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The Years 1960–1977

Lee W. Lenz
Rancho Santa Ana Botanic Garden, Claremont, California

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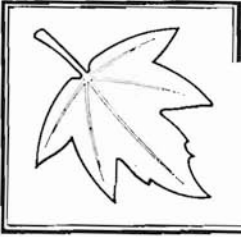


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THE YEARS 1960-1977

Previous to 1960 the garden reports—monthly, quarterly, or annual—had been privately published with distribution restricted to members of the Board of Trustees, the Councilors, until they were disbanded, and members of the garden staff. Beginning in 1960 the annual reports, which were made public and widely distributed, fully recorded the activities of the botanic garden. Because they are generally available they need not here be reviewed in detail.⁹⁴

In October 1959 the Board of Trustees announced the retirement of Dr Munz effective 1 September 1960 and Dr Lenz was appointed to succeed him. In the meantime Dr Lenz was named Assistant Director and granted a leave of absence for the period March to September which he spent in Europe and Russia familiarizing himself with the botanical and horticultural institutions of those countries.

Upon his retirement, the Board conferred on Dr Munz the title of Director Emeritus and he retained an office at the garden and continued his work on the *Onagraceae of North America* which was published in 1965 as volume five of the *North American Flora*, the culmination of 42 years of study on the group. For this achievement Munz was awarded the Henry A. Gleason Award of Merit which was presented to him in 1966 at the annual dinner of the Botanical Society of America. After his retirement Munz began work on a series of popular wildflower books: the first, *California Spring Wildflowers*, appeared in 1961; the second, *California Desert Wildflowers*, in 1962; the third, *California Mountain Wildflowers*, in 1963; and the last, *Shore Wildflowers*, in 1964, all published by the University of California Press. After *A California Flora* was published, Munz began assembling materials for a supplement to the Flora and this material along with corrections to the original work were published in 1968 as a *Supplement to A California Flora*.

After completing the supplement Munz began work on *A Flora of Southern California* which was in press at the time of his death on 10 April 1974 at the age of 82. The new work covered very much the same geographical area as did his original *The Manual of Southern California Botany* published nearly 40 years earlier. The floras stand as fitting memorials to a man

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whose impact upon California botany was felt for over a half century. An appreciation and bibliography were published in the 1975 issue of *Aliso*. In 1974, through contributions made by his family and friends, a Philip A. Munz Memorial Book Fund was established and will be used to add to the garden's library important taxonomic works not already in the collection and for which current funds would not be available. All books purchased from this fund bear a specially designed bookplate.

In May 1960 it was announced that Dr Peter Hamilton Raven had been appointed Taxonomist and Curator of the Herbarium and given a leave of absence until 1 September 1961 to enable him to continue his studies of the Onagraceae at the British Museum (Natural History), London. Dr Raven (b. 1936) was born in Shanghai, China, and received his Ph.D. from the University of California, Los Angeles. His speciality, as was his predecessor's was the Onagraceae. Raven's tenure at the botanic garden was short, however, and in 1962 he accepted a position at Stanford University. His "Flora of San Clemente Island" was published in *Aliso* in 1965.

In 1962 an announcement was made of the appointment of Dr Robert F. Thorne as Taxonomist and Curator of the Herbarium. Robert Folger Thorne (b. 1920) received his Ph.D. from Cornell University and before coming to the botanic garden had been Professor of Botany and Curator of the Herbarium at the University of Iowa. Thorne's interests largely in floristics, plant geography, and plant phylogeny had been broadened by extensive traveling abroad. Under his dynamic curatorship the garden's herbarium with 146,246 specimens in 1962 had grown to 263,000 by 1977 and the total POM/RSA collection to about 600,000.

One of the agreements reached when the botanic garden moved to Claremont was that the Pomona College herbarium would be housed at the botanic garden thus making the two collections available within the same building. Originally the botanic garden herbarium occupied the second floor of the administration building and the Pomona herbarium the third floor. In 1965 a National Science Foundation grant was made to Pomona College for the improvement of its herbarium and the hiring of additional personnel. New steel cabinets were purchased by Pomona and the two collections were physically combined; however, each institution retained ownership of its own specimens. The integration of the collections was of major importance in that it decreased the labor required for curat-

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Portion of the library (top); the herbarium occupies two floors of the administration building.

ing but more important it made the specimens more readily accessible for scholars and students. According to Thorne, Curator of the combined collection, the POM/RSA herbarium would be the third largest in Western United States and the facilities at Claremont a major center for the study of the flora of Western North America. In 1974 the POM/RSA collection was nominated as a National Resource Collection, one of 25 in the United States and one of five in Western United States.

In the combined POM/RSA herbarium the families of vascular plants are arranged within the class or subclass, genera alphabetically within the family, and species alphabetically within the genus. Major geographical areas of the world are indicated by colored stripes on the genus cover margins.

In addition to California plants the POM/RSA collection is particularly rich in material from western North America, northwestern and tropical Mexico included; and because of the special interest of Sherwin Carlquist, Robert Thorne, and their students, in Australia, New Guinea, New Caledonia, Polynesia, and other Pacific islands, and also in smaller plant families of special phylogenetic importance.

Staff research since 1960 has been along many lines but, in accord with previous goals, largely emphasizes evolutionary biology with systematics as the central core. The work of individual members of the staff, (in alphabetical order) will be only briefly reviewed here. Full reports of research activities as well as lists of published papers are to be found in the annual reports.

Dr Benjamin's research since 1960 has involved primarily the taxonomy and morphology of Mucorales and Laboulbeniales. In the former group, he has specialized on the so-called merosporangiferous forms and on the Thamniaceae. His studies of the "merosporangiferous Mucorales," begun in the 1950's, earned for him in 1963 the New York Botanical Garden's award for *Outstanding Contribution to the Fundamental Aspects of Botany*, and his papers on these fungi, all published in *Aliso* from 1958 to 1965, were reprinted as Volume 5 of *Bibliotheca Mycologica* in 1967 published by J. Cramer, Lehre, Germany.

Dr Benjamin has assembled one of the largest collections of living cultures of the Thamniaceae in existence. Much of the detailed study of these has been carried out by Gerald L. Benny, student of Dr Benjamin, from 1969 to 1973, and the results of the studies by both Benny and Benjamin are being published jointly in *Aliso* as a revision of the family.

Dr Benjamin's work on the Laboulbeniales goes back to his student days at the University of Illinois. His collection of these specialized insect parasites undoubtedly is one of the largest in the world and is the result of not only his own collecting activities but also the generosity of a great



Dr Philip A. Munz (left) and Dr Lee W. Lenz. 1967. Photograph by Wentzel.

number of colleagues at home and abroad, especially entomologists, who have contributed specimens through the years. Benjamin's studies of Laboulbeniales have resulted in publications, primarily of a descriptive nature, on a variety of new and interesting representatives of these fungi, especially those occurring on semiaquatic bugs. In 1971 he prepared a detailed *Introduction and Supplement* (155 pp.) to accompany a reprint edition of the classic five-part monograph by Roland Thaxter of Harvard University, *Contribution Towards a Monograph of the Laboulbeniaceae* (1896-1931), published by Cramer (*Bibliotheca Mycologica*, Volume 30). Benjamin also contributed a chapter on the Laboulbeniomycetes for Volume IVA of *The Fungi* published by the Academic Press.

Dr Benjamin was elected President of the Mycological Society of America in 1965 and in 1971 became Editor-in-Chief of its journal, *Mycologia*. He served in this capacity for five years. He has been editor of the garden's journal, *Aliso*, since 1958.

During the early 1960's, Dr Carlquist was largely employed in a study of the wood anatomy of the Compositae which resulted in the publication of 13 research papers. His book, *Comparative Plant Anatomy* was published in 1961 by Holt, Rinehart and Winston. During the academic year 1962-63 he was on sabbatical leave and spent the time in the South Pacific

and Orient where his botanic work emphasized the study of *Scaevola*, a member of the Goodeniaceae. In 1965 his book, *Island Life, A Natural History of the Islands of the World* was published by the Natural History Press. The 452 page semipopular work dealt with the characteristics and peculiarities of island plants and animals and was accompanied by a series of scientific papers bearing the general title of "The Biota of Long Distance Dispersal." In 1967, Carlquist was presented the Henry A. Gleason award of the New York Botanical Garden for his book, *Island Life*, published earlier. Most of the year 1967 was spent overseas in field work related to a series of studies on insular woodiness. In 1970 his 463 page book, *Hawaii: A Natural History* was published by the Natural History Press. Carlquist was abroad again in both 1973 and 1974 as well as during the summer of 1977. In 1973 his book, *Island Biology* was published by Columbia University Press and this was followed in 1975 by *Ecological Strategies of Xylem Evolution* published by the University of California Press.

In 1974 Dr Carlquist was named Violetta L. Horton Professor of Botany in the Claremont Graduate School and in 1976 was given a joint appointment with Pomona College.

The Polemoniaceae continued to receive the greatest amount of Dr Grant's time during the 1960's, work originally going back to his graduate studies at Berkeley. By 1960 work on the cobwebby gilies in which Grant assisted by Alva Day Grant was nearly completed and they were beginning work on the tetraploid species, an investigation that would be continued for several years. The Grants were also interested in flower pollination in the Polemoniaceae as well as in the general flora. Grant's book, *The Origin of Adaptations*, was published in 1963 by Columbia University Press and in 1964 the work was to gain for him the Phi Beta Kappa award in science along with a prize of \$1,000. The same year Grant's *Architecture of the Germplasm* was published by John Wiley and Sons.

Karen A. and Verne Grant's *Flower Pollination in the Phlox Family*, the culmination of six years of study was published in 1965. By this time the Grants were spending considerable time studying hummingbird pollination in the general flora and this resulted in 1968 in the publication of *Hummingbirds and Their Flowers*. The latter two works were published by Columbia University Press. In 1967 Grant accepted a position at Texas A&M University and resigned effective at midyear.

In the early 1960's Dr Lenz's research continued to be an investigation of the species of *Iris* and after work on the Pacific Coast species was completed and published, an investigation of the spuria irises was undertaken. Work on this group was completed in 1964 and the results published in *Aliso*. In 1969 the British Iris Society presented the Foster Memorial



Centuries-old live oaks (*Quercus agrifolia*) line the eastern edge of Indian Hill mesa. Until at least as late as 1917 a permanent stream flowed along the base of the mesa. The oaks supplied acorns for the Indians who lived on the mesa until about 1880.

Plaque to Dr Lenz in recognition of his contribution to a better understanding of *Iris*. *Iris* hybridization studies which were initiated as early as 1948 have continued and a number of named clones have been introduced into the horticultural trade. Because of their specialized nature, they are not included in Appendix III.

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By 1965 Lenz had initiated a biosystematic study of the tribe Allieae (exclusive of the genus *Allium*). Because of the large amount of field work necessary this project has occupied most of his research time since. In connection with his biosystematic study of *Triteleia* he has assembled an extensive collection of living cultures collected from natural habitats. By 1975 results of these studies were being published under the general title "A Biosystematic Study of *Triteleia* (Liliaceae)."

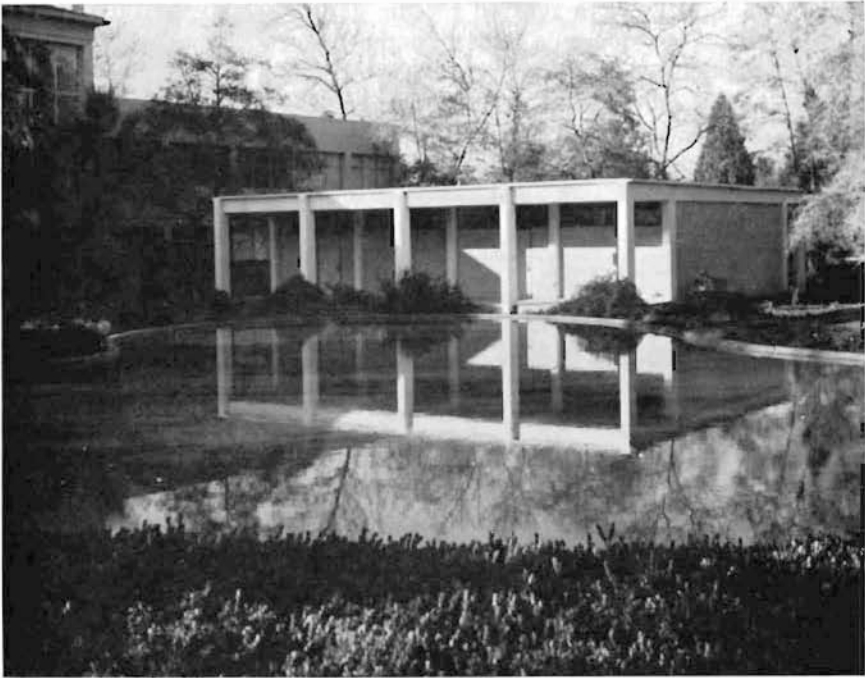
The development and introduction into horticulture of elite clones of California native species and hybrids (other than iris) has continued under the direction of Lee Lenz and Percy Everett and later John Dourley. These are listed and described briefly in Appendix III.

In 1968 Dr John Pierre Simon of Cornell University was appointed as Experimental Taxonomist. Dr Simon (b. 1938), a native of France, received his education in Chile, Australia, and Canada before going to Cornell. In naming a biochemical systematist to the staff, the garden entered a new phase of taxonomy. Simon's tenure at the garden was short and in 1970 he resigned to assume a position in Cuba with UNESCO.

In 1972 Dr Ronnie Scogin was appointed Experimental Taxonomist at the garden and Assistant Professor of Botany at the Claremont Graduate School. Dr Scogin (b. 1941) a native of Texas and a graduate of the University of Texas, Austin, was Assistant Professor of Botany at Ohio University at the time of his appointment. This was the first joint appointment between the botanic garden and the Claremont Graduate School.

The addition of Dr Scogin to the staff allowed the development of the graduate and research programs in the area of comparative plant biochemistry for systematic purposes. In this connection laboratory facilities were expanded to permit both micromolecular and macromolecular comparative phytochemical studies. In 1975 Scogin was one of four authors asked to prepare a review of the role of comparative phytochemistry in plant phylogenetic studies.

For several years after assuming the duties of Taxonomist and Curator of the Herbarium in 1962, Dr Thorne spent much time in the field familiarizing himself with the flora of the state and in filling lacunae in the garden's collections. One of his first projects was the initiation in 1964 and publication in *Aliso* in 1967 of "A Flora of Santa Catalina Island." Other California projects, some already resulting in publications, have included floristic and vegetation studies on other California islands, the Santa Rosa Plateau, the Mojave Desert, and various southern California mountain ranges, often in collaboration with botanists at other institutions. His new classification of the plant communities of California was published in 1976 in a symposium volume as "The Vascular Plant Communities of California." Beginning in 1965 with the physical amalgamation of the



Laboratory annex.

botanic garden and Pomona College herbaria much of his time was devoted to the reorganization and upgrading of the collections.

One of Thorne's longtime interests has been the phylogeny of the angiosperms and for a number of years he has been working on a book covering the subject, portions of which have been published separately. In connection with his phylogenetic studies he had earlier published two significant papers, the first "Some Problems and Guiding Principles of Angiosperm Phylogeny" appeared in the *American Naturalist* in 1963 and a "Synopsis of a Putatively Phylogenetic Classification of the Flowering Plants" appeared in *Aliso* in 1968. A much-expanded and modified version of these two papers with some explanation of his realignments, titled "A Phylogenetic Classification of the Angiospermae," was published in late 1976 in volume 9 of *Evolutionary Biology*.

Thorne served as President of the American Society of Plant Taxonomists in 1968, and the Pacific Section of the Botanical Society of America in 1977.

During the 1960's the library continued to develop at about the same rate as it had in the previous decade. In the early 1960's special attention was given to the filling in of gaps in the files of journals and in 1960, approxi-

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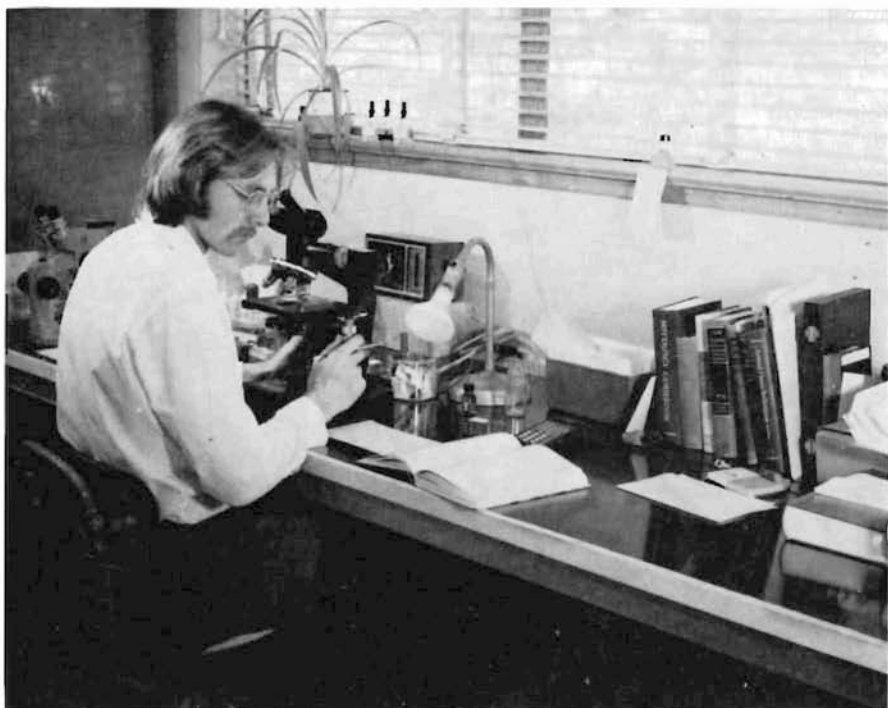
mately 12,000 pages were xeroxed for the garden by G. K. Hall and Co., Boston, Mass. New journals added to the collections were often in the form of microfiches, a satisfactory method of handling rare and little-used periodicals. Not only were they less expensive than regular editions which often were unavailable, but they require less space for storage. Beginning about 1962 special emphasis was placed in binding the completed journals and this continued throughout the decade with the result that at the end of 1969 the library's holdings were for the most part in a very satisfactory condition.

The librarian reported that in 1969 the garden was receiving 464 serials either by subscription or on an exchange arrangement and coverage was worldwide in scope. Book purchases since 1960 have been somewhat fewer than in earlier years and have consisted to a large extent to works of special interest or importance to taxonomy and related fields, in world floras and after the appointment of a biochemical systematist, in the fields of biochemistry and biochemical taxonomy. In addition to the garden's own acquisitions, Honnold Library has deposited its botanical titles in the garden's library, thus making available in one place nearly all the botanical and horticultural works in Claremont. In 1976 Honnold Library published the Union Science Serials List (2nd ed.) which shows all science publication received in Claremont. This listing is of great value because scientific journals are scattered in various departmental or institutional libraries throughout Claremont.

In 1971 with the assistance of graduate students, the garden's extensive collection of seed catalogues was organized on an alphabetical basis by state and/or country and then filed in 312 pamphlet boxes and stored in the herbarium.

In January 1973 a portion of the books in the library was subjected to water damage due to failure of the roof to drain properly after exceptionally heavy rains. Fortunately, due to the quick action of graduate students and staff using paper towels, hair driers, as well as the herbarium plant drier, only 14 of the 90 damaged books and periodicals required rebinding.

Throughout the 1960's the librarian's position was on a halftime basis but toward the end of the decade the use of the garden library by students from the colleges as well as by graduate students in botany and visiting scholars had become so great that in 1970 the position was made full time. One of the problems with the part-time position was in keeping it staffed with trained librarians, for most of the garden's librarians during the 1960's resigned to assume full-time positions, mostly with the Claremont Colleges. Voldemar Siska was librarian between 1961 and September 1965 when he resigned to return to Australia. Myra White (Mrs Alvin) was appointed to



Graduate student Bruce Tucker in mycological laboratory.

replace Siska and she served until 1968 when she was given leave of absence to be with her husband who was taking a sabbatical leave from Claremont. Bertha Makow (Mrs Yoram) was appointed librarian during Mrs White's absence and when she resigned in 1969 she was replaced by Ardra FitzGerald (Mrs John). In 1970 Beatrice Beck (Mrs Myron) was appointed the garden's first full-time librarian. Mrs Beck had previously been a librarian at California State College, Los Angeles (now California State University), before coming to the botanic garden.

The year 1960 was important for the number of capital improvements made at the garden. A new 35' by 60' screenhouse was constructed just east of the existing lath house. It was custom built by Aluminex Inc., Los Angeles, and was glass roofed and screen sided with six individual compartments and a corridor. The structure is protected from the direct sun with plastic Saran netting. With the completion of this structure it was possible to carry on pollination and hybridization studies without fear of accidental pollinations being made by free-flying insects. With only screen

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siding, plants were able to grow under almost the same conditions they would have had in the open garden.

The second major project was the complete overhauling of the two existing greenhouses made necessary by the failure of the heating systems and the need for a modern mist room for the rooting of cuttings. This work was done jointly by Aluminex Inc. and Southern California Greenhouses Mfg., Rosemead.

The third major improvement was the installation of 96 new steel herbarium cases on the second floor replacing the original wooden cabinets. The cases supplied by Jack Sheehan of Bloomington, Illinois, are slightly taller than those previously used, thus allowing more specimens to be stored per unit. Beginning late in 1960 the botanic garden was opened to the public between 8 AM and 5 PM every day of the year except for four major holidays. Since moving to Claremont, it had been closed Saturday afternoon and Sunday. After the new policy was put into effect the number of visitors increased dramatically because many potential visitors were unable to visit the garden on regular week days. By 1976 the annual number of visitors had passed the 100,000 mark.

In 1961 the major development of the grounds was the completion of the home demonstration garden. Designed by the firm of Hahn and Hoffman, Sierra Madre, it is located on the west side of the garden and covers an area approximately the size of an average city lot. A structure was built, using wooden panels, which assumed the size and shape of a house, this in order to provide areas for the planting of various native materials requiring differing amounts of sun and moisture. A fountain, stream, and pool were constructed to give added character to the garden and a brochure provided information about the plants used. In 1962 a large decorative double-sided sign was erected at Foothill Blvd. and College Ave. which aids visitors in locating the garden. The sign designed by Criley, McDowell and Associates, Claremont, was built by Claremont Contractors. Of concrete and steel, it bears a large stylized sycamore leaf and bronze lettering.

In order to call attention to a particularly fine flowering specimen or rare plant, a Plant of the Week program was initiated in 1962. The new feature was very popular with visitors who were directed to the display by means of special directional signs. Due to the popularity of this feature it has been continued.

Through the generosity of the Simpson Lumber Co., Arcata, a large cross section of a redwood log (*Sequoia sempervirens*) was presented to the garden and installed along one of the paths west of the administration building beside living specimens of the same species. Although small compared with logs harvested in earlier years, the garden's, which is six and a half feet in diameter, was about 1,300 years old at the time that it was cut.



Home demonstration garden.

The year 1965 marked the end of the first 15 years of the garden's existence at Claremont and the Superintendent marked the occasion by reporting that over 200,000 plants had been set out, with over 11,000 being planted in 1965. He also reported that in the garden there were representatives of 112 plant families including 407 genera and about 1,345 species. At the time the garden was growing all the oaks native to California; all the Coniferales with the exception of nine species; all species of the Taxales; and all but three species of the Cactaceae. Of the 72 species and varieties of *Arctostaphylos* native to the state all but five species and seven varieties were to be found in the garden's collections. Of the 29 plant communities recognized by Munz and Keck, 20 were accounted for in the plant community area. Of the special gardens the Superintendent commented upon the development of the rock garden, the desert and coastal sand dunes gardens, as well as the pool and streamside plantings.

The plant community area, until 1965 closed to the general public, was

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informally opened after the roads were asphalted and suitable labels and directional signs had been installed. The road work was done by the Laird Paving Co., Claremont.

The annual reports for the 1960's often called attention to problems of pest and disease control and in 1968 the Superintendent detailed at some length the problems encountered saying "In the future it will be necessary to place greater emphasis on plant protection and nutrition These programs constitute an additional burden on the outdoor staff, but to keep the garden plantings in a healthy condition they are vitally important."

In 1966 for the first time smog was reported to have damaged plants at the garden and reports on smog damage are to be found in nearly all reports published after that date. In some years damage was very severe, causing total losses of some plantings. At present Pomona Valley is one of the most severely affected areas in the greater Los Angeles basin and smog continues to affect adversely many of California's native plants.

In 1971 it was reported that the wood rat, or pack rat, had caused considerable damage to trees and shrubs and this same statement has been repeated in every report since. No rodent has ever caused as much damage to the garden's plantings as has the dusky-footed wood rat and all possible means of control have had to be employed. In recent years the garden has been surrounded on three sides by developments and on the fourth side by natural vegetation. During the long hot summers the garden becomes an oasis and rodents of all kinds enter the garden attracted by the availability of food and shelter. Beginning in 1977, the Claremont University Center has declared the undeveloped area an ecological preserve and under such circumstances it will be impossible to eliminate destructive rodents from the garden. They, along with air pollution and deteriorating water quality, will continue to be the greatest threats to the future of the botanic garden.

In 1971 the Superintendent also pointed out two other areas of concern: vandalism and an increase in the number of breaks in the main four-inch pipe lines. The breaks, which sometimes numbered as many as four in one day, appeared to be due to excessive corrosion of the pipe itself and many occurred near welds. By 1968 the situation had become so serious that a decision was made to take corrective action. There were two alternatives: replace the pipes, which originally had been manufactured for temporary usage only; or line the pipes with a thin layer of cement, a process perfected by Pipe Linings, Inc., Wilmington, and successfully employed by oil and water companies in many parts of the world. To replace the entire system would have necessitated the destruction of many plantings, some of which were then nearly 20 years old. The decision was made to have the pipes lined and Pipe Linings Inc. received the contract. Destruction to

plantings was minimal because as many as 600 feet of pipe could be lined between small excavations which could usually be located in areas free from vegetation. In all, over 9,000 feet of pipe were lined at a cost of about one half that of new pipe. The work was completed within a few days in December. There was a noticeable increase in water pressure due to the smooth inner ceramic surface of the pipes which allowed water to flow more freely than it did in the rust-coated pipes. Between 1970 and 1977 no leaks have appeared in the lines that were coated.

Water for the botanic garden is supplied by the Southern California Water Company and is stored in a large reservoir at the northeast corner of the garden. Normally the reservoir is filled automatically during the night but during the drought of 1976 the water company was unable to supply sufficient water during peak periods with the result that garden irrigation had to be curtailed at critical times. To remedy this situation a new four-inch high-pressure line was brought in from north of the garden and the water, which is fed directly into the reservoir, is controlled by a float valve. In the future it should be possible to maintain a full reservoir at all times.

A notable first blooming took place in the garden in 1969 when plants of the Joshua tree (*Yucca brevifolia*) bloomed at the age of 18 years. The plants had originally been put in the plant community area from six-inch pots during the winter of 1951, being some of the first of this species set out at Claremont. A second notable blooming occurred in 1973 when a plant of *Nolina parryi* ssp. *wolfii* blossomed for the first time. The plant was 34 years old and had been moved to Claremont from Santa Ana Canyon in 1951. The subspecies *wolfii* is known only from a small area in San Bernardino and Riverside counties where it grows in the pinyon-juniper and Joshua tree woodlands.

Beginning in 1972 the annual reports were published separately from *Aliso* and in the one for 1973 the Superintendent, John Dourley, contributed as a special feature a description of Christmas in the garden. He reported taking a leisurely tour of the grounds at Christmas time noting the large number of species then in flower: manzanitas, California lilacs, the strange rather naked-looking chuparosa from the desert with its tubular red flowers, as well as the familiar desert ocotillo with its long wandlike stems topped by a cluster of brilliant red flowers, the California fuchsia with its low mats of bright red flowers, and everywhere toyon covered with masses of bright red fruits already being eagerly attacked by many of the birds overwintering in the garden. The Superintendent concluded by saying, "Those who found time to escape from the pace of the Festive Season realized that peace and tranquility could be found in the City of Claremont."

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In the 1974 report Horticulturist Tilforth contributed an article entitled "The Old Originals" in which he described and gave measurements of the largest oaks and sycamores as well as a few notable shrubs then growing in the garden. This was the first time detailed information had been published about the magnificent live oaks (*Quercus agrifolia*) that contribute so much to the beauty of the garden. Tilforth pointed out that the largest tree had an 83-foot spread, was 63 feet tall, and at 4.5 feet from the ground the trunk had a circumference of 13 feet 5 inches. Many young couples have exchanged wedding vows under the canopy of this tree since the garden moved to Claremont.

In the 1975 Annual Report Tilforth wrote of the "Aliens In A Native Plant Garden" in which he listed all the weeds that had been found growing in the garden, a list of 85 species belonging to 27 plant families. He also included information about the history of introduction of some of the weeds into California as well as the ways in which many of them have been distributed.

After the garden moved to Claremont, the original site reverted to the Bryant estate and the garden plantings made earlier received no further care or watering. Over the years many of the plants disappeared but some continued to thrive without care. No study had been made of the survivors until Tilforth began, during the fall of 1976, a survey of the plants still growing at the original site in Orange County. His findings are to be published in the annual report for 1977.

The largest and most interesting grounds project undertaken in many years was the construction of the Ernest R. Johnson Memorial Oval which is situated to the south of the administration building. It was designed by Guy H. Moore of Guy Moore and Associates, Beverly Hills, who generously donated his time and talent to the project. After the area had been tilled and graded, many tons of soil were added to achieve an undulating topography. Two pools and a stream bed were dug after which the irrigation and electrical systems were installed. Pacific Linings Co., Indio, contracted to cement-line the pools and stream. Later, over 60 tons of granite boulders were selected from the Holiday Rock Co. gravel pit, Upland, and transported to the site where, with the aid of a large crane and operator, Guy Moore supervised their placement. By December most of the planting had been completed except for two large buckeye trees (*Aesculus californica*) which were moved in the following year by the Tetley Tree Co.

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Horticulturist Dick Tilforth beside a plant of *Nolina parryi* spp. *wolfii* in the Kingston Mts. Photograph by Thorne.

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of Corona. Funds for the memorial oval were contributed by the Johnson family and friends. Later a bronze plaque was placed on the face of one of the granite boulders designating the area as the Johnson Memorial Oval, a tribute to the garden's first Superintendent.

During the 1960's three appointments were made to the Board of Trustees: Ernest A. Bryant III was appointed a Trustee in 1960 to replace Robert Casamajor who died on 19 February 1960. Mr Bryant is the grandson of the founder of the garden. In December 1966, Susanna Bryant Dakin (Mrs Richard Y. Dakin) and seven members of her family died in the crash of a private plane near La Paz, Baja California. Mrs Dakin was the daughter of the founder of the garden and had been a staunch and loyal supporter of its many activities. Oscar T. Lawler of Los Angeles, a senior Vice President of Security Pacific National Bank, was appointed a member of the Board to replace Mrs Dakin. In 1969, James D. Macneil of Los Angeles was appointed a Trustee to replace Irving M. Walker who died on 9 June. Mr Walker had been a member of the Board of Trustees since 1939. Mr Macneil is Executive Vice-President of Title Insurance and Trust Co. of Los Angeles.

Staff appointments during the 1960's included that of John Dourley (b. 1922) who in 1967 became Superintendent upon the retirement of Percy C. Everett. John Dourley came to the garden from the Morris Arboretum, Philadelphia, where he had been Superintendent for 13 years. 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.

Upon his retirement, Percy Everett was granted the title of Superintendent Emeritus and volume six of *Aliso* was dedicated to him with appropriate photograph and citation. Everett had served the garden faithfully for nearly 35 years and under his capable administration the grounds and plantings had reached a high degree of excellence. Percy Everett died on 5 August 1973 and in his memory the Inland Chapter of the California Association of Nurserymen donated funds for the establishment of the Percy Everett Memorial Fern Garden which was later established in a cool recess on the east side of the mesa. A bronze plaque was installed marking the site.

Upon the death in 1974 of Stuart O'Melveny, Henry M. Duque was appointed to the Board. Mr Duque is Executive Vice-President and Secretary of Western Federal Savings and Loan Co. Mr O'Melveny was the retired Chairman of the Board of Title Insurance and Trust Co. of Los Angeles and a member of a distinguished family of Los Angeles attorneys. Mr O'Melveny had served as a member of the garden's Board of Trustees since 1935.

In 1969 Horticulturist Nick Lolonis resigned to accept a position with a large cutflower nursery in central California. The Superintendent paid tribute to him by saying that he had done a commendable job in compiling information of value on plant nutrition and pest control in the garden. Lolonis, who held a degree in horticulture from the University of California, Davis, had come to the garden in 1961.

In March 1969 Clarence W. (Dick) Tilforth (b. 1916) joined the garden as Horticulturist. Tilforth had held the position of Assistant Superintendent at the Los Angeles State and County Arboretum, Arcadia.

In 1970 Betty Brunstad (Mrs Dean Brunstad) was appointed Secretary replacing Mrs Cleedith Rue who had resigned. Before coming to the garden Mrs Brunstad had been with the Office of Development at Scripps College.

The Youth Education Program was inaugurated in 1966 under the direction of Mrs Mary Coffeen. During its second year over 4,000 students had entered the program which was primarily designed for grammar school students but which also served other organized groups such as the Blue Birds, Boy Scouts, and Cub Scouts. By 1967 the program had its first volunteer guide (later called Nature Interpreters) when Mrs George Shipway offered her services to the group. In later years the Interpreters increased to as many as 15 thus making it possible to handle larger numbers of students arriving at the garden as organized classes from school throughout southern California. Each year Mrs Coffeen arranged a series of training sessions for prospective Interpreters who, when they finished the course, joined the ranks of the volunteers. In 1967 Mrs Coffeen and Percy Everett prepared for display, in a glass-fronted case along the Nature Trail, a complete collection of cones of all the cone-bearing plants of California. In September 1971 Kenneth Zakar was appointed as Supervisor of the Youth Education Program to replace Mrs Mary Coffeen who had resigned earlier. Zakar, who held the position until January 1977 was a native of Illinois and a graduate from California State University, Los Angeles. On 1 January 1977, Bernadette Busenberg (Mrs Stavros N. Busenburg), a former Nature Interpreter, became Supervisor of the Youth Education Program.

Toward the end of the 1960's space in the administration building and the east wing had become so scarce that it was impossible to carry on efficiently all the research activities then under way and a decision was made by the Board of Trustees to construct an annex that would house the biochemical systematic and anatomical laboratories. A proposal was prepared to be submitted to the National Science Foundation requesting matching funds. The proposal was submitted to the National Science Foundation by the Claremont Graduate School and in January 1968 notification was received



Youth Education Supervisor, Mrs Mary Coffeen, with class in cactus garden. RSA.

that it had been approved and funded. The building of steel and poured concrete, was designed by Criley, McDowell and Associates, Claremont. Located to the north of the administration building it provided two large laboratories with full basement. The building was designed so that in the future it would be possible to add a second floor and the annex and administration building then joined by a passage at the second floor level. The general contractors were Meisch Brothers, Pomona, who completed the building in December 1970.

In connection with the building of the annex a large free-form reflecting pool was constructed east of the annex and north of the administration building. This attractive addition to the garden was not planned originally but developed as a solution to the problem of supplying a source of water adequate for fire protection.

In 1971 the garden filed an application for a United States Plant Patent to cover an exceptionally fine hybrid barberry that had been developed at the garden. The selected clone was designated 'Golden Abundance' be-

cause of the masses of golden-yellow flowers produced early in the spring and later in the summer replaced by masses of blue-purple fruits, much relished by birds. Details of this hybrid will be found in Appendix III. The plant patent, number 3332, was granted in 1973 and propagation rights were assigned to Monrovia Nursery, Azusa, on a fixed royalty basis. It is believed that this is the first plant patent granted to a botanic garden. 'Golden Abundance' is perhaps the garden's finest horticultural achievement.

Also in 1971 the botanic garden applied for accreditation by the American Association of Museums. After a thorough examination of the garden's operations by the association's Accreditation Visiting Committee, the Rancho Santa Ana Botanic Garden in early 1972 became the second botanic garden granted full accreditation by that organization.

At a meeting of the Board of Fellows of Claremont University Center on 11 November 1976 and upon recommendation of the board's Committee on Land Policy, the botanic garden was granted use of a parcel of land extending from Foothill Boulevard north to the garden's present property line and east from College Avenue a distance of approximately 350 feet. The agreement was made on the basis of a one dollar-a-year lease. Although as yet unsurveyed, the plot contains approximately 10 acres of undeveloped land originally coastal sage scrub but at present badly disturbed. In recent years the area has been subjected to numerous fires and a portion of it has been the site for the dumping of excess soil, sand, and gravel from nearby construction sites.

According to Munz and Keck ⁹⁵ both the Californian and Sierran Botanical Provinces find their southern limits in northern Baja California. By restricting the garden's operations to the geographical boundaries of the state, both of these unique and floristically distinct provinces were bisected. With the new land made available by the Claremont University Center and by action of the garden's Board of Trustees at a meeting 25 April 1975, the garden agreed in principle to develop the new area as the Baja California annex with geographical limits restricted to those portions of the state of Baja California Norte belonging to the California Province (The Baja California portion of the Sierran Province is included within the boundaries of the California Province). Geographically it includes the coastal area from the California state line south approximately to El Rosario and a few small off-shore islands, and the Sierra de Juarez, and Sierra de San Pedro Martir mountain ranges as well as Guadalupe Island.

Among common California trees and shrubs that reach their southern limits in northern Baja California are *Fremontodendron californicum*, lemonade berry (*Rhus integrifolia*), sugar bush (*R. ovata*), laurel sumac (*R.*



Botanic garden palm oasis. The California fan palm (*Washingtonia filifera*) is the only palm native to California.

laurina), fuchsia-flowered gooseberry (*Ribes speciosum*), madrone (*Arbutus menzeisii*), sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*) and Engelmann's oak (*Q. engelmannii*). Among the conifers are bishop pine (*Pinus muricata*), Jeffrey pine (*P. jeffreyi*), Coulter's pine (*P. coulteri*), lodgepole pine (*P. murrayana*), and the sugar pine (*P. lambertiana*) as well as the two pinyon pines (*P. monophylla* and *P. quadrifolia*).

Among those species which have their greatest distribution in Baja California but extend a short distance into San Diego County are pride of California (*Lathyrus splendens*), *Acalypha californica*, *Fremontodendron mexicana*, *Agave shawii*, and *Ornithostaphylos oppositifolia*. Species that



Marcus E. Jones 1852-1934. Utah mining consultant who published his botanical observations in a private journal, *Contributions to Western Botany*, "that is marked by its cutting criticism of almost all contemporaries." (Munz, *A California Flora*). His extensive herbarium owned by Pomona College is located at the botanic garden. Date of photograph and location unknown.

do not reach the California border include *Rosa minutifolia* and *Aesculus parryi*.

By adding the Baja California portions of the two botanical provinces it will be possible for the garden to have representatives from the entire geographical range of those species that extend south of the state line. The garden's sphere of operations will thus be circumscribed on a phyto-geographical rather than a political basis. At present this portion of Baja California is not included in any published flora.