Back Matter 6 (4)
THE DIRECTOR'S REPORT
Rancho Santa Ana Botanic Garden

1967

The year just ended was one of continued satisfactory advancement in all activities in which the garden is operating. Although no new programs were initiated during the year, current ones were pursued vigorously. The youth education program perhaps experienced the greatest growth.

For the first time in many years visitor attendance was down, with 55,373 passing the turnstile in 1967 compared with 57,541 in 1966. This was unfortunate because rainfall was well above average for the year and as a result the grounds were more attractive than they had been at any time since we moved to Claremont in 1951. From an analysis of the weekly attendance figures, it would appear that temperature may be the single most important factor governing visitor attendance. The first three months of the year had temperatures above normal and the number of visitors recorded was well ahead of the previous year. April, May, and June, months normally with the largest number of visitors, had average temperatures as much as 7.7°F below normal with periods of heavy rain. During those months visitor attendance was off. The normally hot months of August, September, and October, the other months with fewer visitors, had temperatures well above normal.

From the standpoint of the Director and other members of the staff, the highlight of the year may well have been the air-conditioning of the office wing of the administration building which was completed late in the year. Other capital improvements included the installation of additional shelving in the library and venetian blinds in the library and one of the laboratories. One of the small laboratories was completely remodeled and new equipment installed. Some of the latter was supplied by the Claremont Graduate School. It was also necessary to re-roof a portion of the administration building.

Awards made to members of the staff included the Henry Allan Gleason Award of the New York Botanical Garden presented to Dr. Carlquist for an outstanding contribution to the advancement of botany. The award was announced at the Botanical Society of America banquet held at the American Institute of Biological Sciences meetings at College Station, Texas, on August 30. Mr. Everett was presented the Award of Merit by the International Shade Tree Conference, Western Chapter, and the Award of Merit of the California Association of Nurserymen, Inland Empire Chapter. The two awards were conferred on him for his many years of devoted service to horticulture and on the occasion of his retirement. Among the meetings held at the botanic garden during the year were those of the Southern California Botanists and Nature
Conservancy. The University of California extension at Riverside used the facilities of the botanic garden for one of its courses on ‘The Language of Nature’ conducted by Mr. John Olmsted, nature consultant to the Strybing Arboretum of Golden Gate Park, San Francisco, and a former student at the garden.

ADMINISTRATION:

After serving the botanic garden for nearly 35 years, Superintendent Percy C. Everett retired at the end of the year and was succeeded by Assistant Superintendent John Dourley. Mr. Dourley came to the garden earlier in the year from the Morris Arboretum, Philadelphia, Pennsylvania, where he had been Superintendent for 10 years. Mr. Dourley received his training at the Royal Botanic Garden, Edinburgh, Scotland, and had held positions on private estates in Ohio and New York before going to the Morris Arboretum. Under Mr. Everett’s capable administration, the botanic garden grounds and plantings have reached a high level of excellence. At a farewell party, he was presented with volumes one and two of the *Wild Flowers of the United States* published jointly by the New York Botanical Garden and McGraw-Hill. Volume six of *Aliso* is being dedicated to Mr. Everett with appropriate photograph and citation.

During the year, Dr. Grant accepted a position at Texas A&M University, and in July, he and Mrs. Grant left for College Station where he assumed his new duties.

In August Drs. Benjamin, Lenz and Thorne attended the annual meetings of the American Institute of Biological Societies held at Texas A&M University, College Station. In April Dr. Lenz attended the dedication ceremonies opening the new research building at the Fairchild Tropical Garden, Coconut Grove, Florida. While in Florida he visited Dr. C. H. Dodson, a former student and now a member of the biology faculty at the University of Miami.

During the past year Dr. Thorne served as Second Vice-President of the California Botanical Society and as member of the Council of Southern California Botanists. He completed his seventh year as member of the Council of the American Society of Plant Taxonomists, and has been elected President of the Society for 1968. He is also Chairman of the Advisory Council and *ex officio* member of the Steering Committee for the *Flora North America* project. In that capacity he attended, during the year, organizational meetings in Washington, D.C., and later at the American Institute of Biological Sciences meetings at College Station, Texas. He also served on the Scientific Field Trips and Commemorative Stamp Committees for the Eleventh International Botanical Congress to be held in Seattle in 1969.

During the year, Dr. Grant was elected President-elect of the Society for the Study of Evolution. While at the American Institute of Biological Sciences meetings in Texas, Dr. Benjamin attended the annual meetings of the Mycological Society of America and participated in the meetings of the Council of that Society. He continues as a member of the Advisory Committee on Fungi of the American Type Culture Collection, Rockville, Maryland. In September Mr. Everett attended the conference of the International Plant Propagators’ Society, Western Region, held at Vancouver, British Columbia. In February Dr. Carlquist
left Claremont on sabbatical leave for an extended world tour which at the end of the year found him in New Caledonia. He is expected back early in 1968 to assume again his duties as Professor of Botany in the Claremont Graduate School. Librarian Myra White attended professional library meetings at Diamond Bar, Riverside, Los Angeles and Claremont.

WEATHER:

The rainfall for the 1966-1967 season was 28.50 inches. This is 11.21 inches above the normal of 17.29 inches.

Rainfall Report — Monthly Totals
(July 1 – June 30)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>0.16</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>August</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>September</td>
<td>0.70</td>
<td>0.13</td>
<td>0.25</td>
</tr>
<tr>
<td>October</td>
<td>0.00</td>
<td>0.10</td>
<td>0.66</td>
</tr>
<tr>
<td>November</td>
<td>11.17</td>
<td>2.53</td>
<td>1.39</td>
</tr>
<tr>
<td>December</td>
<td>4.36</td>
<td>10.19</td>
<td>2.90</td>
</tr>
<tr>
<td>January</td>
<td>0.84</td>
<td>6.02</td>
<td>3.43</td>
</tr>
<tr>
<td>February</td>
<td>1.68</td>
<td>0.01</td>
<td>3.63</td>
</tr>
<tr>
<td>March</td>
<td>0.67</td>
<td>3.61</td>
<td>2.72</td>
</tr>
<tr>
<td>April</td>
<td>0.05</td>
<td>5.17</td>
<td>1.69</td>
</tr>
<tr>
<td>May</td>
<td>0.11</td>
<td>0.38</td>
<td>0.45</td>
</tr>
<tr>
<td>June</td>
<td>0.00</td>
<td>0.36</td>
<td>0.11</td>
</tr>
<tr>
<td>Total</td>
<td>19.74</td>
<td>28.50</td>
<td>17.29</td>
</tr>
</tbody>
</table>

Frequent spring rains contributed in making the display of annual flowers one of the finest we have had since moving to Claremont in 1951. The 1968 season is also starting with above normal rainfall and on November 19 a flash flood caused some soil erosion. Severe Santa Ana winds struck the garden on December 13 and resulted in the loss of two Catalina Island ironwoods.

Summer temperatures were considerably above normal and the highest for 1967 was 107° F recorded on August 13 and 28. The lowest temperature was 23° F recorded on December 14. The relative humidity on that date reached a maximum of only 37% and this favored the rapid fall in temperature during the night. Considerable frost injury occurred on Acalypha californica, Ambrosia ilicifolia, A. chamissonis ssp. bipinnatisecta, Calystegia soldanella and Trixis californica. Moderate injury was noticed on Boykinia elata, Galvesia speciosa, Hyptis emoryi, and Silene laciniata ssp. major.

In comparison, the high for 1966 was 100° F and the low 28° F. In 1967 we had 76 days with temperatures above 90° F, six in May, four in June, 24 in July, 26 in August and eight each in September and October. During the previous year there were 41 days above 90° F. The lowest relative humidity was 4% reached on October 15, 1967.
Amounts of water used during the past five years

<table>
<thead>
<tr>
<th>Year</th>
<th>Water Used (cubic feet)</th>
<th>Rainfall for Calendar Year (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>1,382,700</td>
<td>6.09</td>
</tr>
<tr>
<td>1964</td>
<td>1,452,800</td>
<td>12.80</td>
</tr>
<tr>
<td>1965</td>
<td>1,287,700</td>
<td>26.98</td>
</tr>
<tr>
<td>1966</td>
<td>3,558,600</td>
<td>16.30</td>
</tr>
<tr>
<td>1967</td>
<td>2,816,800</td>
<td>22.62</td>
</tr>
</tbody>
</table>

SEEDS AND PLANTS:

In 1967, 637 packets of seed were distributed; 512 went to institutions in 31 foreign countries, the remainder to institutions within the United States. In addition, special distributions of large quantities of seed were sent to universities and institutions as follows: California Institute of Technology, Pasadena, 4 packets of Atriplex species for studies on carbon isotope intake by plants; Los Angeles County, 14 packets for development of Hancock Park; Los Angeles State and County Arboretum, Arcadia, 1 packet of Mimulus cardinalis for studies on injuries caused by air pollution; Quail Gardens Foundation, Inc., Encinitas, California, 2 pounds of annual flower mixture; United States Forestry Service, Pasadena, 3 packets of seed for soil erosion control studies. Others receiving seeds or plants were: Mr. Clark Bowman, Arizona State University, Tempe, several plants of Aristolochia californica and Asarum caudatum for morphological studies of the family Aristolochiaceae; Dr. Walter E. Lammerts, Freedom, California, cuttings of 30 species for plant breeding projects; San Fernando Junior College, seeds and cuttings to help establish a teaching botanic garden; Woodland Hills Elementary School, plants of yerba buena (Satureja douglasii).

During the year, 333 collections of plants and seeds were accessioned, of these eight represented genera new to the collections and 63 were species new to the collections. Staff collecting accounted for 124 numbers; 76 collections were received as gifts and 86 were obtained through exchange. Much of the material accessioned during the year represented species of the brodiaea alliance.

GROUNDS:

As a result of an abundance of rainfall, the condition of the plantings in early summer was the best that they have been since the botanic garden moved to Claremont, and full scale irrigation did not commence until after June 15. As reported earlier, the summer was characterized by a long period with temperatures over 90° F and as a result there was an unusual amount of branch die-back on many plants.

During 1967, 252 plant identification labels and 12 large subject information labels were added to the grounds. A 4½ x 6' redwood sign detailing specific information for the public, was constructed and installed near the visitors entrance. The old information board was completely rehabilitated and moved to a more suitable location.
Vandalism continues to be a problem at certain periods of the year and many plant labels have either been stolen, broken or otherwise made unuseable; 32 plant community redwood signs were mutilated or destroyed. Twelve panes of glass were broken in the greenhouses, and the restroom at the north end of the mesa was set on fire, but fortunately this was extinguished before major damage occurred.

A problem of increasing concern is that of breaks in the main four inch water pipeline system. These appear to be caused by excessive corrosion in the iron pipe itself, although many occur near places where the pipe was welded and may be due in part to faulty welding technique.

The most troublesome diseases in the garden are *Phytophthora* on *Ceanothus* and the so called “branch die-back” on manzanitas. Studies on these two diseases have been very limited and no satisfactory control is known. The symptoms of branch die-back are very similar to those described for canker disease of *Arctostaphylos*, except that no cankers have been observed. According to Clark and Miller (unpublished) the organism causing the canker disease is *Botryosphaeria ribis*, an ascomycete. More work is required to determine if these two manzanita diseases are caused by the same organism. At present no method of control is known. Although infection may begin in the spring, dying leaves and twigs are not apparent until during the summer, especially following periods of hot weather in August. *Botryosphaeria ribis* has also been blamed for the serious “branch die-back” on *Sequoiadendron giganteum*. Watering and fertilizing adequately to keep the trees vigorous has been the only suggested control.

The coryneum canker disease caused by *Coryneum cardinal* was responsible for the death of several more trees of *Cupressus bakeri* ssp. *mathevsii* and *C. forbesii*. Bordeaux mixture applied at the rate of 4 pounds per 100 gallons of water was used in the spring to help prevent the spread of the disease.

Satisfactory control of the ceanothus stem gallmoth, *Periplaca ceanothiella*, was again obtained with three applications of Cygon 267 applied at rates of 4 lbs per 100 gallons of water. Applications were made during the first few days of August, September and October. Minimum applications of water during the summer prevented flushes of new growth from appearing and thus helped reduce infestations.

The systemic Meta-Systox-R applied at the rate of 1½ pints per 100 gallons of water, was very effective against aphids on *Arbutus menziesii*, *Carpenteria californica*, ceanothis, irises, *Lithocarpus densiflorus*, loniceras, rhamnus, and other plants. It also proved effective against the psyllids on the fremontodendrons, mites on irises, mealybugs on *Malus fusca* and opuntias, and on the manzanita leaf aphid, *Tamalia cowenii*. It has a residual effect of six to seven weeks which is nearly twice that of Malaphene-D.

The leaf gall wasp, *Neuroterus varians*, is believed to be responsible for the severe die-back and death of the scrub oaks, *Quercus dumosa*. Infestation begins in early February when buds begin to break, and continues into June when growth ceases. Applications of various insecticides, including systemics, have failed to give adequate control.

Kelthane was again used successfully for the control of mites on *Baccharis pilularis*, strawberries and irises.
The vegetable weevil, *Listroderes costiroctris*, continues as a major threat to seedlings of annuals from October through the middle of December. DDT applications at the rate of 2% pounds per 100 gallons of water have given only moderate control of the annuals. *Layia* ssp. are the most susceptible to attack.

The leaves of *Berberis piperiana*, *B. pinnata*, and the hybrid 'Golden Abundance' are frequently attacked by a looper caterpillar when the plants are grown near buildings. When grown 30 or more feet away from buildings the plants are seldom attacked. Three to five applications of DDT dust during the spring and summer months give adequate control.

Rabbits and birds continue to be our most troublesome pests, especially of annuals and bulbous plants. Blood meal, an effective rabbit repellent, requires re-application after rains or over-head irrigations.

For the first time *Arbutus menziesii*, *Pinus lambertiana*, *Sambucus callicarpa* and *Sequoiadendron giganteum* were attacked by oak root fungus, *Armillariella mellea*.

During the spring months *Clarkia amoena* ssp. *whitneyi* was severely injured by smog which caused considerable defoliation of the plants. As an experiment, one lot of plants was fed heavily with a complete fertilizer and as a result the leaves became dark green in color. These plants were little affected by smog. Leaves on the unfertilized plants remained light green in color and were severely injured.

Observations made on snapdragons, chrysanthemums, petunias and dahlias have clearly indicated that the leaves and floral parts of white-flowered varieties are most susceptible to smog injury. The yellows are intermediate and the pink, red, blue and purples are most resistant. This seems to indicate that plants having a high content of chlorophyll and anthocyanins are less subject to injury by smog than those with a low content.

Effective weed control again was obtained using weed oil, Simazine 80W and Paraquat. Simazine, used mostly in conjunction with weed oil or Paraquat, was applied at the rate of 1% pounds per acre. For the first time, Simazine was sprayed over bulb growing areas during the fall. There was excellent control of weeds at 2½ pounds per acre and no apparent injury to bulbs.

The new herbicide, Eptam, S-ethyl dipropylthiocarbamate 2.3%, proved effective against the yellow nut grass, *Cyperus esculentus*, when applied at the rate of 1 pound per 200 square feet.

In late 1966 the mildew fungus causing witch's broom on the California live oak began to appear in some quantity. A spray program was initiated during the early months of 1967, but little control was obtained.

One major project undertaken during the year was the removal of dead material from the large live oaks. The work was done on a contract basis by a professional tree-service company and has resulted in trees that are much more attractive.

Approximately seven thousand plants and 825 bulbs and corms were set out during the year. This is considerably less than in some recent years. When possible, propagating material, both seeds and cuttings, is being taken from carefully selected individuals and as a result the quality of the plantings is being
continually upgraded. Also in connection with this is the program of releasing to the commercial trade propagules of these selected plants. In instances where propagation is asexual the elite clones are given appropriate cultivar names and are described or registered. During the past year, two of the three most recent Pacific Coast iris releases were given awards by the American Iris Society. At the iris show in Arcadia, California, on April 29, the botanic garden received a bronze medal certificate from the American Iris Society for a meritorious educational exhibit. The exhibit consisted largely of a display of iris hybrids grown in recent years at the botanic garden by Dr. Lenz. In late December a number of the finest iris hybrids were propagated and these will eventually be registered and released to the trade. An earlier introduction, *Fremontodendron 'California Glory,'* was awarded a First Class Certificate by the Royal Horticultural Society on April 18 when it was shown by the Director of the Royal Horticultural Society's Garden, Wisley, Surrey, England. The F. C. C. is the highest award given to a plant by that Society and it is the first obtained by a botanic garden introduction.

FIELD WORK:

Due to the abundance of precipitation received during the winter and early spring, certain areas of California were outstanding from the standpoint of field studies. One such area was the foothill region of the Sierra Nevada, especially the southern portion. Because of the unusual season, Dr. Lenz concentrated his collecting to the eastern side of the San Joaquin and Sacramento valleys and the foothill region of the Sierra Nevada. Later in the year he collected in selected areas within the Sierra Nevada at moderate elevations. Dr. Thorne concentrated his collecting to localities in southern California, especially in the mountains and on the Channel Islands, the latter in connection with his flora of Santa Catalina Island. In August he made an eight-day pack trip with Dr. Reid Moran of the San Diego Museum of Natural History through the pine forests of the Sierra San Pedro Martir in northern Baja California to study the southern extensions of the California montane forests. This trip resulted in 400 collections and a much better understanding of the flora and vegetation of the southern California mountains.

Dr. Grant's field studies were made in the Colorado Desert, southwestern Nevada and in Arizona, all in connection with his work on hummingbird pollination of flowers. Mr. Everett collected on Santa Cruz Island and in Tulare County in company with Dr. Thorne. Dr. Benjamin's field work during the year was limited to local forays in southern California except for one trip into the Sierra Nevada in company with Dr. Lenz.

THE SCIENTIFIC COLLECTIONS:

Much progress has been made by the Curator, by Dr. Munz, by the Herbarium Botanist, and by the botanical assistants in the integration of the Pomona College and Rancho Santa Ana Botanic Garden herbaria. Numerous mounted duplicates were removed from the collections for use in exchanges, many sheets were reinforced or otherwise repaired, and genus or species covers in poor condition
were replaced by new color-coded covers (manila for California, green for Old World tropics, and gray for the rest of the world), and newly mounted sheets were filed.

During the year, 1,677 Pomona College and Rancho Santa Ana Botanic Garden sheets were sent on loan to 14 institutions in 19 shipments; 1,286 sheets in 10 loans were returned from 9 institutions; and 450 sheets were borrowed from 6 institutions. During 1967 the graduate assistants mounted 5,220 sheets of vascular plants, bringing the total botanic garden sheets to more than 190,000 and the combined herbarium to more than 500,000 sheets. Received on an exchange basis were 1,465 sheets from 11 herbaria; and sent out were more than 3,000 sheets, mostly mounted duplicates, to 6 herbaria. This included a gift of 400 sheets of mounted northwestern United States plants to Whitman College, Walla Walla, Washington. The large accumulation of unmounted duplicates built up by the staff during the past several years will be distributed in early 1968. More than 2,750 specimens of vascular plants were received as gifts from 16 individuals or institutions, including many received for determination, and nearly 2,500 specimens were collected by Dr. Thorne and several graduate students. Among the latter were 875 specimens collected on Santa Catalina Island and 514 from the San Gabriel Mountains. Three shipments of 726 wood samples were received from the Smithsonian Institution, Washington, D.C., and the Centro Nazionale del Legno, Florence, Italy.

Of the 5,220 processed plant specimens, more than 2,200 were from California, 1,000 from other southwestern states and Mexico, 1,000 from the southeastern states, and 750 from Australia and other Pacific islands. The acquisition of the processed specimens included 1,900 by gifts, 1,900 by exchange, and 1,400 through staff collections.

Approximately 30 new isolates were added to the fungus culture collection during the year by Dr. Benjamin. Routine maintenance of this collection required in excess of 1,000 transfers of isolates to fresh media. Approximately 120 slide mounts were added to the Laboulbeniales collection.

LIBRARY:

The library continues to grow at a satisfactory rate. The number of serials currently received is 471 including four titles acquired through new exchange agreements. There were 1,581 individual issues of periodicals received. One hundred and nineteen bound periodical volumes were added to the collection in addition to 199 deposited by the Claremont Colleges. This is more than four times as many bound periodical volumes as were added last year.

There were 212 new books received as well as 67 deposited by the Claremont Colleges. Three hundred and twenty books and serials were cataloged. This is more than three times the number cataloged during the previous year. In addition, 667 reprints were added to the reprint collection, an increase of 225% over last year.

All the books in the collection were shifted to take advantage of newly acquired shelving which added 15% to the capacity of the library.

A small start has been made on a subject catalog for the book collection.
Subject cards have been made for all new books and for 252 of previously acquired books.

A guide to the periodical holdings, complete with cross references, has been made and posted in the periodical section to facilitate the location of hard-to-find titles. And, finally, the library has for the first time a half-time clerical assistant. She has been responsible, in large measure, for the great increase in cataloging and filing which we have seen.

RESEARCH ACTIVITIES:

Much of Dr. Benjamin's research time during 1967 was given to his studies on the Laboulbeniales. One paper describing the species of *Laboulbenia* known on semi-aquatic bugs (Hemiptera) was published in *Aliso* in June. Eight new species of this genus of fungi were described on these insects and increased the number of species known to parasitize this group from two to ten. During the summer and fall, drawings were completed for two papers describing two new genera of Laboulbeniales, one from Chiapas, Mexico, and the other from California. These works appear in this issue of *Aliso*. Dr. Benjamin's earlier works on the merosporangiferous Mucorales, all published in *Aliso* (1958–1965), have been reprinted by the publishing firm of J. Cramer, Lehre, Germany, as Volume V of *Bibliotheca Mycologica*.

Dr. Benson's research activity included bringing to completion and publication of a phase of a long term project on evolution of oak trees undertaken by the Botany Department of Pomona College in 1944. This was concerned with evolutionary sorting of characters in a hybrid swarm correlated with the direction of slope in a group of hills near Lebec, California. Marked differences in the character combinations occurring at eighths of the distance around the compass were detected. Dr. Benson's chief research activity was in completion of the third edition of *The Cacti of Arizona*, of a new book, *The Cacti of California*, and of the treatment of the Cactaceae for D. S. Correll and Marshall Johnston's *Manual of the Vascular Plants of Texas*. *The Cacti of the United States and Canada*, essentially complete in manuscript, is in the process of illustration and mapmaking.

During most of 1967, Dr. Carlquist was engaged in field work overseas related to his "Studies in insular woodiness," a project supported by National Science Foundation grant GB-4977X. These studies are attempting to elucidate the anatomy and phylogeny of groups of plants which are predominantly herbaceous, but tend to form trees or shrubs—often so-called "rosette trees" or "rosette shrubs"—on insular areas. Localities visited by Dr. Carlquist include the Canary Islands, Madeira, alpine East Africa (Mt. Kenya), many areas of Western Australia, New Zealand and New Caledonia. The results of this expedition incorporate many herbarium specimens, wood samples, pickled specimens, and photographs.

Dr. Carlquist has begun work on a book on the natural history of the Hawaiian Islands to be published by the Natural History Press.

At the annual American Institute of Biological Sciences meeting, Dr. Carlquist's book *Island Life* was awarded the Henry Allan Gleason Award of the New York Botanical Garden.
Dr. Grant spent the early part of the year in field studies of hummingbird pollination on the Colorado Desert and in southwestern Nevada. In May he studied hummingbird activities in Arizona. In collaboration with Karen A. Grant, he finished a book on hummingbird pollination in western North America which is to be published by Columbia University Press in 1968.

Dr. Lenz continued with his cytological studies of members of the brodiaea complex and at present is concentrating his efforts on species of *Triteleia*. Available evidence would indicate that karyomorphological studies will contribute substantially to a better understanding of members of this group. In collaboration with Dr. T. M. Howard of San Antonio, Texas, Dr. Lenz is studying the species of *Milla, Dandyea, Bessera* and *Petronymphae*. A revision of *Milla* and *Dandyea* is in preparation and should be completed within the near future. Cytological information is also proving of great value in gaining a better understanding of the taxa within these groups.

During the year, Dr. Munz completed his studies of the delphiniums of Asia and north Africa and prepared the material for publication. Much of his time during the remainder of the year was spent in assisting with the integration of the Pomona and Rancho Santa Ana Botanic Garden herbaria. Among the families rearranged by Dr. Munz are the Onagraceae, Labiatae, Papaveraceae, Nyctaginaceae. He also spent many months working on a supplement to *A California Flora* which is to be published by the University of California Press. During the autumn he prepared a paper for publication in *Aliso* on the history and content of the Pomona College and Rancho Santa Ana Botanic Garden herbaria.

Dr. Thorne completed his study of the flora of Santa Catalina Island, although he continues his occasional trips to this and other Channel Islands to become better acquainted with the California insular floras. He also has completed, jointly with Dr. Earl Lathrop of Loma Linda University, a floristic study of the Santa Rosa Plateau of the Santa Ana Mountains, mostly in Riverside County. The resulting florula is published in this issue of *Aliso*. Rather extensive field work was done in the San Gabriel Mountains in continuation of a joint study of their flora with Prof. Louis Wheeler of the University of Southern California. Investigation of the plant communities of California has progressed through study of several less well known communities, the acquisition of numerous kodachromes from over the state, and the presentation of a student seminar on California plant communities during the fall term. He has continued work on the angiosperm phylogeny book and his new system of classification of the flowering plants. A synopsis of this system is published in this issue of *Aliso*.

**GRADUATE INSTRUCTION:**

The graduate program in botany at the Claremont Graduate School is presented through the cooperative efforts of the Graduate School, Pomona College and the Rancho Santa Ana Botanic Garden. During the past year nine students were working for advanced degrees, several of them on a part time basis while completing their theses. The first semester found several of them teaching at nearby institutions. These included James Henrickson and Ruth Wilson, both at the California State College, Los Angeles; Mark Parratt and Ted Mortenson
at Chaffey College, Alta Loma; and Martin Rochford at the California State College, Fullerton. Homer Metcalf is finishing his thesis while serving as Professor in the Department of Soil and Plant Sciences, Montana State University, Bozeman.

As reported elsewhere, Dr. Carlquist was on sabbatical leave during the second semester of the 1966-67 academic year. Funds from the Claremont Graduate School made possible the purchase of some much needed new equipment for the anatomy laboratory.

YOUTH EDUCATIONAL PROGRAM:

The second year of the Youth Education Program found it serving 4,337 young visitors, the majority coming as members of school classes. Those attending (often for a second visit) as part of a youth group came with special interests in nature conservation, badge-work and/or preparation for wilderness outings. Two nursery schools scheduled tours this year and Mrs. Coffeen worked with teachers from elementary schools, junior high schools and colleges, who came to do advance planning and to borrow materials for self-guiding tours and individual student-study projects.

During the year, Mr. Everett and Mrs. Coffeen prepared for display in a large glass-fronted case along the nature trail a complete collection of the cone bearing plants of California. The display centers around a chart which graphically visualizes the germination of a pinon pine seed.

Because of the increase in number of young visitors, the garden this year embarked on a broadened policy with regard to labeling. Mrs. Coffeen prepared information on such subjects as the three redwoods, life in the pond, the bee tree, toadstools and the weather station. The new signs, which are placed along the nature trail, are made by a lamination process and are easily read and also are weather resistant.

During the spring, Ornamental Horticulture students under the direction of Mr. James Degen of the California State Polytechnic College, carried to completion the location of the plant indicators on the “Boy Scout Map” of the plant community section of the garden. We are hoping to make this valuable information available to inquiring visitors as soon as we can find both accurate and workable means to implement it.

The peak of the blooming season in 1967 marked the initiation of our first volunteer tour guide. Between April 13 and June 13, Mrs. George Shipway, who relates especially well to very young visitors, contributed 13½ hours of time to guide 9 tours consisting of 278 children and teachers. This was a great help to us and to the schools who cannot afford to run a bus for less than two classes.

During the latter part of the year, the Youth Program initiated two new projects. James Troutner, teacher at Claremont High School, and three of his second year science classes did an ecological field-study in the wild preserve area of the Coastal Sage Scrub plant community. Mr. Troutner and Mrs. Coffeen based plans for the study on Dr. Edwin Phillip’s B.S.C.S. Ecology Manual.

The other innovation was the nature study course entitled “Autumn Is Here” which met after school on six Wednesdays. Graduation was held on December
13. On that chilly afternoon, the fifteen 9, 10 and 11 year old boys and girls, who had made almost perfect attendance records, displayed their notebooks, gave oral reports and received their diplomas in the auditorium. They then took their parents on a “sensing nature” walk in the almost-dark garden. A winter nature class is now in the planning stages.

The final youth program project for 1967 was expansion of the nature slide set. We now have four sets in which both pictures and the accompanying text are oriented to different grade levels. Mrs. Coffeen was assisted in this revision by Mrs. Shipway and Mrs. Byron Crader who also donated additional slides.

Mrs. Coffeen took graduate work in the field of natural history at the summer session of Humboldt State College and is serving on the Council Committee concerned with nature conservation for the Campfire Girls.

The challenge inherent in the future of the youth program here can perhaps best be epitomized in the words of a young nursery school visitor who ran up to our cross-section of a redwood trunk and cried, “Oh look, here’s a tipped-over somethin’!”

### YOUTH EDUCATION STATISTICS, 1967

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Students</th>
<th>Number of Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>After School Youth Groups</td>
<td>677</td>
<td>90</td>
</tr>
<tr>
<td>School Classes</td>
<td>3,281</td>
<td>231</td>
</tr>
<tr>
<td>Pre-planning Adults</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Nursery School</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>Rained Out Tours</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,337</strong></td>
<td></td>
</tr>
</tbody>
</table>

**SEASONAL BREAKDOWN**

<table>
<thead>
<tr>
<th>Period</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>January and February</td>
<td>463</td>
</tr>
<tr>
<td>March, April and May</td>
<td>1,940</td>
</tr>
<tr>
<td>June and July</td>
<td>178</td>
</tr>
<tr>
<td>October and November</td>
<td>614</td>
</tr>
</tbody>
</table>

**PUBLIC SERVICE:**

The public service activities of members of the staff again accounted for considerable amounts of their time. Plant identification for others continues to be an important item and both Drs. Munz and Thorne spent many hours identifying such material.

Dr. Thorne continues to serve as chairman of the Advisory Council and *ex officio* member of the Steering Committee for the *Flora North America* project. He has given several lectures: on native shrubs at the Descanso Gardens for the Payne Foundation; on island endemics in a symposium at the U.C.L.A. meetings of the Pacific Division of the Botanical Society of America; and on angiosperm phylogeny at the University of California, Riverside.
As past president of the Mycological Society of America (1965), Dr. Benjamin served his final term on the council of the society during 1967. About 40 fungus cultures were distributed to other mycologists and institutions, at their request, during 1967. Dr. Benjamin was appointed to the graduate council of the Claremont Graduate School for a 3 year term as the representative for botany.

Mr. Everett served as a consultant to a number of park departments and planting commissions. He also presented the first lecture of the 1967–68 series of Popular Lectures sponsored by the Theodore Payne Foundation at the Los Angeles State and County Arboretum.

Dr. Lenz continued to serve as Chairman of the graduate faculty in botany of the Claremont Graduate School, and, in addition, served on the Admission Policies and Fellowships and the Graduate Courses and Degrees committees. He was appointed as a special consultant to the American Iris Society for matters relating to the taxonomy and nomenclature of irises.

A cooperative project with Dr. Kornelius Lems of Goucher College, Baltimore, Maryland, has been the propagation and growing of a large number of species of Echium, a group that Dr. Lems has been engaged in studying for a number of years.

Mrs. Wilder assisted Mr. Bert Kempers, et al. in the production of a Biological Sciences Curriculum Studies educational film strip for use in high school science classes. The film is based on a research paper by Drs. Benson and Phillips and collaborators which was published in the American Journal of Botany.

All members of the staff reviewed manuscripts sent by editors of scientific journals and served as referees to the National Science Foundation on grant proposals.

PUBLICATIONS:

The third number of Volume 6 of the garden's journal, Aliso, edited by Dr. Benjamin appeared on June 30, 1967. The issue contained 178 pages. In addition to staff contributions listed below, three additional papers were included. Temperate tufted polemoniums were discussed by Dr. Edgar T. Wherry, University of Pennsylvania, Philadelphia. Papers on pollen morphology in the Fouquieriaceae by James Henrickson and hybridization and variation of ponderosa and Jeffrey pines by Mark W. Parratt were derived from theses done at the Rancho Santa Ana Botanic Garden and presented to the Claremont Graduate School as partial fulfillment for the M.A. degree.

PUBLISHED WRITINGS OF THE BOTANIC GARDEN STAFF:


GIFTS AND GRANTS:

Adams, Mr. Stanley, cash donation.

Alf, Mr. Raymond, 1 book.

Balazuc, Dr. J., 6, Avenue Alphonse Daudet, 95-Eaubonne, France, Insect collections bearing Laboulbeniales (European).

Ball, Mr. Clayton, Claremont, cash donation.

Balls, Mr. E. K., Carmel Highlands, seed.

Beauchamp, Mr. R. M., National City, 12 plants and cash donation.

Beckner, Mrs. Jean, Claremont, cash donation.

Beeks, Dr. R. M., Claremont, collections of Brodiaea corms.

Carlquist, Dr. Sherwin, Claremont, 1 book.

Crader, Mrs. Byron, Diamond Bar, slides.

Curtis, Dr. W. M., Hobart, Tasmania, 1 book.

Demaree, Dr. Delzie, Dallas, Texas, 217 herbarium specimens.

Everett, Mr. Percy C., Claremont, 50 kodachrome slides.

Ford, Mr. Frank, South Pasadena, bulbs of Lilium maritimum.

Fuller, Dr. T. C., California Department of Agriculture, Sacramento, 63 herbarium specimens.

Gallaner, Mr. J. M., Claremont, cash donation.

Gaw, Dr. and Mrs. E. A., Glen Ellen, cash donation.

Harvey, Mrs. Dorothy, San Diego State College, corms of Bloomeria clevelandii.

Inland Empire Chapter, California Association of Nurserymen, cash donation for purchase of plant identification labels.
Institute for Genetics, Placerville, 10 packets of conifer seeds.
Killeen, Mrs. Mary D., Pomona, cash donation.
Kimball, Mr. Marston, Sierra Co., California, seeds of *Ceanothus prostratus*.
Kirch, Mr. Jacob, Claremont, cash donation.
Kistler, Mr. Larry, Claremont, 67 herbarium specimens, mostly Washington State (already mounted).
Klein, Dr. W., Colorado State University, Fort Collins, Colorado, 8 herbarium specimens.
Lathrop, Dr. Earl, Loma Linda University, Loma Linda, 105 herbarium specimens.
Leech, Mr. Hugh B., California Academy of Sciences, Golden Gate Park, San Francisco, 5 collections of insects bearing Laboulbeniales.
Lenz, Dr. L. W., Claremont, 9 books.
Lieding, Mr. Calvin A., Pasadena, cash donation.
Long, Mr. William R., San Jose, cash donation.
MacMillen, Mr. Richard, Claremont, cash donation.
Marquez, Mrs. Joan, Claremont, cash donation.
Metcalfe, Mr. Homer, Bozeman, Montana, 2 collections of *Brodiaea* corms.
Montgomery, Miss Barbara, Beaumont, kodachrome slides.
Mroch, Mr. Charles H., Pomona, Wholesale Milling, on Master Information Sign — gift, 1 day millwork.
Mukerji, Dr. K. G., Department of Botany, University of Delhi, Delhi 7, India, 1 fungus culture.
Munoz, Dr. Carlos P., Museo Nacional de Historia Natural, Santiago, Chile, 1 wood sample.
Munz, Dr. P. A., Claremont, 7 books.
Muth, Mr. Gilbert, Angwin, 22 herbarium specimens.
Myers, Mr. C. F., Claremont, cash donation.
Papa, Mr. A. J., Claremont, cash donation.
Parratt, Mr. Mark, Upland, 359 herbarium specimens.
Peterson, Dr. Ronald H., Department of Botany, University of Tennessee, Knoxville, 2 fungus cultures.
Preston, Dr. D. A., San Diego, seeds of *Arbutus arizonica*.
Propst, Mr. Douglas, Santa Catalina Island Company, Avalon, seed and 51 herbarium specimens.
Raven, Dr. Peter H., Stanford University, Stanford, 1 fruit specimen.
Roderick, Mr. Wayne, Berkeley, cuttings of *Arctostaphylos manzanita*, 'Elizabeth McClintock.'
Rose, Mr. Lewis S., San Francisco, 150 herbarium specimens.
Roth, Dr. Louis M., Pioneering Research Division, U. S. Army Natick Laboratories, Natick, Massachusetts, 1 insect collection bearing Laboulbeniales.
Sabah Forest Department, Sandakan, Sabah, Malaysia, 12 bottles preserved materials.
Schmidt, Mrs. Marjorie, Hayfork, 1 packet of *Rhamnus californica* ssp. *crassifolia* seed.
School of Theology, Claremont, 1 book.
South African National Herbarium, Pretoria, South Africa, 1 bottle preserved material.
Stephens, Mr. Trow, Glendora, 12 collections of plants.
Steyermark, Dr. Julian A., Instituto Botanico MAC, Caracas, Venezuela, 8 herbarium specimens.
Thomas, Dr. Joab, University of Alabama, Tuscaloosa, Alabama, 1 herbarium specimen.
Thompson, Mrs. Kenneth, Lake Hughes, collections of seeds.
Thorne, Dr. Robert F., Claremont, 2,000 herbarium specimens and 7 books.
Tickner, Mr. A. J., Pasadena, 1 plant of an albino *Opuntia basilaris* and color photos of same.
Twisselmann, Mr. E. C., Cholame, 290 herbarium specimens.
Watson, Mrs. Dorothy, Claremont, cash donation.
Wilson, Miss Ruth, Upland, 1 book.
Winstead, Miss Janet, Department of Botany, University of Texas, Austin, 2 fungus cultures. Women's Club of Claremont, Claremont, cash donation.
Woods, Mr. Edsal, Florists, Portland, Oregon, 1 bottle of 'Jiffy Grow' (a root inducing hormone).
Wrigley, Mr. Philip K., Chicago, cash donation.
Yeo, Mr. P. F., Cambridge University Botanical Garden, Cambridge, England, 2 herbarium specimens.
Ziegler, Mr. Louis B., San Jacinto, California, 1 collection of Argemone munita seeds and 8 herbarium specimens.
RANCHO SANTA ANA BOTANIC GARDEN

FOUNDER
Susanna Bixby Bryant

TRUSTEES
Ernest A. Bryant, Jr. .................................................. Chairman
Stuart O'Melveny .......................................................... Secretary
Irving M. Walker
Ernest A. Bryant, III
Oscar T. Lawler

STAFF
Lee W. Lenz, Ph.D. .................................................. Cytologist and Director
Richard K. Benjamin, Ph.D. ........................................... Mycologist and Editor
Lyman Benson, Ph.D. (Pomona College) ....................... Research Associate in Taxonomy
Sherwin Carlquist, Ph.D. .............................................. Research Associate in Anatomy
Mary Coffeen, B.S. .................................................. Supervisor, Youth Education Program
Chris Davidson .................................................. Research Assistant
John Dourley .................................................. Superintendent
Percy C. Everett .................................................. Superintendent Emeritus
Verne Grant, Ph.D. .................................................. Geneticist and Experimental Taxonomist
Larry L. Kistler .................................................. Research Assistant
Nick Lolonis, M.S. .................................................. Horticulturist
Philip A. Munz, Ph.D., Sc.D. .................................. Director Emeritus
Cledith Rue .................................................. Secretary
Warren Sullivan .................................................. Nurseryman
Robert F. Thorne, Ph.D. ........................................ Taxonomist and Curator of the Herbarium
Myra White, M.S. in L.S. ........................................ Librarian
Patricia Wilder, M.S. (Pomona College) ......................... Associate Herbarium Botanist

*Resigned August, 1967
ERRATA, Volume 6.

No. 1, March 22, 1965

p. 1, line 2 from top: crystalligena not cristallenga.

p. 15, line 18 from bottom: comma after Centaurodendron not period.

p. 31, line 20 from bottom: fig. 3 C not fig. 3 H.

p. 31, line 9 from bottom: fig. 3 A not fig. 3 F.

p. 31, line 4 from bottom: fig. 3 F not fig. 3 A.

p. 35, line 1: fig. 3 E not fig. 3 J.

p. 35, line 9 from top: fig. 3 J not fig. 3 E.

p. 50, line 6 from bottom: mailor not mailor.

p. 71, first line of heading: fertilitv not fertility.

p. 80, Table 1: Symphoricarpos vaccinoides not vacinioides.

p. 105, lines 12-13 from bottom: Adenostoma not Adensostoma.

p. 105, line 9 from bottom: flordium not flordium.

p. 107, line 23 from bottom: CAPPARIDACEAE not CAPPARIACEAE.

p. 110, line 4 from top: MINUTIFOLIA not MINUTIFLORIA.

p. 118, line 5 from bottom: Sequoiadendron not Sequoidendron.

p. 122, line 24 from top: Gymnoascaceae not Gymnoacsaceae.

p. 123, last line: Gymnoascaceae not Gymnoacaceae.

p. 128, line 17 from top: Cabrera not Carbrera.

p. 132, line 10 from bottom: Percy not Precy.

No. 2, May 20, 1966

p. 52, last line: Selasphorus not Selaphorus.

p. 61, line 7 from bottom: cardinalis not Cardinals.

No. 3, June 30, 1967

p. 2, lines 12 and 15 from top: schists not shists.

[85]
Cardamine californica not Dentaria californica.

Diversilobum not diversiloba.

Marah macrocarpus not Marah macrocarpa.

diversilobum not diversiloba.

Aspidotis not Cheilanthes.

praegracilis not tumulicola.

Crypsis aculeata not Crypsis schoenoides.

P. H. Raven's not P. A. Raven's.

Cercocarpus traskiae not Ceanothus traskiae.

diversilobum not diversiloba.

Marah macrocarpa not Marah macrocarpus.

diversilobum not diversiloba.

S. laciniata of Millsp. & Nutt. not S. laciniata H. & A.

var. sinuatum (J. Murr.) H. A. Wahl not subsp. zschakei (Murr.) Zobel.

Prof. C. H. Mueller not Prof. N. Mueller.

Peyatt not Peyaff.

Elaeagnifolium not Eleagnifolium.

CAREX PRAEGRACILIS W. Bott not CAREX TUMULICOLA Mack.

delete.

S. laciniata not S. laciniata H. & A.

CLARKIA EPILOBIOIDES insert family name ONAGRACEAE.

SEMIVERTICILLATUS not SEMIVERTICILLATA.

lechii not lechii.

F. fasciculata not F. fascicularis.

(in cm) not (in mm).
INDEX TO VOLUME 6, ALISO*

Abies concolor (1): 78, 80
Agrostis alba (3): 171
Ambrosia - Continued
	artemisiifolia (2), 2, 5-6, 12, 17
camphorata (2): 2, 6, 12, 17
	chamissonis (3): 12, 29
	bipinnatifida (2): 2, 6, 8, 12, 17
dumosa (2): 2, 6, 8, 15, 17
eriocentra (2): 2, 5, 6, 8, 12, 17
	spicata (2): 2, 6, 12, 17, 38
	illicifolia (4): 69
	psilostachya (2): 2, 6, 8, 17; (3): 8, 29; (4): 22
	trifida (3): 2, 5-6, 17

Ambrosiaeae (2): 1-23, 27-28, 92
wood anatomy of (2): 1-23
Ambrosinaceae (2): 1-23, 30
Amelanchier alnifolia (1): 78
Ammannia coccinea (3): 12, 55
Amorpha californica (4): 30

Anacapiacaeae (3): 131-132
Anamnesia chamissonis (3): 12, 29

Angiospermae (3): 27; (4): 22, 57
Anemonophylloides albus (3): 27; (4): 22

Anthophora sp. (3): 1-23
Anthophoridae (2): 64

Aphanes cuneifolia (3): 63

Aphanisma blitoides (3): 23, 43

Aphytis graminum (3): 77

Aphroditia (2): 2, 5-6, 17

Aphidoletes (4): 22
Aphis pertinax leaf gall (1): 119; (2): 89; (3): 167

Apirastis angustifolia (3): 10, 28, (4): 22

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
nuttallianum (1): 113; (3): 8, 10, 66; (4): 35

Aphanes cuneifolia (3): 63

Aphanaistis bilaoides (3): 23, 43

Aphid, manzaifa leaf gall (1): 119; (2): 89; (3): 167

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
nuttallianum (1): 113; (3): 8, 10, 66; (4): 35

Aphanes cuneifolia (3): 63

Aphanaistis bilaoides (3): 23, 43

Aphid, manzaifa leaf gall (1): 119; (2): 89; (3): 167

INDEX TO VOLUME 6, ALISO*

Abies concolor (1): 78, 80
Agrostis alba (3): 171
Ambrosia - Continued
	artemisiifolia (2), 2, 5-6, 12, 17
camphorata (2): 2, 6, 12, 17
	chamissonis (3): 12, 29
	bipinnatifida (2): 2, 6, 8, 12, 17
dumosa (2): 2, 6, 8, 15, 17
eriocentra (2): 2, 5, 6, 8, 12, 17
	spicata (2): 2, 6, 12, 17, 38
	illicifolia (4): 69
	psilostachya (2): 2, 6, 8, 17; (3): 8, 29; (4): 22
	trifida (3): 2, 5-6, 17

Ambrosiaeae (2): 1-23, 27-28, 92
wood anatomy of (2): 1-23
Ambrosinaceae (2): 1-23, 30
Amelanchier alnifolia (1): 78
Ammannia coccinea (3): 12, 55
Amorpha californica (4): 30

Anacapiacaeae (3): 131-132
Anamnesia chamissonis (3): 12, 29

Angiospermae (3): 27; (4): 22, 57
Anemonophylloides albus (3): 27; (4): 22

Anthophora sp. (3): 1-23
Anthophoridae (2): 64

Aphanes cuneifolia (3): 63

Aphanisma blitoides (3): 23, 43

Aphytis graminum (3): 77

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
nuttallianum (1): 113; (3): 8, 10, 66; (4): 35

Aphanes cuneifolia (3): 63

Aphanaistis bilaoides (3): 23, 43

Aphid, manzaifa leaf gall (1): 119; (2): 89; (3): 167

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
nuttallianum (1): 113; (3): 8, 10, 66; (4): 35

Aphanes cuneifolia (3): 63

Aphanaistis bilaoides (3): 23, 43

Aphid, manzaifa leaf gall (1): 119; (2): 89; (3): 167

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
nuttallianum (1): 113; (3): 8, 10, 66; (4): 35

Aphanes cuneifolia (3): 63

Aphanaistis bilaoides (3): 23, 43

Aphid, manzaifa leaf gall (1): 119; (2): 89; (3): 167

Aporocycasae (3): 28; (4): 22

Apostrophe ciliata (4): 35
hookerianum (3): 66
kelloggii (3): 66; (4): 35
multiflorum (1): 113
Caulanthus – Continued
cooperi (1): 108
cordulatus (1): 78
conulifer (1): 108
cuneatus (1): 80
integrifolius (1): 80
lemonii (1): 80
prostratus (1): 78, 80
rigidus (1): 120
velutinus (1): 78
Ceanothus (2): 95; (3): 66, 94; (4): 71
arboreus (3): 4, 8, 22, 62
crasstipulins (3): 8, 22, 62-63
leucodermis (4): 34
megacarpus (3): 62
sp. insularis (3): 8, 22, 62-63
sp. megacarpus (3): 63
tomentosus var. olivaceus (4): 34
traskiae (3): 20
(error; should be Cercocarpus traskiae)
ruber (3): 10
stem gall moth (1): 119
Centaura (1): 15, 24
americana (1): 13, 15-16, 20, 23
cineraria (1): 16, 18, 21; (3): 8, 30
cyanus (1): 16
ibera (1): 16, 18
mellitensis (1): 16, 21; (3): 30; (4): 22
ruguina (1): 15-16, 18-19, 21, 23
solidissima (1): 16, 18; (3): 30
Centaurium venustum (3): 12, 52; (4): 31
Centauridendron (1): 13-15, 23
dracanoides (1): 15-18, 23
palmiforme (1): 16, 18-19, 21, 23
Centranthus ruber (3): 68
cerasium glomeratum (3): 6, 42; (4): 28
viscosum (3): 42
Cercidium floridum (1): 105, 109
Cerc ocircialis (1): 75
Cercocarpus arborescens (3): 63
betuloides (1): 80; (3): 81; (4): 35
var. blanchea (3): 8, 23, 63
ledifolius (1): 78, 80
minutiflorus (4): 35
traskiae (3): 8, 20, 63
dierama (3): 41
Chanaetis artemisiifolia (4): 22
glabriuscus (4): 22
Chetogapta aurora (4): 24
bonyi (3): 22-23, 30
Chamaebatiaria millefolium (1): 80
Chamaesyce serpyllifolia (3): 47
Chamissonis (3): 50
californica (3): 50
micrantha (3): 56
Ceratobuflorum (3): 27
newberryi (4): 30
Chenopodiaceae (3): 43, 76; (4): 28
Chenopodium album (3): 44
ambrosioides (3): 44
var. ambrosioides (4): 28
berlandieri sp. sinuatum (3): 44
(zschakel in error)
var. sinuatum (4): 28
californicum (3): 6, 44; (4): 28
muriae (3): 44
Chimaphila umbellata var. occidentalis (1): 108
Chlorogallum parviflorum (4): 37
pomeridianum (3): 12, 70; (4): 37
Chorizanthe coriacea (3): 59
fimbriata (4): 34
procumbens (4): 34
staptoideae (3): 59
sp. staptoideae (4): 34
Christian, James A.
Nomennon cali. California Lupinus concin
mnus – L. sparsiflorus complex. (with David B.
Dunn and C. T. Drejekowki) (2): 45-50
chromosome numbers 103-113; (3): 69, 81-92
chromosomes, of Cobwebby Gilian (1): 42-50
of Gilia lacinia group (2): 69
Chrysactinia (2): 37
Chrysanthemoides (2): 15
monilifera (2): 2-3, 6, 16-17, 22
Chrysanthemum coronarium (3): 30
frutescens (3): 30
Chrysomelidae (3): 134
Chrysothamnus viscidiflorus (1): 80
sp. (1): 78
Cichorieleae (1): 13, 18; (2): 27-29, 35, 38, 42
Cimicidae (3): 113
Cimeroides (3): 112
Cirsium (3): 110
densiflorum (1): 16, 18-19, 21
cracstipulins (1): 13, 16, 18-19, 21; (3): 30; (4): 24
drummondii (4): 24
folsomum (4): 24
occidentale (1): 13, 16, 18; (3): 109
ocrocentrum (3): 32
subcoriaceum (1): 14-16, 21-22
undulatum (3): 30
vulgare (3): 32
sp. (3): 8
Cistaceae (3): 44; (4): 28
Clarkia amoena spsp. whitenyi (3): 167; (4): 72
conica (3): 167
dudleyana (4): 32
epilobioides (3): 56; (4): 32
purpurea spsp. quadriruinerata (3): 56; (4): 32
Clarks, Oscar (4): 18
Claytonia perfoliata (3): 6, 62; (4): 34
Clematis (3): 42
laxanthis (4): 34
ligusticifolia (3): 8, 62
pauciflora (4): 34
Circe izomeri (1): 107; (3): 8, 42
lutea (1): 105, 107
cruralia (1): 105, 107
Cleusiaceae (4): 28
Convolvula (1): 105
dumosum (1): 112
Cnicus nectariflora (1): 15-16, 21
Cobaea (3): 58, 80
Cocculinellidae (3): 133
Coenomiasia majorensis (1): 8
Cynogynes pumila (3): 34
Cokeromyces recurvatus (1): 1, 3, 6
Coleoptera (3): 113, 131-135; (4): 2, 15, 48, 84, 56
Collinsia heterophylla var. heterophylla (4): 35
parryi (4): 35
Collomia sp. (1): 80
Comarostaphylis diversifolia (3): 6
var. planifolia (3): 17, 46, 49
polifolia (3): 46
Compositae (1): 107
Ambrosiae, tribe of (2): 1-23, 27-28, 92;
(3): 170
Anthemidieae, tribe of (2): 1-23, 27-28, 92;
(3): 170
Arctotideae, tribe of (2): 1-23, 27-28, 92;
(3): 170
Asclepieae, tribe of (1): 18; (2): 17, 21, 27-28,
30, 36, 43
Calenduleae, tribe of (2): 1-23, 27-28, 92;
(3): 170
Chlorotheae, tribe of (1): 13, 18-19, 92;
(2): 27-29, 35, 38, 42
Cynareae, tribe of (1): 13, 91, 100, 102;
(2): 27-28, 35-36, 42
Eucentroideae, tribe of (1): 89-103; (2): 27-28,
30, 36
Heliantheae, tribe of (2): 27-28, 36
Heterothaceae, tribe of (1): 19; (2): 27-28, 30, 36
Inuleae, tribe of (1): 93, 102; (2): 4, 27-28,
30, 43
Mustardae, tribe of (1): 14, 24; (2): 17, 27-28,
30, 36-37
Seselionae, tribe of (1): 19; (2): 27-28, 30,
36, 43
Diplacus – Continued
puniceus (2): 62; (3): 66
Diplocoelus sp. (4): 54
Diplomycetes (4): 1-2, 4, 12, 14-15
actinopus (4): 4, 6, 10, 12, 14-15
atangnathi (4): 4
Diplopoda (3): 131
Diplocarpaceae (3): 12
Diplocoroides (3): 111
Diptera (3): 113, 131, 134
Director’s Report, The
1964—(1): 115-122
1965—(2): 83-100
1966—(3): 161-178
1967—(4): 67-84
Dispera (1): 1, 123
Dissanthellium californicum (3): 20, 22, 72
Distichlis spicata var. stolonifera (3): 12, 14, 72
var. stricta (4): 38
Dithorea californica (1): 108
V. wisiornii (1): 108
Dodecanthion clevelandii (4): 34
sp. insulare (3): 10, 62
Dondia californica (3): 44
Downingia cuspidata sp. cuspidata (4): 28
Draja canifolia var. integrifolia (3): 20, 38
Drake, C. J. (3): 123
Drymococcolis glauca (3): 64
Dryopteris arbuta (3): 6, 26; (4): 20
Dubautia (1): 19
Dudleya (5): 61; (3): 25
cymosa var. saxatilis (2): 54
greeni (3): 8, 22, 46
hasei (3): 8, 10, 22, 46
lanceolata (2): 1; (4): 28
pulverulenta (4): 28
vires (3): 8, 23, 46
Dunn, David B.
Nomenclature of the California Lupinus concin
nus–L. sparsiflorus complex, (with J. A. Chris
tian and C. T. Diekanowski) (2): 45-50
Duritis (1): 112
Dysodia (2): 37
Diekanowski, Chester T.
Nomenclature of the California Lupinus concin
Eames, A. J. (4): 45
Eastwoodia elegans (2): 30
Echinocereus trilobidifolius (3): 110
Echinocloa crus-galli (4): 72; (4): 38
Echinops exaltatus (1): 16
Echium (4): 79
Echinocephalus (1): 17, 158-159
Ehrharta calycina (3): 72
erecta (1): 106
Ehrlich, Paul (3): 110
Elatitae (3): 46; (4): 30
Elatine brachysperma (4): 30
californica (3): 12, 46
chenensis (4): 30
Eleocharis acicularis (4): 37
mammillata (4): 37
montevidensis (4): 37
var. parishii (1): 106
palustris (3): 12, 69; (4): 37
Ellisia cymosa (3): 53
Elymus condensatus (3): 75; (4): 38
glauces (3): 72; (4): 38
moucomii (4): 38
multisetus (3): 72
triticoides (3): 72; (4): 38
sp. (3): 8
Emmenanth penduliflora (3): 10, 53; (4): 31
Enarthrops indicus (4): 52
Encelia californica (3): 8, 10, 32, 39
farinosa (4): 24
Ephedra (3): 166
vires (1): 106
Ephedraceae (1): 106
Ephedrine (3): 132
Epilobium adenocaulon var. holosericeum (3): 56
Epilobium adenocaulon – Continued
var. parishii (4): 32
holosericeum (3): 56
Epipactis gigantea (1): 105-106
Euphracentaceae (3): 26; (4): 19
Equisetum kansanum (3): 26
laevigatum (3): 12, 26; (4): 20
telmateia var. braunii (3): 12, 26; (4): 20
Eremocarpus setigerus (3): 12, 47; (4): 30
Eriastrea filliformis (3): 59
sapphirinum ssp. dasyanthum (4): 33
Ericaceae (1): 108; (2): 57; (3): 46, 105; (4): 30
Erichsonius (4): 4, 6
Eriogonum boarish (6): 32; (4): 24
canadensis (3): 32; (4): 24
discoides (3): 32; (4): 24
follens (3): 32
Ericocephalus (2): 38
Africanus (2): 1, 4, 6, 8, 17, 19, 21-22
Eriodictyon crassifolium (4): 31
traskiae (3): 8, 23, 53
Eriogonum elongatum (4): 34
fasciculatum (3): 81; (4): 28
f. foliosaefolium (4): 34
giganteum ssp. formosum (3): 60
ssp. giganteum (3): 8, 20, 35, 60
gracile (4): 34
latifolium ssp. grande (3): 8, 23, 60
nodum (3): 60
var. var. (4): 34
parvifolium (3): 167
thomasi (1): 106, 112
sp. (1): 38
Eriophyllum confertiflorum (3): 8; (4): 24
var. confertiflorum (3): 32
nevii (3): 8, 33
Erodium cicutarium (3): 10, 52; (4): 31
moschatum (3): 53; (4): 31
obtusipunctatum (3): 53; (4): 31
Eryngium arizonicum var. parishii (4): 22
Erysimum capitatum (1): 108
sp. healianum (1): 105, 108
cheiri (3): 40
Eschscholzia californica (1): 111; (4): 33
var. californica (3): 57
var. pinnatifolius (3): 57; (4): 33
elegans (3): 57
parishii (1): 111
ramosa (3): 10, 22, 57
wrigleyana (3): 57
sp. (3): 10
Espeletia (2): 33, 43
Eucalyptus spp. (3): 56
Eucantheromyces (3): 131
Eucrypta chrysanthemifolia (3): 6, 53; (4): 31
Eulochus smaragdinus (2): 62
Eupatoriaceae (1): 89-103; (2): 27-28, 30, 36
wood anatomy of (1): 89-103
Eupatorium (1): 89-90, 97, 100, 102
billergianum (1): 89, 91, 94, 97-100
celidifolium (1): 89, 91, 96-97, 99-100
dalea (1): 89, 91, 95, 99
daleutoides (1): 89, 91, 95
frustratum (1): 89-91, 97, 102
hiemal (1): 89, 91, 95, 97, 99-101
Inatiyantha (1): 89, 91, 95, 99, 101-102
morifolium (1): 89, 91, 95-97, 100
odoratum (1): 89-91, 95, 100
oestudiantinum (1): 89, 91, 95, 97, 100
petiolar (1): 95
pittieri (1): 90-91, 95, 97, 100
portoricensis (1): 90-91, 95, 97, 100
sorensinum (1): 90-91, 95, 97-100
theaefolium (1): 90-91, 97-100, 102
Euphorbia (3): 76
albomarginata (4): 30
crenulata (3): 47
misera (3): 23, 47
nepeta (3): 37
polycarpa (4): 30
INDEX

[...] Continued

serpyllifolia (3): 47, (4): 30
spathulata (3): 47-48, 50
Evax acaulis (4): 24
Fagaceae (1): 32
Fascicula angustifolia (3): 73
dertonensis (4): 38
elata (3): 73
megahra (3): 10, 72, (4): 38
myuros (3): 72, (4): 38
octoflora (3): 72
pachica (3): 10, 72
pratensis (3): 73
reflexa (3): 73

spp. (3): 12
Filago arizonica (3): 32
californica (3): 32
ealcalia (3): 32, (4): 24
spp. (3): 12
Ficellae (3): 26, (4): 20
Fitchia (1): 19, (2): 39, 43
Floctiva (2): 38
flowering plants, phylogenetic classification
(4): 57-66
fly, corded (2): 62
Fox, small island grav (3): 16
Frankenia grandiflora (3): 52
Frankenia sp. (3): 8, 10, 55, 66; (3): 138,
140, 143-144, 148-149, 155-157
Frankeniaceae (3): 52, 137
Franseria (2): 1
champiiensis (1): 11
Fraseria parryi (4): 31
Fraxinus dipetala (1): 111, (4): 32
velutina var. coriacea (4): 32
California Glory (4): 73
Fumariaceae (4): 33
Gaertneria bipinnatifida (3): 29
Galium angustifolium (3): 8, 64
sep. angustifolium (4): 45
aparine (3): 8, 64, (4): 35
catalanense (3): 8, 64
mugilense (3): 65
nuttallii (3): 8
sep. nuttallii (4): 45
var. nuttallii (3): 65
siccum (3): 64
spp. (1): 80
Galvesia (1): 105
juncea (1): 113

Galvesia speciosa - Continued
66; (4): 69
Gambia speciosa (3): 66
Garaventa, A. (2): 67
Garrya fremontii (1): 80
Gaultheria shallon (1): 120
Gaura sinuata (3): 56
Gelastocoridinae (3): 111
Gentiana lindia (3): 48
Gentianaceae (3): 52; (4): 31
Gerace viscida (3): 163
Geraniaceae (3): 52; (4): 31
Geranium carolinianum (3): 53; (4): 31
Gerber, H. (2): 2
Gerris (3): 12, 134
Gerroidea (3): 112
achilleaeolia (1): 58
aliqua (1): 25-30, 32-45, 47, 49-51, 53, 55,
57-58, 62-68, 70, 72-75
spp. brefvilia (1): 34
angelensis (3): 10, 59; (4): 33
bicolor (3): 59
brecciarum, Group (1): 25
capitata sp. senior, santanifolia (3): 59; (4): 33
cilvorum (2): 67-70, 78, 80
clokeyi (1): 25, 27-45, 47, 49-51, 53-55, 57-59,
61, 64-71, 73-75
dianthodes (3): 59
diegensis, Group (1): 26
erecta (2): 73
flutiosa (3): 59
inconspicua (1): 26, 72
lacinuata (2): 67-68, 72-73, 77, 79-80
Group (2): 67-80, 93
var. alpina (2): 73
var. erecta (2): 73
lomensis (2): 67-69, 72-73, 75, 79-80
Group (2): 67-80, 93
var. alpina (2): 73
var. erecta (2): 73
millefolia (1): 58; (2): 67-70, 78, 80
var. var. (2): 68
minor (1): 25-45, 47, 49-55, 57-59, 61-75
modocensis (3): 171
multicaulis (3): 59
spp. millefoliata (2): 68
spp. nevinii (2): 72
var. clivorum (2): 68
var. millefolia (2): 72
var. millefolia (2): 68
nevinii (2): 67, 69, 71, 74, 78, 80; (3): 8, 10,
23, 59
ochroleuca, Group (1): 25-26, 74
Section (2): 67-68, 80
splendescia (2): 72
tenutifera, Group (1): 25-26
transmontana (1): 25-26, 28-30, 32-39, 41-45, 47,
49-51, 64-68, 71-75, (3): 171
millefolia (1): 58; (2): 67-70, 78, 80

var. var. (2): 68
minor (1): 25-45, 47, 49-55, 57-59, 61-75
modocensis (3): 171
multicaulis (3): 59
spp. millefoliata (2): 68
spp. nevinii (2): 72
var. clivorum (2): 68
var. millefolia (2): 72
var. millefolia (2): 68
nevinii (2): 67, 69, 71, 74, 78, 80; (3): 8, 10,
23, 59
ochroleuca, Group (1): 25-26, 74
Section (2): 67-68, 80
splendescia (2): 72
tenutifera, Group (1): 25-26
transmontana (1): 25-26, 28-30, 32-43, 45, 47,
49-51, 61-75
traskiae (3): 59
valdiviensis (2): 67-69, 72-73, 76, 79-80
spp. (3): 10
Gilias, Cobwebby (1): 25-75
Leaf-stemmed (1): 58
Given, Robert K. (3): 24
Gloeosporiaceae (3): 131, 135
Gnaphalium (3): 76; (4): 39
bicolor (3): 33; (4): 24
californicum (3): 33; (4): 24
chilense (3): 33
lepto-album (1): 11; (3): 33; (4): 24
microcephalum (3): 33; (4): 24
palestrense (3): 33; (4): 24
purpureum (3): 33; (4): 24
spp. (3): 8
Gonystylus sp. (2): 37
Godetia epilobioides (3): 56
quadrivulnera (3): 36
Goniothalamus (2): 93
Gonioicus (4): 54
Gonioicolea (4): 54
Goodeniacaeae (2): 93; (3): 70

April 30, 1968]
ALISO

[Vol. 6, No. 4

Grannorum (3): 105; (3): 70
Grant, Karen A.
Records of hummingbird pollination in the western American flora.
I. Some California plant species.
with Verne Grant (2): 51-66
II. Additional California records.
(with Verne Grant) (3): 103-105
III. Arizona records.
(with Verne Grant) (3): 107-110
Grant, Verne A.
Records of hummingbird pollination in the western American flora.
I. Some California plant species.
(with Karen A. Grant) (2): 51-66
II. Additional California records.
(with Karen A. Grant) (3): 103-105
III. Arizona records.
(with Karen A. Grant) (3): 107-110
Genetic and taxonomic studies in Gilia. XIII.
The Gilia laciniata group. (2): 67-80
Grasses, annual and perennial (1): 80
Grindelia robusta (3): 33
Haplopappus palmeri (4): 24
Hamamelidales (1): 19; (2): 39
Gymnoascaceae (1): 122-123
Gutierrezia bracteata (4): 24
Grasses, annual and perennial (1): 58
Hamilton, Edward (4): 18
Hazardia squarrosa (3): 33
Haplopappus palmeri (4): 24
spp. gramineoides (3): 8; 33; (4): 24
venetus ssp. furfuraceus (3): 33; (4): 24
Haplopappus palmeri (3): 24
Heliantheae (1): 19; (2): 27-28, 30, 36
Helianthemum greenei (3): 22, 35, 44
Helenium puberulum (3): 33
Hebridae (3): 112-132
Hebrus (3): 112, 132-133
Hebichneumon (3): 136
Hedysarum scoparium (3): 12, 33, 57, 61
spp. veronicoides (3): 33; (4): 24
Harpagonella palmeri (3): 12, 38
Hazardia squarrosa (3): 33
hawkmoth (3): 109
Heady, Harold (4): 18
Hebridae (3): 112, 132-133
Hebrus (3): 112, 132
Helenium (2): 27-28, 36
Helinum puberulum (3): 33
Heliantheae (1): 19; (2): 27-28, 30, 36
Helianthemum greenei (3): 22, 35, 44
Scoparium (3): 35
var. alderstoni (4): 28
Helenium (2): 35, 45
Helianthus annuus ssp. lenticularis (3): 33; (4): 24
graciliflorus (4): 24
Heliotropium curassavicum (3): 12
var. oculatum (3): 38; (4): 26
chenopodioides (3): 38
Heliotrophioides (3): 112
Hemiptera (3): 111, 113, 131-134; (4): 75
Hemizionia (1): 19; (2): 39
clementina (3): 8, 22, 33
fasciculata (3): 12, 34; (4): 24
var. ramossissima (3): 34
minthorini (2): 10
paniculata (4): 24
ramossissima (3): 34
Henrickson, James S. (1): 90; (2): 2; (3): 25
Pollen morphology of the Fouquieriaceae (3): 137-160
Herbarium, Baker, C. F., the (4): 41
Claremont, the (4): 41-45
present condition (4): 44
Jones, Marcus E., the (4): 42
Pomona College, the (4): 41
Rancho Santa Ana Botanic Garden, the (4): 44
Herpomyces (3): 131
Hesperastragalus didymocarpus (3): 47
gambelianus (3): 38
Hesperocnide tenella (3): 6, 68
Hesperolinon microanthum (3): 55; (4): 32
Hesperomyces (2): 39
Hesperomyces (3): 112, 131, 133
Hesperonia californica (3): 56
Hesperoptera (3): 111
Heteromeles arbutifolia (3): 6; 8, 17, 63; (4): 35
var. macrocarpa (3): 63
Heteroptera (3): 34; (4): 24
Hibiscus lasiocarpus (2): 39
Hill, Albert J.
Chromosome numbers of Spermatophytes, mostly California (with Peter H. Raven and Donald W. Kyhos) (1): 105-113
Hippoboscidae (3): 132
Hirschfieldia incana (3): 38
Holocarpha virgata (4): 24
Holodiscus decolour var. franciscanus (3): 63
Homoptera (3): 111
honey bee (2): 57, 65
Hooker minor (3): 70
Hordeum (3): 76
californicum (3): 12, 73; (4): 38
glaucum (3): 10, 73; (4): 38
hystrix (3); 73; (4): 38
leporinus (3); 73; (4): 38
murinus (3): 73
notosus (3): 73
pusillum (3): 73
vulgaris (3): 73
Hosackia americana (3): 48
aurthyllodes (3): 48
brachycarpa (3): 48
martina (3): 48
rubella (3): 50
strigosus (3): 50
wrigeliana (3): 50
Howell, J. T. (4): 18
hummingbird, Allen (2): 52, 54-55, 60, 63-64;
(3): 103-105
Anna (2): 53, 57, 62-63; (3): 103-105
Blacuilla (3): 52, 54, 57, 63, 65;
(3): 107-108
Blue-throated (3): 110
Broad-billed (3): 108
Broad-tailed (2): 57
Calliopsis (2): 52-53, 57, 60-61, 63-64; (3): 108
Costa (2): 52, 54-56, 58, 61, 63, 65;
(3): 103-105, 108
pollination (2): 51-66; (3): 103-110
Rivoli (3): 105-106
Rufous (2): 52-53, 55, 57, 59, 61, 63-65;
(3): 105, 107-108
Hurd, P. D. (3): 113
Hydrocotyle (2): 66
hydrocotylides (2): 44
Hydrocotyle (3): 112
Hydrophyllaceae (1): 109; (2): 43; (3): 53, 76, 103, 158; (4): 31, 39
Hyliota (4): 54
Hymenoxes (2): 2, 8
monogyra (2): 6, 10, 12, 15
salsola (2): 1, 5-6, 10, 12, 17, 19, 38
Hymenoptera (3): 113, 131
Hypericaceae (1): 109; (4): 28
Hypericum concinnum (3): 109
formosum var. aculeati (4): 28
Hypochoeris glabra (3): 34; (4): 24
Hypist emoryi (2): 55; (4): 69
Idahoan (1): 103
scapigera (1): 108
Idria (3): 137, 146, 157, 159
columnaris (3): 140-141, 144, 148, 155-156
Ilythea (3): 132
Ilythea (4): 32
Ilitis, Hugh (1): 14
Inuleae (1): 93, 102; (2): 27-28, 30, 43
Ipomea hederacea (3): 45
Iponomia albida (2): 73
Ipomopsis aggregata (2): 57, 59, 61; (3): 107
var. texana (3): 107
Iridaceae (3): 69; (4): 37
Iris (1): 124
missouriensis (3): 172

94
INDEX

95

Lathyrus - Continued

tingitanus (3): 8, 48
Laurocerasus (3): 64
illicifolia (3): 64
Lavatera (3): 71
assurgentiflora (3): 10, 19, 25, 25
Layia platyglossa ssp. campestris (3): 10, 34;
(4): 24
sp. (4): 72
Leech, H. B. (3): 113, 121
Lees, Dennis (3): 24
Leguminosae (1): 109; (3): 47
Leiodidae (4): 37
Lemna gibba (4): 37
minima (4): 37
Lemnaceae (4): 37
Lenz, Lee W. (1): 27; (3): 139
Chromosome numbers in the Alliaceae (Liliaceae)

Director's Report, The (1): 115-132; (2): 83-
100; (3): 161-178; (4): 67-84
Lepiophthora calycina (1): 109
fragrans (3): 8, 34
Lepidion densiflorum var. pubicarpum (1): 108
lasiocarpum var. lasiocarpum (3): 40
latipes (3): 40
nudum (3): 40
nudum (4): 26
var. nudum (3): 40
virginicum var. pubescens (3): 40
sp. (3): 12
Lepidopterum calycina (1): 125; (2): 95
Leptidium squamatum (2):

velliæ (3): 112, 114, 116, 134-135

Laboulbeniales (1): 122-123; (2): 91; (3): 170;
(4): 1, 47, 74, 75

on semi-aquatic Hemiptera (3): 111-136

Lactuca serriola (3): 34; (4): 24
virea (3): 34
Lagophylla ramosissima (4): 24
Lamarcia aurea (3): 73; (4): 38
Lamb, I. M. (3): 113
Lamiaceae (3): 54, 76; (4): 32
Lasiocladus pallasii (3): 112
Lasiocladus sylvii (3): 103
Lastariaceae chlori (3): 95
Lathyrus alefeldii (3): 48
laetiflorus ssp. alefeldii (3): 48; (4): 30
var. laetiflorus (1): 110

Lathyrus = Continued
tingitanus (3): 8, 48
Laurocerasus (3): 64
illicifolia (3): 64
Lavatera (3): 71
assurgentiflora (3): 10, 19, 25, 25
Layia platyglossa ssp. campestris (3): 10, 34;
(4): 24
sp. (4): 72
Leech, H. B. (3): 113, 121
Lees, Dennis (3): 24
Leguminosae (1): 109; (3): 47
Leiodidae (4): 37
Lemna gibba (4): 37
minima (4): 37
Lemnaceae (4): 37
Lenz, Lee W. (1): 27; (3): 139
Chromosome numbers in the Alliaceae (Liliaceae)

Director's Report, The (1): 115-132; (2): 83-
100; (3): 161-178; (4): 67-84
Lepiophthora calycina (1): 109
fragrans (3): 8, 34
Lepidion densiflorum var. pubicarpum (1): 108
lasiocarpum var. lasiocarpum (3): 40
latipes (3): 40
nudum (3): 40
nudum (4): 26
var. nudum (3): 40
virginicum var. pubescens (3): 40
sp. (3): 12
Lepidopterum calycina (1): 125; (2): 95
Leptidium squamatum (2):

velliæ (3): 112, 114, 116, 134-135

Laboulbeniales (1): 122-123; (2): 91; (3): 170;
(4): 1, 47, 74, 75

on semi-aquatic Hemiptera (3): 111-136

Lactuca serriola (3): 34; (4): 24
virea (3): 34
Lagophylla ramosissima (4): 24
Lamarcia aurea (3): 73; (4): 38
Lamb, I. M. (3): 113
Lamiaceae (3): 54, 76; (4): 32
Lasiocladus pallasii (3): 112
Lasiocladus sylvii (3): 103
Lastariaceae chlori (3): 95
Lathyrus alefeldii (3): 48
laetiflorus ssp. alefeldii (3): 48; (4): 30
var. laetiflorus (1): 110

Lathyrus = Continued
tingitanus (3): 8, 48
Laurocerasus (3): 64
illicifolia (3): 64
Lavatera (3): 71
assurgentiflora (3): 10, 19, 25, 25
Layia platyglossa ssp. campestris (3): 10, 34;
(4): 24
sp. (4): 72
Leech, H. B. (3): 113, 121
Lees, Dennis (3): 24
Leguminosae (1): 109; (3): 47
Leiodidae (4): 37
Lemna gibba (4): 37
minima (4): 37
Lemnaceae (4): 37
Lenz, Lee W. (1): 27; (3): 139
Chromosome numbers in the Alliaceae (Liliaceae)

Director's Report, The (1): 115-132; (2): 83-
100; (3): 161-178; (4): 67-84
Lepiophthora calycina (1): 109
fragrans (3): 8, 34
Lepidion densiflorum var. pubicarpum (1): 108
lasiocarpum var. lasiocarpum (3): 40
latipes (3): 40
nudum (3): 40
nudum (4): 26
var. nudum (3): 40
virginicum var. pubescens (3): 40
sp. (3): 12
Lepidospartum squamatum (2): 30
Leptilium canadense (3): 35
liniflorum (3): 35
Leptodactylon californicum (4): 33
Linaceae (3): 55; (4): 32
Limonium perezii (3): 8, 58
Linaceae (3): 55; (4): 32
Linaria bipartita (3): 67; (4): 35
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Limonia perezii (3): 8, 58
Linaceae (3): 55; (4): 32
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Linaria bipartita (3): 67; (4): 35
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Linaria bipartita (3): 67; (4): 35
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Linaria bipartita (3): 67; (4): 35
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Linaria bipartita (3): 67; (4): 35
Linaria nitida (3): 67; (4): 35
Lilium (1): 54
humboldtii (2): 58, 65
var. ocellatum (4): 37
parryi (2): 61
pauy (2): 85
Lyonothamnus (1): 110
convalas (3): 48
grandiflorus (1): 110; (3): 48
hamatus (3): 48; (4): 30
heermannii (3): 48; (4): 30
humistratus (3): 48
psorians (3): 48; (4): 30
rigidos (1): 110
salsuginosus (3): 48
var. brevivexillius (1): 110
var. salsuginosus (1): 110
convarious (3): 8, 50; (4): 30
var. brevialatus (1): 110
strictus (1): 110; (3): 50; (4): 30
subpinnatus (3): 50; (4): 30
ssp. (3): 10, 12
Ludwigia peploides (4): 32
Lupinus (3): 76; (4): 39
albifrons (3): 50
agardhianus (3): 46, 49; (4): 30
albifrons (1): 110; (3): 8
var. albifrons (3): 50
arbores (3): 167
arizonicus (2): 46, 49
bicolor spp. microphyllus (3): 50
ssp. tridentatus (4): 30
ssp. umbellatus (3): 50
brevior (3): 46, 49
concinuus (3): 45-47, 49; (3): 50
ssp. concinnus (2): 45, 48
ssp. optatus (2): 45
ssp. occurti (2): 45-46
var. agardhianus (2): 46
var. brevior (2): 46
var. concinnus (3): 30
var. desertorum (2): 46
var. optatus (2): 45
var. pallidus (2): 46
congdonii (2): 46
densiflorus (3): 167
var. austrocollum (4): 30
desertorum (2): 46
excubitus var. hallii (4): 30
gracilis (2): 46; (3): 50
hallii (3): 50
hirunisissimus (3): 10, 50; (4): 30
micrancus (2): 46
microanthus (3): 50
occorti (2): 46
pallidus (2): 46, 49
pontii (2): 49
spiriflorus (2): 45-49; (4): 30
ssp. inopinatus (2): 45-49
ssp. mohavensis (2): 47, 48, 49
ssp. pondii (2): 49
ssp. sparsiflorus (2): 47-49
var. brevior (2): 46
var. inopinatus (2): 48
var. pontii (2): 48
subvexus (3): 167
succulentus (3): 50
truncatus (3): 10, 50; (4): 30
ssp. (3): 10, 12
Lycium califomicum (3): 111, (3): 55
var. laxillorus (3): 32
sp. (3): 112-130, 135
sp. (1): 113, 125-130, 135
Macrovelia (3): 112-113, 128, 134-135
Mada dissiflora (3): 34
exigua (3): 34
gracilis (3): 34; (4): 24
sativa (3): 34
Madia — Continued
Mahonia (1): 124; (2): 94
Malacothamnus fasciculatus ssp. catalinensis (3): 8, 23, 55
var. laxiflorus (4): 32
Malacothamnus clevelandii (4): 24
saxatilis (3): 8
var. tenuifolia (3): 34
Mallow (3): 132
Malus fusca (4): 71
Malva parviflora (3): 55
Malvaeeae (3): 111; (3): 55; (4): 32
Malvastrum catalinense (3): 55
exile (3): 55
fasciculatum (3): 55
Manzanita leaf gall aphid (1): 119
Marah macrocarpus (3): 8, 46; (4): 28
Marrubium vulgare (3): 54; (4): 32
Maristea vestita (4): 20
Marsileaceae (4): 20
Marula cotula (3): 29
Matricaria matricarioides (3): 34; (4): 24
Matula, Elizi (3): 139
Medicago arborea (1): 110
hispida (5): 50; (4): 30
polymega (3): 30
savila (3): 50; (4): 30
Molanagromyzia agromyzicae (1): 121
Melica flexuosa (4): 38
inperfecta (3): 8, 73; (4): 38
fortreyana (3): 73
Mellilotus albus (3): 51; (4): 30
indicus (1): 110; (3): 51; (4): 30
Mellissia (3): 100
Mentha aquatica (3): 54
x. piperita (3): 54
spicata (3): 54
ssp. (3): 12
Mentzelia affinis (3): 55
micrantha (3): 8, 55
pectinata (4): 32
Merragata (3): 112, 132
Mesembryanthemum aequilateral (3): 27
cordifolium (3): 27
x. crystallinum (3): 10, 12, 27
dodiflorum (3): 10, 12, 27
Mesovelidae (3): 112, 133
Metcalfe, C. R. (1): 58
Micranthopsis macrocarpa (3): 46
Microchtera chamissonis (3): 54
Micropus californica (4): 24
Microseris douglasii ssp. platycarpa (3): 34;
(4): 24
gracilis ssp. gracilis (4): 33
heterocarpus (3): 34; (4): 24
indleyi (3): 34
linearifolia (3): 36; (4): 26
ssp. (3): 19
Microvelia (3): 117-118, 120, 135
albomeleolata (3): 112
beantar (3): 118
ssp. (3): 118-121
Mikania (1): 89-90, 100
cordifolia (1): 90-95, 97, 99-100; (2): 25, 30
Milla (3): 171; (4): 76
biflora (2): 82
magnifica (2): 82
Mills, H. B. (3): 113
Mimoseeles (4): 14
lataneae (4): 14
Mimus (3): 70; (4): 39
anarchiacis ssp. australis (4): 35-36
brevipes (4): 35
cardinalis (2): 56, 61; (3): 66; (4): 35, 70
diffrus (4): 36
floribundus (4): 36
var. floribundus (3): 66
guttatus (4): 36
ssp. guttatus (3): 66
longiflorus (3): 66
piilosus (4): 36

ALISO [Vol. 6, No. 4]
INDEX

April 30, 1968]

Mimulus — Continued

puniceus (3): 8, 66; (4): 36
traskiae (2): 20, 67
sp. (3): 12
MiraLibia laevis (3): 10, 56; (4): 32
Modoc Cypress (1): 111; (3): 36
Mogavea (1): 105-106
confertiflora (1): 113
Monanthochloe lirratilis (3): 12, 73
Monardella lanceolata (4): 32
macrantha (3): 103
robinsonii (1): 109
undulata (1): 109
Monocotyledoneae (1): 106; (3): 69; (4): 36, 65
Montia perfoliata (3): 62
Morus (1): 41
Morgan, Reid (1): 452
moth, ceanothus stem gall
Mucorales (1): 122; (2): 92; (4): 75
Muhlbergia aepisephoria (4): 38
microspora (3): 10, 73; (4): 38
rigens (4): 39
Muille maritima (2): 82; (4): 37
Muller, Neil (3): 25
The Glæremontium (4): 41-45
Mycetophagidae (4): 54
Myodocha unispinosa (3): 112
Myrtaceae (3): 56
Myroxozora tuberosa (3): 57
Nasturtium officinale (3): 26
Myosotis arvensis (3): 59
spp. (3): 12
Nemophila aurita (3): 53
crithcidifolia (3): 53
menziesii (4): 31
ssp. nemmptia (3): 53
pedunculata (4): 31
racemosa (5): 52
Neotrophus varius (4): 71
Nicotiana bigelovii (3): 67; (4): 36
glauca (3): 67; (4); 36
Niebhaus, T. F. (4): 18
Norta altissima (3): 40
Notholaena californica (3): 27
Notoentenctaeae (3): 111
Nuphar polysepallum (2): 87
Nyctaginaceae (3): 56; (4): 32
Nycterebiaeae (3): 131-132, 135
Nymphaeaceae (4): 58
Ochtheridae (3): 111
Ocypina (4): 3-4, 6
Oenothea (1): 129; (4): 39
bistorta var. veitchiana (3): 167
californica (4): 32
contorta var. epilobioides (4): 32
hirtella (4): 106; (2): 63
hookeri (2): 61
ssp. grisea (4): 33
iuquata (3): 56; (4): 33
micrantha (3): 56; (4): 33
Oleaceae (1): 111; (4): 32
Olearia (2): 8, 38, 42
paniculata (2): 37
Oligomeris glaucescens (3): 62

Oligomeris — Continued

linifolia (3): 10, 62
Omalathusa (4): 58, 56
Onatraceaeae (2): 55, 92-93; (3): 25, 56, 170; (4): 18, 32, 39
Onopordon acanthium (1): 15-16, 18-19
Opatia (2): (3): 55, 66; 76; (4): 18
"demissa" (3): 41
ficus-indica (3): 41
littoralis (4): 8, 10, 19, 21, 39, 41
var. austrocalifornica (3): 41
var. littoralis (3): 41
var. vasyei (3): 41
megacantha (3): 41
occidentalis (3): 41
oricola (3): 19, 41
plujaconantha var. discata (3): 41; (4): 26
var. major (4): 26
prolifera (3): 10, 21, 41
ssp. (3): 10
Orchidaceae (1): 106; (3): 70; (4): 37
Omnithostaphylos oppositifolia (1): 119
Orobancheaeae (1): 111; (3): 57
Orobancheaeae (3): 25
bulbosa (3): 8, 57
californica (3): 57, 61
var. californica (3): 57
darrenii (3): 57
cooferi (1): 111
fasciculata (1): 111
var. fasciculata (3): 57
Orthocarpus densiflorus (4): 36
purpureus (3): 31; 67; (4): 36
Orthoptera (3): 113, 131
Osteospermum (2): 37
Oxalidaceae (3): 57; (4): 33
Oxalis albicans spp. californica (3): 57
californica (4): 33
corniculata (3): 57; (4): 33
pes-caprae (3): 57
Oxytys (1): 105
lutea (1): 107
Oxytynia (2): 21-22
acerosa (1): 2-12, 6, 20, 16, 18, 17, 38
Paederinae (4): 14
Paeonia californica (4): 33
Paeoniaeaeae (4): 33
Papaver californica (4): 33
Papaveraceaeaeaeae (1): 111; (3): 57; (4): 33
Parapholis incurva (3): 12, 74
Parietaria debilis (3): 68
Ridoliana (3): 6, 88; (4): 36
Parratt, Mark W. (3): 139
Hybridization and variation of Ponderosa and Jeffrey pines on Mt. San Antonio, California. (3): 79-96
Paspalum dilatatum (3): 74; (4): 39
distichum (3): 74; (4): 39
Pectocarya (1): 105
lineatis var. feroxula (1): 107; (3): 12, 38; (4): 36
pennicillata (1): 107; (3): 38
Peduncularis (2): 63
Sideriflora (2): 63; (4): 36
Pelargonium ×hortorum (3): 113
Pellaeana var. veitchiana (3): 10; 27; (4); 20
musconata (3): 10; (4): 20
spp. musconata (3): 27
Penstemon (1): 106; (2): 63
albomarginatus (1): 113
bridgesii (2): 63
centranthifolius (2): 63
clevelandii (2): 63
var. angelicus (1): 113
cordifolius (3): 8, 67
Petrophytus spp. austraulis (4): 36
labrosus (2): 64
newberryi (2): 80, 64
Penstemon – Continued
spectabilis (2): 54; (4): 36
ternatus (2): 64
Pentachondra lyoni (3): 30
Perezia microcephala (3): 8, 36; (4): 26
Periploca ceanothiella (1): 119; (2): 88;
(3): 166; (4): 42
Perityle emoryi (3): 10, 36
Pernomyscus manipulatus catalinae (3): 16
Peronema (4): 76
decora (3): 82
Peyritschia (4): 14
geminate (4): 10, 12, 52
Phaca fastitia (3): 47
leucopsis (3): 47
trichopoda (3): 48
Phacelia (3): 76; (4): 39
cicutaria var. hispida (3): 10, 53; (4): 31
distans (3): 53; (4): 31
egena (1): 109
grandiflora (3): 53; (4): 31
hispida (3): 53
imbricata ssp. patula (4): 31
lyonii (3): 8, 53
minor (3): 103; (4): 31
ramossissima var. suffrutescens (4): 31
tanacetifolia (2): 87
vicida (3): 53
Phalaenaridae (3): 133
Phalaris aquatica (3): 74
canadensis (3): 74;
lemmonii (3): 74
minor (3): 74; (4): 39
rubescens var. rubescens (3): 74
Philbrick, Ralph (3): 25
Philibertia hirtella (3): 28
Philobus (4): 6, 8
sp. (4): 6
Phlegmethontius (3): 109
Phloxorus (4): 48, 56
Phlox sp.
Phlois fastitia (3): 1-24
Pholisoma aurantium (3): 6, 53; (4): 31
racemosum (3): 6, 23
Pholiurus incurvatus (3): 74
Phoradendron bolleanum var. densum (1): 80
tomentosum ssp. macrophyllum (4): 36
villosum ssp. villosum (4): 38
sp. (1): 84, 86
Phorinia arbutifolia (3): 63
Phlomopsis scouleri (3): 12, 75
torreyi (3): 15, 75
phylogenetic classification of the flowering plants
(4): 57-105
Phytolophora (3): 71
Pickeringia (1): 105
montana (1): 116
Picris echidnas (3): 36
Pilosyles (1): 125, 127; (2): 95
thurberi (1): 125, 127; (3): 171
pine, Jeffrey (3): 79-96
Ponderosa (3): 79-96
western yellow (3): 79
Pinus attenuata (1): 80
jeffreyi (1): 78; (3): 79-96
lambertiana (1): 80; (3): 81; (4): 72
murrayana (1): 78
ponderosa (1): 76, 80; (3): 79-96
radiata (2): 89; (3): 167
remora (2): 89
Piptanthophyllaceae (2): 92
Piptanthus (2): 92; (3): 170
Piqeria (1): 90, 102
peruviana (1): 90-92, 95, 97, 99
Piptopusaceae (3): 58
Pityrogramma triangulare (3): 6, 27; (4): 29
viscosa (3): 6, 27
Plagiobothrys acanthocarpus (4): 26
arizonicus var. arizonicus (4): 26
var. catalinensis (3): 38
californicus var. macrines (3): 38
canescens (3): 38
nothofulvus (4): 26
Plagiobothrys – Continued
undulatus (4): 26
Plantaginaceae (1): 13, 111; (4): 33
Plantago bigelovii (3): 58
coronopus (3): 12, 58
dura (3): 58
cructa (3): 59; (4): 33
donkeriana var. californica (3): 58
insularis (1): 111
var. insularis (3): 58
major (3): 58; (4): 33
obversa (3): 58
parishii (3): 58
speciosa (3): 58
subnuda (1): 111
ssp. (3): 12
Platanaceae (1): 111; (3): 58; (4): 33
Platanus racemosa (1): 105, 111; (3): 6, 58;
(4): 27, 33, 36
Plataspidae (3): 112
Platystemon californicus (3): 58; (4): 33
cermus (3): 58
Plectritis (1): 105
ciliosa ssp. insignis (4): 36
macrocarpa (1): 113
Pleae (3): 111
Phacelia camphorata (3): 36
purpurascens (3): 12, 36
sericea (3): 36
Plumbaginaceae (3): 58
Poa annua (3): 74; (4): 39
bullosa (4): 39
scabrella (3): 8, 74; (4): 39
Posea (3): 76; (4): 18, 38-39
Pogogyne (1): 105
serpylloides (1): 109
disphoryphodes (4): 109
Polemoniaceae (1): 25; (2): 57, 91; (3): 55, 59,
76, 107, 137-138; (4): 18, 33, 39
Polemoniales (3): 158-159
Polemonia (1): 124
berris (3): 99
aromaticum (3): 97-98, 100
ssp. californicum (3): 100
ssp. columbianum (3): 100
calycium (3): 100
cochleareum (3): 100
delicatum (3): 98-100
ssp. delicatum (3): 100
ssp. scopulorum (3): 100
fasciculatum (3): 99
humile (3): 98
longi (3): 98
mexicanum (3): 98
montrosense (3): 99
nevadense (3): 98, 100
orthicaleare (3): 99
oreades (3): 99
oregencne (3): 100
paddenscens (3): 100
parvifolium (3): 98
var. haydenii (3): 99
var. parvifolium (3): 99
pulcherrimum (3): 98-100
var. lindley (3): 99
var. pileosum (3): 99
var. pulcherrimum (3): 99
quadriflorum (3): 98
reptans (3): 98
var. macrophyllum (3): 98
var. villosum (3): 98
rotatum (3): 99
shastense (3): 99
tevisii (3): 99
tricolor (3): 100
pollination, hummingbird (2): 51-66; (3): 103-105
Platyctenis (3): 112, 132
coptosomalis (3): 112
var. macrines (3): 112
Platycarpus depressus (3): 42
tetraphyllum (3): 42

Rumex salicifolius – Continued
forma ecallas (3): 60
ssp. (3): 12
Rupnua maritima (3): 12, 75
spiralis (3): 75
Ruppiaceae (3): 75
Ruta chalapensis (3): 65
glaucens (3): 65
Rutaceae (1): 112; (3): 65
Rutherford, Robert (3): 139
Sagina occidentalis (3): 42
Salazaria (1): 105
mexicana (1): 109
Salidaceae (3): 112
Salicaceae (1): 112; (3): 65; (4): 35
Salicornia subterrinalis (3): 12, 44
glaucina (3): 12, 44
Salix argyrophylla (3): 65
gooddingi (1): 112
hindsiana var. hindsiana (3): 65
laevigata (3): 6, 65; (4): 35
lasiolepis (1): 105, 112; (3): 6, 65; (4): 35
ssp. (1): 80
Salsoa kalli ssp. rutherfieldii (3): 44
ssp. tenuifolia (3): 44
pestiferia (3): 44; (4): 28
Salvia (2): 87
aethiops (2): 87
apiana (2): 54; (3): 8, 54; (4): 32
brandegei (1): 11
columbiana (3): 10, 54; (4): 32
lemonii (3): 107
mellifera (3): 8, 45, 54; (4): 32
spathacea (2): 27
Salviniae (3): 27; (4): 20
Sambucus caerulea (3): 42
callicarpa (4): 72
mexicana (1): 105, 107; (3): 6, 42; (4): 28
Samolus parviflorus (4): 34
San Clemente Island, California (1): 11; (3): 1,
5, 10, 22
flora of, notes on (1): 11
San Miguel Island (3): 22
San Nicolas Island (3): 22
Sanderson, M. W. (3): 113; (4): 1
Sandersoniomyces (4): 1-16
dicaricus (4): 1, 3-4, 10, 12, 14-15
Sanicula arguta (3): 16; (4): 22
bipinnatifida (4): 22
crassicaulis (3): 29; (4): 22
laciniata (3): 29
menziesii (3): 29
Santa Barbara Island (3): 22
Santa Catalina Island, A flora of (3): 1-77
Santa Cruz Island (1): 11; (3): 1, 22, 23
Santa Rosa Island (1): 11; (3): 22, 23
Santa Rosa Plateau, flora of (4): 17-20
Santalina (2): 1, 8, 21, 37
chamaecyparissus (2): 4, 8, 10, 14-15, 17
macchi (2): 21
virens (3): 4, 10, 17
Sarcostemma cymnochoides ssp. hartwegii (3): 20,
28
Satureja chandleri (4): 32
douglasi (3): 54; (4): 70
Saururaceae (1): 112; (3): 65; (4): 35
Saururus (1): 122
Saxifraga (1): 14
Saxifraga californica (4): 35
Saxifragaceae (1): 112; (2): 54; (3): 65; (4): 35
Scaevola (1): 150
Scalea (2): 43
Scheuchzeriaceae (4): 40
Scleranthus molle (3): 29
Scleranthus barbatus (3): 74
Schismatoptera rigida (3): 18
Scleranthus catenulatus (3): 167
Scrophularia californica ssp. californica (1): 113
var. floribunda (4): 36
mariandica (1): 113
montana (1): 113
villosa (3): 8; 23, 67
Scrophulariaceae (1): 113; (2): 26, 43, 60;
(3): 67, 76, 104; (4): 35, 39
Schizocodon tuberosa (4): 32
Scutellaria rostellae (3): 112
Synedrella nodiflora (3): 131
Secale cereale (3): 74; (4): 39
Selaginella bigelovii (3): 10, 36; (4): 18
Selaginellaceae (3): 26; (4): 18
Selagophyllum platycercus (2): 57
rufus (2): 52
sasin (2): 52
Sanecocia (2): 53, 43
douglasi var. douglasi (3): 36
lyonii (3): 8, 23, 36
vulgaris (3): 36
Senecio (1): 19; (2): 27-28, 30, 36, 43
Sequoia sempervirens (1): 118
Sequoiadendron giganteum (1): 118; (4): 71-72
Sericotheria franciscana (3): 60
Sibara filifolia (3): 20, 22, 40
Sida hederacea (3): 55; (4): 32
Sidathea malvaeflora ssp. spartifolia (4): 32
Silene anticarpa (3): 10, 42
gallica (3): 10, 42; (4): 28
laciniata (2): 53; (4): 28
Sonchus major (4): 69
multinervia (3): 43
ssp. (1): 80
Silphium marianum (1): 14, 16, 18-19, 21, 23;
(3): 36
Simmondsia (1): 105
chinensis (1): 11, 107, 121; (2): 87; (3): 163
Simaptenus (3): 38
Sisymbrium altissimum (3): 40; (4): 26
hiro (3): 40
nasturtium-aquaticum (3): 40
officialis (3): 40; (4): 26
orientale (3): 40
Sisyrinchium bellum (3): 10, 69; (4): 37
Sitanion hystrix (4): 39
sibatum (3): 72; (4): 39
skippor (3): 109-110
Skottsberg, Carl (1): 14
Smith, C. F. (1): 11
Solanaceae (1): 113; (2): 43; (3): 67, 158;
(4): 38
Solanum clemey (3): 68
douglasi (3): 113; (3): 8, 67; (4): 36
elaegnofoenum (3): 87
wallacei (3): 8, 67
var. clemey (3): 68
var. wallacei (3): 20
xantii (4): 36
Solidago californica (3): 36; (4): 26
Sonchus asper (3): 36; (4): 26
oleraceus (3): 36-37; (4): 26
tenerrimus (3): 36
ssp. (3): 6
Sophia pinnata (3): 38
Sorghum bicolor (3): 74
halepense (3): 74; (4): 39
vulgaris (3): 74
Spartium junceum (3): 51
Specularia biflora (3): 42
Spergula arvensis (3): 43
Spergularia bocconii (3): 43
macrotheca (3): 12, 167
var. macrotheca (3): 43
martine (3): 12, 43
villosa (3): 43
Sphaele fragrans (3): 54
Sphaeralcea acuticaulis (1): 111
Sphaerostigma micranthum (3): 56
Sphenopsida (3): 26; (4): 19
Stachys rigida (4): 32
Stahelina arborens (3): 18
Staphylea bolanderi (1): 105, 113
Venegasia carpesioides (4): 26
Verbena bracteata (3): 12, 68
lasiosathyis (1): 112; (4): 36
prostrata (3): 68
robusta (3): 8, 68
Verbenaeeae (1): 113; (3): 68; (4): 36
Vernonia baccharoides (1): 95
Vernonieae (1): 18, 24; (2): 27-28, 36-37
Vicia americana sp. oregana (4): 31
angustifolia (1): 111
dasyacarpa (3): 51
exigua (3): 51; (4): 31
Vinca major (3): 28
Viola pedunculata (3): 10, 68; (4): 36
purpurea (1): 80
Violaceae (2): 26; (3): 68; (4): 36
Vitis girldiana (3): 8, 69
Walkington, David (3): 25
Warionia (1): 14
saharae (1): 14-16, 18, 21-22
wasp, pseudomasarid (3): 103
weevil, vegetable (3): 166
Wherry, Edgar T.
Our temperate tufted Polemoniums. (3): 97-101
Wilkesia (2): 8
Wilson, Carl (4): 58
Woodford, A. O. (3): 25
Woodwardia fimbrata (4): 20
Wrigley, Philip K. (3): 24
Xanthium pennsylvanicum (3): 37
spinosum (3): 37
strumaria (2): 2-3, 5-6, 17; (3): 37; (4): 26
spp. (3): 8
Xanthoxalis californica (3): 57
Xylococcus bicolor (3): 8, 47; (4): 30
Xylocopa (2): 55, 61
brasiliarorum (3): 105
Yucca whipplei (3): 164-165; (4): 37
Yunquea (1): 13-13, 23
tenzi (1): 16, 18, 23
Zannichellia palustris (4): 40
Zannichelliaeae (4): 40
Zauschneria californica (2): 57
ssp. angustifolia (3): 56
ssp. californica (3): 56
ssp. mexicana (3): 56; (4): 33
cana (3): 56
latifolia (2): 55
villosa (3): 56
spp. (3): 8
Zea mays (3): 145
Zigadenus fremontii (4): 37
Zostera marina (3): 12, 75
Zosteraceae (3): 75
Zuill, Henry (4): 18
Zygophyllaceae (4): 36
RANCHO SANTA ANA BOTANIC GARDEN

FOUNDER

Susanna Bixby Bryant

TRUSTEES

Ernest A. Bryant, Jr. .........................................................Chairman
Stuart O'Melveny ..............................................................Secretary
Irving M. Walker
Ernest A. Bryant, III
Oscar T. Lawler

STAFF

Lee W. Lenz, Ph.D.................................................................Cytologist and Director
Richard K. Benjamin, Ph.D. ................................................Mycologist and Editor
Lyman Benson, Ph.D. (Pomona College) .......................Research Associate in Taxonomy
Sherwin Carlquist, Ph.D ....................................................Research Associate in Anatomy
Mary Coffeen, B.S ..........................................................Supervisor, Youth Education Program
Chris Davidson ..........................................................Research Assistant
John Dourley ..............................................................Superintendent
Percy C. Everett ............................................................Superintendent Emeritus
Verne Grant, Ph.D.* ........................................................Geneticist and Experimental Taxonomist
Larry L. Kistler ..............................................................Research Assistant
Nick Lolonis, M.S..........................................................Horticulturist
Philip A. Munz, Ph.D., Sc.D ................................................Director Emeritus
Cledith Rue .................................................................Secretary
Warren Sullivan ............................................................Nurseryman
Robert F. Thorne, Ph.D ....................................................Taxonomist and Curator of the Herbarium
Myra White, M.S. in L.S ....................................................Librarian
Patricia Wilder, M.S. (Pomona College) .........................Associate Herbarium Botanist

*Resigned August, 1967
RANCHO SANTA ANA BOTANIC GARDEN

Dedication of Garden Foundation to the Board of Trustees for the Rancho Santa Ana Botanic Garden of the Native Plants of California:

"The Nature, Object and Purpose of the Institution hereby Founded and to be Maintained Hereunder:

"Its Nature: A botanic garden of the native plants of California, herbarium and botanical library, containing living and/or preserved specimens of trees, plants and flowers native to California, and literature relating thereto.

"Its Object: The preservation and improvement of the property now transferred and such property as may hereafter be transferred to the Trustees for those who not only wish to enjoy, but to study, assembled in one accessible locality, native California plants; and for the advancement of science and education with reference to plant life indigenous to the State of California.

"Its Purpose: (a) An institution founded primarily for scientific research in the field of local botany.

(b) To preserve the native California flora, try to replenish the depleted supply of some of the rarest plants which are rapidly being exterminated, and bring together in a comparatively small area as complete a collection of the rich store of native California plants as can be grown in this southern section of the state, thereby promoting the general welfare of the people of the state by providing the means for encouraging and carrying on the above mentioned activities in said state and by doing such other things as may be necessary and desirable to carry out the objects thereof."