who sells seeds on a subscription basis. A previous arrangement had been made by Dell Sherk.

European Union BX: President Hansen welcomed Johannes-Ulrich Urban to the PBS Board. He has established the new European Union bulb exchange, European Union BX. In September the first online list will be published. McGary will send him a list of European PBS members. Martin Bohnet also works on the European Exchange. Trachtenberg moved that Bohnet be appointed a member of the PBS Board as Assistant Manager of the European Union BX. Second by Vollmer, motion passed.

Credit for all seed donors: Moved by Trachtenberg, seconded by Andersen that donors be credited for out-of-pocket expenses such as postage. Motion carried. The meeting was adjourned at 1:14 pm.

Respectfully submitted,
Kathryn S. Andersen,
PBS Secretary

Next Meeting: Sunday, February 20, 2021
are several *Sisyrinchium* species, including the familiar garden subject *S. striatum* and smaller-flowered *S. arenarium*.

The flowers you see in high meadows, looking like onions, are likely species of *Tristagma* or *Zoellnerallium*; if pinkish, the former, and if yellow, the latter.

If you’re wondering about the famous *Tecophilaea cyanocrocus*, you’ll not see it in the wild; there are sites, but their locations are closely guarded to preserve them. Its smaller relative, *T. violiflora*, may be seen in the easily accessible Parque Nacional La Campana.

Enthusiasts of South African *Oxalis* may know that the genus is also widespread in South America, including Chile. Most of the Chilean species are not really geophytes, and don’t have bulbous storage organs, though common *Oxalis adenophylla* and far southern species like *O. enneaphylla* can be moved as dormant crowns.

A discussion of geophytes can well take a look at the many terrestrial orchids, which become more frequent as one travels into the moister, cooler southern region. The showiest genus is *Chloraea*, and its stars are *C. aurea*, brilliant golden yellow, and *C. magellanica* with intricately veined black-and-white flowers. These and other *Chloraeas* tend to grow in open areas, in grassy clearings, among rocks, or in old lava flows. Another common genus is *Gavilea*, with smaller white flowers.

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You can also mail in your renewal. Make check payable to: Pacific Bulb Society and mail to:

PACIFIC BULB SOCIETY
c/o Arnold Trachtenberg, 140 Lakeview Avenue, Leonia NJ 07605

Whether renewing online or by mail, please contact Jane McGary (janemcgary@earthlink.net) if any of your contact information has changed.

Thanks again for your continued support of the Pacific Bulb Society!

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requires visiting at different times of year, from October for the lowland flowers on through January for the high alpines. Last January another PBS member, Mark Akimoff (Illahe Rare Bulbs), and I took just two weeks, but with Mark’s indefatigable driving we saw quite a bit, including one or two places new to me. The country was in the second year of a bad drought, but in the Lake District the vegetation was still lush. I hope I’ll get at least one more visit to Chile and Argentina, to visit old favorites and find new ones.

( Editor: In Chile, national parks, reserves, and other managed places are under the management of CONAF: www.conaf.cl. Each place has a page on this website with information, including opening times. )

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