ARBORETUM FOUNDATION

Financial Statement

May 1, 1967 — April 30, 1968

Funds on Hand May 1, 1967

$156,031.00

Receipts (operative):

Dues
Unit Control Operations
Donations
Bulletin
Education Program
Japanese Garden
Memorials
Miscellaneous

$20,235.00
$14,302.00
$3,272.00
$203.00
$124.00
$394.00
$684.00
$363.00

$40,207.00

Capital Income:

Interest on Savings
Interest on Endowment Trust Principal

$6,688.00

$682.00

$7,370.00

Disbursements (operative):

Salaries
Telephone
Miscellaneous
Bulletin
Education Program
Unit Council Operation
Publicity
Membership
FICA
Christmas Bonus

$12,000.00
$300.00
$1,512.00
$4,404.00
$377.00
$6,636.00
$660.00
$1,452.00
$502.00

$225.00

$30,150.00

Disbursements (capital):

Contributions—University of Washington Arboretum

$7,424.00

SUMMARY

Funds on Hand May 1, 1967

$156,031.00

TOTAL RECEIPTS (all sources):

$40,207.00

7,370.00

47,577.00

$203,608.00

TOTAL DISBURSEMENTS (from all funds):

$30,150.00

7,251.00

37,401.00

Funds on Hand April 30, 1968

$166,034.00

FISCAL YEAR SUMMATION

Petty Checking Savings Total

Unrestricted General Funds

Cash 25.00 5,490.72 Account 28,117.34 33,631.06

Restricted Funds:

Japanese Garden
Lilac Fund
Memorials
Education Program
Unit Council
Floral Hall
Rhododendron Trust
Endowment Trust Fund

406.53 234.47 1,268.00 1,871.50 5,121.27 83,631.13 506.52

$14,404.49

$151,604.16

$166,008.65
VOLUME XXXI, NUMBER 4

Winter, 1968

TABLE OF CONTENTS

Tour in Yugoslavia, June 1967 .......................... B. O. Mulligan 78
Western Red Cedar—An Ethnobotanical Sketch ........... John A. Putnam 82
Pinus Armandii .......................................... 87
Report on the Arboretum Buildings ..................... 87
Pruning By Eye ........................................... Marjorie Baird 89
New or Unusual Plants in the Arboretum
   XVI—Sorbus Species .................................... J. A. Witt 90
Report of the 1968 Plant Sale ........................... Gloria C. Sundberg 95
New Members .............................................. 95
Some of Our Favorites ................................... 96
Book Reviews ............................................ 96
Index to Volume XXXI (1968) ............................ 99

Cover photo:

Pinus Armandii

Photo by William Eng
Tour in Jugoslavia, June, 1967
B. O. Mulligan

The International Dendrology Society, founded in 1952, having headquarters in London, England, a president (the Duke of Abercorn) in Northern Ireland, an honorary treasurer in Belgium, and a membership extending into at least three continents, is a most active and enterprising group of persons interested in the study of trees and woody plants in general.

Each year one or two tours are arranged in different countries, in order to see interesting examples of either wild or cultivated trees; in June 1967 such a tour was organized in southern Jugoslavia, with the aid of several members in that country, especially Prof. D. K. Ogrin, Dept. of Forestry, University of Ljubljana, and Prof. P. Fukarek, Faculty of Agriculture, Sarajevo.

This was the tour which I was able to attend, with Mrs. Mulligan, following my visits in central Europe covered in the last Bulletin, separated by three days in and around Zagreb, in northern Jugoslavia.

Our first morning there was spent in the well arranged garden of the Institute of Pharmaceutical Botany, situated on a hillside of about seven acres on the outskirts of Zagreb. The Director is Prof. Fran Kusan, who has spent about twenty years in assembling an extensive collection of native plants and growing them very successfully in the calcareous soil which most of them enjoy. The arrangement of the plantings is by altitudinal zones; thus the plants of the Mediterranean littoral are found in the lowest parts of the garden, those of the mountains towards the top of the slope. The collections cover all kinds of plants, from true alpine plants, including bulbs and Corms, to shrubs and trees. We found many of considerable interest in all classes, including the small Ericaceous shrub Rhodothamnus Chamacestus, and Erica verticillata which flowers in spring; Iris illyrica and Iris variegata; the yellow flowered Linum capitatum; Helleborus multifidus; Rosa glutinosa, about 3 feet tall, with rose-purple flowers, and the nettle tree of southern Europe, Celtis australis, a relative of our hackberries.

Next morning Dr. Kusan, his son and his assistant Miss Kapka, drove us up the winding road to Zagreb mountain behind the city. The road for much of its length passes through a dense stand of beech trees (Fagus sylvestris), the largest 60-80 feet tall, now decked in their fresh green foliage. Nothing tolerates their dense shade, but by the roadside we saw some wild laburnum trees in bloom, while near the top of the mountain grow the native ash, hornbeam, sycamore maple, fir and spruce. Walking along a trail through the trees we found a variety of wild herbaceous plants, of which the most interesting in bloom were the willow gentian (Gentiana asclepiadea) and Herb Paris (Paris quadrifolia), the latter closely related to our genus Trillium. Yew (Taxus baccata) was also found here. We had lunch outside a small log-cabin type of restaurant, also used by skiers in winter; the altitude was about 2,500 feet.

The following day, June 4, we were driven by Mrs. Petric, of the University of Zagreb Botanic Garden, to see the Arboretum Opeka, near Varazdin, about 37 miles north of Zagreb in the valley of the Drava river. This, like so many others in central Europe, was formerly a large private estate with a mansion dating back to about the middle of the 19th century. Some of the largest trees were of American origin, including three giant sequoias 90-100 feet tall, Pinus Strobus, Tsuga canadensis, the Californian incense cedar, Libocedrus decurrens, Quercus palustris, and the swamp cypress, Taxodium distichum, growing beside a pond. The house is surrounded by trees on three sides, a meadow of hay in process of cutting on the fourth. The property is now operated by a high school in Zagreb.
After breakfast next morning we walked two or three blocks along the street to the University Botanic Garden, and were taken round it in detail by Mrs. Petric who works in the greenhouses, one of which contains a collection of begonias. In frames outside was an excellent collection of cacti growing in pots, plunged in sand, where they remain throughout the year, though covered by glass lights in winter. Several mound type of rock gardens, of recent construction using limestone rock, held a number of interesting plants, including campanulas, Dianthus and Euphorbia species. Beside a pond full of water lilies were three large specimens of swamp cypress, about 80 feet tall, but the evergreen conifers, especially pines, were suffering severely from the city atmosphere.

At 6:00 p.m. we left the hotel for the airport, whence we were due to take off for Dubrovnik, on the south coast, at 7:00 p.m. Before that time a plane arrived from London bringing several members of the I.D.S., including Mr. and Mrs. H. G. Hillier from England, M. Robert de Belder from Belgium, and Mr. and Mrs. G. Krussmann from Dortmund, Germany, so we had good company in the Caravelle for the hour’s flight. The airport at Dubrovnik is some distance south of the city, therefore it was after 9:00 p.m. when we finally arrived at our hotel, the Argentina, overlooking the bay.

Tuesday, June 6, was the first day of the planned tour which was to take us by bus in eleven days inland through the hills and river gorges to the town of Visegrad, at the junction of the Drina and Lim rivers, then south to Pec, close to northern Albania, thence returning through Titograd, Cetinje and Kotor to the coast. In the party of 33 members were representatives of eight countries, together with our three guides who accompanied us all the way, Prof. D. K. Ogrin, Prof. P. Fukarek, and Dr. N. Plavsic from Zagreb, so it was truly an international party.

That morning, which was sunny and warm as anticipated, we were taken by boat to the island of Lokrum, a mile or so out in the bay, now in charge of the Academy of Sciences and being used in part as a testing ground for trees and shrubs of the southern hemisphere—Acacia, Eucalyptus, Hakea, Callistemon, etc. These plantings are only five to seven years old but many of the species seem to be flourishing. The native evergreen woody vegetation is typically Mediterranean; trees of Pinus halepensis, Quercus illex, Arbutus Unedo; shrubs including Pistacia, Erica arborea, Juniperus phoenicea, Phillyrea, Cistus and Ruscus. The island was well covered by them, except where clearings had been made for some specific purpose.

Later in the afternoon we had a conducted tour of the city, of which the history is known to pre-Roman times. It was largely destroyed by an earthquake in 1767, then rebuilt; the population now is about 24,000 of whom some 5,000 live within the walled portion, where the “streets” of the residential area are only eight feet wide between the houses.

Next day we embarked on a bus with all our baggage and climbed up out of the city to the east, stopping twice to take pictures of the magnificent view below us and also to observe the local flora, already somewhat different from that of Lokrum since we noted the dwarf, golden Genista dalmatica, purple Edraianthus tenuifolius and blue flowered shrubby Moltkia petraea beside the road among limestone rocks. Bushes of Spartium junceum were also blooming conspicuously.

Farther inland we passed into a different plant zone where several deciduous tree species competed together and formed an intermittent small forest, dense in places; they comprised Acer monspessulanum, Carpinus orientalis, Fraxinus Ornus and Quercus macedonica. In one area the rocky ground was covered with purple sage (Salvia officinalis) in full bloom, forming a carpet beneath scrubby trees of the flowering ash, a remarkable piece of natural landscaping. We also made a short diversion to see a stand of Petteria ramentacea, a
shrubs related to Laburnum found only in this part of the world. The plants were in young fruit, 6-7 feet in height.

In a vast meadow at Gacko we ate a box lunch, surrounded by lavender-blue Ajuga genevensis and a pale pink species of Thymus in bloom, while larks sang overhead. Across the road in a damper meadow were thousands of Narcissus poeticus, combined with a tall blue Scilla and creamy yellow orchids. Certainly we were on an exciting tour so far as the plant life was concerned, and apparently at about the best season for flowering.

Later that afternoon from a high point on the road we had a superb view of the higher limestone mountains ahead, bearing patches of Pinus nigra, probably var. austriaca, on their flanks, before descending gradually through spectacular scenery into the gorge of the Sutjeska river, along which the Romans once built a highway. Here for the first time we saw a pure stand of European beech (Fagus sylvatica) and in smaller numbers Acer Heldreichii, a near relative of our own Acer macrophyllum but smaller in size (30-50 ft.) and harder. We spent the night at the Hotel Sutjeska at the foot of the gorge, ninety miles from our starting point.

On Thursday, June 8, we drove up to Perucica National Park above Tjentiste, and walked from the end of the road to scattered snow masses at about 4,700 ft.; the day was sunny but the air was cool at that height. Here were large specimens and groups of Pinus mugho, varying greatly in age and size; the average height was 4-5 ft. On the edges of the snow banks lavender-purple flowers of Crocus vernus were pushing up and opening in the sunshine. Lower down bright blue Gentiana verna and the larger trumpets of G. Clusii were noticeable on the roadside. Beech trees were found as high as the pines, and the creeping Juniperus communis var. saxatilis grew even higher.

After lunch in the hotel we continued northwards to Visegrad along the Drina river valley, where on the opposite bank ran a narrow gauge railway built by the Austrians prior to 1914; we saw three trains on it—one freight, two passenger—so it is still busy. We also saw two new oaks today, Q. Cerris, the Turkey oak, and Q. Frainetto, with much broader leaves. The smoke tree, Cotinus (Rhus) Coggygria was plentiful on the hillsides, in bloom at this season, 6-8 ft. in height.

We spent two nights at the Hotel Visegrad, on the bank of the Drina and at one end of the famous old 15th century stone bridge. The prime objective here was to see one of the very limited areas of the native spruce, Picea Omorika, a species closely related to and more common in cultivation than P. Breweriana from S.W. Oregon and N.W. California. To reach it we drove about fifteen miles up a good gravel road, first through hayfields full of flowers—daisies, meadowsweet, scabious, orchids—then a belt of Austrian pines and above them beech trees, 80-100 ft. in height, 2½ ft. d.b.h., followed by a mixture of beech and silver fir (Abies alba); only selective logging is practiced here, we saw no clear cutting.

At about 2,500 ft. altitude we left the bus and walked first up a muddy track, then straight up the timbered mountain side of Stolac for about half a mile until we came to the spruces at 3,600 ft. At this point these were about 12-15 ins. d.b.h., the tallest perhaps fifty feet or thereabouts, but this was difficult to judge because of the steep terrain and the close growth of the trees; there were probably larger examples elsewhere. In outline they were narrow and tapered to a sharp apex, much like our own Abies lasiocarpa in the Cascade mountains. Each of us was given a sample of branch, cones and seeds as a souvenir, and many also took photographs under difficult conditions.

Upon descending to the starting point we found a remarkable scene. Tables had been set up under the big beeches, covered with white cloths, glasses, silverware, and all preparations were made for a lunch of lamb, roasted whole in situ, accompanied
by green onions and tomatoes and preceded by a small glass of slivovitz, the native plum brandy, to warm the stomach! Beer, local wines and mineral water were served with the meal. This was indeed a most pleasant surprise and happy thought on the part of our hosts, and certainly one of the highlights of the entire tour. Fortunately, the weather cooperated and the day was fine.

Next morning we headed southeast down the valley of the Lim river, a major tributary of the Drina, for Ivangrad, about 100 miles distant. Most of this road is gravel, a short section of concrete. En route we lunched at Milesevo monastery, near Prijevo, a most attractive building of 12th century origin, but much damaged in the interior during a roofless period in the 16th and 17th centuries under Turkish occupation. Close to it was an ancient tree of the field maple, *Acer campestre*, of which the trunk measured ten feet in circumference; no one would estimate its age. The final 20-25 miles into Ivangrad provided some of the most spectacular limestone gorges and scenery that we had yet encountered, the mountain sides generally covered with hornbeam trees (*Carpinus Betulus*) and with pines scattered along the ridges and buttresses, often in the most extraordinary and fantastic situations.

The following day, Sunday, June 11, was somewhat cloudy from its start, and as we were heading for Cakor ("Chakor") past at 6,000 ft. we wondered what was in store for the party. The road, mostly hard gravel, ascended gradually first on one side then on the other side of a long, wide valley; at about 3,000 ft. we reached beautiful meadows flushed purple by thousands of plants of *Pedicularis verticillata*; on the roadside banks grew large patches of the yellow form of *Viola gracilis*, 4-5 inches high, accompanied by a slightly taller golden buttercup. Above this area was a forest of young Norway spruce, coning heavily on many trees, which continued almost to the top with decreasing size. There it was cold and damp, so we were glad of shelter in a small building where hot coffee or other drinks and some food could be obtained. Here we were met by members of the Forestry Research Institute in Pec ("Pech"), who guided us a short distance along the ridge to see *Pinus Peuce*, the Macedonian pine, in its native habitat. This reminded me forcibly of the limber pine in Wyoming (*P. flexilis*), although it is more compact in its growth habit like the Swiss stone pine, *P. Cembra*. Accompanying it were some weather-beaten junipers about a foot high, with *Empetrum hermaphroditum* and *Vaccinium Myrtillus*, which indicated at least an acid surface layer. Most of these pines were young trees 10-20 ft. tall; many of them were coning so a few cones were collected for the Arboretum.

Driving down the east side about four miles we halted by an open field of short grass beside a rushing torrent, the stage for a first class display of folk dancing in native costume, by a group of about twenty young men and women from Pec. They were led by a drummer, a woodwind player and two stringed instruments resembling small guitars. Numerous pictures were taken of this unique performance and its members. Here we also consumed a box lunch in this delightful setting before continuing down another fascinating gorge towards Pec. On these mountainsides another pine was pointed out to us, *P. Heldreichii* var. *leucodermis*, a relative of the Austrian pine but more compact in habit and oval in form than the latter; it also grew chiefly on the highest ridges with a few stray trees lower down.

On reaching Pec we first spent an hour visiting the 13th century monastery with its remarkable frescoes covering the walls, then drove to the Forest Research Institute for an informative talk by the Director about their research program. The Hotel Metohija, where we spent two nights, was the largest and most comfortable since leaving Dubrovnik.

(Continued on Page 97)
Western Red Cedar
An Ethnobotanical Sketch
JOHN A. PUTNAM*

Western Red Cedar, *Thuja plicata*, is one of the very large trees growing in moist situations in lower valleys of the northern Pacific slopes. Its range extends from northern California, through Oregon and Washington, through the province of British Columbia, and into the southeastern part of Alaska. An eastern extension goes through southern British Columbia and northern Washington into the western valleys of the Rocky Mountains of northern Idaho and Montana where moisture conditions make its growth possible. It is usually found in mixed stands of Douglas Fir, *Pseudotsuga menziesii*; Western Hemlock, *Tsuga heterophylla*; and Sitka Spruce, *Picea sitchensis*. It rarely occurs in pure stands and seldom forms more than 50 per cent of a mixed stand over any considerable area. Near the range perimeter and depending upon the locale, it may also be found with Western White Fir, *Abies grandis*; Engleman Spruce, *Picea engelmannii*; White Pine, *Pinus monticola*; Alaska Cedar, *Chamaecyparis nootkatensis*; and at times Larch, *Larix occidentalis*.

As an individual tree, Western Red Cedar attains a very large size. Trees measuring 16 feet in diameter and a height up to 250 feet have been found. However, the average old-growth timber measures from about 3 to 8 feet in diameter and from 150 to 200 feet in height. As the tree increases in age it develops a very wide buttress and at times a hollow trunk and broken top. Red Cedars may attain a very old age. Specimens have been found well over 1000 years old.

Besides producing the Red Cedar, this area had another important contribution to make. Its streams are the major spawning grounds for the Pacific salmon which were the Indians' most important food staple. Capturing the salmon on their migration from the sea to their spawning grounds was one of the major food-gathering activities of these people. The ease with which large quantities of these fish could be captured, coupled with the variety and quality of articles made from Western Red Cedar, made possible a culture that in some areas had unique and highly developed material, heraldic, and ceremonial aspects.

Indians of many tribal groups with a variety of cultural levels live in the geographic range of the cedar. The Northwest Coast Indians, living coastal from the mouth of the Columbia River, north through southeastern Alaska, seemed to derive the greatest cultural advantage from the combination of salmon and cedar. It is now sometimes referred to as the “salmon-cedar” culture. Wood technology was most highly developed in the central and northern areas. Different kinds of hardwood such as Maple, *Acer macrophyllum*; Alder, *Alnus sp*.; Vine Maple, *Acer circinatum*; as well as the soft woods were occasionally used. But it was the cedar tree that provided them with many of the necessary articles of life that would otherwise have been difficult to obtain. Most of these articles were universally made, although there were minor differences from tribe to tribe. Manufacturing techniques also varied from group to group as did the quality of workmanship. Tribes immediately be-

---
*

*We are pleased to have a “first” article from one of our Directors and Officers of the Foundation. Mr. Putnam is Assistant in Science Education, Seattle Public Schools.

Articles of cedar made by Northwest Coast Indians: background left, cedar bark mat, Kwakiutl; center, dance neckring of cedar bark cordage, Tsimshian; right, houseboard, Nootka; foreground, Hamasta headdress, Kwakiutl; bentwood storage box; Haida imbricated basket of cedar rootlets, probably Cowlitz.

Fig. 13—Photo by: John A. Putnam
beyond the area where Red Cedar grew or where the crafts involving cedar products were not highly developed, traded for these items.

The Spanish expedition, as it explored the west coast of Vancouver Island under Captain Malaspina in 1791, was one of the first European groups to report the existence and use of cedar. The arts and crafts were highly developed at that time. With primitive tools these huge trees were felled, formed, and finished into items of a quality that amazed the early explorers.

The wood, although not as strong as Douglas Fir, has other important qualities. It is remarkably straight grained although young material tends to be somewhat coarse and is very easily worked with primitive hand tools and very durable, much more durable than trees of other species growing in the same area. There is very little shrinkage to the wood, and it seldom warps when drying. When it is dry it is only approximately three-fourths of the weight of the lightest of the other species. The bark is thin, about three-fourths of an inch, and can be easily pulled from the trees in long, fibrous strips. The roots grow very shallow and are tough and flexible. These attributes made it one of the most useful single plants for indigenous people, with the possible exception of the coconut palm in the South Pacific.

Cedar trees were felled by a combination of chiseling and burning, and dropped as accurately as modern loggers do today. Due to the wide flaring buttress of the standing tree, scaffolding was rigged around the tree and the falling was done from high off the ground. It is reported that the burning was accomplished by the use of hot stones. Most often, due to the weight of the logs, canoes were made or boards split right where the tree fell. The Indians had also developed a technique for splitting boards out of standing trees.

Perhaps the most impressive item made from the timber would be the homes of the Indians. These buildings ranged from approximately 40 feet wide to as much as 100 feet long, some longer. The straight grain of the cedar, with its ability to be split into long lengths with simple tools, made it an ideal material for the construction of these buildings. The boards were often split in widths of 2 to 4 feet. Their length, depending upon their need, sometimes reached as long as 40 feet. After splitting, the boards were carefully dressed with an adze and usually formed with a curved edge so that they would overlap neatly in the wall, or would shingle tightly as part of the roof. When finished they exhibited the adze marks of the workers in a beautiful pattern. Cedar twigs or rootlets were used to fasten the boards to the house frame, which was probably of cedar also. The house boards were prized items in the family and were kept as long as they were usable and carried about if it was necessary to move.

The Northwest Coast Indians were a marine people and water transportation was their main way of getting about. The long straight bole of the cedar was ideal material for making dug-out canoes. The canoes were designed in a variety of forms and sizes depending on their use. No matter how large (some were reported as large as 75 feet long with 7 foot of beam), a single cedar log was used. These canoes were indispensable in the lives of the Indians and were valuable trade items. The Haida people were considered some of the best canoe makers and their canoes were sought after through the entire area. Their length exceeded the length of some of the early European ships used by the explorers. Lewis and Clark reported the first northwest style canoe at Celilo Falls as they came down the Columbia River. These craft so impressed them that they purchased one to use for their trip down the river. When the canoes were not in use and hauled up on the beach, they were often covered with cedar bark mats to keep them from cracking.

Many household items were made of this wood. One of the most ingenious was the bentwood box, which in various forms,
could be used for cooking, storage, or as a ceremonial drum. These were made from cedar planks adzed to a thickness of less than one inch and a width depending upon the desired height of the finished box. One piece was used for all four sides. The board was kerfed or notched where the corners were to be, then steamed and bent into a deep rectangular frame and sewn or pegged together where the ends of the plank met. The bottom piece was skillfully fitted and pegged into place, making a strong tight box. Since cooking boxes were used to hold liquids, they were usually more shallow than storage boxes and more care was used in fitting the bottom. Cooking was done by the use of hot stones. Storage boxes were usually of thicker boards and often fitted with a thick lid made from a cedar plank. Sometimes these boxes were decorated on their front and back with paintings of abstract animal forms and had a simple design on either side.

Articles made of the bark of the cedar were also commonplace in the household. Where the bark was easily obtained the items made from it were considered in much the same way as disposable items are today and might be thrown away after limited use. The bark was easy to get and was easy to prepare and could be stripped from downed trees or as they stood in the forest. A few articles were made from the bark directly as it came from the trees, among them, canoe bailers and simple containers. Usually only the inner bark or the bast was used, either shredded or split into strips.

Shredded, the bark was used for clothing. Skirts that looked something like Hawaiian grass skirts were made, and it was also plaited into capes, used as toweling and as diapers, or as padding for a baby's cradle.

Left unshredded and cut into strips, the widths depending upon the purpose of the bark, it was used for making mats, baskets, and some types of clothing. Boas mentioned wooden sails for canoes, although other authorities mention only the Cedar Bark mats sewn together.

At times the bark was dyed with alder juice to give it a reddish color. The inner bark was twisted into cordage and could be as fine as twine or as heavy as rope. Blankets of twisted bark were known but not particularly common.

The roots were used for a variety of purposes. Sometimes they were split for binding the blades of the adze to the handle, for tying together the parts of a halibut hook, or used without splitting for sewing the corners of a bentwood box, or for tying together the parts of a fish weir or trap. Their major use was probably in making coiled imbricated baskets where the roots were split and used for both the coiling elements and the sewing elements. The more northern Northwest Coast Indians made few of these baskets, but the Salish people of interior British Columbia, the Frazer River Basin, the Puget Sound region, and along the Columbia River Basin, were highly skilled in their manufacture. Some of the finest of these baskets came from Chinook groups along the Cowlitz and Lewis Rivers. Many of these baskets were watertight and could be used for cooking with hot rocks in the same way that cooking was done in bentwood boxes.

At times certain cedar trees had a reputation for producing roots that surpassed others in their quality. Perhaps this was because, in pulling the roots from the ground or digging them up, the earth was loosened and the rocks removed so that the next crop of roots would be straighter and stronger.

The branches of the cedar tree were sometimes used in the same way that the roots were. They could be stripped of their leaves and bark, soaked in water, and twisted into rope; rope so strong, in some cases, that they could be used by the whale hunting tribes for harpoon ropes and for towing home dead whales. Open-work baskets were also made of branches. Green

(Continued on page 93)
Pinus Armandii

Nearly thirty years ago seeds of this white pine were received from the Arboretum des Barres, Nogent-sur-Vernisson, Loiret, France. Four seedlings were planted November 1947 in rather heavy clay soil, near the center of Foster Island, on a site that was protected from the north and west by nearby trees and shrubs. Records show that some of this group were eleven feet high in September 1955, that they received a severe set-back by the freezing weather of November of that year, and that one was killed. The remaining three grew apace, with one tree outstripping the others. This more vigorous tree coned during the summer of 1968, twenty-one years after planting and twenty-nine years after germination. It is thirty-one feet tall, somewhat sparse on the northeast side where its branches come in competition with a large madrona; otherwise it is a fine, vigorous tree quite reminiscent in general appearance of our western white pine, *P. monticola*. It is, however, most closely related to the limber pine, *P. flexilis*, a tree found in western North America, and indeed there is a marked similarity between the cones of these two geographically distant species.

Armand’s pine is native to central and western China, Taiwan, Korea and Japan. It was introduced into cultivation in the west about 1895 but was discovered some twenty years earlier by the French missionary, Father Jean Pierre Armand David and named for him.

J. A. W.

Report on the Arboretum Buildings

As most readers of this bulletin know the University of Washington has been developing plans to construct new facilities in the Arboretum for some time. In order to determine the overall needs for such an Arboretum building complex and to clearly define the objectives of the Arboretum in relation to the University and the community, a University Committee appointed by President Odegaard completed a study and developed a report in June, 1967. The concepts in this, the Gessel Report, which was widely circulated and approved by all segments of Arboretum interests, became the basis for present Arboretum building planning, as well as for general development of the Arboretum.

The architectural firms of Ibsen, Nelsen and Associates and Bain and Overturf have prepared plans for the building based on the Gessel Committee Report. These have been approved by the University Architectural Commission and the University and civic committees concerned with the Arboretum. The plans have also been publicly exhibited to all interested groups and have met with generally universal approval.

The total cost of the planned facility is estimated to be $1,389,196. Because this exceeds the potential funds available at this time, the building program has been separated into two phases.

Phase I (fig. 15) calls for construction of a floral hall complex which includes Arboretum administrative offices, library and conference rooms, office space for organizations having special relationships to the Arboretum, classroom and laboratory areas for regular and continuing education programs conducted in the Arboretum, and some display and interpretative space. A large auditorium, a special floral hall, and accompanying storage and preparation space are part of the complex. Public restrooms are planned in a separate building. Road relocation and landscaping changes necessary in the construction are part of

*Pinus Armandii* in Arboretum. (Close up of cones and branches on Cover).

Fig. 14—Photo by: William Eng
Phase I. Parking space for 84 vehicles will also be developed.

Phase II includes replacement of the old greenhouses and lath house area with expanded and improved plant growth facilities. Storage space for all Arboretum equipment and the shop areas are a part of this phase. As previously stated, funds are not sufficient to include the Phase II program in the initial building effort. However, this part of the program is most essential for a complete Arboretum.

In the past, one of the real deficiencies of the Arboretum has been the lack of a technical staff and the facilities necessary to deal with the ever-increasing number of inquiries related to plant growth problems which gardeners in Seattle and western Washington present to the Arboretum. Therefore, two aspects of the overall Arboretum program merit further comment.

The first is that, although a certain amount of daytime University use is contemplated for special courses such as tree identification, the classrooms and other teaching facilities in the building have been designed for continuing education programs to be operated in the Arboretum. These may be either day- or night-time classes. Secondly, the laboratory facilities which are included in the building plans are for the use of Arboretum staff and graduate students who are working on research specifically related to the Arboretum.

All Arboretum users will appreciate the skill with which the architects have blended the building design into the natural features of the Arboretum. The Architectural Commission was especially mindful of this need and instructed the architects to make certain that this concept was fulfilled. Examination of the photograph should convince you that the architects have achieved this goal and that floral hall structure and landscaping will enhance rather than detract from the beauty of the Arboretum. Also, the building placement was carefully studied in order to reduce plant movement to a minimum and to take advantage of all natural topographic features.

Other long-awaited improvements in the
Arboretum, such as road relocation, Emma Stimson Memorial Gate construction, and lighting, will be completed along with the building.

As of the present, total funds for construction of Phase I are short by about $200,000. We hope various organizations will help with the financing to achieve these building goals for Phase I and thereby make the Arboretum a much more useful public and University facility.

Pruning By Eye

Have you a Thujopsis dolabrata which is just a big blob?—Or an old Juniperus pfitzeriana whose compact mound of branches hides every bit of its beautiful russet-barked trunks?—a Pieris japonica or a “Pink Pearl” rhododendron which has grown so large you cannot see out of your window?

Don't be afraid to prune! Pruning “by eye” may not be the scientific way but you will be pleased, and surprised, at the results.

Seasons for pruning vary. Bits of minor surgery may be done at any time of year but a major remodelling on broad-leafed evergreens should be done just before, or just as the new growth is pushing forth. Conifers may be done in the fall and winter. Deciduous shrubs and tree “face-lifting” is usually done in the winter, although I find that they are amenable to frequent snipping during the spring and summer. This is fortunate for flower-arrangers—and outdoor cooks who like to flavor their barbecue with crabapple twigs!

Before you begin an “Operation,” take a long look at the natural habit of the plant. Is it upright? Is it horizontal? Is it drooping? Will it object to your having you own way with it? Some do object. There are many hawthornes (Crataegus “Paul's Scarlet”) along Seattle streets whose owners have bobbed off all the lower twigs like a “bowl” haircut and lopped the tops of the upright branches. The hawthorne sulks at this treatment and grows more ugly and tangled than a witch's broom. Let your hawthornes grow up, the way they want, but prune out some of the inner branches to reduce the tangled mass. You may also cut off all down-sloping twigs on the lower branches and perhaps some of those lowest branches would not be missed.

Other deciduous shrubs and trees may be pruned similarly. Remove crossing and inward-growing branches.

Deciduous plants of the genus Prunus (flowering plums, cherries, apricots) should be pruned during their growing season as the cuts heal faster and there is less chance of their “bleeding” to death.

Large rhododendrons are fascinating when you can see their branching structure; and, just for fun, try thinning-out a tiny Rhododendron impeditum or a R. indicum var. balsaminaeflorum. Pieris japonica acquires a restrained magnificence with all down-sloping twigs removed. English and Portugal Laurels are far more handsome when pruned as trees, unless you are in dire need of a hedge.

Conifers, such as Thujopsis. Chamaecyparis, pines and others can be “opened-up” by cutting off all but one branch which grows out of any one level on the trunk, taking care that those you leave ascend the trunk spirally.

RULES: (1)—Leave no stubs! If your good, sharp shears are too small for certain branches, use a sharp, fine-toothed saw. (2) Use a tree-healing preparation (I use the spray-can type) on any cuts over 1/2 inch in diameter and on all Prunus cuts.

To get yourself in the mood, look at some good Bonsai specimens and see how artistic pruning has brought out the beauty of the plant.

Marjorie Baird

CORRECTION: Arboretum Bulletin, Fall 1968—Volume XXXI, No. 3 (incorrectly listed Volume XXXI, No. 4).
New or Unusual Plants In The Arboretum

XV. Sorbus Species

J. A. Witt

Sorbus commixta with bright orange fruit.

Fig. 16

The mention of “Mountain Ash” brings a picture of the European Sorbus aucuparia into the minds of most gardeners. It is undoubtedly the most commonly seen species in cultivation in the Pacific Northwest and has found the climatic conditions in western Washington, at least, so much to its liking that it has become naturalized through bird-distributed seedlings. The clusters of bright orange-red fruit are a favorite of the many kinds of birds that may strip the trees by early fall, and of small boys who find the “berries” ideal ammunition for their little wars or just to keep their throwing arm in practice. This fruit is technically a pome, a small apple, but since it is almost always called a berry I’ll continue to use that familiar, if botanically incorrect, term.

The red fruited Sorbus are so common that it is the rare gardener who is aware that the berries of other species may come in other colors, white, pink, orange, yellow and brown. The shape and size of the fruit is as variable, ranging from small and round to over an inch in diameter and pear shaped. The fruiting clusters are equally diverse—some are great tight flat-topped corymbs while others are few fruited, loose and drooping below the branches.

The five photographs were selected from some of the more unusual Sorbus that fruited well this year and give some idea of the diversity of this great genus.

Sorbus commixta (fig. 16). This is a small tree native to northeastern Asia, where it may reach a height of about thirty feet. Our specimen was raised from seed sent by a Polish botanic garden in 1950. It is now about fourteen feet tall with a very narrow habit. The fruits are among the
smallest of the various *Sorbus* species, mostly a quarter inch or less in diameter, bright glossy Chinese-red, in compact cor-
ymbos four to five inches across. These clusters are surrounded by a collar of six inch long leaves which may turn a handsome orange-red in early October. Although the individual fruit is small, *Sorbus commixta* produces fruiting clusters as large as is found on any species growing in the Arboretum.

*Sorbus cashmiriana* (fig. 20) came to us as seed from the Royal Botanic Garden, Edinburgh, Scotland, in 1957. As the specific epithet indicates, it is native to the Himalaya mountains and Kashmir. It has

---

*White fruit on Sorbus Koehneana.*

Fig. 18

*Fruits of Sorbus gracilis—bright red.*

Fig. 19

*Left*

Bright yellow fruit of *Sorbus* "Joseph Rock seedling".

Fig. 17

*Right*

Large ivory-white fruit of *Sorbus cashmiriana*.

Fig. 20—Photos by: B. O. Mulligan
developed into an attractive small tree with rosy-red flowers that are followed by pendulous corymbs of half an inch long, somewhat ovoid fruit which are white flecked with rosy pink. These large fruit are among the most attractive of all our Sorbus with their clusters of porcelain berries set against green leaves in early fall, and finally, after the leaves have fallen, the tree remains decked with the snowy fruit well into late autumn.

Sorbus gracilis (fig. 19) is one of the smallest of the genus, forming a shrub rarely exceeding six feet in height. A native of Japan, our plants were raised from seeds received from the Experimental Forest Station, Kyoto University, in 1955. They are sprawling shrubs with small leaves and pendulous few-fruited bunches of red berries that hang well below the branches. The fruit is about half an inch long, flattened at both ends, bright scarlet red. Although the corymbs are rather small the fruit makes a good show since it is not hidden by the small leaves and tends to hang well clear of them.

Sorbus Koehneana (fig. 18). This is another of the white-fruited mountain ash found native in China. A shrub, it may be ten or more feet tall with numerous stems. Our plant, now about eight feet tall, was raised from seed Mr. B. O. Mulligan collected in the nursery of W. J. Marchant, Dorset, England, in 1950. The leaves are among the most elegant of all Sorbus, four to five inches long, with ten to twelve pairs of slender bright green leaflets. The berries are born in loose clusters of eight to fifteen scattered among the leaves so they appear to be playing hide-and-seek. They are slightly larger than a quarter of an inch in diameter, ivory white with pink staining, especially at the calyx end. Sorbus Koehneana is a fine small mountain ash that should be better known than it is.

Sorbus 'Joseph Rock' seedling (fig. 17) has an interesting history. In 1950 we were sent seed of a Sorbus from the Royal Horticultural Society’s Garden, Wisley, England, under the name Sorbus sp. (368-37) (white fruited). There seemed to have been a mix-up somewhere since the seedlings raised from this seed turned out to have golden yellow or orange berries. An extensive correspondence with the authorities at Wisley and the Royal Botanic Garden, Kew, revealed two points. First, there is considerable confusion about the origin of the plant from which the seeds came, although it is generally conceded that it must have come from seeds collected by Dr. Joseph Rock during his travels in western China. Second, no authority so far is willing to give it a specific name, although Mr. J. R. Sealy of Kew (in a letter to Mr. Mulligan dated March 7, 1961) suggests it might be a hybrid of S. serotina.

There seems to be some variation in the seedlings that might indicate hybrid origin, but one could expect this from open pollinated seeds regardless of whether it was a hybrid or not. Since a good name for this plant was lacking Mr. C. D. Brickell proposed the clonal name, Sorbus ‘Joseph Rock’ (published in “The Journal of the Royal Horticultural Society,” vol. LXXXIX, (1), pp. 19-22 (Jan. 1964) for the parent and all vegetatively reproduced offspring. Our plants are not vegetatively reproduced, hence are not entitled to that name, but they are very similar to the original, and it seems appropriate to retain Dr. Rock’s name to these attractive trees.

The tree from which our illustration was made is about twelve feet tall with an open habit. The fruit hangs in heavy pendulous clusters well below the dark green leaves. Each berry is shining orange-yellow; about 5/16 of an inch long and wide. Because of its fruit color this is perhaps the most unusual mountain ash in our collection and certainly is one of the most showy.

All the above plants are growing in the mountain ash collection on the east side of Arboretum Drive E. opposite the magnolia collection and south of the nursery. These five are only a small sampling of the fifty odd species, hybrids, and clones of Sorbus now growing in the Arboretum. We invite your inspection of them.
Western Red Cedar
An Ethnobotanical Sketch

(Continued from page 85)

branches of the cedar tree were used in scrubbing the body during a bath. This was for the regular “Saturday night bath” as well as for purification rites before important events.

Some groups used the buds on the cedar twigs for medicinal purposes, either as a tea for cold medicines or in some cases as a TB medicine, or chewed them for toothaches.

One authority credits the use of the cambium layer for food, which was scraped off after the removal of the bark. This is not reported in more recent work. It could be that the use of the cedar cambium was confused with the use of pine and alder tree cambium which was used in the eastern areas of British Columbia.

The cedar tree contributed significantly to the dress and ritual paraphernalia for a variety of ceremonies that were so much a part of the Northwest Coast Indians’ life. The most elaborate forms of this would be found north of the central part of Vancouver Island up to the southeastern part of Alaska. Masks, whistles, and drums were carved from the wood, and headresses, neckrings and other parts of the costumes were made of cedar bark, shredded or plaited.

Another part of the ceremonial life was the totem pole. The characteristics of cedar wood, its durability and the ease with which it could be carved, contributed to the beauty and size of these magnificent ceremonial objects. There may be some question as to their origin and the time of their appearance, but there can be no question that the introduction of the white man’s steel tools made them much more prominent and widespread in the northwest coast area.

This ceremonial and traditional art developed a style so unique that it is easily recognized wherever it may be found. There were few items which were not decorated in some way.

Few of the native crafts involving cedar are still practiced. Most of the great trees are gone, as well as the older people who so ingenuously used them. The items so carefully and beautifully done during the later part of the last century have either decayed where they were left or have found their way into museums or into the hands of collectors. Few of these items are left where they were made, and few are used today with their original purpose in mind.

References

Drucker, Philip; Cultures of the North Pacific Coast, Chandler Publishing Co. 1965.
Gunter, Erna; Ethnobotany of Western Washington, University of Washington Press 1945.
Haberlin, Hermann and Erna Gunther; The Indians of Puget Sound, University of Washington Press 1930. (1952 reprint)
Henry, Joseph Kaye; Flora of Southern British Columbia and Vancouver Island, W. J. Gage and Co. Limited. 1915.
Holm, Bill; Northwest Coast Indian Art—an Analysis of Form, University of Washington Press 1965.
Krause, Aurel; The Tlingit Indians; Translated by Erna Gunther; University of Washington Press 1956.
Sudworth, George; Forest Trees of the Pacific Slope, U. S. Department of Agriculture 1908.
British Columbia Heritage Series; Our Native Peoples, Series 1, Volumes 2, 3, 4, 5, 6, and 10; Department of Education Province of British Columbia.
The Officers and the Board join with me in sending our best wishes for a Joyous Holiday Season to all the membership of The Arboretum Foundation. Though you will receive this after the holidays, our appreciation to all our members is none the less diminished. At this year end we take particular note of the tremendous contribution that all the many Arboretum Units have given to the betterment of the Arboretum during this past year. We look forward to the Unit Council Spring Plant Sale to be held at South Center which surely will be a major success. I would call your particular attention to the inside front cover where you will find the audited financial statement of The Arboretum Foundation. We are looking forward to a 1969 year of special importance to the Arboretum, that of the International Botanical Congress in August and the start of an Arboretum office building and Floral Hall.

Many thanks again.

Robert J. Behnke
Report of the 1968 Plant Sale

Our 21st Annual Plant Sale was not as profitable as last year. While the final bills and receipts are not all in and it is impossible to give an accurate account, I estimate we will only make around $4,700. This may be due to several factors: our attendance was lower; nurserymen reported sales were down this year; our expenses were greater due to increase in wages for police protection and guards, also plant prices; in our planning sessions we stressed that plants be purchased on consignment which was not always possible.

On the glowing or real credit side, we can commend our 32 dedicated department heads and 169 hard workers. With the additional parking area at the Broadmoor Golf Club our traffic problem was solved. We had a most efficient shuttle bus system to the Japanese Garden parking area and had many compliments on the smoothness of its operation.

Our publicity was excellent from newspapers, radio and TV. Our poster was beautifully done and distributed in all areas and suburbs. The plant list distributed through the Arboretum Bulletin was an excellent idea.

We had an abundance of donations of good quality and of course many plants from our own greenhouse which was clear profit to us.

In taking over as acting chairman late in the planning stages of the sale and with no experience, I feel I gained a wealth of knowledge and a new insight of the comradeship that exists between all the participants. My whole-hearted thanks to all my loyal department heads and workers, to Mr. Mulligan and Mr. Witt for their warm cooperation and to Gene Webb who proved to be a first class backstop.

Gloria C. Sundberg,
Acting plant Sale Chairman, 1968

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members (August 24 through November 20, 1968): Contributing—Mr. & Mrs. Harold Farshoi, Sustaining—Mr. & Mrs. John W. Anderson, Mrs. Edward C. Sweeney, Forest Hills Garden Club, Vancouver Garden Club. Annual—Miss Allison Abbott, Mrs. Charles L. Anderson, Mrs. George Barnuta, Mrs. Alfred J. Barran, Mrs. A. M. Bledsoe, Mrs. Milton H. Bohart, Miss Mildred Bollwell, Mrs. Robert L. Briggs, Mrs. William Burnside, Mrs. James Bycroft, Mrs. James R. Callaghan, Mrs. Michael J. Carney, Lowell V. Casey, Mrs. Robert E. Chase, Mrs. Richard A. Clark, Mrs. Karl W. Cunningham, Mrs. Arthur R. Dusto, Mrs. Barry L. Eberhardt, Mrs. John Edmonds, Jack R. Evans, Mrs. Donald S. Farner, Col. & Mrs. Claude Farrow, Mrs. Earl G. Glover, Jr., Mrs. P. H. Hagen, Mrs. Bradley Henke, Mrs. Cleo L. Hill, Jr., Mrs. Myles Holmdahl, Mrs. Richard C. Huffsmith, Mrs. Sydney R. Imus, Mrs. Robert J. Jensen, Mrs. Reynolds E. Jerome, Mrs. Donald S. Jordan, Mrs. G. Philip Koon, Mrs. Irl E. LaGrange, Jr., Mrs. E. C. MacIntyre, Mrs. George M. Makela, Mrs. Rex M. Marinoni, Mrs. David P. McBrayer, Mrs. J. Elroy McCaw, Mr. & Mrs. C. M. McCune, Mrs. D. Middaugh, Mrs. William D. Moore, Mrs. Dorothy C. Morrell, Mrs. Lyle L. Nelson, Mrs. Dean Parker, Mrs. Wallace E. Post, Mrs. John Powell, Mrs. P. G. Quitlund, Mrs. William Rahr, Jr., Mrs. R. J. Rankin, Mrs. John Reid, Mrs. George J. Rowley, Mrs. Sydney E. Ryerson, Mrs. Harrison Sargent, Jr., Mrs. James R. Scott, Larry C. Sieker, Mrs. Frederick J. Slavin, Mrs. Ben Smith, Mrs. George A. Smith, Mrs. Henry Steinhardt, Mrs. John W. Tabb, Mrs. Maurice N. Vining, Mrs. Milton E. Walker, Mrs. Ross A. Whitt, Mrs. W. Roland Wilby.

We are also grateful to the following who have increased their membership dues to: Sponsor—David J. McNett. Sustaining—Mrs. Roy E. Marsden, Mrs. Giacomo Pirzio-Birolti.
Some of Our Favorites ☆
☆ Won't You Send Us Yours?

Viburnum Fragrans

... A WINTER PROMISE

No shrub among those termed "winter blooming" can be more happily classified than Viburnum fragrans; the listing is so deserving—the procession of bloom is veritably winter into that spring which cannot be too far behind.

One needs only to thumb through back numbers of the Royal Horticultural Society's Journals to find this attribute fully borne out by continuous mention of the honored spot in which it is planted, Wisley's "Award of Merit" Garden. September (says the author)—"Viburnum fragrans with a few early flowers among the warmly tinted leaves." October—"In full bloom this year by mid-October." November—"Early flowers of perhaps the best of all winter-blooming shrubs." January—"Displaying pale pink and sweetly scented white clusters at every mild break of the weather." February—"Pale clusters of bloom."

Yet, Reginald Farrer, its discoverer, found it blooming in early April near a little village in North China. No one can describe it better than Mr. Farrer, for it is perhaps his finest memorial... "Viburnum fragrans for the first time appeared to us, amid a cloud of white... gracious arching branches, ten feet high and more across, whose naked boughs... before the foliage, became one blaze of soft pink lilac spikelets breathing an intense fragrance of heliotrope."

Viburnum fragrans in the Winter Garden at the Arboretum put forth its first fragrance in October this year, and from now on until March only the severest winter can keep it from its lovely appointed promise.

G. H. W.

BOOK REVIEW


Occasionally, a reviewer's task is aided by the appearance on the market of a second book, contrasting the one under focus.

In Trees of North America, a guide to field identification; Professor C. Frank Brockman has produced an eminently practical field guide that undoubtedly will find its way to many more pockets than bookshelves. Condensed in a handy format (4 1/4" x 7 1/4"), we find the pertinent information that helps us identify 594 tree species native to the North American continent north of Mexico, as well as many additional exotics commonly found in the United States. The descriptive text with its many helpful hints and critical comparisons is obviously the distilled product of a long and successful career in teaching dendrology to both students and amateurs. The main body of the book is devoted to the description of individual species and is organized in the conventional sequence of families and genera. The unit of description is a very effective composite of a concise text (with Latin and common names) juxtaposed to a range map and to several colored illustrations of diagnostic value. Together, the three elements make a unique impact and allow quick scanning for the optimal match. Rebecca Mer- riles deserves the highest praise for her outstanding artwork; rarely have I seen such meaningful illustrations in a book of such modest price. Technical terminology is kept at a minimum; those terms that are essential are explained in a well-illustrated section at the beginning of the book.

I question, however, the usefulness of the eight pages of introduction to the tree families. To the layman, for whom the book is intended, plant families are somewhat abstract groupings quite remote from the practical working unit of the genus. I feel, therefore, that the same space might have been more effectively used for a comprehensive key to all the tree genera represented. There are a few minor inconsistencies and oversights in the text and an occasional illustration of little value. They should not detract from the overall high quality of this guide which can be highly recommended to any tree enthusiast of amateur or professional status.

The qualities of Professor Brockman's guide acquire a sharper profile in the light of a comparison with another current book: Die Baume Europas (The Trees of Europe) by Gerd Krussmann (Verlag Paul Parey, Berlin, Hamburg, 1968.) Intended for the same clientele, packed into the same format (4 1/2"x7 1/2"), information is presented for the identification of 167 tree species in Europe. However, the reader soon finds himself confronted with the never ending task of turning pages. The reason: The descriptive text for any given species is separated from the corresponding illustration (leaf silhouette) as well as from the range map and from the appropriate photograph. The Yellow Pages are better organized than that. Apart from the impractical assembly of the selected information I find many illustrations and photographs quite inadequate, because non-diagnostic (notably those of the Cupressaceae) and at least one photograph incorrect (Abies grandis). On the positive side, this guide offers a useful key to all 167 species described in the text.
and an index of the common names in German, French, Italian and English.

The contrast between the two books reflects a differential awareness of reader psychology by the two publishers. Undoubtedly, the sales will bear this out, too.

R. F. Stettler

Tour in Jugoslavia,
June, 1967

(Continued from page 81)

Next day we were considerably delayed by a broken rear spring of the bus, caused by hitting a narrow bridge on a sharp curve of the mountain road the previous day, and did not get off until 4:00 p.m. So all we accomplished was a visit to the early 14th century monastery at Decani ("Dechani"), nine miles south of Peć, and very well preserved, including the numerous interior frescoes covering the walls. On the hill above the building is a large planting of Pinus nigra var. Pallasiana in the form of a cross, made about a century ago from seeds obtained from the famous monastery of the Greek Orthodox church at Mt. Athos in Greece.

On Tuesday the 13th we set out again for Cakor Pass on the return journey, but stopped about two miles down on the west side at the top of a flowery meadow to eat lunch and admire the immense 180° view. The flowers were similar to those seen coming up, including the Viola, Pedicularis, Orchis sambucina (pale yellow), Myosotis and the pink Scorzonera rosea together forming a most colorful carpet, with the spruce trees as a background, certainly an excellent spot for a lunch stop.

The following morning we took the winding older road across the limestone hills to Cetinje, capital of Montenegro prior to 1914. Here we began to return to the flora of the inner coastal areas, last seen at Dubrovnik, but with some additions including the needle leaved, shrubby Juniperus oxycedrus, with fruits changing from green to brown; wild pomegranates (Punica granatum) with scarlet flowers bedecked with foamy white sprays of Clematis Flammula—a very successful combination; Paliurus spinosa-Christi, the Christ-thorn, both in flower and early fruit, the latter flattened, circular, green in color, and Carpinus orientalis, a smaller type of hornbeam than C. Betulus seen earlier.

The descent into Kotor is a remarkable piece of road engineering, built by the Austrians prior to 1914 with 25 hairpin turns in a few miles; in the lower portion we again noted Spartium junceum in full bloom. Kotor is an attractive old town at the head of a landlocked gulf approached only through a very narrow entrance which can be blocked in time of war. Its history likewise goes back to at least the Roman period but it was also occupied in later years by Venetians and Turks. Now it has direct ship service to Italy (Ancona). Thence we drove around the Gulf in the late afternoon and along the coast highway to Herceg-novi where we spent the night in a modernized small but comfortable hotel, the Topoli.

Here we were back in the warm Mediterranean coastal flora and gardens which we had seen at Dubrovnik, with palms, oleanders, cacti and succulent plants commonly grown. Along the 25 miles of coast road to that city we stopped once for a group photograph and again at the top of the long hill down into Dubrovnik, where the columnar cypresses are so noticeable on the hillsides. After a rest in the afternoon we continued another 16 miles north to see the Arboretum at Trsteno, formerly a private estate but now maintained by the State. The site is magnificent, high above the Adriatic sea on a bluff with superb views to the west. At the entrance are two truly stupendous trees of Platanus orientalis, said to be 400 years old, 14 ft. d.b.h., and the largest of their kind in Europe. Both appeared to be in healthy condition and were certainly well worth coming to see. In the Arboretum was a specimen of Magnolia grandiflora 50 ft. in height, a big camphor tree, a jungle of the native Laurus nobilis, and a dense thicket of bamboo at least 100 ft. x 50 ft. in area.
Back in Dubrovnik we had dinner for the last time on the covered terrace of the Argentina. Next morning we spent in the town, exploring the old walls and doing some shopping in the market square. We finally left the hotel at 4:00 p.m. with three other I.D.S. members, departed by bus from the central depot for the airport and took off at 6:30 p.m. in a Yugoslav Airlines Caravelle. With one stop of 30 minutes at Ljubljana we landed at London airport at 10:10 p.m.—and a very wonderful and instructive tour was over. To the organizers, especially M. and Mme. de Belder and Prof. Ogrin, and the three principal guides our thanks and appreciation are most gratefully expressed.

SAXE FLORAL

ALL YOUR GARDEN NEEDS

and

CUT FLOWERS

Too

LA. 3-4415

LA. 2-1951

CHOICE and UNUSUAL

Trees — Shrubs — Vines

Garden Accessories

TROPICAL INDOOR PLANTS

Largest & Finest Selection

In the Entire Northwest

Cut Flowers

Potted Plants and Gifts

COMPLETE FLORAL SERVICE

Swanson's

LAND OF FLOWERS

9701 - 15th N.W. — Phone SU 2-2544

Producers of Fine Plants Since 1888

Index to Volume XXXI (1968)

Abies alba, 80
— amabilis, 2
— concolor compacta glauca, 17
— grandis
— koreana Prostrate Beauty, 17
— losiocarpa, 81
— sibirica, 59
Acer campestre, 81
— cinnamatum, 3, 82
— glabrum, 59
— Heldreichii, 80
— laxiflorum, 61
— macrophyllum, 2, 80, 82
— monspessulanum, 80
— saccharinum, 60
Adenocaulon bicolor, 3
Aesculus neglecta, 60
— turbinata, 60
Ajuga genevensis, 80
Alnus, glutinosa, 61
— Inokumae, 9
— oregano, 3
Anaphalis margaritacea, 2
— nemorosa drummondii, 4
— antennaria Lanata, 5
— Aquilegia formosa, 4
Arboretum Buildings, Report on, 87
— Early History of the University of Washington, 30
— Fire at Clubhouse, Apr. 7, 1968, 44
— Growth of Trees at, 8
— Growth of Young Trees Planted Since 1958, 12
— Manzanitas in the, 37
— New or Unusual Plants in the, 90
— Notebook, Reprint from Summer 1948, 48
— Report; July 1, 1967-June 30, 1968, 50
— Some Books Added to the Library in 1967, 28
— Waterfront Trail, 34
— Year End Flowering Census, 1967, 21
Arboretum Foundation Financial Report, Inside Cover, Winter
Arbutus andrachne, 37
— Menziesii, 38
— Unedo, 37, 79
Arctostaphylos Andersonii, 38
— Auricularia, 38
— canescens, 38
— columbiana, 38
— manzanita, 38
Baird, Marjorie (Mrs. Hugh), 89
Betula davorica, 59
— Jacquemontiana, 60
Bonsai: Dwarfing Trees for Beauty, 43
Book Reviews
— Hardy Foliage Plants, 24
— New Zealand Flowers and Trees in Colour, 72
— The Endemic Flora of Tasmania, 24
— Trees of North America, 96
— Trees of the Australian Bush, 72
Brockman, C. Frank, 24
Calochortus luteus, 71
— venustus eldorado, 71
Camassia leichtlinii, 71
Campanula piperi, 4
— rotundifolia, 4
— Scouleri, 2
Carpinus Betulus, 59, 60, 81, 97
— orientalis, 80, 97
Carya avata, 60
Castilleja agustifolia, 2
— oregana, 4
Ceanothus Puget Blue, 68
Cedar, Western Red, 82
Cedrus atlantica Glauca, 15
— Deodara Pygmaea, 15
— libani Nana, 17
Cellis australis, 76, 78
— occidentalis, 56
Chamaecyparis Lawsoniana, 56
— Filiformis Compacta, 18
— Fletcheri, 18
— Fletcher’s White, 18
— Lombartsi, 18
— Lane, 18
— Nana, 18
— Witzelliana, 17
— nootkatensis, 4, 18, 82
— obtusa, 18
— Caespitosa, 18
— Ericoides, 18
— Filicoides, 18
— Kosteri, 18
— Lycopodioides, 18
— pisifera Boulevard, 18
— Golden Spangle, 18
— Plumosa Rogersi, 18
— thyoides Ericoides, 18
Chimaphila umbrata, 2
Cirsium edule, 4
Clematis Flammula, 97
Clintonia uniflora, 3
Collarino, M. C., 48
Cornus canadensis, 3
— Kousa, 53
Cotinus (Rhus) Coggygria, 80
Crataegosmeplus Dardari
Asnieresi, 61
Cratoegus Paul’s Scarlet, 89
Crocus chrysanthus E. P. Bowles, 70
— Goldilocks, 70
— Princess Beatrice, 70
— Snowbunting, 70
— Imperati, 70
— venus, 80
Cryptogramma acrostichoides, 4
Cryptomeria
— Compressa, 17
— Pygmaea, 17
— Vilmoriniana, 17
Davidia involucrata, 59
Douglasia laevigata, 5
Dryopteris linnnea, 3
Dudley, T. R., 14
Dwarf Conifers at the U.S. National Arboretum, Unusual and, 14
Edraianthus tenuifolius, 79
Emetrum hermaphroditum, 81
Erica arborea, 79
— verticillata, 78
Erigeron compositus trididus, 5
Eriganum ovatifolium, 5
Fagus sylvatica, 78, 80
Favorites, Some of Our
— Arctostaphylus columbiana, 46
— Euphorbia Wulfenii, 22
— Euphorbia Wulfenia, 22
— Viburnum fragrans, 96
— We Like Bulbs, 70
Fish, Edwards R., 35
Fraxinus excelsior, 61
— Cornus, 80
Genista dalmatica, 79
Gentiana asclepiadea, 78
— Clusii, 80
— verna, 80
Gleditsia triacanthos, 60
Granston, May (Mrs. Roy), 6
Grow Your Own, 6
Gymnocladus dioicus, 60
Hamamelis mollis, 55
Helleborus multifidus, 78
Haldiscus discolor, 2
How To Grow Sunshine, 55
Hoyte, Eric, W., 34
In Czechoslovakia, Poland and Hungary, May-June 1967, 56
Iris danfordiae, 70
— illyrica, 78
— reticulata, 70
— variegata, 78
Juniperus communis Echiniformis, 18
— Hemisphaerica, 18
— saxatilis, 80
— horizontalis Bar Harbor, 18
— Blue Horizon, 19
— Douglasii, 18
— Filicinus, 18
— — Minimus, 18
— Wiltonii, 18
— media Blaucou, 18
— Blue Cloud, 18
— Obelisk, 18
— Oxycedrus, 97
— Pfitzeriana, 19
— phoebea, 79
— scopulorum Gray Gleam, 19
— Kenyoni, 19
— Mounteneer, 19
— Platinum, 19
— Repens, 19
— Springtime, 19
— squamata Meyeri, 19
— Prostrata, 19
— virginiana Globosa, 19
— Gray Owl, 19
— Skyrocket, 19
Kalmopanax pictus, 59
Lorix decidua, 61
— x eurolepis, 59
— occidentalis, 82
— polonica, 61
Latin Names of Plants, More on, 62
Laurus nobilis, 98
Libocedrus decurrens, 78
Lilium columbianum, 2
Linnnea borealis, 2
Linum capitatum, 78
Lucretia pectinata, 5
Lychnis Flas-cuculi, 76
Magnolia grandiflora, 98
— Sargentiana robusta, 53
Malus baccata, 60
Manzanitas in the Arboretum, 37
Marckworth, Gordon D., 30
McClure, Donald K., 54
Memorials—Mrs. Fred G. Clarke, 20
Minulus moschatus, 3
Mollisia petraea, 79
Monatropa uniflora, 2
Mulligan, B. O., 40, 50, 56, 78
Narcissus campanellii odoros plenus, 70
— cyclamineur, 70
— minimus, 70
— poeticus, 80
— rupicola, 70
— triandrus albua, 70
— W. P. Midner, 70
National Forest Garden, 42
New Members, 21, 69, 95
New or Unusual Plants in the Arboretum, 90
Oplopanax horridum, 3
Orchis sambucina, 97
Paliurus spina-Christi, 97
Paris quadrifolia, 78
Pedicularis verticillata, 81
Petasites frigidus, 4
Petteria ramentacea, 80
Phacelia sericea, 4
Photos
— Abies procera Glaucu, 17
— Arboretum Building, 88
— Arboretum Clubhouse after fire, 45
— Arboretum Waterfront Trail, 35
— Arctostaphylus auriculata, Cover Summer
— Articles of Cedar made by North-west Indians, 83
— Botanical Garden of the Univ. of Agriculture, Brno, Czechoslovakia, 59
— Clematis tangutica in fruit, Cover Fall
— Crataegus Oxyacantha, 57

99
GREENUP SPRAY SERVICE

Member of
WASHINGTON ASSOCIATION OF GROUND SPRAYERS
ENTOMOLOGICAL SOCIETY OF AMERICA
NATIONAL SHADE TREE CONFERENCE
NORTHWEST TURF GRASS ASSOCIATION

- SPECIALISTS in INSECT CONTROL
- PLANT DISEASE CONTROLS
- WEED CONTROLS
- FERTILIZING
- STERILIZING
- PRUNING

CHerry 2-4720
If No Answer
Call RO 2-2175

For GIFTS and FLOWERS
of Unmistakable Distinction

Crissey
FLOWERS - GIFTS

1329 Fifth Avenue
MAin 2-1100

Bunge Lumber & Hardware Co.
High Grade Peat Moss and
All Types of Fertilizer
Including
Acid Fertilizer for Rhododendrons, Azaleas, Camellias, etc.
WEst 2-0022
9616 16th Avenue S.W., Seattle 6